BLOCK CHAINS & CULTURAL PADLOCKS

Digital Strategy Research Report

Towards a Digitally Cooperative Culture:
Recommoning Land, Data and Objects

221A

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Published by

221A
16-1265 Howe Street
Vancouver, BC, V6Z 1R3
Canada

Unceded Territories of the xʷməθkwəy̓əm (Musqueam), Skwxwú7mesh (Squamish) and Səl̓ílwətaʔ/Selilwitulh (Tsleil-Waututh) Nations

Mission

221A is a non-profit organization that works with artists and designers to research and develop social, cultural and ecological infrastructure.

Vision

221A envisions a pluralistic society in which all people have the means to access and make culture.

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Acknowledgements

Special thanks to the Canada Council for the Arts Digital Strategy Fund, the Goethe Institute, New Models and Blockchain@UBC for the financial, intellectual and strategic support.

Canada Council for the Arts | Conseil des arts du Canada | GOETHE-INSTITUT | Blockchain @UBC | NEW MODELS

E-Book ISBN: 978-1-7777153-0-4

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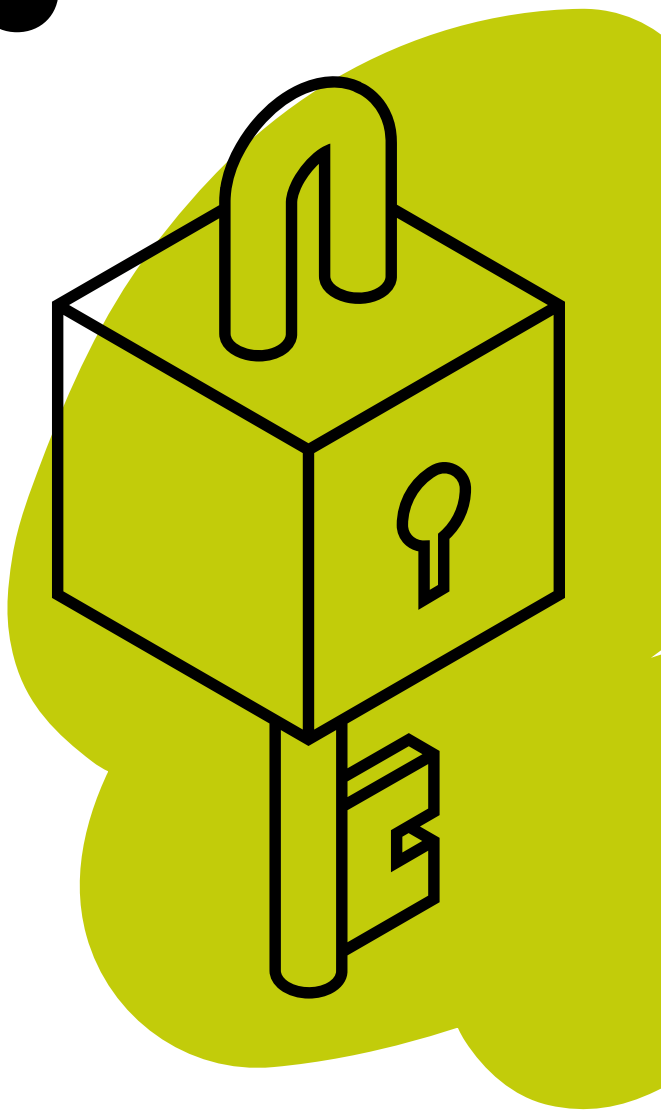


DIRECTOR'S FOREWORD

Beginning as a student-led initiative in 2005, 221A was initially animated by an opposition to the division between art and design. Leaving the university grounds in 2008 to establish our first public exhibition space, 221A would be shaped by the history and upheavals of our new home in Chinatown, the embattled neighbourhood itself a microcosm of a post-2008 economic recession, and the transformation of Vancouver before and after the 2010 Winter Olympics.

Operating under the intensifying conditions of neoliberal capitalism and individualism, in a "global city" such as Vancouver, in 2017 we envisioned a new kind of institution and shifted our operating model away from a presenting organization, to a research and infrastructure institution. *Blockchains & Cultural Padlocks* sits squarely within this new framework. With support from the Canada Council's Digital Strategy Fund, this multi-year initiative gathers a cross-sectoral network of researchers, advisors and partner organizations around the emergence of the blockchain, to interrogate and speculate on its social, cultural and ecological use cases, and advance its development as an institutional technology.

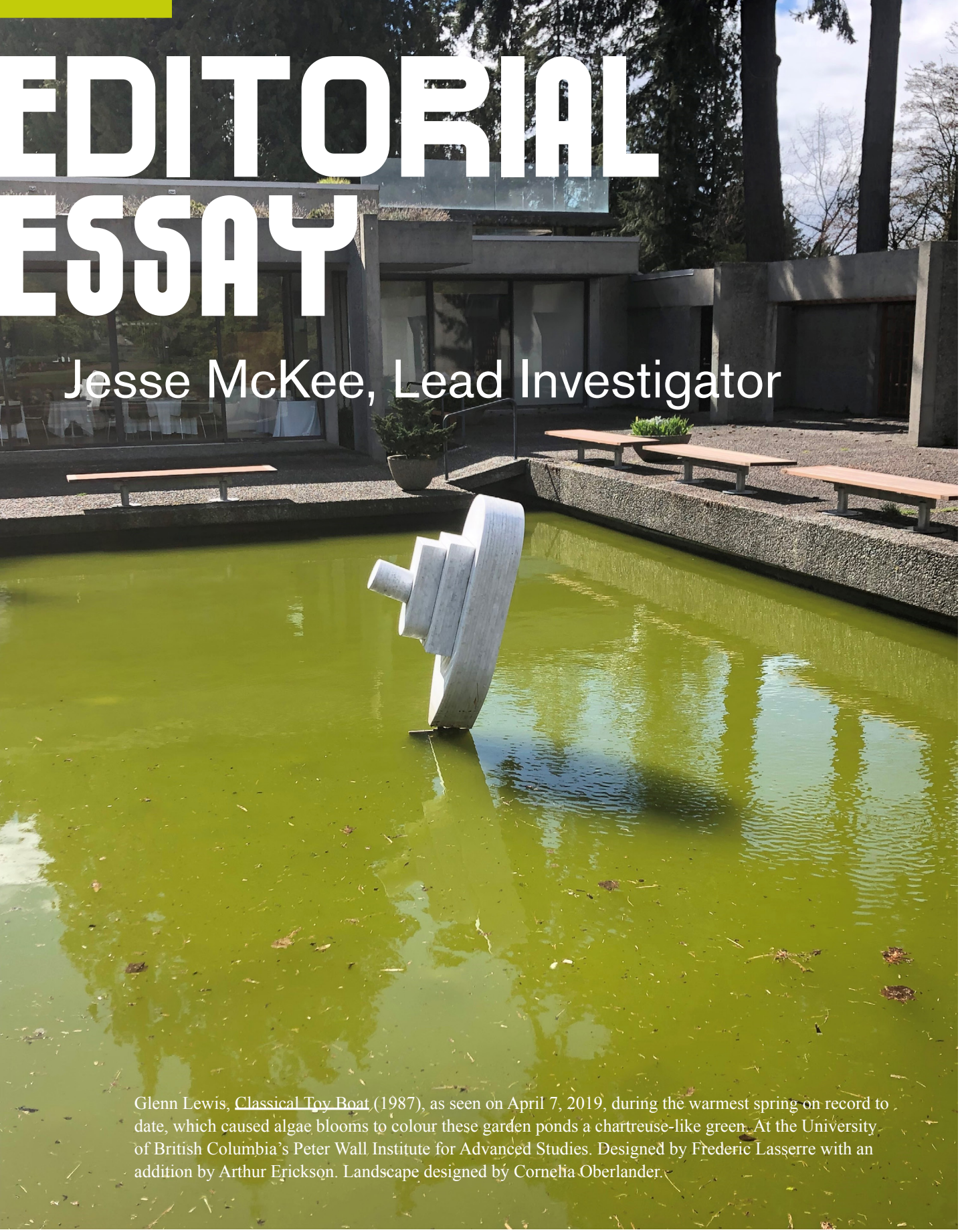
Culminating in the pages of this report, the Research Phase of *Blockchains & Cultural Padlocks* has yielded a values-based knowledge bank at a time of dizzying, accelerating developments in the blockchain space. This evolution is hastened amidst compounding, historic ruptures in our societies: a global pandemic, proliferating movements for racial and economic justice, the rise of authoritarianism and surveillance capitalism, looming climate catastrophe. In this study, we have leveraged cultural and equity-based perspectives, using critical theory, social and economic justice lenses to foreground moral and ecological imperatives for the speculative technology, to develop a digitally cooperative culture that works towards recommoning land, data and objects.

It is our hope that this report circulates widely and freely, seeding new networks, further proposals, debates, revisions and critical engagements initiated by the cultural, non-profit and education sectors, along with those of technology, social finance, energy, food and health. It will take a diverse and pluralistic stakeholder base to develop the blockchain space towards a more collective, interdependent and resilient future. I hope you will join us in this momentum.

Brian McBay
Executive Director, Co-Founder, 221A

EDITORIAL ESSAY

Jesse McKee, Lead Investigator



Glenn Lewis, Classical Toy Boat (1987), as seen on April 7, 2019, during the warmest spring on record to date, which caused algae blooms to colour these garden ponds a chartreuse-like green. At the University of British Columbia's Peter Wall Institute for Advanced Studies. Designed by Frederic Lasserre with an addition by Arthur Erickson. Landscape designed by Cornelia Oberlander.

221A's *Blockchains & Cultural Padlocks* Research Initiative was born at the beginning of 2019, and is supported by the Canada Council for the Arts Digital Strategy Fund. This fund is intended to support Canadian creators and cultural organizations to develop some acumen and potentially new infrastructures within the digital ecosystem, where we can seed new opportunities and experiment with new forms of conceiving, producing and disseminating cultural works and the efforts of cultural workers. 221A responded to this call by proposing research into the blockchain, the much-hyped and speculated about technology. The blockchain is the openly readable and unalterable ledger technology, which is most broadly known for supporting such applications as bitcoin and other cryptocurrencies. This report documents the first research phase in a three-phased approach to establishing our digital strategy, as we learn from the blockchain development communities. This initiative's approach is an institutional one, not one that is interpreting the technology for individuals, artists and designers alone. The central concept of the blockchain is that exchanges of value need not rely on centralized authentication from institutions such as banks, credit cards or the state, and that this exchange of value is better programmed and tracked with metadata to support the virtues, goals and values of a particular network. This concept relies on a shared, decentralized and trustless ledger. "Trustless" in the blockchain community is an evolution of the term *trust*, shifting its signification as a contract usually held between individuals, managed and upheld by a centralized social institution, and redistributing it amongst the actors in a blockchain network who uphold the platform's technical operational codes and can access ledgers of exchange. All parties involved in the system are then able to reach a consensus on what the canonical truth is regarding the holding and exchange of value within the system.

This changing nature of value is what drove our research. Not just the value of money, but how these economic terms can be applied to conceptions of social equity; the language travels with a polyphony. Economies are not science, but a secondary science built on top of human mores and cultural norms. Moreover, as is, the economy often operates in opposition to most biological science, be it human capacity and health or a particular bioregion's integrity. Our late-capitalist, growth-driven form of economics has been described by William E. Rees, the co-inventor of the ecological footprint tool, as "expansionist thinking is rooted in abstract economic models and monetary analyses that are devoid of biophysical data and ignore fundamental physical laws."[1] Rees was writing in 2003, and the impacts of the system he describes have been made increasingly visible to broader majorities of people as the century has progressed and we've witnessed an accelerating global climate—and perhaps have

[1] William E. Rees, "Carrying Capacity and Sustainability: Waking Malthus' Ghost," in (Theme) 'Introduction to Sustainable Development,' edited by David V.J. Bell, and Y. Annie Cheung, in *Encyclopedia of Life Support Systems* (EOLSS), Eolss Publishers, Oxford, UK.

become more widely legible within this first year of living amid a global pandemic. This self-terminating paradigm is so strong that it has become a primordial reactionary force that has an almost synthetic intelligence control over governments and international corporations, and it is the critical challenge of our lifetimes, and potentially one of the most important charges ever met by humanity. How we reorient these processes to be more coherent with the beings and territories the economic system moves over and through is the essential question, and the blockchain proposes a new, still-nebulous space where this work can be initiated.

As the values of the world shift in reaction to our popular understandings of this current destructive economy, the blockchain will find its place in the back-ends of our new start-ups, new community organizations, and even through experimental new currencies that are being imagined by and for specific networks. This is where it begins, much in a similar fashion to the way information and communication have been irrevocably changed in the past thirty years by emergent technological systems and capacities, dating back to 28.8 kbps download speeds powered by dial-up modems. The gradual, and then sudden, change to how we access and use information has become so mainlined that traveling to a rural place that flips your phone back to a 3G network feels akin to a trip to your grandparents house for a weekend when you were young; a quaint drag, but *boy* won't it be nice to get back to real life on the LTE and 5G networks we're used to. Much of this has come with benefits, but also drawbacks as we adjusted to cyber-crime, cyber-bullying, social media overdosing, constant surveillance as a business model, and now, information warfare in the political landscape that has destabilized western democratic governance models.

The printing press was feared and, in some cases, outlawed by pre-democratic European royal courts because it fueled social upheavals and powerful revolutions. The internet, until now, has mostly been based in information exchange. Though it is controlled by a powerful set of monopolistic and proprietary companies, it has nonetheless become a tool to unite people who have been oppressed by a globalized economy devoid of regional thinking and acting. The economic models we live under do not fit all places and work for all people; hardly. In the coming decades, we will continue to experience levels of upheaval and change akin to that of the information revolution; however, this time it will be the contracts and ties that bind us together through social and economic value that will be coevolving in ever-more responsive ways.

We have to recognize that at the time we entered the blockchain space, it was during a crypto winter. The major gains had waned, and we were experiencing a moment of adjustment to the fundamentals of the economy and the technology's development. That overhyped mood of the

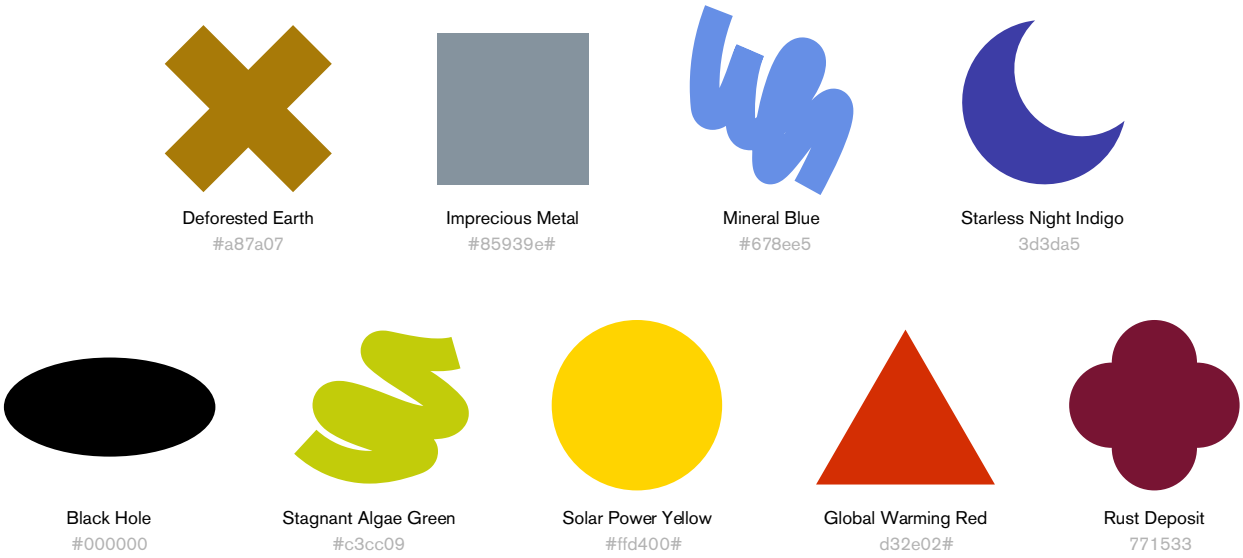
2017 crypto rise felt like an aberration to those who had been in the blockchain community for some time, as the technology had been built on the values of decentralization over traditional market value. The multi user shared hallucination of the overinflated crypto market led companies to simply point to the technology as a new pathway for their business without much else behind their announcements. It resulted in meteoric rises and falls in stock values for things like Kodak, who tried to brand cryptocurrency mining hardware with their nostalgic logo. And let us not forget about the iced tea company that "pivoted" to blockchain and saw a 200% increase in value. There's been much conspiratorial blog posting about this cool-down in the blockchain space, with some claiming that large corporations and financial institutions, governments and universities caused this crash in order to reclaim the technology and become more influential in its development.

We will continue to experience levels of upheaval and change akin to that of the information revolution; however, this time it will be the contracts and ties that bind us together through social and economic value that will be coevolving in ever-more responsive ways.

What was made clear coming out of this crypto-winter period is that the blockchain was unlikely (in the Global North at least) to replace transactional cash in small amounts that are currently managed by things such as coins, banks notes, debit and credit cards. These existing systems, though centralized, are still functional and deeply embedded in our social commons. Blockchain technology was too contested, too cumbersome and not user friendly enough for decentralized transactional currency to take off as a broadly popular use case. In the Global South, the threshold of access to traditional financial institutions (which port you into the existing digital commerce system, where access is ported via credit card and bank account) is too high for the majority, and so cryptocurrencies such as bitcoin are sewing a divergent or forked path. This has been demonstrated in Venezuela, where the social use of cryptocurrency has risen in the wake of the collapse of the former state economy. The technology is functional, as is well proven by bitcoin's endurance since 2008, and it has developed a new global subculture of users around it. However, it is not quite a prime-time technology or community yet. In terms of energy consumption and processing time, bitcoin itself is too cumbersome and should be thought of less as a cash asset and more of a reserve asset, like gold bars.

Though the proof of concept of the blockchain has been validated through the use of bitcoin to date as an asset class token, we still have not reached wide and popular adoption through

a socialized use case. The first essential and popular use case is what drives a technology's adoption, and for blockchain I do not think we have found that use case yet. As we publish this essay in the spring of 2021, the more dominant crypto currencies have not only regained the majority of their market values (when valued in fiat currencies), they have doubled the historic values of 2018. The blockchain space has been reignited with development interest as the overall global economy shifts and changes amid the COVID-19 pandemic. The GameStop scenario that took place in the mainstream stock market in early 2021 was validation that broad groups of people were ready to get involved in the work of developing new more accessible markets that re-ascribe value to new narratives. It felt like an acceleration towards the next layer of the internet; the internet of value. In tow, quickly after the GameStop scenario, we saw a tremendous increase in the crypto minting, collecting, trading and discourse surrounding the NFT or Non-Fungible Token. We have also seen countries such as Canada, Sweden and China, and platforms such as Facebook, prototyping centralized versions of cryptocurrencies, conscripting the technology in service to more traditional market forces.



Blockchains & Cultural Padlocks colour palette, developed by the initiative's lead designer Christy Nyiri, 2019.

Cultural Padlocks

So where does this lead us, in the art and design realms, in thinking about the potential use cases of the blockchain? Ben Vickers, who works as the Chief Technology Officer at London's Serpentine Galleries, is a leader among an emergent international community of cultural workers experimenting with the blockchain. Vickers describes the scenario as not so much a

new form of art and design, but a space where cultural workers are contributing to a new form of collective cultural praxis: "Artists who were previously thinking through almost utopian ideas or different organizational structures as part of their practice have got mixed up in the blockchain space, and then suddenly, they've found themselves migrating away from the art world. They're now participating in this emergent blockchain economy and are producing companies but working with an artistic toolset."[2]

Though the blockchain has yet to produce a widely used form of digital cash, it is useful at managing, trading and negotiating assets, both physical and digital. This application of the technology could enable new forms of collective governance over land, property and rights agreements. The stacking and layering of the land is nothing new for the digital space. Since the tech industry's origins, land has always been intrinsic to its identity and functioning—just think of Silicon Valley and Prairies, and now we have Crypto Valley in Zug, Switzerland.

> What was made clear coming out of this crypto-winter period is that the blockchain was unlikely (in the Global North at least) to replace transactional cash in small amounts that are currently managed by things such as coins, banks notes, debit and credit cards.

At the same time, land and territory have become one of the central focuses of cultural praxis, being tied to both ecological movements and anti-colonial practices. This invites the cultural worker to bring their theoretical learning, cultural research and discursive practices to contribute to multidisciplinary negotiations between the ever-complexifying forms of relationships among human and nonhuman entities, which need major structural reorganizing amid the accelerating emergencies and contingencies of the twenty-first century. Some early examples of this are demonstrated by blockchain coders, designers and artists who have developed nascent DAOs (distributed autonomous organizations) in order to begin the early imaginings of a smart commons for humans to commune and interrelate with other forms of life, such as pollinators, forests or green energy production projects within traditional Indigenous territories. These use cases are well demonstrated through experimental platforms such as Terra0, the beecoin project, and ChinookX, which use smart contracts to

[2] Ben, Vickers. *Artists as Cryptofinanciers: Welcome to the Blockchain*. August 9. 2018, theartnewspaper.com/feature/artists-as-cryptofinanciers-welcome-to-the-blockchain

negotiate sustainable agreements with meta data collected by DAOs in order to determine more co-evolutionary ways for forests, people, pollinators, and green energy projects to interface with the impacts of economies. These platforms prioritize working and trading at the scale and pace of the organic realm, which is too often externalized and a casualty in industrial society.

This expanded set of political possibilities of cultural praxis is urgently needed. It is time for us as a community of cultural workers to put our collective resources and shared cultural value where our mouths, minds and bodies are. We can achieve this lofty goal by renegotiating and designing how metadata is used and leveraged. This could allow for smarter, more responsive systems that sense and model the world around them. How these systems are designed and deployed is in the hands of the development community to hedge its utopian idealism and lean into the real challenges of redistributing power across networks. Cade Diehm points to the challenges ahead in his text "This is Fine: Optimism & Emergency in the P2P Network" for The New Design Congress, a platform he co-founded. Diehm recognizes the internet itself as a decentralized network, in which the power of peer-to-peer had been extinguished in the late 1990s and early 2000s with the copyright wars that countered the emergence of BitTorrent and software like Napster. This was resolved in a series of high-profile lawsuits that quickly placed power back into the hands of the industry, which held control of the commons. Since this time, how we access and distribute music has been rehashed through centralization with platforms like Apple Music (formerly iTunes) and Spotify. Diehm leaves the reader with two sharp challenges in advancing the power of the peer-to-peer within decentralized networks:

> *"By embracing a reverse Shock Doctrine as a Service, developing clear, historically-grounded narratives, and building sensitivity to the user's abilities and safety, these new decentralisation reformists can succeed where others have failed."*

> *"Designers must discard the tools that crush divergence and nuance, such as design thinking, user personas and so-called ethical design practice. There is a rich but incomplete field of emergent work to draw from: New frameworks such as Socio-technical Security, and Decentralization off the shelf, exist to assist protocol designers [better] understand and model interfaces and threats more completely and realistically. We must draw from groups that resist the Californian Ideology's definition of identity, from the 1970s civil-rights aligned student activists who fought against digitised student records, to today's Decolonise Design movement. Reformists must cede space for decision-making and expertise to under-represented or assailed communities."*[3]

[3] Cade Diehm. "This Is Fine: Optimism & Emergency in the P2P Network | The New Design Congress." *The New Design Congress*, July 2020, newdesigncongress.org/en/pub/this-is-fine/

The blockchain itself is a technology, not an ideology. The responsively designed systems Diehm conceives of will be crucial in a time of climate collapse, and a now long-tail global pandemic, which is intensifying economic/political instability. These systems can no longer function with the idea that there is a baseline normal. The systems need to be constantly adapting. The ways that value and assets are gained, held and redistributed is going to be far too complex to expect legacy forms of governance, such as centralized bureaucracy, to manage the risks and opportunities on the road before us. Moreover, the trans-national structure of the networks causes further potential for the power of the state to be recategorized and renegotiated through a decentralized apparatus.

This expanded set of political possibilities of cultural praxis is urgently needed. It is time for us as a community of cultural workers to put our collective resources and shared cultural value where our mouths, minds and bodies are.

But why should artists, designers and cultural workers be tasked with such lofty and real propositions?

From 2014 to 2016, the filmmaker Adam Curtis produced a series of documentary films for the BBC that provoked many cultural workers, including myself, to pause and reconsider our roles, our contributions and what we thought our voices were doing, a decade deep into the social media echo chamber. I bring up Curtis' narratives because he pays attention to the role, actions and impact of artists in society since WWII, as well as testing and prodding of the long-held narratives about revolution and freedom ascribed to by the left and progressives. First, in 2014, came the year-in-review short film *Nonlinear Warfare*, broadcast on UK television and widely distributed online. This film brought into perspective the growth of political populism fueled by social media companies on the rise. It focused on the effects of one of Vladimir Putin's closest advisors, Vladislav Surkov, known as the Grey Cardinal:

> *"'I am the author, or one of the authors, of the new Russian system,' Vladislav Surkov told us by way of introduction. On this spring day in 2013, he was wearing a white shirt and a leather jacket that was part Joy Division and part 1930s commissar. 'My portfolio at the Kremlin and in government has included ideology, media, political parties, religion, modernization, innovation, foreign relations, and ...'—here he pauses and smiles—'modern art.' He offers to not make a speech, instead welcoming the*

Ph.D. students, professors, journalists, and politicians gathered in an auditorium at the London School of Economics to pose questions and have an open discussion. After the first question, he talks for almost 45 minutes, leaving hardly any time for questions after all.

It's his political system in miniature: democratic rhetoric and undemocratic intent."[4]

Surkov's own dandyish past and training came from experimental theatre and conceptual art, before earning a degree in economics and taking roles in private media and communications. He then entered military and government roles in the 1990s, as Russia transitioned from its Communist collapse towards market and globalist economies which were skewed and mutated by the country's Oligarchs.[5] Surkov imported postmodern ideas into the heart of Russian politics, turning the Russian political machine into a vaudevillian cacophony by supporting both sides of political and territorial conflicts. His communications strategy supported neo-Nazi skinheads and liberal human rights organizations; Ukranian independence movements and pro-Crimea annexation forces. He then let Russia's public know that he was supporting forces that were traditionally opposed. This is a strategy designed to increase a stronghold on power that leaves little room for opposition because it is rendered fluid, bewildering and indefinable. The impact of this strategy was detailed in the Astroturfs of Offence study, conducted by the Agency of Shifting Uncertain Situations, which examined Surkov's role as a political strategist working with art theory to advance anti-egalitarian intentions: "in turn, no one knows who is 'genuine' and who is paid, and thus the default assumption is that everyone is equally corrupted and so no one can be trusted."

The inability of western governments to offer a vision of the future—one that meets the base realities of social equity, public health and the ecological essentials for continued life on the planet—has been accelerated by Russian and Russian-style psychological operations, leaving citizens misled, distrustful and rendered anxiously and violently partisan. The #Russiagate of the 2016 Presidential Election in the US, remains unresolved and a useful frame through which to examine the liberal sphere as it operates today. The liberal media found it easy to sell the cold war muscle-memory story of a complex Russian operation hijacking the US presidential election, while in fact its election interference impacts remain unknowable and indefinable. The psychological operations of leaking Democratic Party server contents, while stoking

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[4] Peter Pomerantsev. "The Hidden Author of Putinism." *The Atlantic*, 7 Nov. 2014, theatlantic.com/international/archive/2014/11/hidden-author-putinism-russia-vladislav-surkov/382489/

[5] James Dixon. "Is Vladislav Surkov an Artist?" *New Minds Eye*, 27 May 2016, newmindseye.wordpress.com/is-vladislav-surkov-an-artist/

the flame wars around race and immigration within the social media echo chamber, were chaotic disruptions in an already unstable world in the process of undoing itself. The liberal establishment couldn't deal with being accountable for previous Democrat voters who turned their backs on Hillary Clinton, nor take seriously voters who were being awakened by the calls of an accelerating right wing oriented around a hybrid class-race-info war. In the centralized, unregulated and unmediated social media networks, anger and nationalism connected and grew in power, reach and impact. The liberal establishment and media were unprepared and unwilling to deal with the force of this chaos within digital cultures. Big tech's impacts on the election were largely met with bewilderment and negligent arrogance by politicians, while being simultaneously embraced, championed and weaponized by far-right political strategists.

This has now given rise to further fissures, which were definitely not enacted by Russian agents. Meanwhile, Russian's industrial scale cyberwarfare went unnoticed until it was endemic. The delegitimization campaign attacking the entirety of the 2020 US electoral process—as well as the January 6, 2021 attacks on the U.S. Capitol by Trump supporters and an allegiance of white supremacists and conspiracy theorists—are but the effects of ongoing trauma enacted by the deeply seeded and mutating camps of anti-democratic and fascistic power. Bálint Magyar defines these ruptures as ongoing signs of an "autocratic attempt," which can be used to understand how progressively staged cultural shocks and the creation of false narratives can nudge a society towards anti-democratic processes, allowing for authoritarianism to gain footholds in formerly democractic societies. The majority of Republicans still back Trump, and would re-nominate him for the 2024 election. This creates a forking reality that sets up a "true President in exile" mythos for the GOP and its base. These ways of operating have mutated into info-wars, further advancing climate change denialism and COVID-19 misinformation, two long-tail scenarios that have now been irrevocably influenced by these actions. Directly responsible or now vaguely causal, what's the difference in this new perma-war of violently politicizing material threats, when a democratic population is rendered so divided and distrustful of their society's infrastructures and apparatuses?

What Curtis was foreshadowing in his portrait of Surkov's tactics have gone on to spread rapidly and globally into Western democracies and aspirational-authoritarian states alike. How can such ideologically divergent forms of politics be susceptible to the same weaknesses? Because we are all at the end of something: an unstable global climate on the ecological scale also means shared instability and weaknesses amongst the complex bonds that tie the democractic and non-democratic parts of the world together through trade, industry, migration and media. The role of digital networks needs to be understood as the accelerant in the scenario; softer forms of disinformation become system-level threats when spread within weak and

defenseless "open democratic communities," which are unmoderated on centralized and corporate networks. This was by no means a master plan. However, we now all live with the Russification of politics, and this has delivered a zombified injection into global liberalism, which feels like living in an un-dead state animated only by the momentum of a self-terminating modernity behind it.

Since 2016, the rise of the deep fake and cheap fake within this information warfare space has only further accelerated the momentum of a liberal world context collapse in a post-truth media landscape, where shared and widely understood narratives are being splintered and discarded amid the rise of disinformation and the active promotion of conspiracy theories as fuel for political capital. And while they stoke mass confusion, fierce and often violent debate, deep and cheap fakes have mostly served to consolidate power for those who hold majority control already. Amid this new (dis)-information threat, many who hold power are resorting to older forms of control, such as regulations that are quasi-forms of censorship, such as registering content creators through some sort of yet undefined public registry so that chains of transmission can be identified and surveilled. Even critics of these power plays often place the responsibility on the individual to do their homework so as not to be fooled by deceptive content. But both approaches are inherently neoliberal, aiming to control, regulate and punish the individual, rather than designing equitable changes to the system. A more equitable and decentralized approach, which would rely less on compliance and enforcement, would be to tie the content itself to shared factual realities through blockchain-backed smart contracts that could come embedded in audio, image and video files to verify the content as having been recorded, edited and produced at a certain place, time and the like. Ultimately, as summarized by information scientist Britt Paris and sociologist Joan Donovan, "new media technologies do not inherently change how evidence works in society. What they do is provide new opportunities for the negotiation of expertise, and therefore power."[6]

Curtis goes deeper into the role that social media has played in contributing to this context-collapse for the West in the first 10 minutes of his nearly three-hour 2016 film *Hypernormalisation*, released just after the Brexit referendum and a few months ahead of Donald Trump's election to the Presidency. Curtis traces "how we got to this strange place dominated by technological monopolies and political strongmen, who sold us a vision of a dream world that could never exist, and we went along with it because the simplicity they offered was reassuring." Curtis continues, "even those who thought they were attacking the

[6] Britt Paris and Joan Donovan. "Deepfakes and Cheap Fakes: The Manipulation of Audio and Visual Evidence." *Data & Society*, 18 Sept. 2019, datasociety.net/library/deepfakes-and-cheap-fakes/.

system—the radicals, the artists, the musicians and our whole counterculture—actually became part of the trickery, because they too retreated into the make-believe world, which is why their opposition has no effect and nothing ever changes." I remember hearing these words for the first time in 2016—it was if they had given form to a spectre or force that had been lurking behind my work since completing grad school in 2009. Of course external to a predominantly white-led cultural sector, this story was different. I was trained in a culture that measured artists' abilities on how well they could convey a cool detachment from the decaying society around them. Artists who were considered at the forefront or vanguard of the art world worked with post-modern practices such as conceptualism and post-conceptualism from the 1970s to the 2000s, through to the relational aesthetics and post-internet art of the 2000s to today. They no longer tried to intervene in life: they experienced it, witnessed it and documented it. As I moved into professional work, and as time progressed, what I had been sold as an education did not seem to add up. My education could not teach me how to breach, adapt and change this liberal establishment, because it was produced from it.

> And while they stoke mass confusion, fierce and often violent debate, deep and cheap fakes have mostly served to consolidate power for those who hold majority control already.

Working in the cultural sector over the next couple of years, as the crash of to-date unimaginable systemic externalities like the Brexit vote and Trump's election unfolded, as indifference toward rapid global heating perpetuated, as the largest wealth gap in modern history increased, and as never-before-seen waves of human migration strained liberal democracies worldwide, I watched the work of the western-modeled artists and arts institutions become less and less of a potent and relevant force in the world we were actually living in. Caroline Busta of newmodels.io—who contributed workshop programming to our research, and whose digital community via podcasts, an aggregator and a discord server I have been a member of for the past two years—wrote about this western art world collapse in *Kaleidoscope's* 2020 Spring/Summer series *What is Influence?* with the salient text "Influencing the Void":

"Art used to tell the truth; this is both what made it art and made it valuable. Then sometime around 2008, when quantitative easing[7]... compelled those with available cash to disproportionately invest in art as an alternative asset, art-world art lost its "truth" edge. Ever since, art critics, curators, and artist communities have had about as much sway on the actual value operations of the art world, as the people holding cardboard signs at a mass protests do on the workings of corporate multinationals. Artists could either comply with the industry and enjoy proximity to its riches (the illusion of class mobility) or consign themselves to relative precarity and the microcelebrity of making the most damning banner."[8]

Then the cultural industry's work became content production, bouncing around an echo chamber that only got louder when amplified through social media networks. But in fact, the reach of our multiplying, metastasizing messages became shorter and weaker. So how do we break out of the illusion that the global system we have built to trade images, slogans, stories and symbols through the art industry is influencing the world around us? The answer, for now, seems to be that the organizations and creators who can still count on slim public support should make a swift value change and worry much less about those things that we held up in the twentieth century as cultural pursuits, such as:

[7] Quantitative easing is a monetary policy whereby a central bank purchases at scale government bonds or other financial assets in order to inject money into the economy to expand economic activity.

[8] Caroline Busta. "Influencing the Void. What is Influence?" *Kaleidescope* 36 (Summer 2020): 263-272.

- Festival-like biennials and overly performative museum programs that continue to be grounded in “critical art practices,” which swell resources and disperse them sloppily without long-term engagement, impact or infrastructural development planning;

- Major surveys and publications devoted to celebrity artists and cultural figureheads, which are privileged, biased and subjective nodes that deny access to polyphonic histories, which are being rewritten as part of anti-colonial momentum;

- Emphasis on the individual authorship of the genius artist or designer, which only further enables contemporary zombie-finance mechanisms to exploit their mediated authenticity and our access to their content;

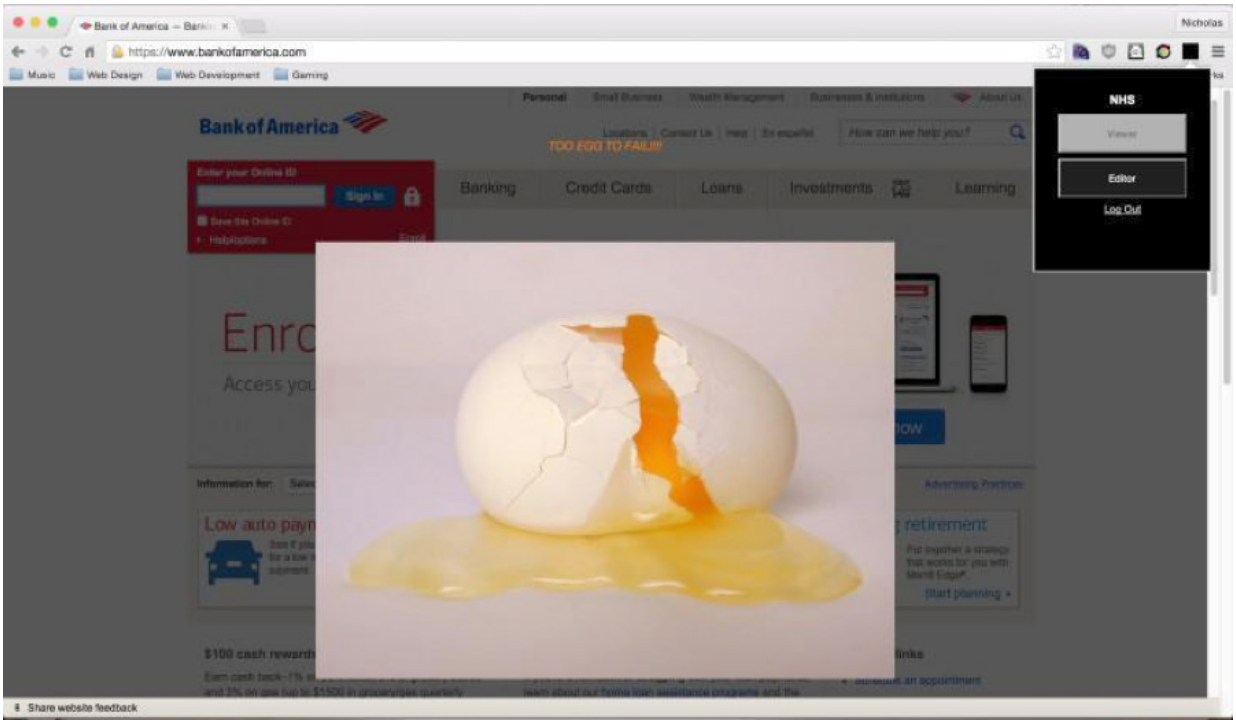
- A cultural discourse that is too myopic and narrow in scope to have any broad influence, failing to sufficiently reorient the society to more coherent narratives;

- An overserved stakeholder group at the heart of public cultural funding, who use these democratic resources to finance a private members club of aesthetic enclosure and self-interested financial speculation;

- Utopian architecture and urbanism in a time of growing inequality and climate collapse, which degrades the profession of the architect altogether by asking them to abandon their commitment to the society their work is embedded within, in favour of a more technical role interpreting finance, neoliberal regulation and design as coexistent variables for their research and production.

Another reason to quickly find pathways outside of these cultural padlocks is that they are relics of a view of culture baked in white supremacy and the European notions of originality, excellence and genius. That movements for racial and economic justice coincide with such emergent critiques of the art industrial complex should come as no surprise.

The cultural production of organizations like 221A—nonprofits who draw their most significant financial support for programming through public interest via the state—should be redefined for and reoriented around using information and value to build systems, infrastructure and capacity for our communities to work differently; engaging more coherently to support the health of existing life; and ensure there is ample space for new life to take hold when the time comes. Black Lives Matter Toronto core team member Syrus Marcus Ware—an artist and activist whose BLM chapter contributed to the movement-wide strategy to demand the abolition of the prison system and defunding of the police—references the literary scholarship around the author Octavia Butler from a recent talk for @amypoehlersmartgirls on Instagram, sharing the wisdom that "all activism is a form a speculative fiction, because it imagines and works towards a world otherwise." This is a learning for all cultural organizations to move closer to the impact of activists and their goals, which help us construct progressive and bankable images of the future, rather than keeping us stuck as a public in redundant approaches which self-replicate the systemic issues we are trying to resolve.



Toggle, a cultural infrastructure as Chrome plug-in engineered by the neverhitsend collective, 221A curatorial resident, 2015.

Making the Shift

How does an organization like 221A orient itself within this sea-change of expanded contexts in the digital and physical realms? When I began my time with the organization in 2015, we were hosting a project called *Toggle* by the neverhitsend artist collective. *Toggle* was designed as both an exhibition and Chrome browser plug-in that allows users to overlay content atop existing web pages, creating a hidden metapage of text, images, hyperlinks and other information that is only visible to those with the plug-in installed, like digital invisible ink. This project bridged the gap between practice and platform, offering a cultural object for the digital realm that also functioned as an infrastructure that could live on after its original use had passed, and that was free to be taken up and furthered by other users. I like to think that somewhere in the machinations of 221A's transition over the past several years from a rather traditional white-cube artist-run centre, *Toggle* played a cornerstone role in our conceptual re-thinking and acting. In 2017, 221A changed its mission to transition the organization away from the typical visual art and design presenting model. Our mission today is more entangled and embedded, as we work with artists and designers to research and develop social, cultural and ecological infrastructure. Through our Fellowship program, 221A engages with cultural workers over extended periods to lead the organization's research and programming, engaging deeply with contexts, collaborators, ideas and audiences. This proposes an institution that learns and collectively works for the betterment of the conditions in which it exists, rather than typical presenting organization models which aestheticize the problems of our conditions within their programs, while upholding the status quo through their governance, finance and communications activities.

> This moment [signals] an endpoint...for many Western conceptions of how culture should be produced, engaged with, trafficked and traded.

While this may seem like a progressive institutional model, its DNA stretches back into twentieth-century histories of contemporary art and design, and can be seen in the works of such leaders as Mierle Laderman Ukeles, who authored the *Manifesto for Maintenance Art 1969!* Ukeles opens her manifesto by plotting the space between what she calls the death instinct and the life instinct:

The Death Instinct: separation, individuality, Avant-Garde par excellence; to follow one's own path to death—do your own thing, dynamic change.

The Life Instinct: unification, the eternal return, the perpetuation and MAINTENANCE of the species, survival systems and operations, equilibrium.

Contextualizing the avant garde as a manifestation of the world's overall death drive is elder wisdom that we should seriously sit with in the face of our collapsing climate, a deteriorating economy and within the first year of a long-tail global pandemic. Of course, the dominant narratives driving Western art history—and much of today's contemporary art production—is fluid with this atomizing, do-your-own-thing, avant-garde death drive. Recognizing that the impulses that drive the trained and taught notions of the avant garde are actually part of the destructive and deceitful forces of the world, as Adam Curtis alludes to in his films, is crucial in making a shift to intentional, collectively actualized and sustainable forms of cultural praxis. Within this ontological, Copernican-level cultural shift, the blockchain emerges as a new kind of development space and conceptual fuel: to host dialogues, find points of common challenge and—crucially—to enable us to remodel our value and economic relations with each other, other species and our bioregions.

In making these recommendations, I don't mean to imply that there is a single way forward for culture and art. There are many forms of cultural practice becoming praxis that have emerged from non-western traditions and are being redeveloped and regrown at this time, which is part of the broader decolonial and anti-colonial movements taking place across all aspects of society. However, this moment does signal an endpoint or a cliff for many western conceptions of how culture should be produced, engaged with, trafficked and traded. I do not see much hope in a future for systems of commercial galleries, museums and biennials, nor for the academies that train people into these systems, for reasons that Busta made blisteringly obvious in the *Kaleidoscope* essay excerpted above.

How can blockchain-enabled practices help us advance the theory and praxis required to respond to this moment? I'll point to some recent examples within literary, philosophical and institutional practices that have pushed us towards pluri-disciplinary thinking across culture, political activism and economics as models to consider. American literary scholar Lauren Berlant's 2011 book *Cruel Optimism* is a benchmark in accepting the downhill momentum of the dream or liberal world. She writes about the mythology of the American dream, which can be reframed globally to be referred to as the dream of liberalism. Berlant's thinking dovetails

with Francis Fukayama's notion of the end of history, of a frictionless "good life" tethered to an ever-expanding global marketplace. Western people have remained attached to unsustainable, never-achievable fantasies under current contexts, including promises of perpetual upward mobility facilitated by widespread job security, under a framework of political and social equality that enables every individual to cultivate an ever-open heart, ready for social intimacy. As Berlant summarizes, "it's a heartbreak that the world isn't worthy of our attachment to it, that it gives us objects or ways of life or forms of life that are constantly betraying us."[9]

But evidence to the contrary is stacked against liberal societies, because they no longer provide such frictionless structural opportunities for individuals to make their lives add up to something—in fact, they never did. We cannot simply place ourselves as individuals and communities in the flow of a redundant culture and hope for good results. An excising of politics, struggle and sacrifice from the work of striving for a healthy and equitable life for oneself and one's communities is an absurd proposition under our current conditions, as generation after generation since the 1970s has experienced downward mobility and insecurity. The market could never replace politics. And likewise with the blockchain, code cannot replace politics either.

We cannot simply place ourselves as individuals and communities in the flow of a redundant culture and hope for good results.

Rather than looking for alignment with the liberal narrative, what Berlant would like us to consider is the power of an affect theory. This is a theory that seeks to organize *affects*, a term sometimes used interchangeably with emotions or subjectively experienced feelings. This is emergent thinking developing on a collective scale, as we recognize the ways that societies sense, feel and somewhat nebulously arrive in the present, rather than theorizing and providing linear, rational approaches to the way the world operates and how we should respond to it. This presents a more accurate model of the present, where we can no longer rely on the fixed conditions promised in the liberal framework of the world. Instead, we're looking ahead to a state of perpetual and competing crises. When we make the mistake of applying liberal management frameworks to the present reality, we perpetuate a willful cultural ignorance about the historical shifts taking place, furthering the ongoing and

[9] Lauren Berlant in "Big Brains Podcast: Why Chasing The Good Life Is Holding Us Back". University of Chicago, 4 Apr. 2019, news.uchicago.edu/podcasts/big-brains/why-chasing-good-life-holding-us-back-lauren-berlant

harmful fiction that liberal society spins to keep us in a useless, fragile shelter—in a state of forever not-remembering. Venkatesh Rao, tech critic, author and founder of the *Ribbon Farm* and *The Art of Gig* blogs, describes this context in his memorable early-pandemic text "Murder on the History Express":

> *Nobody is in charge. Not Trump, not Wall Street, not central banks, not Dr. Fauci, not the WHO, not Xi Jinpeng, not 3M churning out N95 masks, not Amazon, not Instacart, not motorcycle gangs LARPing Mad Max futures. Not your favorite Cassandra exulting in a dark sense of their own prophetic told-you-so rightness. Agency does not equal controllability. All these actors are doing things that will shape the emergence of the new world, but the bulk of the emergence will be ungoverned. It will involve all sorts of weird random things that get locked in as new defaults. Strange initial conditions nobody chose will turn out to be crucial in setting new directions and creating an anatomy for the new world. So pay attention. The outcomes will not match the blueprints.*[10]

To meet the reality of the present is a critical challenge to overcome and one of the core cultural padlocks that is referred to in the title of our research initiative. Rather than allowing for a liberal fantasy to manage the world's major events and seismic shifts, we imagine that the blockchain could become a powerfully important and potentially revolutionary space to allow us to better sense, model and characterize our terrains of affect, and how to meaningfully live amidst them. Further, the blockchain could facilitate and strengthen our social, cultural and political activism with better and more realized feedback systems that position our social, cultural and ecological health as the driving forces behind the behaviour of our networks. This technology could offer the affective power we need to enter into a new ideological paradigm, which the Cameroonian philosopher and political theorist Achille Mbembe is calling a radical break from the paranoia of the western mindset, moving us toward a planetary consciousness that can be described as a new non-western universalism, in which the west is but a province within this arrangement. In turn, westerners will need to come to terms with and offer accountability for our foolish and violent emperor-with-no-clothes history as the beneficiary of colonization, and our dubious performance as the twentieth century's global "leader."

Pierre Bourdieu, a French sociologist, argues in his 2000 text *Towards a Scholarship with Commitment*, for softer and fuzzier boundaries between the scholar, the public intellectual

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[10] Venkatesh Rao. "Murder on the History Express". 2 Apr. 2020, artofgig.substack.com/p/murder-on-the-history-express.

and political activist. Bourdieu, having been critical of post-1968 French politics and its progressive neoliberalization throughout his career, rails against the institutionalization of thought, which he defines in this, his final text, as a form of disciplined knowledge production whose purpose is to directly affect the world outside of it. Intellectual institutions such as the academy, library, archive and museum have become instruments hardwired in the liberal world. How, then, could their collective work, a disciplined scholarship and practice designed to uphold the liberal framework, ever be disruptive and transformative for our overall culture? Is this not their purpose: to maintain stability at the expense of ignoring or being unable to adapt to externalities? Bourdieu does not see one way forward in this regard, but rather asks for individuals trained within the knowledge production system to take up their causes and commit to the real work of advancing our society, a kind of realpolitik utopianism. Bourdieu further instructs us to push back against the disciplinary trappings of the institutional frameworks that relegate our work to theoretical realms—which is especially urgent for cultural workers. We've become too discouraged and distracted because our institutions lack the resources, frameworks, capabilities and interest to support the longevity and spirit of the commitment that Bourdieu is calling for:

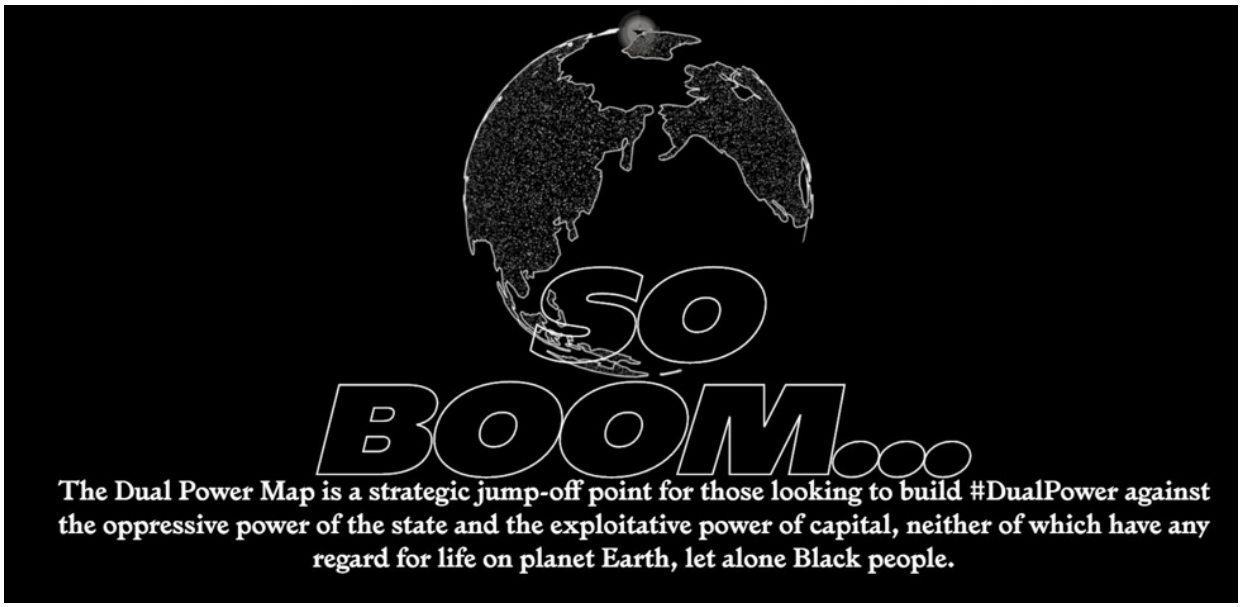
> *"If I recall now that the possibility of stopping this infernal machine in its tracks lies with all those who, having some power over cultural, artistic, and literary matters, can, each in their own place and their own fashion, and to however small an extent, throw their grain of sand into the well-oiled machinery of resigned complicities."*[11]

Alongside Bourdieu's work in the sociological field, the cultural realm of the early 2000s, specifically contemporary art institutions in Northern Europe, was experiencing a movement known as New Institutionalism. This movement downplayed the traditional prominence of solo, survey and historical exhibitions, and instead created cultural arenas in which the conditions of the larger world could find space and inspiration to reassemble themselves and create new forms of democracy in order to improve existing political relations. This is a continuation the late-1900s work of curator Harold Szeemann, who dissolved the lines between art and life in his exhibition-making, and is further informed by the Relational Aesthetic scholarship of Nicolas Bourriaud in the 1990s. The New Institutionalism of the 2000s—spearheaded by artistic directors and curators such as Maria Lind and Charles Esche through an expanded view of programming—developed in dynamic relation to the work of artists and designers, which invited viewers to become participants in a new agora. What the institution could really do for

[11] Pierre Bourdieu. "For a Scholarship with Commitment." *Profession*, 2000.

society was the central question. Some lines of inquiry they put forth: Could the institution provide social and political security by granting research visas to undocumented peoples? Could the institution provide technology access and education to the working class?

This progressive momentum was stopped in its tracks by the 2008 financial crisis. I witnessed this shift during the course of my graduate studies in Europe, as institutions quickly reverted to performances of "neutrality" which served to reinforce the ideologies of the liberal state rather than fermenting and transforming dominant ideologies into new realms of possibility and praxis within the institutions. It must be noted that the New Institutionalism of the 2000s did not centre or engage directly with issues of racial justice; the closest they came was through softer notions of multiculturalism and mandated inclusion. Now that perpetual financial crises are our cultural norm and racial justice has become a central pillar of the cultural realm, we have an opportunity to coalesce the critical mass necessary for holistic change. The blockchain offers us the potential to generate a culturally affective space that reignites the New Institutionalism movement as we reimagine how our institutions might operate and what they can achieve, should they commit to developing change-frameworks that are grounded in the reality of a world that is undoing itself.



Dual Power Map, Black Socialists of America, 2018 – present.

Business in the Front, Blockchain in the Back

Since the crypto winter of 2018 and following the collapse of overinflated cryptocurrency markets and exchanges, blockchain as a technology has become somewhat of a cheap trick cited by companies and organizations purporting that their products and services would be advanced by blockchain, without much evidence in their backend to support their lofty proclamations. Some sage advice was offered to our project team amid the 2019 Blockchain@UBC annual conference in Vancouver: put your business model out front, and develop the blockchain technology to support it in the back. In other words, don't lead with the technology; blockchain itself is not an ideology nor a business model. It can be used in many ways—by a neoliberal ideology, by emergent ideologies that are more socially and ecologically aligned, and by those who lead conversations that confuse decentralization with libertarian politics. What *Blockchains & Cultural Padlocks* offers is an opportunity for 221A and our collaborators to take stock of an emerging digitally-native economy, while advancing the organization's mission of creating new forms of cultural, social and ecological infrastructure.

It has become clear, in researching these models, that the broader the network, the more sense blockchain makes as an enabling technology.

In our research, we came across two stand-out, wide-scope models for development opportunities that prioritize more cohesive and aligned social futures in their public-facing iterations, while working on blockchain quietly in the backend. Though these initiatives find their roots well before blockchain's arrival in 2008, the scope and reach of their efforts achieves power gained through network effects. It has become clear, in researching these models, that the broader the network, the more sense blockchain makes as an enabling technology.

The first example is the Platform Cooperative Consortium, which roots itself in the 1844 Rochdale Principles that have formed the basis on which cooperatives around the world continue to operate to today. Trebor Scholz of The New School's Institute for a Cooperative Digital Economy founded the consortium, which includes partners across the Americas,

Asia and Europe. Through their work, they have been able to provide essential development advice and support for worker-led digital cooperatives that assemble and aggregate their value locally, such as nanny-services and ride-shares, enabling more competitive services, greater compensation and more reliable job security to workers. This gives such small organizations collective competitive power in relation to the mainstream platforms that have become icons of the first generation "sharing economy," such as Uber and Airbnb, which are underpinned by exploitative and extractive corporate principles. Only in the past few years has the Platform Consortium begun developing quietly with the blockchain, enabling this new wave of cooperative social enterprise to be enhanced with the power of a decentralized internet of value.

The second example is the Black Socialists of America's (BSA) *Dual Power Map*, which is inspired by the Leninist principle that workers should hold dual power in a society—a concept that led to the October Revolution. In the 21st century, dual power, or counter power, has been used to refer to nonviolent strategies of achieving a socialist economy by means of incrementally establishing and then networking institutions of direct participatory democracy to contest the existing power structures of the capitalist state. The American art critic Yates McKee describes a dual-power approach as "forging alliances and supporting demands on existing institutions—elected officials, public agencies, universities, workplaces, banks, corporations, museums—while at the same time developing self-organized counter-institutions."[12] The BSA's *Dual Power Map* has become their core strategy, and it began by crowd-sourcing and aggregating worker-owned business across the US. They found that large corporate enterprises (500+ employees) make up roughly 51% of all employment in the US, whereas the remainder was shared by medium, small and very small enterprises. This is an optimistic finding that shows the political potential of uniting such businesses and their workers to harness the economic and political power held within these networks.

The BSA has signaled that they are working with blockchain developers to find ways to incorporate the technology into their ongoing work, and given the nature of the way that the *Dual Power Map* has been assembled, it seems likely that they will be able to implement a pertinent use case for things such as smart contracts to manage and share asset control and distribution through responsive and urgent means. That the BSA is not yet trumpeting their findings or providing much public insight into this development comes as no surprise. The disruptive nature of this work toward the United States' corporate-led economy is not only a trade secret, but also the means for workers to take the controls back after generations of

[12] Yates McKee. "Art after Occupy — Climate Justice, BDS and beyond," *Waging Nonviolence*. 30 July, 2014, wagingnonviolence.org/2014/07/art-after-occupy/.

aggressive anti-labour action by disabling unions and diminishing employment legislation, brought about from the liberal globalist politics of the past 30 years. Combine this with the legacy of how the US responds to Black-led self-organization—through regimented domestic terrorism enacted by state security forces against its own citizins, by conducting surveillance, psychological operations, character attacks, community intimidation, bodily violence and openly targeted assassinations—it is clear that BSA has plenty of reasons to keep its blockchain developments buried deep until the most socially contagious use case for their network is found and made into scalable tech.

Maral Sotoudehnia, a feminist geographer and PhD Candidate at the University of Victoria, looks into some of the early promises being made too quickly by finance-driven startups with socialized ideas in mind as selling points, pointing out that these ideals are not evident within their design and outcomes. In Sotoudehnia's paper "Encrypting Enclosure: Fractionalized Real Estate on the Blockchain," which 221A commissioned as part of this initiative, it becomes clear that without cultural and social networks to feedback into the design of such platforms, they turn out to be lizard-brained, their smoke-screened ambivalence revealing a major pitfall that could further damn oppressed communities seeking equity and justice. Sotoudehnia further raises a pertinent question also brought forth more broadly by the GameStop scenario of early 2021, which is about the rights and access publics are afforded as investors, versus the more traditional accredited investor route. Sotoudehnia's writing offers an exemplar of what cultural work has to offer to the world: a space for review, critical engagement and holistic advancement of the tech sector's lofty but often shallow ideals and notions about its own ability to improve our common conditions.

One startup that does seem to have the critical and anti-capitalist cultural positioning to offer something of more promise is DOMA, a nonprofit developing a platform cooperative for housing. DOMA traveled to Vancouver in the spring of 2019, to join 221A, the University of British Columbia and Emily Carr University of Art & Design to host a series of events, workshops and public presentations of the platform. DOMA's users are token holders, like shareholders, who increase their stake in a housing co-op as they start paying monthly dues equivalent to market-rate rent for access to a network rather a stationary inhabited unit. This allows for the occupant to remain in place and accrue equity over time while decreasing monthly payments, and allows for movement between network-owned units to adapt to the scale of household changes over time, offering flexibility with stability. In addition to rights of occupancy, users maintain voting rights and a data co-op and developer status in a peer-to-peer marketplace, through which they can provide and receive in-home services and goods using their positive equity balance as credit. With such a well-honed use case and critical approach

to the development space, 221A worked with DOMA as a Fellow in 2020/21 to more closely study, model and assess how their platform might be used to counteract the deleterious housing crisis in the Lower Mainland of British Columbia, which has been brought on by speculative finance tools of the past four decades.

This strategic dismantling of late-stage capitalism and (re-)building of socialist ideals within western economies and politics is enabled by a growing constituency of Millennials and Generation Z-ers. However, this is not a socialized movement that is ideologically or patriotically led. Artist Joshua Citarella, who surveys and analyzes emergent political theory and culture in online communities, refers to this wave of socialism as more akin to the common-sense realization that bulk buying plans result in the best possible agency to provide increased quality of life for the many. Considering the still-accelerating tech-lash post-2016—as the egregious abuses of information and content management by social media companies such as Facebook and Twitter and consolidated data powerhouses like Google have became common public knowledge—forging a social environment to develop alternative futures should become a priority of the cultural realm. We have a ready and willing audience and population eager to explore alternatives to the dire and apocalyptic future we're hurtling toward.

In 2019, two books on this topic breached best-seller lists and have influenced some within the older generations to consider ideas of better and radical design, and the potential to align the digital realm to meet the social and political ideals of our societies—improving social, economic and political literacy. Jenny Odell's *How to Do Nothing: Resisting the Attention Economy* was a meandering, intuitive and effective series of personal essays about her artistic practice and intellectual preoccupations, which can be summarized in her idea that "capitalism, colonialist thinking, loneliness, and an abusive stance toward the environment all coproduce one another."[13] This tangled mess is something that won't be solved through technology alone, but rather through shifting perspectives and rearticulating the interdependencies we have been ignoring. Those interdependencies that exist between one another, our histories and the bioregions we inhabit, are too externalized as separate from the atomized, optimized self—thus we are rarely adequately able to account for them in our cultural work and thinking.

Shoshana Zuboff's book *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power* has become an urgently needed canonical text that will hopefully inspire the drafting and design of a new type of digital realm—a realm that is striving to

[13] Jenny Odell. *How to Do Nothing: Resisting the Attention Economy*. (Brooklyn: Melville House, 2019), xviii.

become uncoupled from the controlling and intrusive surveillance practices of major tech platforms. As Zuboff notes in an interview, surveillance capitalism was enabled by the US state, and now it has reached such a powerful and pervasive phase that it is undermining the democracy that bore it. In offering alternatives, she proposes that "it's impossible to imagine surveillance capitalism without the digital, but it's easy to imagine the digital without surveillance capitalism."[14] This calls for cultural work to imagine spaces within the digital where we can design new forms of participation that will be leveraged on self-sovereign identities, rather than spilling our personal data into every platform we encounter without consent. This is both an idea and movement that leverages the notion that individuals should have agency over their digital identities and data that they produce. The notion of the self-sovereign digital identity is core to blockchain's potential to build a new internet that is leveraged on a transparent management of individual and collective data through the use of smart contracts, which adhere to our chosen principles of engagement and exchange.

Rosemary Heather's paper "The Staking Internet" on crypto network staking, within this report, further explores the potential of forms of new crowd-funding that provide all a stake in governance, access and ownership. Access is too often the only focus of a liberal society, and in neoliberal conditions, the governance and ownership of web 2.0 networks are hardly democratic processes. Just recall Cade Diehm's framing of the centralized defeat of the early peer-to-peer disputes around the music industry in the late 1990s and early 2000s; we all have access to music very cheaply now, however, artists and producers have much less of a financial stake in the work they make—as well as its circulation and distribution, which has shifted to being algorithm-led.

221A's approach from here on out is to engage the digital realm with the full weight of our mission; this orientation has emerged not only from the development of the blockchain, but also its related and interdependent technologies. Ours is a strategy that leans into a future which is predicting that immersive synthetic intelligence systems will become more functionally integrated into our daily lives, organizations and systems by the year 2030. When you weave this technological tapestry with emergent blockchain communities designing their own economies, to be federated into both provincialized and planetary networks, you arrive at artist Julian Yi-Zhong Hou's ergonomic manifesto for "Anoetic Tokenization." His project sketches out conditions where networks will ergonomically adapt to their users and resource conditions, unlike the algorithms of today on centralized platforms, which nudge behaviours towards the will of the network designers themselves. His manifesto, detailed later in this report, articulates

[14] John Laidler, et al. "Harvard Professor Says Surveillance Capitalism Is Undermining Democracy." *Harvard Gazette*, March 4, 2019, news.harvard.edu/gazette/story/2019/03/harvard-professor-says-surveillance-capitalism-is-undermining-democracy/

a sense of economy and intentional design for cultural work that starts to conceptually connect into this future.

As the end-point of our current decade, 2030 is also significant as the point of no return with respect to the heating of the planet through the release of carbon emissions. Artist Patricia Reed's research paper commissioned for this report, "The Valuation of Necessity," dives deep into the philosophical and ontological past, and offers a perspectival shift from existence to coexistence. In so doing she reaches the blockchain as a present-tense technology and social apparatus with great potential, where she sees two camps of operation working towards different ends and advances some terminology coined by media theorist Lana Swartz. Firstly, the side of the *digital metallist* within the blockchain space "remains focused on price and existing hegemonic market configurations in order to entrench private wealth sovereignty." Whereas, "the infrastructural mutualists work towards the distribution of agency through the emphasis on equal access to information (and therefore communicative power) as a systems-design priority." The infrastructural mutualist camp is inherently where 221A's digital strategy finds resonance and inspiration to advance.

Given this science, the praxis and business model for all of us should become very clear: all activities should find ways for us to become more organic, not in the sense of carbon-based lifeforms or some dopey, head-in-the-sand approach to the world, but in the sense of Buckminster Fuller's definition of organic. Fuller saw wholly integrated and sustainable systems—even those designed artificially by humans such as planned habitats, major buildings and ships—as attempts at moving closer towards organic models of engineering, which are more sustainable and able to be managed within the means of given resources and natural conditions of any given time and context. One of the most remarkable projects in this regard that brings to attention the urgency of the 2030 deadline is the recently initiated free postgraduate program of the Strelka Institute in Moscow, whose Terraforming research cohorts, led and programmed by Benjamin Bratton, are being challenged with this very mission of redefining planetarity as a concept and emergent force which will forge a new politics, as opposed to liberal globalism. Planetary approaches to cultural production, design, technology and science are being fused to develop proposals for wide-scope evolutions of human cultural praxis, such as repurposing global militaries to abandon state-led warfare and to take up the challenge of transitioning societies and bioregions with new infrastructure to adapt and respond to the collapsing climate.

The notion that blockchain is going to be the key to unlocking all this potential within our culture and societies is not what is proposed by this initiative. Rather, the blockchain is a culturally affective development space that we should enter with our existing toolkits. This momentum will need to be endorsed by pluri-disciplinary trades, professions, practices and communities who are also invested in teaching us new ways of relating so that we can better sense the connection points and interdependencies that exist between us. We should be starting on this work directly by addressing the crises that we must respond to in the realm of white supremacy and the colonial perspectives that have been pre-programmed into our society, and are being further inflamed today. These can be unprogrammed if we can stay committed to the task and are willing to acquiesce into a future that doesn't promise the same accelerated trajectories and false securities of their past. The necessary culture and economy won't be made for us by emergency measures or quantitative easing; we have to make the economy ourselves and the onus is on all of us, especially the institutional and cultural cohort of civil societies, to be part of this transition. This is a wake-up call to our collective liberal fever dream. We can no longer afford to be stuck in the position of offering band aids for structural trauma, instead we must build out from these sites of harm, and do the urgent work of repairing what we can take forward and rethinking anew that which we must leave behind.

RECOMMONING LAND, DATA & OBJECTS

What is a blockchain but a tool for recommoning? A blockchain is a network technology collectively managed by its users, a group of entities that stretches all the way from personal computers to bitcoin mining conglomerates. The ability of every user of a blockchain to directly interact and transact with every other user creates the terms for a new commons. Cryptocurrencies and other forms of token economies give users an added measure of control over their network lives. For instance, the verifiability of blockchain tokens creates the terms for on-chain governance. Possible uses for this form of internet citizenship include data sovereignty—for individuals and collective entities. The first era of blockchains focus on the wealth generation that crypto makes possible. The next era of blockchains will enable the creation of a more fully realized network-based commons. A reimagined engagement with land, data and objects is the starting point for this future, as articulated in the quotes below.

The Commons

A commons is a resource that is shared by a group of people. Historically, a commons has been a physical resource (for example, a land resource), but its definition has now expanded to non-physical, human-made resources such as peer-to-peer information networks. Physical commons therefore relate to physical resources and their use. The digital commons relates to aspects of the non-market networked information economy that are controlled and negotiated by social exchange and agreements. Networks here represent systems of human interactions

that emphasize human action and structural patterns. Physical commons may also be further categorized into open commons (like oceans, air, highway systems) and limited access commons (like pasture agreements for farmers), or regulated (like forests that have restrictions of use placed on them) and unregulated commons (like grazing pasture for farmers with no use restrictions).

-Dimeji Onafuwa, Designer
http://www.recommoning.com/hello-world/

Land

Land is the terrestrial bio-productive system that comprises soil, vegetation other biota, and the ecological and hydrological processes that operate within the system. Our perceptions of land are not only a response to the outside world, but also a cause and effect of cultural filtering, by which certain phenomena feature prominently, while others recede into the background. In other words, the less visible the elements of land are to a particular stakeholder, the less meaning they have for that person and perhaps result in a lack of awareness as to their possible critical functions. The meaning and value of land can change as we become wealthier or do not directly depend on the land for our immediate survival. Furthermore, land is often infused with a feeling of sovereignty and jurisdiction—aligned with different patterns of ownership and use rights— which in turn governs our economic and socio-political interactions and conflicts with others. All these factors influence attitudes towards land use and the way that land is managed. Nevertheless, keeping land in a healthy state is an essential contribution to human security—access to food and water, the stability of employment and livelihoods, resilience to climate change and extreme weather events, and ultimately social and political security. Recognizing the perspectives of diverse stakeholders and ensuring their participation in decision-making is a critical first step towards better land management and planning. Land is owned and managed by governments, corporations, communities and individuals, but we all depend upon the land for our health and well-being.

-United Nations Convention to Combat Desertification
https://knowledge.unccd.int/GLO/part-one-big-picture/chapter-1-meaning-land#:~:text=The%20UNCCD%20defines%20land%20as,Article%201%20of%20the%20Convention

Data

Data are artifacts that reflect a phenomenon in the natural or social world in the form of figures, facts, plots. Information is anything communicated among living things. It is one of the three mainstays supporting the survival and evolution of life, along with energy and materials. Knowledge is a human construct, which categorizes things, records significant events and finds causal relations among things and/or events, in a systematic way.

-Yishan Wu, Deputy Director Institute of Scientific and Technical Information of China
http://www.success.co.il/is/zins_definitions_dik.pdf

Objects

Objects are not reducible to the material, perceptible and consumable goods we commonly refer to as “objects.” The world of objects, however “ordinary,” is a trove of disguises, concealments, subterfuges, provocations and triggers that no singular, embodied and knowledgeable subject can exhaust. This is precisely why artists have a say in any discussion of the object’s plurivocality, since the artwork is a prime example of the object’s capacity to evade the knowing grasp. The study of objects through the prism of art, and through the words of artists, allows one to see how complex the world of ordinary and less ordinary objects and things truly is.

-Anthony Hudek, Curator
https://tallertrustme.files.wordpress.com/2015/08/objects-define-us.pdf
https://mitpress.mit.edu/books/object

RESEARCH CLUSTER

The Blockchains & Cultural Padlocks Research Cluster engages professionals across the sectors of culture, design, tech, geography, urbanism, architecture and finance (both for-profit and co-operative/credit union). This strategy establishes a knowledge bank with a values-based learning culture about the emergence of blockchain; its potential for the nonprofit sector; social and cultural organization use cases on the blockchain; as well as digital urbanism and platforms to manage shared cultural assets.

Julian Yi-Zhong Hou, Artist

Daniel Keller, Artist

Patricia Reed, Artist

Joshua Citarella, Associate Artist

Matthias Einhoff, Associate Artist

Sharona Franklin, Associate Artist

Tiziana La Melia, Associate Artist

Ron Tran, Associate Artist

Christian Vistan, Associate Artist

Ross Gentleman, Advisory

Victoria Lemieux, Advisory

Scott Nelson, Advisory

Geoffrey Routledge, Advisory

Christina Hirukawa, Consultant

Christy Nyiri, Designer

Ellen Lee, Book Designer

Rosemary Heather, Editorial Director & Principal Researcher

Maral Sotoudehnia, Principal Researcher

Erika Wong, Principal Researcher

Lil Internet, Associate Researcher

Caroline Busta, Associate Researcher

Christine Lariviere, Associate Researcher

Maksym Rokmaniko, Associate Researcher

Francesco Sebregondi, Associate Researcher

Francis Tseng, Associate Researcher

Stephanie Wakefield, Associate Researcher

Blockchain@UBC, Partner

ChinookX, Partner

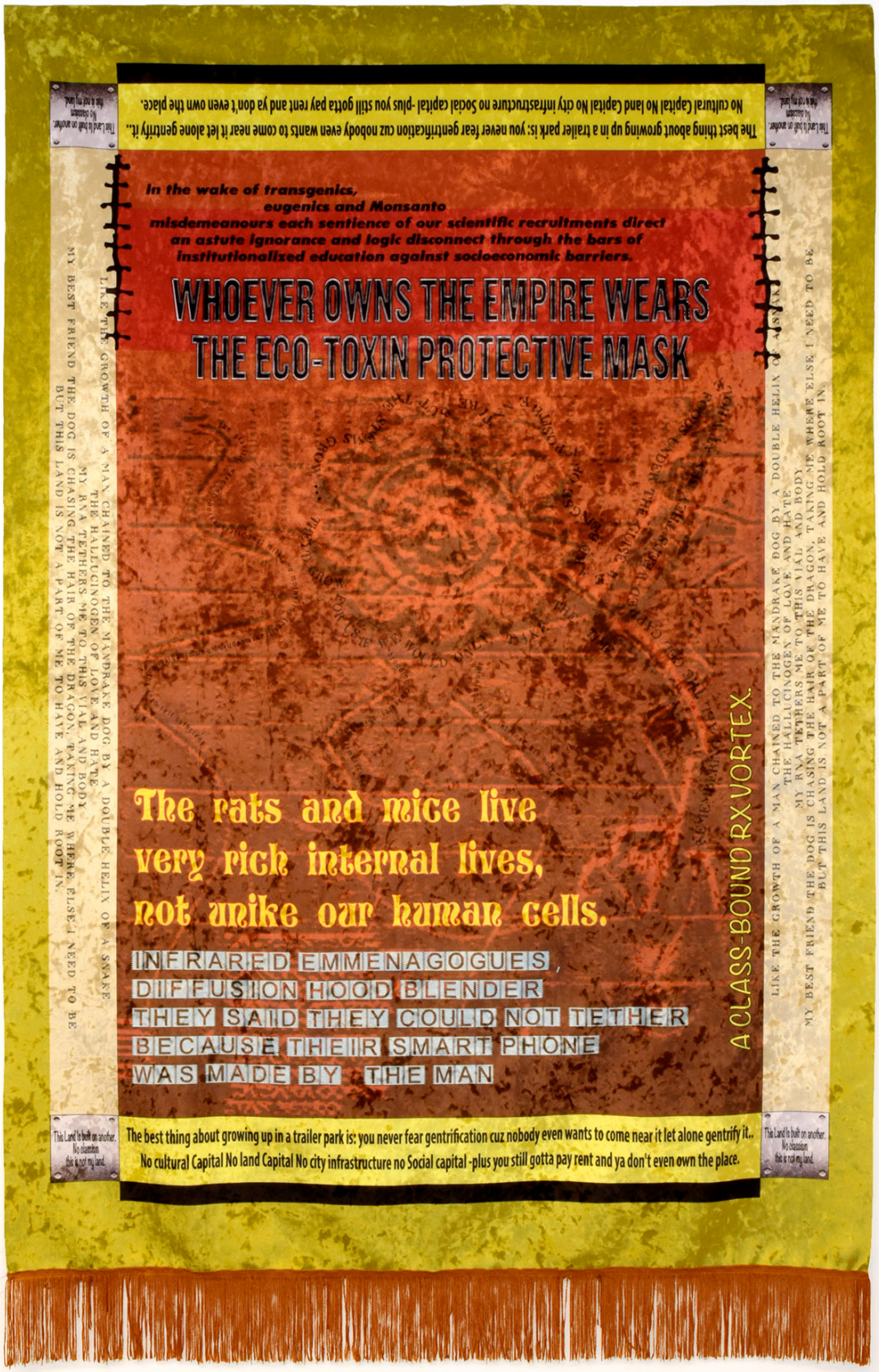
DOMA, Partner

New Models, Partner

Brian McBay, Staff

Jesse McKee, Staff

Tao Fei, Staff



Class-Bound Vortex, 2019
Sharona Franklin

Dye sublimation print on velvet with
polyester tassel
147.3 x 96.5 cm

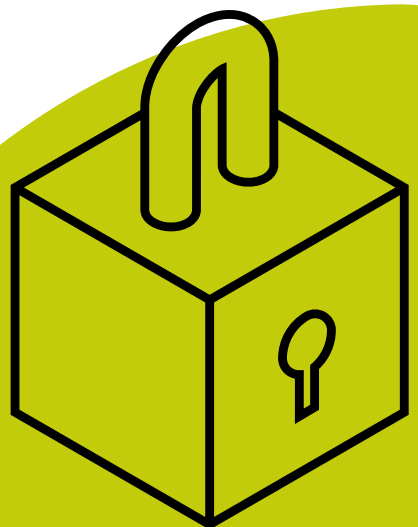
Courtesy the Artist
Photograph by Nicole Kelly Westman

STRATEGY SCREEN

The Strategy Screen is a tool for determining the criteria for adopting any new strategy. This values-based criteria is used to guide future strategic decisions before the critical moment of decision arrives.

Our strategy must:

- Reject Surveillance and advance self-sovereign digital identities as way to build a better internet.
- Interrogate Utopian Visions and solutionism, while being mindful of heroic claims.
- Counter Neoliberal Expansionist Paradigms, without falling into the trap of disruption as innovation.
- Develop Systems That Steward socially and ecologically ergonomic design that reinforces anti-ableist, anti-racist and Indigenous positions.



- Strive For Simplicity on behalf of the usership (humans, bots/AI and other organic lifeforms).
- Distribute Political And Economic Power through an infrastructural mutualist framework.
- Decenter Western Ideology by applying non-Western historical and ontological knowledge.
- Unify And Heal social and cultural divisions through new mass-narratives.

EVENTS AND PROGRAMMING

May 29-20, 2019: ParTeck19 – BACP Presentation and Workshop

221A Head of Strategy, Jesse McKee, presented the *Blockchains & Cultural Padlocks* project and led a workshop at ParTeck19—1.5 days of cross-sectoral engagements with tech and social innovators around issues of tech and ethics, an annual event that is organized by the Human Data Commons Foundation in Vancouver (Unceded Territories).

June 1, 2019: Designing Affordability – Panel Discussion

Co-organized by 221A with the University of British Columbia's School of Architecture and Landscape Architecture SALON 2019 graduate exhibition and public program, this panel discussion addressed the question of how to design affordability, and offered a forum for emerging and professional architects and planners to discuss shared culpability and resolutions to Vancouver's housing crisis. Blockchain solutions local and international were presented by 221A's Jesse McKee, who convened and moderated the event. Presenters: Bruce Haden (Human Studio Architects, Vancouver); Inge Roecker (ASIR Architekten, Vancouver); Grant Fahlgren (PFS Studio, Vancouver); Christine Rohrbacher (Graduate, UBC School of Architecture); Noha Sedky (UBC School of Community and Regional Planning); Travis Hanks (Haeccity Studio Architecture, Vancouver); Jesse McKee (221A, Vancouver).

June 5, 2019: New Models Module 1: Imagining Collapse

Through a multimedia presentation and lecture, a Q&A, and interactive exercises, this 3-hour workshop explored some of the foundational concepts and teleologies from online communities

engaged in the discussion around climate collapse, and how we must keep the planet's ecological conditions as the base-code when imagining use cases and futures for blockchain tech. Presenters: Lil Internet (director and cultural critic, Berlin); Caroline Busta (writer and critic, Berlin); Christine Lariviere (Senior Social Media and Communications Manager Climate-KIC, Berlin); Daniel Keller (artist, writer and filmmaker, Berlin); Joshua Citarella (artist, New York); Stephanie Wakefield (Geographer and Urban Studies Foundation Research Fellow, University of Miami).

June 8, 2019: DOMA Multi-Stakeholder Workshop, Emily Carr University of Art & Design

DOMA gave a presentation about its distributed housing platform, and participants explored how blockchain technology can support new models of home ownership and pivot the current housing crisis in this four-hour workshop. The workshop included a design challenge, break-out group work, and roundtable discussion about new models and technologies for housing and urban space making. A very diverse audience of artists, designers, students, faculty, planners, architects, blockchain developers, builders and cooperative entrepreneurs attended. Presenters: Francesco Sebregondi, Francis Tseng, and Maksym Rokmaniko (all of DOMA); Laura Kozak (Instructor, ECUAD); Rosemary Heather (221A, Toronto).

June 10, 2019: Presentations by DOMA and Julian Yi-Zhong Hou, Blockchain@UBC Annual Conference

BACP Artist Researcher Julian Yi-Zhong Hou and BACP partner DOMA presented their research at the Blockchain@UBC Annual Conference 2019, an all-day conference held at UBC Robson Square that featured presentations by expert academics on various topics in blockchain and distributed ledger technologies. Hou presented his research for a feasibility study titled *Motives*, which proposes a new organization that supports diverse approaches to rural life, in order to prioritize local histories and bio-regional contexts. DOMA presented on their non-profit housing platform and multiplayer game. The event culminated in the second annual "Talent and Innovation Showcase," which brought students who had been participating in the Blockchain@UBC Summer Institute together with local and international industry partners for networking around jobs and internship opportunities.

June 13, 2019: International Research Roundable: The Truth Machine

BACP Principal Researcher Maral Sotoudehnia and BACP partner DOMA participated in a roundtable discussion convened at the UBC Westpoint GreyCampus, bringing researchers, industry and community partners from diverse backgrounds together. The roundtable sought to unpack relationships and interdependencies among the social, data/records and technological "layers" of blockchain technology which are, at present, not fully appreciated and understood, and help to assess the potential net benefit for humanity of this important emerging technology.

October 8, 2019: Jesse McKee, Blockchain@UBC Research Talk

As part of Blockchain@UBC's monthly research talk series, Jesse McKee, 221A's Head of Strategy and lead on the Organization's *Blockchains & Cultural Padlocks* Research Initiative, gave a presentation to public, faculty, students and industry leaders on the project's intentions, development, its contributors' research and projects and next steps for development. Presenters: Blockchain@UBC and Jesse McKee.

January 19 & 22, 2020: the beecoin project, ChinookX and Multispecies Digital Cooperativism Seminar, Toronto & Vancouver

In partnership with the Goethe Institute, the seminar "The Last Question: How can we design the blockchain towards systems that encourage equity, ecological integrity, and living within the planet's carrying capacity?" was presented by Matthias Einhoff, Artist and Director of Z/KU, Berlin (Centre for Art and Urbanistics), about Berlin's the beecoin project. In Toronto, the event was co-presented with SUGAR Contemporary Art and featured a roundtable response by Ala Roushan (Instructor, OCADU, Toronto); Dr. Alexis Morris (Instructor, OCADU, Toronto); Ceit Butler (Instructor, George Brown College, Toronto); moderated by Rosemary Heather (221A, Toronto). In Vancouver, 221A co-presented with Emily Carr University of Art & Design a workshop and public talk about the beecoin project, presented by Matthias Einhoff. Respondents: Lee White, CEO of ChinookX (Vancouver/Unceded Territories); Jesse McKee (221A, Vancouver); Julian Yi-Zhong Hou (221A, Vancouver); Maral Sotoudehnia (221A, Vancouver; UVic, Victoria; B.C.'s Climate Action Secretariat).

May 5, 2020: Witness Webinar: Can Governments Respond to the COVID-19 Pandemic and Still Respect Personal Privacy?

BACP Lead Investigator Jesse McKee participated and presented in a public day-long Witness Seminar, hosted by UBC's Peter Wall Institute, The School of Information Science, and Blockhcain@UBC, which brought together academics, healthcare practitioners, policy-makers and members of civil society organizations to debate the question: Can governments respond to the COVID-19 pandemic and still respect personal privacy? McKee's presentation sought to aggregate knowledge on blockchain-backed Self-Sovereign Identity with the BACP project, offering a cultural lens through which to consider the impacts of these new co-evolutionary forces affecting tech, economics, policy making and the diverse public reactions from an ever-changing political spectrum. This presentation was followed by an immediate co-authored position paper (June 2020) directed at the Federal Government's Ministry of Digital Government and a forthcoming academic journal article, by the Seminar's convenor, Victoria Lemiueux, who sits on the BACP advisory group.

November 13, 2020: Blockchains & Cultural Padlocks Editorial Overview, Vancouver Biennale

Jesse McKee, Lead Investigator of BACP, presented an abbreviated version of his editorial essay as part of #ArtProject2020, hosted by the Vancouver Biennale, a virtual art and technology expo exploring how the latest technologies are influencing the art world. Within the context of 221A's blockchains research, the paper surveys the crucial role the arts, design and the humanities has to play in deeply adapting our culture towards something that is more cognizant and reactive to the major historical narratives we are navigating today: climate collapse, context collapse, decolonization, economic justice and the equitable redistribution of resources. The essay will be published as part of the first phase (research) of 221A's *Blockchains & Cultural Padlocks* Digital Strategy. The #ArtProject2020 expo ran from November 11-15, 2020 and featured over 80 international speakers and 40 events offering accessible information and educational resources for digital art.

RESEARCH PAPERS

A series of commissioned essays by BACP researchers.

BACP's commissioned research papers consider the relevance of blockchain technology beyond tech startup orthodoxy. This knowledge production is part of the project's mandate. It's a preliminary way to discover how the technology might capture the imagination and what its future applications might be—in an art context and beyond. That said, all research was pursued without any directives about expected outcomes. The researchers come from different professional backgrounds and embarked on their projects with varying levels of familiarity with blockchains. What resulted is a multifaceted set of essays that reflect the complexity of the technology. Other projects pursued by BACP researchers are equally diverse, specifically: the fractional housing ownership initiative of DOMA; ChinookX's proposal to use blockchain as a mechanism for Indigenous sovereignty; and Daniel Keller and the New Models project, which produces alternative narratives for understanding the complexity of the twenty-first-century world. Considered as a whole, the BACP research initiative delivers the message that blockchains are not any one thing beyond an accelerant for thought and a technology of wide-ranging possibility. Shared in common by all researchers is an ability to think beyond prevailing dogmas towards a reimagined future for all.

Full papers are available as appendices in this report.

Rosemary Heather - The Staking Internet

Proof-of-stake uses a security deposit model for blockchain management. That is, it's an incentivized method for managing blockchains, which is proposed as an alternative to the excessive resource consumption of the proof-of-work protocol. An "internet with stakes" has the potential to empower a global network of users. Even very recent history proves the viability of this idea. Recent goings-on in decentralized finance, known as DeFi, shows that users have the ability to fork a protocol to gain more direct access to the funds under its management.[1] The staking internet is the next internet. Heather, a journalist who has worked for a number of blockchain startups, outlines a brief history of this emergent culture that blockchains make possible. Read

Julian Yi-Zhong Hou - Anoetic Tokenization

Trained as an architect, artist Julian Yi-Zhong Hou has referred to his practice as "hypnagogic," a word that defines the transitional state between wakefulness and sleep. Applied to an art practice, this idea points to Hou's attentiveness to how bodily experience combines sensations from both the material and immaterial worlds. Applied to the blockchain, Hou imagines a wholly different use for the concept of tokenization. Anoesis, the mind in a state of sensation without cognition, provides the conceptual basis for Hou's idea of anoetic tokenization—tokens that quantify the value of relationships, not things. In Hou's view, this form of token economy has the potential to upend the hierarchical relationships typical of the legacy artworld. Beyond art, Hou offers a clever prognostication of how networks will continue to disrupt and reorganize social relations. Read

Patricia Reed - The Valuation of Necessity

Reed is an artist, essayist and theorist. A member of the Laboria Cuboniks (techno-material feminist) working group, she was one of the coauthors of the group's *Xenofeminist Manifesto* (2015), which was widely distributed on the internet and republished by Verso books in 2018. For her 221A research, Reed undertakes an in-depth look at the conceptual constraints that, increasingly, are proving lethal to life on this planet. Persuasively, Reed shows that our current predicament (climate disaster and massive global inequality, all further complicated by a

[1] See: Kevin Helms, "Sushiswap Creator Returns $14 Million After Community Cries Exit Scam," *Bitcoin.com*, September 12, 2020 https://news.bitcoin.com/sushiswap-returns-14-million-exit-scam/; and Laura Shin and 0xMaki, "How SushiSwap Proved That Liquidity Is Not a Moat," *Unchained*, September 11, 2020 https://unchainedpodcast.com/how-sushiswap-proved-that-liquidity-is-not-a-moat/

pandemic) is not one of necessity but a historically based cultural construct that, if recognized as such, could be changed. With smoke from West Coast wildfires disrupting daily life in Vancouver in 2020 (and even reaching Toronto), to give just one example, the need for such an "epistemic rupture" could hardly be more urgent. Reed's essay is accompanied by diagrams drawn by the artist, adding a further conceptual dimension to her argument. Read

Maral Sotoudehnia - Encrypting Enclosure: Fractionalized Real Estate on the Blockchain

Maral Sotoudehnia is a PhD candidate at the University of Victoria. In her dissertation, she treats the blockchain space as a field of ethnographic study. For 221A, Sotoudehnia uses this background to scrutinize the value proposition claims made by blockchain applications for real estate. The digitization of housing by apps like Airbnb have intensified the crisis of housing scarcity. Do blockchain-based fractionalized ownership apps (e.g., RealT and Reitium) remedy the problem? Sotoudehnia investigates, often finding telling details that undermine broader claims made by startups. Read

Beneath the pleasant grass, 2019
Ron Tran

Dye sublimation print on silk
94 x 86 cm

Courtesy the Artist
Photograph by the Artist

PARTNER FEATURES

Partners deliver development research around platform mapping and modeling, as well as advise on systems engineering needs for subsequent phases. Also working in education and dissemination, partnerships develop content for broader distribution at events, academic initiatives and through digital platforms.

- Blockchain@UBC
- New Models
- DOMA
- ChinookX
- the beecoin project

BLOCKCHAIN @UBC

Blockchain@UBC is a multidisciplinary research cluster at the University of British Columbia focusing on blockchain technology as a central component in investigating the broader research question: “How can emerging technologies be leveraged to benefit Canadians?”

Engaged in both research and education to advance the design, development and adoption of blockchain technologies, the cluster’s initiatives bring academics, industry and community partners, and policy-makers together to explore pressing issues and advance the emergence of blockchain and distributed ledger technologies. Teaching initiatives span undergraduate, graduate and executive levels to advance the knowledge and qualifications of students and professionals interested in blockchain and distributed ledger technologies.

Current Research

The Blockchain@UBC research cluster is helping Vancouver to grow as a leading innovation ecosystem for blockchain technology. They currently have 221 affiliates and 13 research projects underway, including initiatives focusing on digital identity cards for Vancouver’s Downtown Eastside homeless population; secure smart contract design; quantum-safe blockchain systems; data sovereignty for Indigenous sovereignty; and the application of blockchain technology to land transaction recording.

Blockchain@UBC has published a number of research papers, through various academic partners and collaborative efforts; papers can be found here, as well as an archive of research talks here.

People

The Blockchain@UBC Cluster consists of cluster leads, core faculty, postdocs and staff. The Cluster is lead by Dr. Victoria Lemieux, Associate Professor of Archival Science at the iSchool@UBC, and Chen Feng, Assistant Professor in the School of Engineering at UBC.

Core faculty currently include Dr. Ivan Beschastnikh, Associate Professor of Computer Science; Dr. Cristie Ford, Director of the Centre for Business Law and Professor at the Peter A. Allard School of Law; Dr. Harish Krishnan, Director of the Centre for Operations Excellence and Professor, Operations and Logistics Division, at the Sauder School of Business; Dr. Ning Nan, Assistant Professor, Accounting and Information Systems Division, at the Sauder School of Business; Dr. Chris Rowell, Sessional Lecturer at the Sauder UBC School of Business; and Dr. Zehua (David) Wang, Adjunct Professor in UBC's Department of Electrical and Computer Engineering.

How can emerging technologies be leveraged to benefit Canadians?

Education

Blockchain@UBC's educational programs serve undergraduates, graduates and executives. In 2020, UBC officially launched Canada's first blockchain and distributed ledger technology (DLTs) training path for graduate students. The initiative aims to build capacity for existing Master's and PhD students in this area and help contribute to scaling Canada's blockchain industry while also tackling some of the world's most complex socio-technical issues. The training path focuses on four primary sectors: health and wellness, clean energy, regulatory technology and Indigenous issues, and aims to train 139 students over six years. The initiative is supported by 15 industry partners from a wide range of sectors who offer students high-value internships in collaboration with Mitacs. Boehringer Ingelheim (Canada) Ltd. is a flagship partner, providing funding to support research at the intersection of blockchain and healthcare.

In collaboration with industry and academic partners, since 2017 Blockchain@UBC also offers an annual Summer Institute on Blockchain and Distributed Ledger Technologies. The Summer Institute provides upper undergraduate and graduate students from any discipline at UBC with advanced, specialized training in blockchain and distributed ledger technologies. Topics covered include: basic blockchain architecture and operations; privacy, security, and trust and blockchain/DLTs; emerging international standards and use cases; technical knowledge on the Bitcoin, Ethereum and Hyperledger blockchain/DLTs; and understanding of blockchain and DLTs in social, economic, legal and political contexts.

NEW MODELS

Inspired by the hyperlinked aesthetic of Web 1.0, New Models is part aggregator and part independent journal that compiles a human-directed selection of information and opinion (including scholarly research, mass media and social media threads) onto a single webpage. Founded in Berlin in May 2018, New Models also produces podcasts and other proprietary content. New Models spans art, politics and pop culture, while offering insights and analysis regarding emergent tech and online ecosystems.

New Models believes that cultural debate needs discursive context—and that people with a personal stake in that debate should be given the chance to define it. In pursuit of this, they solicit input and feedback from users—i.e., you—and others in the creative/academic/media/tech community. New Models aims to intelligently centralize the information in this network, aggregating it outside the individuating channels of social media and their algorithmically determined streams.

Research Motivation

When 221A invited New Models as a Researcher on the *Blockchains & Cultural Padlocks* initiative, they proposed to examine the online communities who are responding to the collapsing climate by imagining the societal collapse conditions that accompany it. This research stream was crucial to the overall project by giving it a planetary acknowledgement. New Models ensured BACP embraced the most essential base-codes we have, which are the biochemical relationships between, human, non-humans and inorganic materials such as carbon and silicone. As this code is deteriorating and reshaping itself into an unpredictable future for all who live on earth, this knowledge centered our inquiries and conversations around blockchain development as a coevolutionary tool that needs to address this transformation/succession event as part of its design.

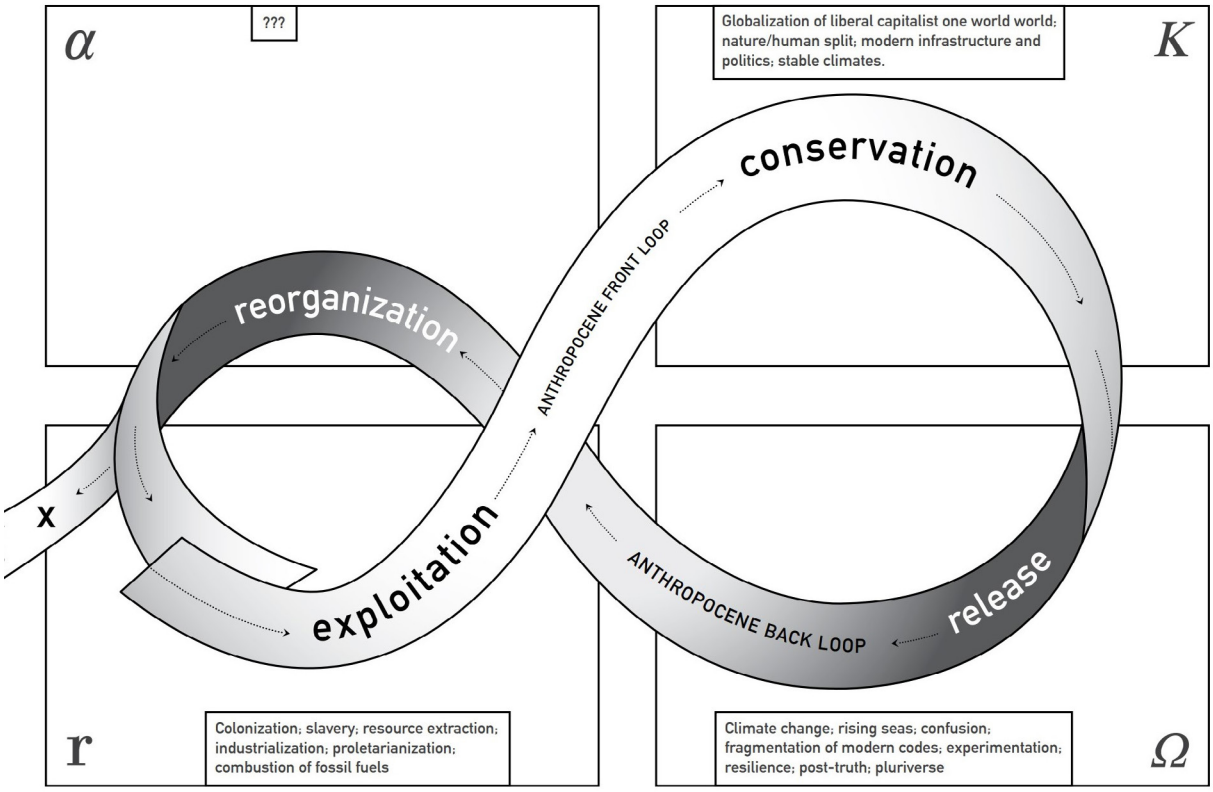
New Models Module: Imagining Collapse was a workshop delivered in two locations at 221A's Pollyanna 圖書館 Library, as well as at Blockchain@UBC's 2019 Summer Institute, which is an annual training program for beginner, intermediate and advanced blockchain developers, scholars, critics and professionals. This forked audience connected artists and designers with emerging actors in the blockchain space. The workshop was presented as a multimedia stream of talks, videos and Q&A, with interactive exercises through which participants explored some of the foundational concepts, teleologies and online communities engaged in the discussion around climate change and collapse, moving away from the impossibility of "sustainability" and resilience and towards a strategy of "relinquishment." The workshop was based in diverse and interlocking memeplexes about coping with—and maintaining dignity and individual sovereignty in the face of—inevitable twenty-first-century climate tragedy.

Since at least the 1990s, the conventional messaging around climate change has been focused on "resilience"—recycling, driving/flying less, reducing plastics, building/farming with the expectation of more volatile weather patterns—all with the intention of being able to mitigate the velocity of climate change and society's chances of snapping back to "normal" in the wake of extreme events. But increasingly, people who work in the climate sector feel that this hope-and-resilience narrative suppresses the full truth: that in the face of climate change, untold loss is inevitable—and that the timeline for living life as we know it, is far shorter than assumed.

Some in this cohort are advocating for a policy prescription that supports societies in psychologically preparing for this change. Indeed the model for this—acknowledging the limits of human production, de-possessing, assuming loss—is the opposite of the narrative capitalism sets out: one of total control, perpetual accumulation, requirement of gains. And not surprisingly it is not only in the science community where this shift in thinking has already begun to take place.

Outcomes

As the BACP initiative presented its work through further participatory research events, such as The Human Data Commons Foundation annual ParTek gathering (2019), and its engagements with the Blockchain@UBC (over 2019 and 2020), we kept returning to a concept originating with Stephanie Wakefiled, an urban geographer based in Miami, which is her elaboration of the cultural shifts taking place as our climate and ecosystems deteriorate. The Anthropocene Back Loop, as detailed in Wakefield's writing, first for the *Brooklyn Rail* in 2017 and more recently in 2020, with the publication *Anthropocene Back Loop, Experiments in Unsafe Operating Space* (Open Humanities Press, London), which is an understudied aspect of biological and chemical ecosystems that maps and speculates what happens in an ecosystem when it breaks down.



Adaptive cycle from Lance H. Gunderson and C.S. Holling, *Panarchy: Understanding transformations in systems of humans and nature* (Washington, D.C.: Island Press, 2002), adapted by Caroline Castro for *Anthropocene Back Loop: Experiments in Unsafe Operating Space* by Stephanie Wakefiled (London: Open Humanities Press, 2020).

Wakefield maps the historical narratives of modernity, and locates us in the period after Exploitation (colonization, slavery, industrialization, proletarianization, fossil fuel combustion) and Conservation (globalisation of liberal capitalism, nature/human divide, modern infrastructure, partisan politics, stable climates) which has built up our world and its systems to today. This sequence of systems and behaviours has ultimately brought our environment and human-made systems to an unstable point, and it is here in the back loop when this breakdown—often swift and violent—starts to bring together new agents and actors (new forms of life) who had previously not been in association or contact with each other. These new connection points create emergent forms of energy and life, which rebuild the ecosystem into something new and more operationally tied to the current threats and factors influencing these changes.

Still from *New Models Module 1: Imagining Collapse*, 2019. Courtesy New Models, Berlin.

The blockchain becomes a key new technology within this framework of the transfer of energy, intentions, culture and behaviour. The new systems that result will enable societies to mitigate and nurture ways of recognizing and exchanging value, so that any assets or currency we rely on become embedded with new forms of meta-data that can be responsive to a rapid and innovative period of mass change. This is a much needed evolutionary succession to the fiat currencies of the Conservation period, which was based in economic systems that are devoid of interrelation and interdependence with biological systems. Through the lens of the back loop we can see the blockchain harnessing so much potential to connect and incentivize more healthy valuation and exchange processes between human and nonhuman actors, found in both natural and technological systems.

Convenors

Daniel Keller

Caroline Busta

Lil Internet

Curriculum Contributors

Christine Lariviere

Stephanie Wakefield

Joshua Citarella

Related New Models Content

New Models: Episode 10 - Loose Climate Change with Christine Larivere

New Models: Episode 13 - Je Refuse with Jenny Odell

New Models: Episode 15 - Remote Port with Benjamin Bratton

DOMA

All around the world, real estate markets are hurting real people. With no prospect of ever owning a home, an entire generation has resigned itself to a lifetime of rent. It is time we change this unsustainable mode of urban living.

Bridging the great divide between renting and owning a home, DOMA leverages the principles of the new token economy to make housing accessible to everyone. Designed for a fair distribution of urban value, DOMA works as a platform cooperative, owned and run by its users. A flexible and secure investment into the economy of tomorrow, DOMA triggers a shift towards affordable, inclusive and sustainable cities

A Platform Cooperative: Infrastructure for a New Sharing Economy

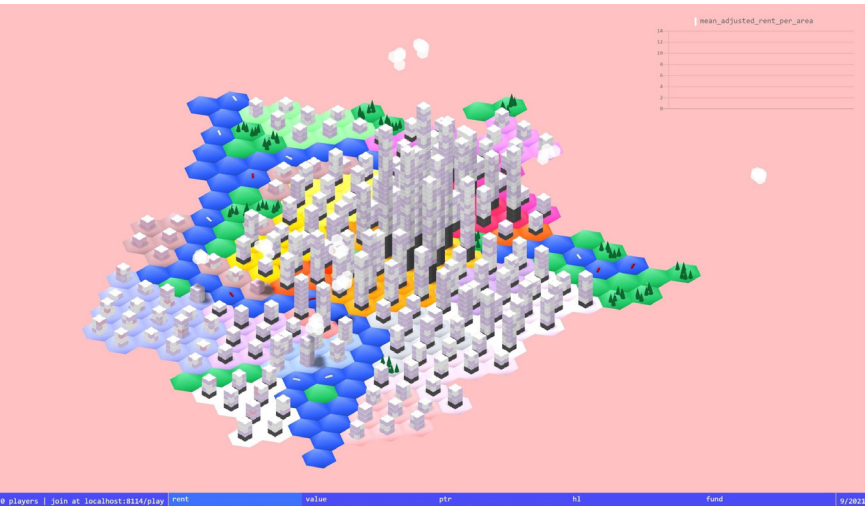
DOMA operates as a platform cooperative, which enables the crowd-buying of housing. By guaranteeing a fair redistribution of equity, it empowers people, neighbourhoods and cities. DOMA consists of existing residential housing units stacked with the platform's financial architecture and its community of users.

DOMA is inspired by the cooperative model: people getting together to achieve a common goal and sharing the profits that are generated collectively. With DOMA, people can pool their resources together so as to raise their collective buying power, while lowering the cost per member in all the services and products associated with home ownership.

Set up as a digital platform, DOMA enables a multitude of urban dwellers to get together and to coordinate their actions at scale. The DOMA platform is optimized for the efficient management of a vast housing network, making it easy for each of its members to participate in the cooperative. Powered by blockchain technology, DOMA offers a flexible, secure and transparent way for anyone to gain a stake in the city.

Crowd-Buying of Housing: Distributing Access to the Housing Market

As a platform cooperative, DOMA enables the crowd-buying of housing. The platform issues DOMA tokens, namely digital titles of property backed by real property assets. By purchasing DOMA tokens, members acquire shares of the DOMA portfolio of properties, and become stakeholders in the platform. They also become entitled to receive rental dividends on their investment. DOMA's stakeholders have access to a single online interface that allows them to purchase and sell tokens; keep track of their investment; explore the portfolio of DOMA properties; contribute to the smart, collective management of DOMA's portfolio; interact with the DOMA community of stakeholders; and apply to live in a DOMA housing unit.



doma play

Redistribution of Equity

DOMA buys housing to rent using a fair and sustainable model. Every resident of a DOMA housing unit is automatically included in the community of DOMA stakeholders. Residents receive DOMA tokens in return for every portion of rent they pay. Between 10 and 15 percent of rent paid is returned to stakeholders as equity. By accumulating DOMA tokens, residents are also entitled to a growing share of the platform's rental dividends. Over five years, residents can expect the effective amount of rent they pay to decrease by 10 to 20 percent compared to general market rate rents. Through DOMA, all stakeholders are rewarded for their respective role in generating new urban value. Instead of pitting landlords versus tenants, DOMA is designed to gather them into the same community of interest.

Empowered People and Cities: Fostering New, Sustainable Models of Urban Living

With DOMA, the community of stakeholders collectively owns the portfolio of DOMA properties. This is a step away from the traditional one-to-one relationship between a single-family household and a housing property. By establishing housing as a commons, DOMA facilitates the emergence of new models of urban living, sharing, organizing or caring that fits the diversity of today's urban condition.

DOMA opens up the chances for all urban dwellers to gain a stake in the city they live in. The potential consequences of this shift are vast—the stronger involvement and participation of urban residents, and the development of a new culture of sharing, by which cities are owned and maintained in common.

DOMA and 221A

For *Blockchains & Cultural Padlocks*, DOMA traveled to Vancouver in June 2019 to meet with the research cluster, host a Multi-Stakeholder Workshop in partnership with Emily Carr University of Art & Design, attend the Blockchain@UBC Annual Conference, and participate in a Researchers Roundtable, which has a forthcoming publication (Springer).

DOMA continued to work with 221A in 2020-21 as a Fellow. In partnership with the Centre for Spatial Technologies (Kyiv), they are developing a closer study of the Lower Mainland of British Columbia's housing markets. Through the development of a digital dashboard with a rich array of interrelated data sets, the team is determining an affordability index and platform narrative which can provide a vision towards an operating strategy, within an overheated and rapidly densifying housing market that is on the spear's edge of the global housing crisis.

CHINOOKX

ChinookX is a network of technologists and social innovators in the Pacific Northwest seeking to help facilitate the clean energy transition by grounding emerging technologies in the wisdom of Indigenous ways of being and relating to each other, the environment and ourselves.

Vision

Canadian Indigenous communities achieve their economic, social, sustainability and political goals through owning and operating innovative technologies.

Mission

To support Canadian Indigenous communities to access economic opportunities through innovative technologies.

Values

- Integrity – to work for the best interests of our clients.
- Compassion – to consider the history of our clients.
- Courage – to be bold, innovative and honest.
- Respect – to appreciate the cultures of our clients.

Objectives

- Reconciliation – Acknowledging past wrongs and creating a better future for Canadian Indigenous people through economic enfranchisement.
- Sustainability – Responsible economic development through fiscal, social, cultural and ecological stewardship in the context of traditional Indigenous values.
- Social Justice – Supporting disenfranchised and marginalized groups.
- Equitable Distribution – Non-hierarchical and decentralized value exchange.
- Consensus – Modelling Indigenous consensus processes for deep dialogue.

What Does ChinookX Do?

ChinookX operates data centres in partnership with Indigenous utilities, synergizing private sector interests with reconciliation in the pursuit of regional economies based on clean energy transition. ChinookX is also leading research in partnership with Blockchain@UBC and the HumanData Commons Foundation, exploring how Indigenous values can be expressed in computational algorithms.

A data centre is a building or space used to house computer systems and associated components such as servers. Data centres are used for the purpose of collecting, storing, processing, distributing and allowing access to large amounts of data. Just about every business and government entity either needs its own data centre or access to one. Data centres provide important services such as data storage, backup and recovery, data management and networking. ChinookX sees the potential for small-scale data centres to utilize artificial intelligence to operate SMARTgrid circuitry. SMARTgrids are computer stacks with automated switches that create real-time supply and demand of energy within a region, enabling more intelligent energy use and production.

Why Indigenous Data Centres?

Indigenous Nations have the jurisdictional authority and moral fortitude to accelerate and transform energy transitioning not only in British Columbia, but globally. Data centres operated on Indigenous territories have the potential to facilitate the transition from fossil fuels by managing SMARTgrid circuitry and renewable energy distribution. The economic spinoff opportunities for our Indigenous partners and the regions we operate in are also substantial and diverse. These opportunities may include cryptocurrency investment, the ability to offer sovereign cloud hosting to regional businesses and communities, as well as animation rendering for the entertainment industry. Most importantly, operating data centres in partnership with Indigenous utilities empowers Indigenous sovereignty and nationhood. Indigenous Nations are able to manage cumulative impact modelling of their traditional territories, store digital archives of language and cultural knowledge, as well as implement data science supported by traditional metrics.

By placing the implementation of this technology into the hands of the rightful stewards of these lands, ChinookX supports not only energy equity and regional governance participation in the transition from fossil fuels, but also reconciliation and the resurgence of strong Indigenous cultures, societies and governance structures.

Indigenous Values as Computational Algorithms

Many Indigenous cultures in the Pacific Northwest and around the world have ancient laws that ensured reciprocity between tribes and maintained harmony with the natural world. Protocols were established and passed on through oral tradition to govern all aspects of trade and commerce, social structures and territory stewardship.

ChinookX has asked the question: Can the fundamental values of these Indigenous laws and protocols be programmed on a blockchain? A blockchain is essentially a digital ledger of transactions that is duplicated and distributed across an entire network of computer systems on the blockchain. The blockchain network has no central authority. It is governed by "consensus protocols" that make sure that every new "block" (ie. dataset or record) added to the blockchain is the one and only version of the truth. Thus, a consensus algorithm aims at finding a common agreement that is a win for the entire network.

Can the fundamental values of these Indigenous laws and protocols be programmed on a blockchain?

The same principles of transparency, accountability and consensus building are at the core of many traditional Indigenous governance systems. ChinookX aims to create consensus algorithms heavily influenced by these ancient protocols. When talking about something like the perennial characteristics of Indigenous Consensus Protocols there needs to be extensive due diligence, community consultation and rigorous academic research.

From the onset ChinookX has worked with Blockchain@UBC and the Human Data Commons Foundation to build emergent technologies and applications through authentic processes. There is no room for appropriation nor tokenism. It is our aim to work in partnership with Indigenous elders, knowledge keepers, researchers and programmers to build our vision of bringing the village back into the modern world. From 2019 through 2022, ChinookX Technologies Ltd is a central partner to a $2.7 million research grant to Blockchain@UBC from National Science and Engineering Research Council (NSERC).

Why Chinook?

The Chinook are the largest species of Pacific salmon, and have long been the literal and symbolic lifeblood of Indigenous tribes in the Pacific Northwest. Ancient intertribal economies, trade and commerce were formed on these lands and waters thanks to salmon. These economies were grounded in the spirit of reciprocity, a drastic and far more sustainable practice and way of being than today's global economic system focused on growth and built on the premises of selfish self interest. The industrial eras have exported modernity throughout the world, bringing with it centralized power hierarchies and asset accumulation systems built to favour shareholder interests over the wellbeing of any bioregion's inhabitants and supporting ecosystems. ChinookX believes that in order to reverse the effects of climate change, transition from fossil fuels and ultimately build a world where we live in sustainable coexistence with each other, the environment and ourselves, we must return to the values and worldviews of the Chinook cultures that stewarded these territories since time immemorial.

ChinookX and 221A

ChinookX is a partner of 221A on the *Blockchains & Cultural Padlocks* Initiative. In early 2020, ChinookX facilitated a stakeholder design workshop bringing together a broad coalition of students, designers, artists, planners, urbanists and developers around questions of prototyping for a blockchain community and reciprocity currency platform. Seeking ways for the blockchain to be designed with Indigenous consensus protocols, ChinookX's work contributes a perspective anchored in data sovereignty for First Nations communities and responsive resource management for traditional territories.

the beecoin project

The beecoin project is a project by artists, biologists, engineers, programmers and bees.

Bees uphold the ecosystems we depend on every day, yet we repay them by destroying their habitats, smothering them in pesticides and globalising parasites that threaten entire colonies.

The beecoin project is an experiment in recoding the community as organisation—one in which our relationship with bees is symbiotically reinforced and the relations of our shared environments reconfigured. Open-source sensoring kits generate data from bee hives, and a crypto-economic system redefines the inherent value of the reproduction of colonies. This project invites anyone to become a vanguard beekeeper, DAOist shareholder, or simply a curious supporter.

History

The beecoin project was borne within STATISTA, a cooperative project between ZK/U, Center for Art and Urbanistics, and KW Institute for Contemporary Art. Using its historical location—Haus der Statistik at Alexanderplatz in Berlin—as the point of departure, STATISTA investigates models of cooperation in the field of urban development, which aim to maximise public welfare and undermine private profit maximisation. The project develops artistic prototypes for an urban society based on common property. Prototypes remain responsive to the participation of the diverse parties involved, and are built to make a lasting change.

As one of these prototypes, the beecoin project expands the notion of common property as the reproduction of a species we depend on daily to uphold our ecosystems—bees. The project builds on the research of Hiveeyes, a project based in Berlin that develops monitoring

Photo: Tomaschko

infrastructure and DIY toolkits. Hiveeyes runs on open-source software, affordable hardware and wireless telemetry. Thus beecoin began as the proposition to build an organisational crypto-economic structure on top of Hiveeyes' open source hardware platforms.

The beecoin decentralised autonomous organisation (DAO) is inspired by the idea of self-governance of non-human stakeholders based on early versions of smart contracting explored in projects such as Terra0, which aims to create a self-owned forest. Paul Seidler and Max Hampshire, co-founders of Terra0 and Nascent, created the coding base for the guild around bee care.

Prototype

The initial concepts for beecoin sought out an alternative currency, one that would run against the stream of fiat systems to create an economic sphere of autonomous exchange—a token bound to the value produced by honey, or a token generated by the steady reproduction of the beehive. As the project progressed, beecoin became the origin from which a DAO was born.

Using smart contracts on the Ethereum blockchain to automate administrative tasks, the first prototype of the DAO surfaces as a general social agreement programmed as protocol: bettering the conditions for bees. Using The Moloch DAO—created to contribute to the development of public goods infrastructure on the Ethereum blockchain—as a template, the proposed "Minimum Viable DAO" encodes a guild as a self-governing funding body.

Mission

The loss of bees is a phenomenon making its mark globally, particularly in North America and Europe. In North America, the loss of 30-40 percent of commercial honeybee colonies is tied to a syndrome called "colony collapse disorder," while in Europe the loss of honeybee colonies since 1985 is estimated at 25 percent. These statistics only represent the tip of the iceberg. Honeybees are the species best documented in the tracking of this phenomenon, standing in stark contrast to what is known about wild bee populations. Yet scientific research shows that a diversity of wild bee species is paramount for sustainable crop production. The complexity of issues surrounding the livelihood of bees is difficult to penetrate and even more difficult to

Photo: Tomaschko

conquer if not collectively. As such, what beecoin addresses is the need for a process that may collectively find an answer to the difficult question of how to better the predicament faced by bee populations.

Within this process, the main aim is to create an organizational structure that incentivises beekeeping and data gathering for further research, acting as a catalyst for community-driven action. Starting small from a handful of honeybee hives, the aim is to bring together human and non-human actors in a constellation, distributing resources so that small individual contributions can ripple into larger collective zones of impact. Can the care of one honeybee colony at Haus der Statistik spawn the explosive propagation of colonies around the city, or contribute to research into better conditions for wild bee populations in urban spaces?

Beecoin and 221A's Blockchains & Cultural Padlocks Initiative

Beecoin collaborated with 221A in Phase One of the *Blockchains & Cultural Padlocks* (BACP) initiative as a program partner, contributing findings and research from its experimental DAO prototype. Its advancement of equitable, distributed relationships between human and non-human actors (bees) offered compelling support to BACP's central axis of inquiry around imagining equitable and ecological design on the blockchain. In partnership with the Goethe Institute, 221A presented two events (Vancouver, Toronto) in early 2020 with the beecoin project's Matthias Einhoff, Artist and Director of Z/KU, Berlin (Centre for Art and Urbanistics).

FREQUENTLY ASKED QUESTIONS

Why is decentralization such a big blockchain talking point?

The vision of the original bitcoin white paper sought to leverage an innate capacity of the internet, which is to function as a decentralized entity that produces value. A crypto network creates secure assets (of any kind) by using network consensus algorithms. A blockchain resolves to consensus by doing cross-network audits of the data it's managing, in intervals ranging from ten minutes to a few seconds. The bigger the network the harder it is to corrupt its data. Therefore, the more nodes on a network the more secure the data it manages will be. Cross-network decentralization makes the data secure. Other innate potentials of blockchain technology include decentralized peer-to-peer value transfer. Transactions that are broadcast to the network can be processed by the network as a whole, without the need to be routed through a central clearinghouse. To date, blockchains have produced upwards of $1 trillion USD worth of value, proving the viability of cryptocurrencies as a use case for the technology.

What is a DAO?

DAO stands for decentralized autonomous organization. All blockchains are DAOs in the sense that they are organizations that run across a network, in accordance with the consensus of its users. Consensus on a blockchain operates on a number of different levels: 1) at the level of the algorithm, which does regular updates on the state of its consensus; 2) at the level of the node operators, who can decide to make significant changes to how the network operates through so-called "forks"; 3) at the level of the developers, who can choose to participate in a network by building applications on top of it; 4) and at the level of the user, who implicitly participates in network consensus through the buying and trading of tokens. When referring to a formal entity, a DAO makes use of all of the above levels of network consensus, and adds governance mechanisms. Considered by some to be the killer app of blockchains, today's active DAOs are still in an early stage of development.

What is a smart contract?

Also known as self-executing contracts, smart contracts are part of a wave of automations that blockchains make possible. The network feeds specified types of data to the contract, which will then execute when certain conditions, encoded into the contract, are met. The contract might be dependent on some form of verification (of weather events, for example) that gets confirmed via a network of IoT sensors. Betting, in the form of a prediction market, is another example of blockchain-enabled smart contract functionality. Prior to blockchains, the cryptographer Nick Szabo theorized the smart contracts as a potential use of network-based computer programming. Today, the Ethereum network is the original, but not the only, blockchain-based smart contract network. The Bitcoin network itself has some limited smart contact functionality (The Lightning Network is one example). Another name for the Ethereum network is the EVM, or Ethereum Virtual Machine—i.e., the network running as a massive virtual automated entity.

What is staking?

The first era of blockchains operate in most cases using the proof of work algorithmic consensus mechanism. With proof of work, all nodes in a network must be in agreement on the contents of its database, which is managed across the network. This consensus is continually updated. While highly decentralized and therefore secure (because it is very difficult to corrupt data on the network [see above]), proof of work requires huge network resources to manage its database. Proof of stake is the consensus mechanism proposed to solve this problem. In proof of stake, network participants can make a deposit of crypto in exchange for the right to operate a node on the network. Node operators earn a percentage of the fees users pay as part of every blockchain transaction. Their crypto deposit, or stake, has a chance to grow in value if the network is properly managed, which incentivizes good practices in network management. Participants can also pool their crypto with other users, and this stake is then managed on their behalf by a node operator or some other entity.

What is an NFT?

Non-fungible tokens or NFTs are digital assets made unique (and therefore non fungible) using blockchain technology. NFTs can be owned and traded but never altered or copied. Blockchains “mint” the authenticity of each NFT digital file, creating the terms for a new

economy of monetized content on the internet. Early use cases include card trading games, like CryptoKitties and NBA Top Shot, and digital artworks. The latter have found success within digital marketplaces that combine legacy art world-type auctions with hype cycle "drops" of limited edition goods (e.g., Supreme). NFTs could be said to be commodifying network dynamics of attention; their value lies in galvanizing discrete moments of consensus amongst networked communities. Unlike traditional artworks or collectables, the terms of this relationship can be encoded into an NFT's smart contract. For instance, an artist's right to a percentage of a work's resale value could be specified in an artwork's smart contract[1]—only one example of the type of instructions the artist could embed in a work to control or change it over time. Beyond art and collectibles, the use cases for NFTs are considered to be numerous. An NFT could be a form of verifiable and incorruptible digital identity, for instance. NFTs could also provide an authentication mechanism for consumer goods, creating what one still-in-development project terms Phygital Ownership. Further, there are many financial use cases for NFTs currently being prototyped—such as the tokenization of invoices, which can then be used as the basis for asset-backed loans.

What are some key differences between blockchains and the internet?

Joel Monegro, a venture capitalist with Placeholder Ventures, wrote two influential posts about the difference between blockchains and the internet. Monegro makes the observation that the two technologies are differentiated by the respective ways each generates value. On the internet, everything happens at the application layer. Open protocols at the base layer (TCP/IP, HTTP, SMTP) combined with user services made available for free on the application layer, has generated tremendous value for a proprietary internet. By contrast, blockchain technology generates value at its protocol layer; i.e., on token networks. Monegro calls this the token feedback loop. The success of a token attracts new investors and innovators to the blockchain, which helps grow the network, which attracts more investors, and so on. Compared to the amount of value token networks have generated, the development of an application layer on blockchain networks is still at an early stage.

[1] This is an important departure from practices in the legacy art world, in which the artist does not profit when the value of their work appreciates at auction.

LOOKING AHEAD

Blockchains & Cultural Padlocks Development Strategy

221A advances towards planning development opportunities through the work of *Blockchains & Cultural Padlocks* in 2021-22, with nearly two years of research, consultation, education and learning programming completed. In the process, we have also developed a richer network that expands the organization's reach beyond the cultural space and towards the tech, social justice and cooperative economic sectors. With this in mind, 221A looks forward to working with blockchain in this capacity, as an institutional technology to develop the next layer of the internet that will enhance and accelerate the exchange of value across information networks, without the intermediation of legacy institutions such banks, credit cards, regulatory bodies and national reserves.

The research period yielded a strong body of critical interrogation of the technology from a cultural perspective, using lenses such as critical theory, economic justice, social justice and equity. 221A's entry into the blockchain sectors in Vancouver and elsewhere was welcomed as a singular and exciting addition. This was echoed by one of our core partners, the Blockchain@UBC Research Cluster. Too often discussions around emerging technologies meet the legal minimum requirements for scientific and ethical review. 221A quickly saw its position as a

rich opportunity to grow into, with its background in design and critical theory. When these methodologies are applied to the sectors developing blockchain such as energy, finance and labour, 221A can provide more thorough, comprehensive and cross-disciplinary strategies through which to interrogate blockchain technology at large, as a socially co-evolutionary tool.

This presents an opportunity to develop 221A's role in the digital ecosystem. Previously, cultural institutions might be invited into technology development ecosystems in order to provide creative use cases of the tech, which is rooted in a history of neoliberal ideals about creativity and technology at large. With the many upheavals in the global economy, politics and social order, these old paradigms no longer seem sufficient. Instead, what 221A proposes as a way forward is to insert itself as an active agent within the technology sector in order to bring great critical review, cross-sectoral learning, equity-focused design challenges, and to offer greater integrity to the development communities of emerging technologies, especially blockchain, with the broad scope goal of nurturing forms of digital cooperativism. These efforts coalesce to instill alternatives to the existing surveillance economy that is standard for the digital realm today, and allows 221A to advance its intentions of recommoning land, data and objects with the blockchain. Overall, 221A wishes to see great uptake and commitment to the notion of "data equity," and how this is deployed with self sovereign identities online.

Clear objectives, new milestones and deliverables for the Development Strategy

221A continues to work with several of its researchers and organizational partners to produce development planning towards our organizational modeling, and how we can better support both the development of cultural research praxis through its artistic program, while providing the grounds and means to find opportunities for this research to nurture blockchain technology use cases. The first major initiative is with one of its research partners, DOMA. DOMA is a blockchain-based, shared ownership platform for equitable real estate. Bridging the great divide between rentership and ownership, DOMA leverages the principles of the new token economy to support a cooperative model of networked property ownership and access, enabling a fairer distribution of value for urban living and working, by creating a network of properties across several cities. DOMA is already registered in Kyiv Ukraine and Paris, France and is developed by Francesco Sebregondi (Paris, Artist & Architect at Forensic Architecture, London) and Index (Paris), Maksym Rokmaniko (Kyiv, Architect and Lead, The Centre for Spatial Technologies) and Francis Tseng (New York, Systems Developer and Engineer).

DOMA is now a 221A Fellow, working with the organization over a year-long period. DOMA takes a particular interest in Vancouver's property market, due to the severity of the market's dislocation from regional incomes. Nowhere in the Americas or Europe is this divide as severe. Only Hong Kong and Sydney, Australia, have comparable gaps between regional income and property value. Being on the spear's edge of the speculative property bubble in Vancouver enables DOMA to understand how its platform can transform these kinds of property markets, by providing great by providing greater diversity of tenureship.

Throughout the fellowship, DOMA will assess the regional and global pressures influencing Vancouver's property bubble, and will model programming of their platform to be applied in the context of Vancouver. This is an advancement of the DOMA platform, which has previously been designed as a stacked digital layer that will adapt to cities in Europe where the housing stock is relatively stable and available, without too much new development being foreseen. Vancouver offers a new model to adapt to, with a highly inflated existing property stock, along with a rapidly developing and densifying city where values of the new properties are predicted to increase and widen the divide between property costs and incomes. The long-term impact of the pandemic on this market is still to be seen, and its impacts are being factored into DOMA's ongoing work.

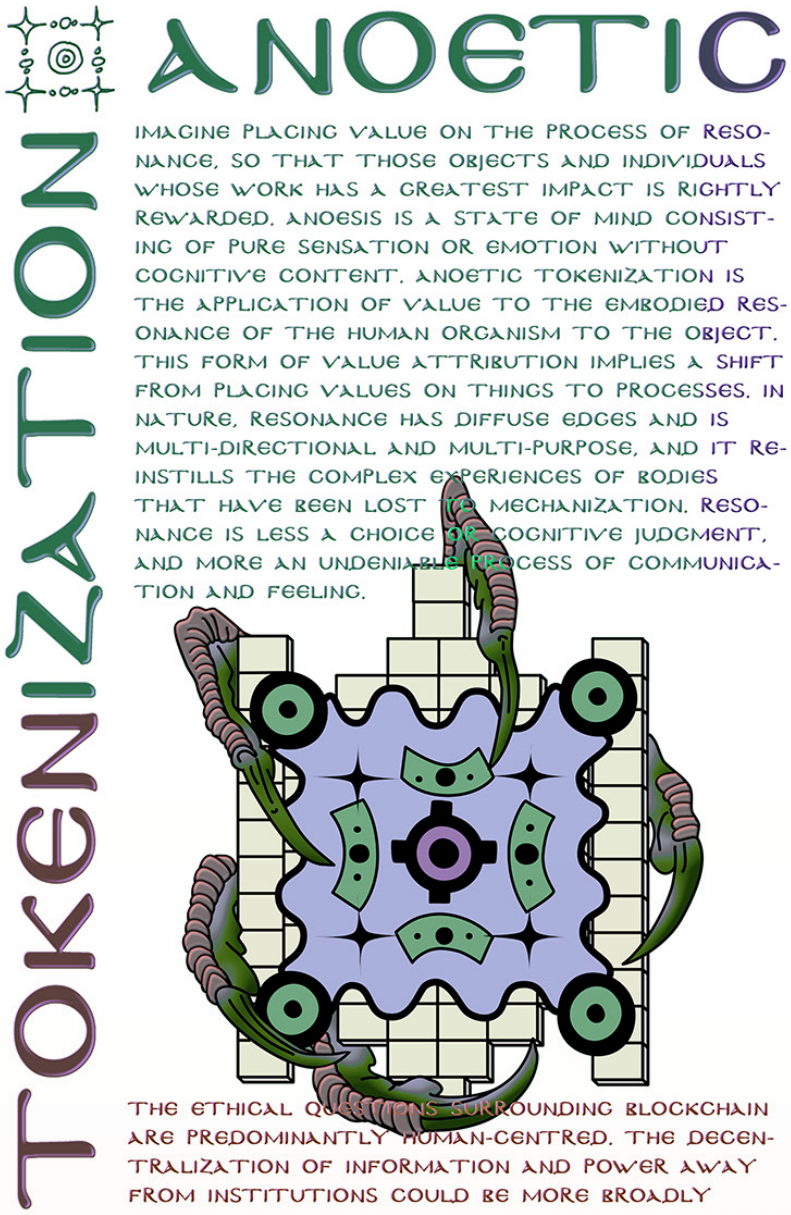
Equally, 221A will be working to explore potential and progressive forms of legal partnership with new digital infrastructures, through which we can continue to co-develop towards our shared values and goals. Initially, 221A will explore the establishment of a charitable ventures arm within 221A's organizational model. This new venture arm would transform 221A's organizational model by looking for experimentation with regulatory frameworks, and encourage and support the development of nonprofit and cooperative digital platforms, which could operate with minimal administration through a distributed autonomous organization (DAO) initiated by 221A. 221A would share in the ownership and development of these platforms. This change would provide a long runway for 221A to lean into the development of beneficial use cases for the cultural sector via blockchain technology. Administering a ventures arm via a DAO would provide the smart contracting, consensus protocols and financial administration that would have been beyond the capacity of our two medium-scale organizations, but the streamlined advantages of blockchain will make this more achievable with less labour, investment and overhead expense.

In its development phase, 221A will also pursue use case implementation with its Editorial Director and Principal Researcher, Rosemary Heather, to further develop 221A's potential within the emerging blockchain proof-of-stake consensus algorithm. Staking, which enables

community network ownership—members help manage and profit from a network by running nodes, and through interest earning "stake" deposits of network native tokens—has become a much-anticipated alternative to the blockchain mining, proof-of-work protocol, which is the first and current phase of the technology and which is criticized for being overly time, data and energy consumptive. The overall potential for staking pools to nurture the mass collaborative potential of the blockchain was swiftly advanced in early 2021, with the popularization of NFTs or non-fungible tokens. NFTs are now increasingly being used for the sale and trading of unique digital tokens as artworks, such as rare digital images, new writing and music production. This space is interesting to 221A for the potential it offers creators in having a long-term relationship with their work through smart contract protocols. Creators could find ways to gain value from the resale of their work on token exchanges, or later access control of the work so that it can change and evolve over time.

As part of 221A's future growth and facility development, we can look towards being the host of blockchain staking nodes for networks and use cases, which 221A sees aligned with its vision for nonprofit and cooperative blockchain development towards the recommonig of land, data and objects. By starting to contribute its resources towards developing the future digital ecosystem for cultural, education and nonprofit sectors, 221A will grow its reach and influence in the blockchain sector. 221A's staking node hardware and the resulting transactions could also be administered through the organization's nonprofit and collaborative ventures arm and DAO.

221A looks to develop this kind of technology to support its collectivist business models, so that 221A can transition towards a more robust and resilient organizational model. This model keeps cultural production by artists prioritized amidst a material and economic future that will be inconsistent, harder to plan towards with current tools and structures. 221A steps into this ultimately less stable world, in which we must learn to operate cooperatively, ethically and with long-term sectoral care and leadership.



Anoetic Tokenization, 2019
Julian Yi-Zhong Hou

Digital print for cotton t-shirts with beads, charms and stitchwork
Dimensions variable

Courtesy the Artist

KEY PERFORMANCE TARGETS

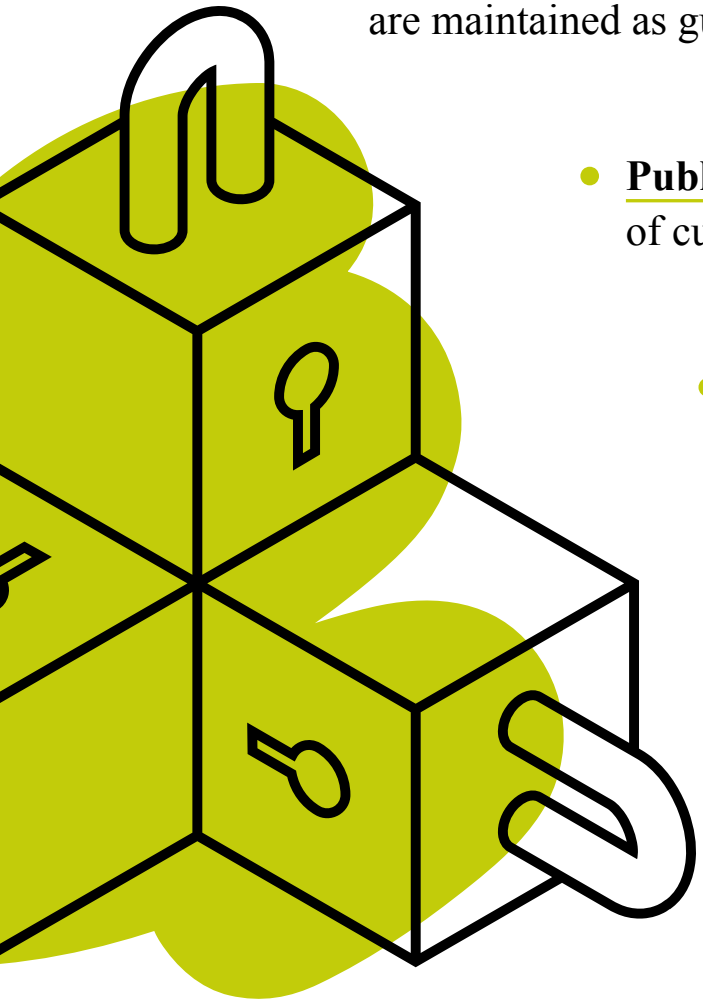
A list of the values and objectives that will guide 221A and its Blockchains & Cultural Padlocks Digital Strategy.

Now → 2025

Funding

Strive for an equitable mix of public, private and self-generated revenue in order to bolster 221A's ability to lead

- **Private equity** should be raised through a mix of foundation and corporate giving, in order to ensure strategy screen values are maintained as guiding principles.



- **Public equity** should be raised through a mix of cultural, academic and scientific funding.

- **Self-generated revenues** from the implementation of strategy will be applied to the advancement of the digital strategy and 221A's charitable purposes at large.

Education, Outreach and Onboarding of Usership

Prioritize access and diversity of engagement, keeping simplicity of outcomes for usership in sight

- **Institutional Peer Learning Network:** 3-5 cultural institutions who are committed to this learning and development; half of these institutions represent the interests of non-white, non-tech, non-university sectors.

- **Communications Partnerships:** 7-10 content-sharing partnerships developed around public programs, prioritizing multi-sectoral engagement.

- **Geography:** audience engagement on national and international level; learning across continental-scale digital stacks (the Americas, Europe, China/Africa, and Russia).

- **Platforms:** engaging audiences both within user-directed and algorithm-led digital social spaces.

2025 ⇝ 2030

Human and Ecological Equity via the Digital Realm

De-center Western ideology and foster a diversity of design, development and usership

- **Social and Cultural Equity** advancement of the platform coop development community, diversifies usership and increases likelihood of wide-scope social and cultural benefit.

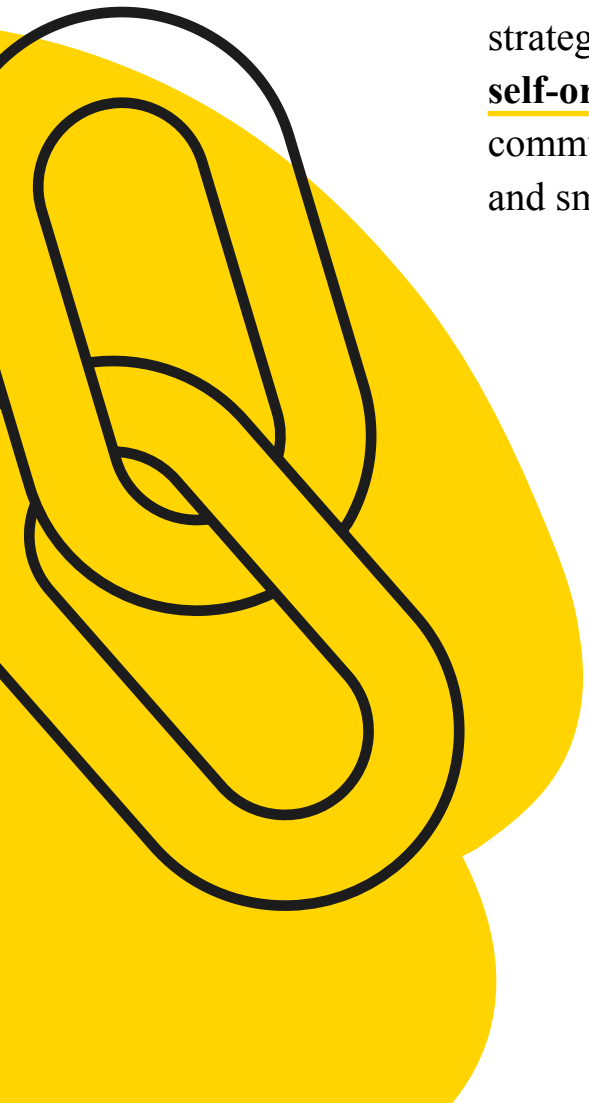
- **Value** is generated through non-hierarchical means and aims for the distribution of value in different forms, and responds to the changing nature of valuation across cultures.

- **Bioregionalism** informs the way value is aggregated locally, and the decision making for distribution of value outside of the bioregion.

Distributing Political and Economic Power

The potential of the network's reach and scope incentivizes relationships beyond the primitive hierarchy of 20th century political and economic delineations.

- **Majority of projects should promote mutualist and cooperative aims**
  - The majority of networks initiated by the digital strategy **should be advanced through collective self-organization** of existing resources held within communities, in order to grow the dual power of workers and small and medium enterprises.
    - Distributed ledger **community incentives grow usership, reach and scale of network,** while safe-guarding against bad actors and coordinated inauthentic behaviour.
      - **Find new methods to onboard stakeholders** who have been excluded by traditional financial benchmarks and criterias for political participation/citizenship.



PARTICIPANTS

Editorial Director

The Editorial Director provides multi-sector strategic planning, networking, dissemination and supports the achievement of core deliverables.

Rosemary Heather is a journalist, curator and researcher with a specialization in blockchain. She writes about art, the moving image and digital culture for numerous publications. Art projects include *Nasty*, co-curated with Daniel Faria, 2017; *Kim (Us)* collaboration with Nicolaus Schafhausen, 2015/16; *Moby Dick*, 2002/2015; *Screen and Décor* collaboration with Rodney La Tourelle and Louise Witthoeft, 2013-2014; *Ron Giii*, *Hegel's Salt Man*, 2007-2008; *Serial Killers: Elements of Painting Multiplied by Six Artists*, 2000; *i beg to differ*, 1996. She is a co-author of the collectively written novel *Philip*, 2006. From 2013-2015 she was Director of Publications for Fogo Island Arts, and from 2003-2009, the editor of *C Magazine* (Toronto). Since 2015, she has worked in the blockchain industry as a writer and researcher. An archive of her writing can be found at https://rosemheather.com/

Principal Researchers

Principal Researchers invite associates, gather research materials, propose areas of study, synthesize knowledge, and produce long-form texts, feasibility studies, white papers, and other forms of content.

Rosemary Heather see above

Maral Sotoudehnia is a PhD Candidate in the University of Victoria's Department of Geography. Her research investigates the cultural politics and commodification of digital and urban spaces shaped by global policies, peer-to-peer systems and smart technologies. Equally influencing her scholarship are contemporary approaches to critical data studies, feminist political economy and new materialist scholars that foreground questions surrounding access, citizenship, embodiment, financial exclusion, social justice and subject/ivities in relation to multi-scalar decision-making processes. Her doctoral research project, supported by the Social Sciences and Humanities Research Council, traces an ethnography of contemporary

life under distributed but rambunctious instances of capitalism generated by blockchains and cryptocurrency markets.

Erika Wong is a PhD Candidate and installation artist from the University of Brighton where she is studying the valuation and legitimization system of the art world and its relationship to the creative class. Erika's research focuses on closing the gap between creativity and the monetization of it, and she is looking into creative entrepreneurship and current technologies as potential solutions to diversifying the current funding models for artists and other creatives. Erika has worked internationally in tech, fashion and art strategizing, as well as in piloting programmes that focus on customer relations and return on investment. She holds a Master of Arts in Creative Practice for Narrative Environment from Central St. Martins in London, England, and a BFA from Art Center College of Design in Pasadena, California.

Artist Researchers

Artist Researchers explore instances of cultural production that would lend themselves to developing blockchain use cases. The artistic research also provides theoretical, ethical and moral perspectives around the emergence of the technology.

Julian Yi-Zhong Hou is an artist working in textiles, sound, performance, text and drawing. He adopts empathic and fluid methodologies in addition to hypnagogic practice to produce works that speak about cultural motives, animism and figuration in objects and interiors. He recently held the solo exhibitions *Dreamweed*, Unit 17, Vancouver (2018); *Cloudcuckooville*, Soon. tw, Montreal (2018); *Milman Parry's Waiting Room Rhapsody*, Artspeak, Vancouver (2017); *Stupid sun*, 8eleven, Toronto (2017); *Help me remember*, L'escalier, Montreal (2015); *Window Bended Harmony*, CSA space, Vancouver (2014). Hou holds a BA in Art and Culture Studies from Simon Fraser University, Vancouver, and a Masters in Architecture from the University of British Columbia, Vancouver.

Daniel Keller is an American artist, writer and filmmaker whose wide-ranging output engages with issues at the intersection of politics, economics, technology, culture and collaboration. He is a contributor to New Models, Texte Zur Kunst, DIS and Spike Art. His work has been exhibited at The New Museum, NYC; Musée d'Art Moderne de la Ville de Paris; Kunsthalle Wien, Vienna; Museum of Modern Art in Warsaw; Fridericianum, Kassel; The Athens Biennale; KW, Berlin and The Zabludowicz Collection, London. In 2018, Daniel co-founded the podcast and website https://newmodels.io with arts journalist Caroline Busta, and film director and audio producer Lil Internet.

Patricia Reed is an artist, writer and designer based in Berlin. As an artist, selected exhibitions include: TIER, Berlin; Meet Factory, Prague; The One and The Many, CUAG, Ottawa; Homeworks 7, Beirut; Witte de With, Rotterdam; and HKW, Berlin. Recent writings have been published in Angelaki 24; Making & Breaking; Para-Platforms (Sternberg); Post-Meme (Punctum Books, forthcoming); e-flux Architecture; Xeno-Architecture (Sternberg Press); Cold War Cold World (Urbanomic); and Distributed (Open Editions). With Victoria Ivanova, she co-curated the 1948 Unbound: Tokens session with the House of World Cultures team, Berlin (2017), and was a theory researcher for Public Art Munich 2018. Reed is also part of the Laboria Cuboniks (techno-material feminist) working group whose *Xenofeminist* Manifesto (2015), was reissued by Verso books in 2018.

Advisory Group

The Advisory meets quarterly to review and criticize the research cluster's work, and they advise on decision making, regulation policy, and project targets for future development.

Ross Gentleman was CEO for CCEC Credit Union, a community development credit union in Vancouver until mid-2016. He also served on the Legislative Committee at Central 1 Credit Union. From 2005-2013, Ross was the Executive Director of Tradeworks Training Society in Vancouver's Downtown Eastside. Previously, Ross served as both Superintendent & Deputy Superintendent of Pensions, with 17 years experience working in various roles at the Financial Institutions Commission of BC, Ministry of Finance.

Victoria Lemieux is an associate professor of archival science at the iSchool and lead of the blockchain research cluster, Blockchain@UBC, at the University of British Columbia—Canada's largest and most diverse research cluster devoted to blockchain technology. Her current research is focused on risk to the availability of trustworthy records, in particular in blockchain record-keeping systems, and how these risks impact upon transparency, financial stability, public accountability and human rights. Dr. Lemieux has organized four summer institutes for Blockchain@UBC to provide training in blockchain and distributed ledger technologies for undergraduate and graduate students from across UBC.

Scott Nelson is an open technologist, aspiring futurologist, avid cyclist, serial entrepreneur and social innovator. He's worked with decentralized digital currencies and blockchain technology since 2010. He is chair and founder of the Human Data Commons Foundation, a founder and chair of Crowdgift Canada CCC, and sits on the Futurists, Religion & Spirituality and Robotics/AI advisory boards of the Lifeboat Foundation.

Geoffrey Routledge has a broad technology, sales and business background. His experience ranges from founding technology startups like PayByPhone, to IT leadership at large industrial corporations, to enterprise sales at technology leaders like Dell, Oracle and SAP. Currently, he is CEO at Liquuid Home Ownership. Liquuid is a real estate technology startup that is directly addressing the growing unaffordability and neighbourhood disruption caused by unchecked global capital, while simultaneously providing that capital with a vast new asset class to invest in.

Associate Artists

Associates contribute to research through collaborations that generate knowledge, broaden thinking and share skills.

Joshua Citarella is an artist based in New York, who studied at The School of Visual Arts (New York). Interested in the hazy divide between traditional galleries and the internet, Citarella employs photography, sculpture and software to manipulate the semiotics and visual vocabulary of images. Citarella's work has been exhibited at Anonymous Gallery, Mexico City; Museum of Image, Breda, Netherlands; Pioneer Works, Brooklyn; and Museum of Contemporary Art, Los Angeles. His PDF *Politigram & the Post-Left* was named by rhizome.org as one of the most important cultural productions of the internet in 2018.

Matthias Einhoff is co-founder and director of the Center for Arts and Urbanistics (www.zku-berlin.org), an interdisciplinary hub for urban research and artistic practice located in Berlin. He also heads the development of research-based projects at the interface of urban discourses and local practices with outcomes such as www.citytoolbox.net, a learning platform for urban practitioners; www.wasteland-twinning.net, an urban wasteland survey; www.hackingurbanfurniture.net, urban infrastructure revisited. As a founding member of the artist collectives www.kunstrepublik.de, and Superschool, Einhoff has been working in the public sphere exploring the potentials of art to (re)activate the social and spatial relationships of individuals and groups.

Sharona Franklin is a Canadian multidisciplinary artist, writer, designer, consultant and advocate. Working from lived experience of physical, mental health and cognitive disabilities, her practice explores radical therapies, cybernetic craft, bio-citizenship, the pharmaco-industrial complex and social interdependence. Franklin's methodologies advance access through a plurality of senses, while also building social disability communities online through @disabled_personals, @hot.crip, @paid.technologies and @star_seeded. Franklin is an ambassador for the National Arthritis Society.

Tiziana La Melia lives and works on unceded Coast Salish Territories/Vancouver and received an MFA from the University of Guelph. She brings together references from literature, film, history, bio-ecology, the pastoral and personal history to elaborate on the multifaceted meanings and layers latent within images, matter, symbols, class, gender and text. She is the author of T*he Eyelash and the Monochrome*, Talonbooks, and *Oral Like Cloaks*, Blank Cheque Press. Solo and group exhibitions of her work have taken place at Mercer Union, Toronto; Damien and the Love Guru, Brussels; The Rooms, Saint John's; the Vancouver Art Gallery, Oakville Galleries, Anne Baurrault, Paris; Walter Phillips Gallery, Banff; Truth and Consequences, Geneva; and Unit 17, Vancouver.

Ron Tran is an artist who was born in Saigon, and currently lives and works in Vancouver. His practice incorporates sculpture, photography, video, performance and installation. He is invested in the social and political nature of space which he foregrounds through interruptive strategies and collaborative practices that engage the public and gallery. His work addresses shifting understandings of public and private space, and questions ideas of individual ownership. Tran studied at Emily Carr University and has participated in group and solo exhibitions in North America, Europe and Asia. Tran participated in the 6th Berlin Biennale (2010) and was selected for the Kunstlerhaus Bethanien residency in Berlin (2014).

Christian Vistan is a Filipino-Canadian artist originally from the Bataan Peninsula, Philippines. He currently lives and works in Nanaimo, BC, on traditional Snuneymuxw territory. He makes paintings and texts that are hybrid in form, responding to the embodied processes and experiences of diaspora. His work and projects have been presented locally and internationally at Artspeak, Centre A, and Nanaimo Art Gallery in Canada; mild climate and Atlanta Contemporary in the United States; and Kamias Triennial in the Philippines.

Associate Researchers

Associates contribute to research through collaborations that generate knowledge, broaden thinking and share skills.

Lil Internet is a host and co-founder of New Models, as well as a director and cultural critic. His video clients include Beyoncé, Nike and Vogue, and his writing has been published in *Texte zur Kunst* and Metahaven's catalogue *Psyop* (2018).

Caroline Busta is a host and co-founder of New Models, as well as a writer and critic. From 2014-2017, she served as the editor-in-chief of *Texte zur Kunst* and, prior to that, as an associate editor of *Artforum*, New York.

Christine Lariviere is the Senior Social Media and Communications manager for Climate-KIC, the European Union's main climate innovation initiative. She works at the intersection of climate change and media with a data-driven approach. Focusing on community building and engagement—which are essential to brand loyalty—she deploys social media for customer acquisition. Additionally, Lariviere works in PR and communications, specializing in minimalist, front-loaded UI and SEO copy.

Maksym Rokmaniko is an architect, designer and entrepreneur. His research and design work explores new forms of urban living enabled by emerging technologies. He is the founder of the architectural practice Anarchitects (Kyiv), a partner at The Center for Spatial Technologies (Kyiv) and the project lead at DOMA (Paris/Kyiv), a networked-ownership housing platform for the token economy.

Francesco Sebregondi is a partner of DOMA, an architect and a researcher, whose work explores the intersections of violence, technology and the urban condition. Since 2011 he is a Research Fellow at the award-winning practice Forensic Architecture, former Research Coordinator of the project (2013-2015), and co-editor of its first collective publication *Forensis: The Architecture of Public Truth* (Sternberg Press, 2014). Since 2015, he's a CHASE-funded PhD candidate at the Centre for Research Architecture, Goldsmiths University of London, where his research examines the architecture of the Gaza blockade. In 2017, he was a participant in The New Normal speculative design programme at Strelka Institute in Moscow. Since 2017, he is also a Research Fellow at University College London's Centre for Blockchain Technology.

Francis Tseng is a designer and software engineer working in simulation, machine learning and games. In the past he was a designer at IDEO, an OpenNews fellow at the Coral Project (New York Times/Washington Post), a Researcher-in-Residence at NEW INC, adjunct professor at the New School, and was the co-publisher of *The New Inquiry*. While at *The New Inquiry*, Francis developed projects such as White Collar Crime Risk Zones and Bail Bloc, a well-known cryptocurrency scheme that raises funds against immigrant detention in the U.S. Presently he is working on economic and transit demand simulations for the Institute of Applied Economic Research, and is a Lead Independent Researcher at the Jain Family Institute.

Stephanie Wakefield is a Geographer and Urban Studies Foundation Research Fellow based at Florida International University in Miami. Her recent paper "The Possibilities for New Ways of Living" was published on *Public Seminar*, a Social Research website in the spirit of The New School. Her new book, *Anthropocene Back Loop: Experimentation in Unsafe Operating Space*, is forthcoming from *Open Humanities Press's Critical Climate Chaos: Irreversibility* series.

Consultant

Consultants bring industry knowledge and skills in capacity building, with leadership in the finance, technology and culture sectors.

Christina Hirukawa is a business strategist with more than seven years of experience in startup & technology sectors and arts & culture. Christina founded and manages a full-service cultural advisory consultancy whose clients have included PwC, Barclay's and Microsoft Canada. From 2015-2018 Christina was the Director of Development of Ryan Holmes' youth business accelerator, The Next Big Thing, which saw over 30 ventures raise over 15M in pre-seed/seed stage capital. Active in the startup community, Christina is both an angel investor and advisor.

Designers

The Lead Designer creates the Blockchains & Cultural Padlocks visual identity and style guide and oversees its implementation. The Book Designer applies the visual identity to the design and layout of the digital publication.

Christy Nyiri (Lead Designer) is an interdisciplinary artist, designer and web developer based in New York. She co-founded the Vancouver artist collective Norma, which received a 2011 Mayor's Art Award and has performed/exhibited work in Vancouver at the PuSh Performing Arts Festival (2014, 2005), Artspeak Gallery (2010), Vancouver Art Gallery (2008) and Access Gallery (2005). Nyiri also hosts various karaoke events as part of the collective Weekend Leisure. She holds a Bachelor of Media Arts from Emily Carr University.

Ellen Lee (Book Designer) (she/her/hers) currently lives and works in the traditional territories of the Treaty 7 Nations in Southern Alberta, and the Métis Nation of Alberta, Region 3. Since graduating from Emily Carr University in 2009 with a BDes in Communication Design, she has worked as a freelance graphic designer for clients across many sectors, with a focus on culture, food and the arts.

221A Staff

221A Staff guide the project vision, coordinate the research cluster, coordinate meetings, deadlines and deliver research outcomes.

Brian McBay (pronouns he/him/his) is Executive Director of 221A, a non-profit organization that works with artists and designers to research and develop social, cultural and ecological infrastructure based on the unceded territories of the Musqueam, Squamish and Tsleil-Waututh First Nations in the city known as Vancouver. As a student Co-founder of 221A during the height of the 2007-08 global economic crisis, he is part of a new generation of leaders in the cultural sector aiming to reverse deepening inequality, xenophobia and colonialism in Canada. In addition to his role at 221A, he was named a 2018 Fellow at the Salzburg Global Forum, and is currently a member of the City of Vancouver Arts and Culture Advisory Committee, a member of the National Gallery of Canada Board of Trustees and a member of the newly founded Chinese-Canadian Museum Board of Directors.

Jesse McKee is the Head of Strategy at 221A. He leads the organization's advancement, communications, research and programming. From 2019-22, he is the lead investigator on 221A's *Blockchains & Cultural Padlocks* Research Initiative. From 2020-22, he is a member of the Downtown Vancouver Business Improvement Association's Policy Advisory Council. Previously, he was the Curator of Walter Phillips Gallery, The Banff Centre and the Exhibitions Curator, Western Front, Vancouver. In 2017, he was the co-curator of *Vancouver Special: Ambivalent Pleasures*, the inaugural edition of a civic survey exhibition series at the Vancouver Art Gallery. As a curatorial resident, he has worked with Things that can happen, Hong Kong and Tranzit.org, Romania. McKee served as a juror for the Sobey Art Award, and was a member of the Canada Council for the Art's Asia Pacific Delegation. He has written essays and reviews for *Canadian Art*, *C Magazine*, *Fillip*, *Border Crossings*, *Kaleidoscope*, and *Cura*. His recent catalogue essay, "Surreal Ghosts and Neuroplastic Ancestors" correlates Julia Feyrer and Tamara Henderson's filmmaking with the neuroplastic effects of Vancouver's economic enclosure over the past decade; published by the Morris and Helen Belkin Art Gallery, University of British Columbia and Institute for Contemporary Art, University of Pennsylvania. A forthcoming catalogue essay, "Counting on People: How it Started… How it's Going," frames the productions of Neïl Beloufa's films from the mid-2010s as they foretold a global pandemic enacted through video calls, propelled by the consequences of social media's unchecked narrative accelerants; published by After 8 Books, Paris.

Tao Fei is the Program Producer at 221A. She is a cultural worker and writer with a background in interdisciplinary performance-based practice. She was previously Executive Producer of the POP Montreal International Music Festival, where she oversaw the expansion and integration of visual art, film and public symposia programs alongside the festival's core music programming, and produced annual site-based commissions and artist-led youth projects. She was in residence at the Banff Centre in 2018 as part of the Critical Art Writing Ensemble, and currently sits on the Board of Directors of the newly-established Cinéma Public in Montreal.

DIGITAL COOPERATIVISM RESOURCES

The cooperative digital economy, or platform cooperativism, is an under-researched area in the fields of anthropology, cultural theory, political science, sociology, history and economics. Throughout the research phase of *Blockchains & Cultural Padlocks*, these diverse resources served as footholds for the collaborative knowledge production of the initiative.

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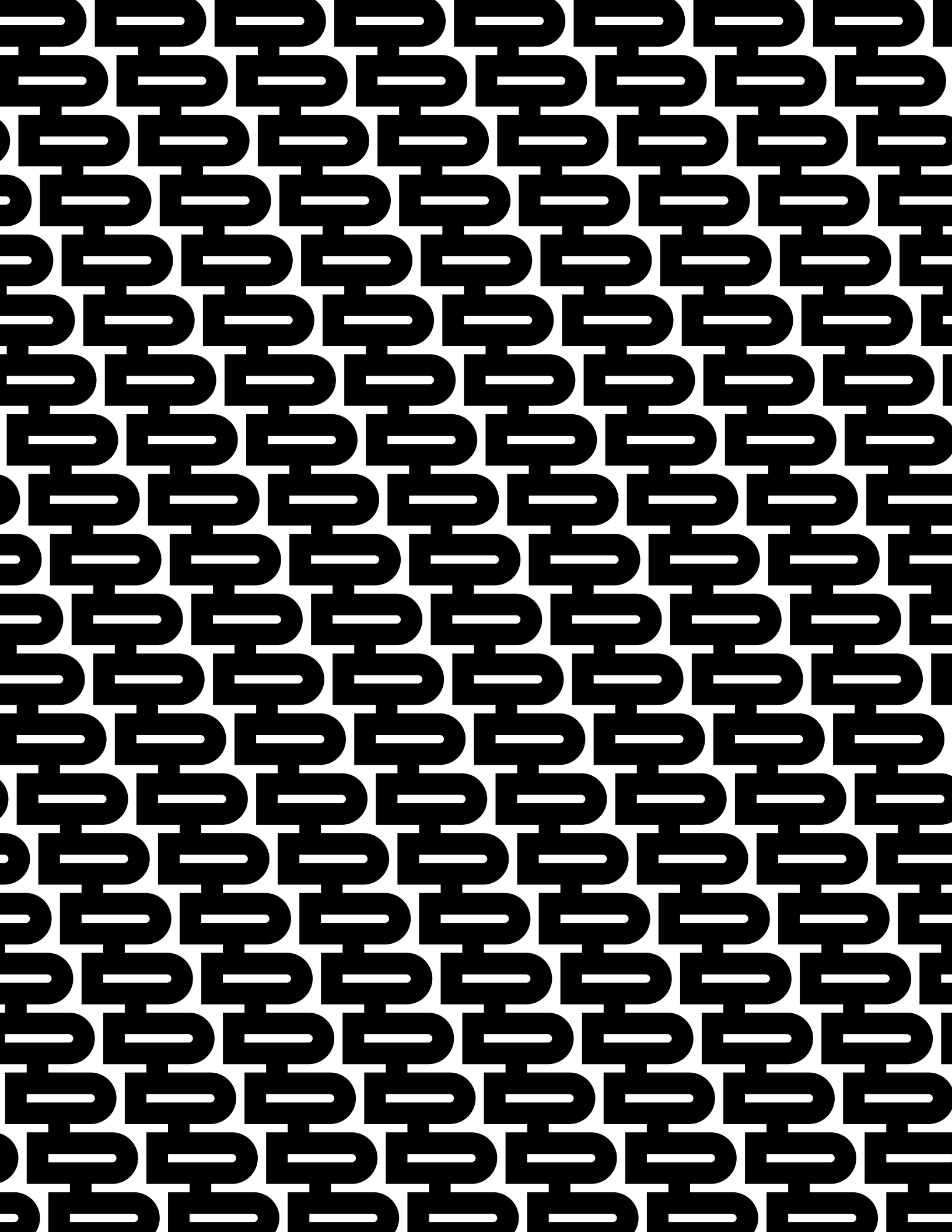

RESEARCH PAPERS

A series of commissioned essays by BACP researchers.

THE STAKING INTERNET

Creating new forms for mass collaboration

Rosemary Heather

This essay looks at blockchain-based staking networks as a prototype. Staking is a way to collectively manage a network using cryptocurrency dividends to incentivize participants. A staking network also provides the tools for decision making. In this basic form of network governance, the foundation is laid for a new era of internet citizenship. Broadly speaking, the first internet gave voice to the individual, and gave a home to niche concerns. Communities were built based on common interests without regard to location of participants. This ability to "connect" people was a much-ballyhooed capacity of the early internet. The next internet gives this connected populace new powers; specifically, a new understanding about the kinds of self organization the network makes possible. With the first internet, platform interfaces like Facebook and Google brought communities together—and grew massively rich in the process. The next internet changes the narrative. Power shifts away from the internet giants, by giving voice not only to niche but also collective interests. With the current internet, the value created by network effects has accrued to the entities that own a platform and its network. By contrast, staking enables the value created by a network effect to accrue to the users of that network. Staking is an incentive/disincentive mechanism for the alignment of group action. As such, staking presages cryptocurrencies creating a new kind of internet, one based on the self-organizing tools blockchain makes possible. This includes the mainstream emergence of the DAO (decentralized autonomous organization), a format for collective governance, as a new type of online organization. Taking first a look at how the conditions for staking are embedded in the current UGC (user-generated content) internet, the essay ends with recommendations to

221A for 1) running one or more nodes as part of the organization's conceptual and business practice; 2) creating a staking pool pilot project to promote crypto web adoption in the legacy arts community.

Introduction

Blockchain technology creates the terms for a different kind of internet. Appearing on the world stage about 10 years ago, blockchains invented a way to use networks to create value in the form of currencies native to the internet. Rightly celebrated as innovative, blockchain technologies also tend to be touted as revolutionary. Crude inferences of a new Libertarian social order are wildly extrapolative from a few basic aspects of the tech. For instance, blockchains enable cross-network (i.e., peer-to-peer) transactions without routing through a centralized entity. What kind of world will these peer-to-peer interactions create? To some people (Libertarians) it means world without government—and more importantly, taxation. An extreme example of this is seasteading.[1] These are luxury pods anchored in the ocean that certain rich people claim they would want to live on. Extraterritorial reveries are the best metaphor for the highly undesirable society Libertarians imagine they want to build. Such claims indulge in grandiose fantasy while overlooking the problems created by the current internet that blockchains have the potential to solve, at least in part.

The culture of the current internet is an effect of users embracing the technology—specifically, in the form of user-generated content (UGC), i.e., posting photos to Instagram or family news to Facebook, writing restaurant reviews on Yelp, participating in discussion boards on Reddit, or setting up a side-hustle on an ecommerce platform like eBay. Most internet users don't do all of these things, but they probably do a few of them, daily. Blockchain technology offers a further iteration of this hands-on relationship to the network. The current internet profits from UGC by monetizing user data. Blockchains hold out the possibility for users to own and make money from their data—just one example of the utility blockchains can bring to internet usage.

UGC creates much of what we experience as contemporary culture today. Internet-based communities thrive globally. Through memes, tweets, message boards, chat rooms and other forms of shared internet content, UGC generates today's cultural conversation. The negative effects of this are well known. UGC is a vehicle for fraud, bullying and disinformation. The

[1] Tech billionaire Peter Thiel, cofounder of Paypal and an early bitcoin investor, is one of the most high-profile proponents of seasteading, and an investor in the Seasteading Institute. See: https://www.seasteading.org/

consequences have been world changing. Weaponization of UGC by foreign and domestic actors created the still-unfolding Brexit drama—just one example. Another: the global pandemic is best understood as a public health crisis, but UGC distorts the problem. Internet-born tribalism needlessly politicizes the issue. Viral videos of anti-masker tantrums become flashpoints for culture war polarization. Covid-19 vaccines bring a post-pandemic world into view, but UGC-fuelled anti-vaxxers threaten to prolong the crisis, needlessly.

Blockchains are in the process of building an internet with stakes.

Blockchains have the potential to be UGC on steroids, with all the attendant good and bad effects. This is already evident in the booming global culture that surrounds cryptocurrencies. However, looking beyond blockchains used for financial speculation, other possibilities come into view. Blockchains are in the process of building an internet with *stakes*. This is UGC with stakes for the user, to be won or lost. More mundane than a dystopian Libertarian-led future, blockchain based solutions offer a chance for a better internet.

The Internet

The writer Joshua Cooper Ramo has a maxim: connection changes the nature of an object.[2] It's a useful idea. For example, in the aftermath of World War II there was broad agreement that fascist ideology was a bad thing. The fight against resurgence included the banning of Nazi affiliations. Network connection wreaks havoc on this principle. Not only does Facebook not ban Nazis, it gives them a platform. Facebook is indifferent to the negative unintended effects of its own power, claiming not to be the "arbiter of truth" in Mark Zuckerberg's words. But the power of the platform creates connections between the would-be Nazis among us. Connection changes the nature of the object. In this case, the Nazi creed is no longer constrained by the laws of sovereign nations—or even the shared values upon which the post-war consensus in the West was built.

[2] Joshua Cooper Ramo, *The Seventh Sense: Power, Fortune, and Survival in the Age of Networks* (New York: Little, Brown and Company, 2016).

Facebook is a microcosm of our age of connection. Whatever the distortions and uncertainties it has wrought upon us, whatever we might think of the platform and the people who run it, billions of people still elect to use it on a daily basis. Networks define us beyond the ability any one of us has to opt out of using them.

Cooper Ramo writes: "The act of linking our bodies, our cities, our ideas—everything, really—together introduces a genuinely new dynamic to our world. It creates hyperdense concentrations of power. It breeds fresh chances for complex and instant chaos."[3] He notes that we are at the early stages of this epochal shift, which is as consequential as the Enlightenment or the Industrial Revolution.

Networks define us beyond the ability any one of us has to opt out of using them.

The origins of this transformation began in the late 1960s when ARPANET,[4] a project of the U.S. Department of Defence, began to study how to share information across a network of remote computers (a node is a nexus of data transmission on a network and the initial network consisted of four nodes). The solution they chose was packet switching, in which data is broken up and transmitted across the network, then assembled again at its destination. Packet switching ensures broken spokes in the network are inconsequential. Designed to ensure that data seeks the most efficient path of transmission, a broken spoke means data shifts to another path. The operational resilience guaranteed by packet switching makes use of the redundancy built into network topography. Duplicated paths of transmission overcompensate for potential failure points in any one part of the network. This foundational internet was in essence a distributed computing operation, and carried within it the seeds of what would become blockchain technology more than forty years later.

[3] Cooper Ramo, ibid.

[4] ARPANET is the acronym for the Advanced Research Projects Agency Network: https://en.wikipedia.org/wiki/ARPANET

The Blockchain Internet

Today's internet is a success because the protocols at its base layer have been designed as open source and not proprietary. Using these freely available technical specifications private companies have each built their own little corner of the web. The utility of the technology for these companies derives, however, from each segment's connection to the wider network. In this sense, the network is collectively managed. Through self-management, each section of the web contributes to the viability of the network as a whole; at the same time, the network as a whole isn't dependent on any one part of the network to remain viable.

The story of the contemporary web[5] starts with private entities building proprietary applications on top of this network made from open protocols. Forty years on, Facebook, Amazon, Netflix and Alphabet (Google) are amongst a "new breed of companies that are the fastest growing in history."[6] Collectively known as FAANG, these companies have created immense value, and changed the world in the process, all because each one found a business use case for networks. The global popularity of user-generated content has been key to their success.

Through the network—and its extension through mobile and web apps—FAANG have shown an incredible ability to scale. Their business model combines free use of apps and platforms with data collection of the resulting online activity. Users readily incorporated UGC into their lives because of its utility as a "social" media.[7] The network enhances already existing social networks through the facility of connection, offering a form of convenience and personal affirmation that is difficult to resist.

With UGC, citizens of the world become de facto citizens of the internet, because of what these internet tools enable users to do. This agency plays a foundational role in twenty-first-century commerce. In 1980, the futurologist Alvin Toffler coined the term "prosumer,"[8] which combines consumer and producer into one. Toffler suggested the idea in reference to what he predicted would be a trend of mass customization, in the wake of a saturated market for standardized

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5 Though often used interchangeably, the internet and the web are two different things. The former refers to the open protocol network; the latter, to the proprietary internet that has been built on top of it.

6 Cooper Ramo, ibid. The author cites: Uber, Instacart, Alibaba, Airbnb, Seamless, Twitter, WhatsApp, Facebook, Google.

7 "I said, 'Well, it's not like service media, and it's not quite informational media -- it's social media!'" she said. "It wasn't media we were creating -- it was media we were facilitating," Jeff Bercovici, "Who Coined 'Social Media'? Web Pioneers Compete for Credit," Forbes, Dec 9, 2010:
https://www.forbes.com/sites/jeffbercovici/2010/12/09/who-coined-social-media-web-pioneers-compete-for-credit/#3cf3ee1251d5

8 Alvin Toffler, *The Third Wave: The Classic Study of Tomorrow* (New York: William Morrow, 1980).

products. Toffler foresaw the lack of differentiation in mass production leading to bespoke products tailored to consumer tastes and needs.

With the advent of network society, customization took on a different form. The reason for this was not only a need for market differentiation. Far more important are the kinds of user agency digital tools enable—i.e., our UGC-powered digital life. On a digital platform, as the saying goes, the product is you (and your data). Toffler's customization became a reality in the twenty-first-century activity of creating one's personal brand—for profit, social status or just for fun—which UGC helps to facilitate.

A further factor is basic economic necessity. For many, UGC is a source of income. The rise of the internet has a parallel in the rise of neoliberalism. Neoliberal ideology, a belief in unregulated free market capitalism, has driven economic policy in the West for the last four decades. Its legacy is a ruinous landscape of short-term jobs and stagnant wages. Neoliberalism has created an army of underemployed or undercompensated workers. This underemployment creates a highly motivated workforce, who are supplementing their income through the quasi self-employment offered by the "gig economy." Writing in the *Guardian*, George Monbiot notes that neoliberalism "redefines citizens as consumers."[9] Toffler's coinage offers a better fit: neoliberalism redefines citizens as prosumers. The gig economy of part time, on call or temporary employment is arguably a species of UGC. Whether working as an Uber driver, delivering take out orders for DoorDash, selling your crafts on Etsy or setting up an ecommerce business on Shopify, the performance rating you get from your customers is key to the continued viability of your gig employment. This market micro segmentation of the side-hustle workforce makes good on Toffler's vision. In the end, it's just a more extreme version of the UGC invitation to become both producer and consumer of your own content. The need to secure wages is one driving factor behind the popularity of prosumption.

Web platforms have been shepherding users along this road to personal brandom for some time now. In early promotions of the network as a social technology, this idea was sometimes expressed by companies placing the prefix "my" ahead of a product or platform. For instance, the Facebook precursor, Myspace, which was the biggest social network by user base from 2005-2008; or CocaCola's music download site MyCokeMusic.com, which had a relatively

[9] "Neoliberalism sees competition as the defining characteristic of human relations. It redefines citizens as consumers, whose democratic choices are best exercised by buying and selling, a process that rewards merit and punishes inefficiency. It maintains that "the market" delivers benefits that could never be achieved by planning." George Monbiot, "Neoliberalism – the ideology at the root of all our problems," *The Guardian*, April 15, 2016. https://www.theguardian.com/books/2016/apr/15/neoliberalism-ideology-problem-george-monbiot

brief two-year existence in Europe.[10] Putting the user in the driver's seat is the implicit message too conveyed by the "i" prefix appended to Apple products—the iPod, iPhone, and iPad (released in 2001, 2007 and 2010, respectively). Apple smartphones and their competitors enabled the creation of the mobile app economy. While at first, use of Facebook was limited to university students, by 2006 the app was made open to the public. The subsequent explosive use of the two products,[11] Facebook and smartphones, is a clear case of business symbiosis. By the time of his death in 2016, Alvin Toffler had seen the prosumer become a dominant economic force, with the user playing a starring role in the rise of these technologies.

Recent years have proven, however, that UGC agency comes at a cost. There may be a symbiotic relationship between platforms and their user base, but only the platforms got fantastically rich in the bargain. If prosumers created the internet behemoths, the behemoths repaid them with an erosion of their personal well being on a number of fronts. On the neoliberal internet, precarity is a way of life. Worker entitlements, such as health benefits and paid sick leave, threaten gig economy profit margins and tend to be avoided, if possible.

In 2020, a group of app-based companies in California, including Uber and DoorDash, sponsored the Proposition 22 ballot initiative. Prop 22 was successful, ensuring that gig workers in the state would continue to be classified as independent contractors and not employees. This, the most expensive ballot initiative in California history, is worth mentioning because of the way it exemplifies the Gordian Knot of problems facing an internet-based workforce. The platforms behind Prop 22 spent over $200 million USD to avoid costs associated with employing, as opposed to contracting, their workers. In advance of the ballot vote, Uber bombarded its drivers with messages urging them to support the initiative. A group of Uber drivers fought back with a lawsuit against the company, claiming that the "barrage" of messages violated their employment rights. The lawsuit was ultimately unsuccessful because it could not prove that drivers would face penalties from Uber for not supporting Prop 22.[12] Regardless, Uber subjected its drivers to a kind of app-based psychological warfare. The workplace intimidation was implicit, if not liable in a court of law. The case shows that, in addition to precariously employing its workforce, Uber imposed a disciplinary regimen on

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[10] Seán Byrne, "Former #1 EU music service MyCokeMusic to close down," Myce, June 21, 2006: https://www.myce.com/news/Former-1-EU-music-service-MyCokeMusic-to-close-down-11991/

[11] "Number of active users at Facebook over the years," The Associated Press, October 23, 2012: https://finance.yahoo.com/news/number-active-users-facebook-over-years-214600186--finance.html; "Unit sales of the Apple iPhone worldwide from 2007 to 2018," Statista, February 19, 2020: https://www.statista.com/statistics/276306/global-apple-iphone-sales-since-fiscal-year-2007/

[12] Faiz Siddiqui and Reed Albergotti, "Court rejects Uber drivers' bid to bar app from pushing political message on employment status," The Washington Post, Oct. 28, 2020: https://www.washingtonpost.com/technology/2020/10/28/uber-prop22-ruling/

its drivers, even if more implied than stated. This is in addition to the monitoring drivers are subject to via the performance ratings they get from their passengers.

The Uber story is part of a larger tale about today's participatory surveillance culture spawned by UGC. The tracking of user data creates today's familiar bastions of internet empire (Facebook, etc.), while also subjugating users as fully surveilled points of aggregate data.[13] The thinking around surveillance capitalism is beyond the scope of this essay. Still, the concept should be noted in passing because of the way the surveillance capitalism extracts value from internet relationships. Facebook, for instance, monetizes the data related to not only your internet purchases, but also your interests—the groups you belong to, the conversations you participate in, the stories you "like." So there is internet commerce made up of the platform as a marketplace for goods and services; then there is another commercial internet, one that profits from the data internet usage produces. The internet self is thoroughly enmeshed in the imperatives of internet commerce. These are imperatives that play out in the form of algorithmic behaviour modification or control. The relationship is "top down." As noted, however, this top down dynamic (me as a highly differentiated but still categorized Facebook user subject to algorithmic nudges and manipulations) is still dependent on a "bottom up" dynamic, one that consists of my online life, an entity that comprises me and all my myriad internet-based relationships.

Having an internet life is an already established behaviour. Within it lies the seeds of the next internet, one that extends today's UGC-based forms of internet agency and commerce. The sharing economy, as represented by AirBnB and Uber, can be seen as an early form of this new type of internet relationship. You can rent out your home on AirBnb through a connection made possible by the network. Using AirBnB is different from subletting your home through newspaper want ads or even using Craigslist, because of the app's reputational scorecard. Though not perfect, online reputation metrics instill a sense of confidence about a transaction. AirBnb and other sharing economy apps are living documents of this form of internet-based relationship.

Creating, while simultaneously documenting, collective events in real time is a fair definition of what the internet does. It's also a pretty good definition of the blockchain. Bitcoin, the original blockchain use case, was invented in 2008, and is the brainchild of a person or group of people known by the pseudonym Satoshi Nakamoto. Blockchains today create the backbone

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[13] Ramona Pringle, "'Data is the new oil': Your personal information is now the world's most valuable commodity," CBC News, August 25, 2017: https://www.cbc.ca/news/technology/data-is-the-new-oil-1.4259677

of a new type of internet. A blockchain is in essence a database, but one that is duplicated thousands of times across a network of computers and is subject to ongoing self-audits to reconcile its content. On average, these self-audits happen in regular intervals (depending on the blockchain), each one producing a block of data, which is added to the list (the chain) of transactions. This is a way of using the network that has obvious benefits. The blockchain database isn't stored in any single location, meaning the records it keeps are truly public and easily verifiable. No centralized version of this information exists for a hacker to corrupt. Hosted by thousands of computers simultaneously, its data is accessible to anyone on the internet. Since its invention, the bitcoin blockchain has operated without significant disruption. To date, any problems associated with bitcoin have been due to hacking or mismanagement of applications associated with the blockchain, not the infrastructure itself. In other words, these problems come from bad intention and human error, not flaws in the underlying infrastructure.

> Creating, while simultaneously documenting, collective events in real time is a fair definition of what the internet does. It's also a pretty good definition of the blockchain.

A network of computing nodes make up the blockchain. Together, nodes create a powerful second-level network, a wholly different vision for how the internet can function. Every node is an administrator of the blockchain, and joins the network voluntarily (in this sense, the network is decentralized). Collectively, the nodes on a blockchain manage a ledger of transactions, which is constantly updated according to a cross chain agreement, or consensus. (Because of the role node operators play in network consensus, they are often also referred to as network validators.) The bitcoin blockchain operates according to the proof of work (POW) consensus algorithm. POW offers each validator an incentive for participating on the network: the chance of earning bitcoins.

Nodes are said to be "mining" bitcoin, but the term is something of a misnomer. In fact, each one is competing to win bitcoins by solving computational puzzles. By design, nodes operating the POW algorithm have a low probability of success in each competition, in effect randomizing the process. This guarantees an averaging out of successful validators across the

network.[14] Bitcoin's cross-network computing process, which undergoes regular self-audits, ensures that the data it manages is secure. However, while it is extremely difficult to override the network, this form of data security comes at the cost of an excess expenditure of network resources.

Blockchains burn electricity to mint coins; specifically, POW blockchains do this. Bitcoin, as the marquee example of a cryptocurrency, is often derided as being extravagantly wasteful for this reason. Proof of stake (POS) is the proposed solution to this problem.

The Staking Internet

Bitcoin was the raison d'etre of the blockchain as it was originally conceived. In the decade following bitcoin's invention, thousands[15] of other versions of this blockchain use case have been created, to varying degrees of success.[16]

Blockchains turn the internet into a mechanism that can create value and authenticate digital information. With Ethereum, the number two blockchain by market capitalization (Ether is its native token) blockchain technology gains an additional layer of functionality.[17] Launched in 2015, Ethereum has the most active developer ecosystem of any blockchain. The platform was first envisioned by the technologist Vitalik Buterin in a white paper he wrote when he was seventeen. Buterin's vision was to make blockchains programmable through the implementation of automated, chain-based "smart contracts."[18] Blockchains use networks as secure, encrypted data verification mechanisms; building on this capacity, a smart contract executes on a blockchain when certain pre-specified conditions are met. A data feed of real-time information would trigger such an event. A simple example would be a successful bet placed on

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[14] In theory—the near monopolization of bitcoin production by a few players is an ongoing problem. China has dominated in recent years, but that could be changing. Tom Wilson, "Crypto asset manager sees bitcoin mining shift from China to North America," *Reuters*, February 11, 2020: https://www.reuters.com/article/us-crypto-currencies-idUSKBN2052FW

[15] "There are approximately 5,392 cryptocurrencies being traded with a total market capitalisation of $201bn (as of April 22, 2020)." Rick Bagshaw, *Coin Rivet*, April 22, 2020: https://finance.yahoo.com/news/top-10-cryptocurrencies-market-capitalisation-160046487.html

[16] Estimates are that, to date, over 1700 cryptocurrency experiments have failed. The list includes many scam or joke coins. Coinopsy is a site that indexes failed coins. Though easily dismissed as noise, a quick scan of the site provides a snapshot of an internet ecosystem made up of professional and niche communities that were thought to have a potential user base for a cryptocurrency token. See https://www.coinopsy.com/dead-coins/

[17] Ethereum has inspired many rival smart contract platform projects. When judged according to the amount of "meaningful economic activity" each one shows, these so-called Ethereum killers appear to have failed in their mission. See : Matthew Finestone, "Ethereum Enhancers, Not Ethereum Killers," *Coindesk*, October 14, 2020: https://www.coindesk.com/ethereum-enhancers-not-ethereum-killers

[18] The concept of smart contracts was first proposed by Nick Szabo in 1994. In 1998, Szabo also proposed the idea of bit gold, a digital currency that is recognized as the precursor to bitcoin. https://en.wikipedia.org/wiki/Nick_Szabo

the outcome of a sports match, which would then prompt a cryptocurrency payout. An online ecosystem that combines the legacy internet with blockchain technology enables this kind of chain-based automation.

In Buterin's vision, Ethereum has the potential to create a global computer, or what he calls the Ethereum Virtual Machine (EVM). If fully realized, Ethereum creates a network that thrums with countless automations. Smart contract use cases are in development for everything from cross border finance and solar grid management, to home purchasing (transfer of title) and voting in elections. This vision for the EVM is notable for the way it gives the user a more direct role in certain kinds of transactions, while displacing the people and bureaucracies that previously acted as intermediaries for them. Blockchain users can leverage the network for direct (peer-to-peer) interactions with a vast field of potential connections globally. This is today's internet, in other words, but with a powerful added dimension of functionality made available to the user.

Blockchains are a mechanism for creating digital network-based value. A smart contract-based ecosystem for digital assets is being steadily built out to leverage this value.[19] The staking internet plays a central role in this ecosystem, in two ways: as a vehicle for financial investment, and as a function of network security.

As a financial investment, a staking internet is an internet with table stakes for its users. In a gaming enterprise, investing table stakes means you are willing to risk losing your stake for the chance of winning more than you bet—poker, sports betting, etc. In a business context, Wikipedia defines table stakes as the "minimum requirement to have a credible competitive starting position in a market."[20] It's a similar proposition of winning or losing on a bet in a game, but with higher real world consequences.

What staking means in the context of a network is somewhat different. The competitive starting position of networked table stakes is by definition a collective proposition. This is true not simply because staking is a form of pooled investment; in general, traditional financial products—a pension fund, for example—also fit that definition. The difference resides instead in the internet-based, peer-to-peer nature of the staking relationship. Simply put, staking is an evolution of certain types of behaviour the internet makes possible. Automations combined with

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[19] 2020 saw huge growth in the popularity of decentralized finance, or DeFi, most of it built on the Ethereum blockchain. See: Alyssa Hertig, "What is Defi?" *Coindesk*, December 3, 2020: https://www.coindesk.com/what-is-defi

[20] *Wikipedia*, "Table Stakes," https://en.wikipedia.org/wiki/Table_stakes

self organization contribute to the viability of whatever good on a network is under collective management.

As a function of network security, the staking internet is a foundational part of the EVM. Staking is made possible by the proof of stake (POS) consensus algorithm. In late 2020, the Ethereum blockchain began the process of shifting from POW in favour of the less resource-intensive POS, a long promised upgrade for the platform. POS achieves network security in a similar way to the POW blockchain protocol: through the management of a shared ledger that is reconciled at fixed intervals by network validators. However, whereas POW requires cross-network computing to verify each transaction, POS takes a different approach to achieving network consensus. POW blockchains incentivize network participation by rewarding node operators with coins. With POS, validator nodes stake coins (i.e., make a security deposit) in exchange for the right to help manage the network. Stakers earn interest on their deposits from network transaction fees, with stakes locked in for a specified amount of time. For each block produced, validators are selected according to a randomizing algorithm. Through this randomizing process, each validator is incentivized to help manage the network via the chance to win a block of coins. Equally, validators lose some or all of their stake in response to any action that is detrimental to the network. Leaving the POW protocol for POS allows Ethereum to process transactions faster, promising greater mainstream viability. Ethereum's move to POS is still early enough in its implementation to be considered unproven. If successful, it will help to scale the network, in theory creating a cryptocurrency ecosystem that rivals legacy finance.

The Emergent Internet

"We're at the Early Stages of a Truly Novel Structure That can Organize Humans and Money"[21]

Blockchains have the potential to shift the top-down internet into a more equitably bottom-up technology. Incentivization to form relationships on the network is at the heart of the cryptocurrency story. Because it's still in the early stages of its development, most blockchain success stories adhere closely to the original raison d'etre for the technology: internet money.

[21] Olaf Carlson-Wee, "We're at the Early Stages of a Truly Novel Structure That can Organize Humans and Money," *The Defiant*, August 20, 2020: https://thedefiant.substack.com/p/were-at-the-early-stages-of-a-truly-85f

But that will change. Networks and crypto presages a new era of networked relationships. Financial incentives made possible by crypto have the potential to transform the relationship users have with their internet lives. Particularly ripe for change is the top-down dynamic in which users enrich the internet giants in exchange for the privilege of having a digital life.

One proof of concept for a bottom-up internet derives from staking; i.e., the user's participation in the proof of stake protocol. For the typical user, staking as it currently functions is a way to earn interest on your crypto, much like earning interest on your savings account in a legacy bank. In many important ways, however, staking is an entirely different proposition. An investment in a stake is an investment in the staking protocol. Staking is a prototype version of a more fully user-controlled bottom-up internet, in other words.

A bottom-up internet already exists, to the extent that it was built by UGC. But the agency UGC provides users comes with considerable costs. These are not limited to the invasion of privacy that comes with tracking of user activity across the network (those ads you see on Facebook connected to your Google search the day before). Free access to internet platforms also enables all manner of internet fraud, imposture and distortion of information.

These negative effects of internet use are well known. However, the advantages of UGC are such that users tend to overlook its downsides. The value created by users is primarily social—though this generalization should of course include every business opportunity that comes from participating on the network, along with all businesses launched on the internet or because of it. In terms of producing a skilled army of content creators, however, UGC lays the foundation for the next era of internet use, one that is underpinned by cryptocurrency networks. This means, potentially, that social interactions on the web (restaurant or product reviews, commenting on and liking your friend's post, producing and sharing memes, etc.) could be profitable for users. Further, the enhanced utility that users get when UGC is combined with cryptocurrency will in all likelihood have other more profound effects, starting with the users' relationship to the network.

Staking blockchains have the potential to reset the balance between the proprietary web and its vast global user base. The large internet entities get their massive scale because of how easy it is to coordinate users on the internet. Users come together on the current internet most typically by virtue of common interest and shared emotion. In the best version of this internet, money is raised through crowdfunding for people in need. In the worst, the internet crowd becomes a mob, one that bullies without consequence. Staking promises a better internet, one on which altruism and self-interest align, and where bad actors get penalized.

> "Token networks... align participants to work together toward a common goal."[22]

Currently, this kind of alignment happens at the level of the crypto token. As Chris Dixon, quoted above, notes: the common goal for today's active crypto networks is "the growth of the network and the appreciation of the token."[23] This feedback loop drives the creation of value in the cryptocurrency industry. Joel Monegro describes it as a process in which token holders are "stakeholders in the protocol itself."[24] Another way of saying this is that successful network projects benefit from network effects,[25] but with users investing in the network itself. Early investors in bitcoin or ether are also creators of the network. This happens either through the building of products or services that help extend its functionality, or through pure speculation on the tokens. The thousands of tokens[26] that came after bitcoin and ether took a similar approach (if not to similar success in the majority of cases). If cryptocurrencies get derided as ponzi schemes it is because of this curious tautology that lies at the heart of their inception: users of the network own the network. Running a blockchain node or staking on the network offer two variations on this idea.

A large part of crypto activity today focuses on speculation.[27] But this happens alongside the many blockchains that are prototyping other kinds of use cases for the technology. Innate to this stakeholder internet is the true meaning of decentralization. User-owned networks reduce the role of intermediaries and allow users to directly accrue profits that typically go to large entities

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[22] Chis Dixon, "Crypto Tokens: A Breakthrough in Open Network Design," *Medium*, June 1, 2017: https://medium.com/@cdixon/crypto-tokens-a-breakthrough-in-open-network-design-e600975be2ef
See also Moloch Dao's Ameen Soleiman: "Ethereum is a coordination platform. As the cost of coordination itself drops, the most disruptive opportunities will be the one's that enable unprecedented levels of coordination." "MolochDAO: Could This Decentralized Autonomous Organization Help Ethereum Scale Faster?" *Unchained*, March 19, 2019: https://unchainedpodcast.com/molochdao-could-this-decentralized-autonomous-organization-help-ethereum-scale-faster/

[23] Ibid.

[24] "When a token appreciates in value, it draws the attention of early speculators, developers and entrepreneurs. They become stakeholders in the protocol itself and are financially invested in its success. Then some of these early adopters, perhaps financed in part by the profits of getting in at the start, build products and services around the protocol, recognizing that its success would further increase the value of their tokens. Then some of these become successful and bring in new users to the network and perhaps VCs and other kinds of investors. This further increases the value of the tokens, which draws more attention from more entrepreneurs, which leads to more applications, and so on." Joel Monegro, "Fat Protocols," *Union Square Ventures*, August 8, 2016: https://www.usv.com/writing/2016/08/fat-protocols/

[25] "The value of a product or service increases according to the number of others using it." "Network effect," Wikipedia. Facebook is the *par excellence* example of a business benefitting from a network effect. For multiple millions of users, their personal networks on Facebook provide a value that banishes any thought of leaving the platform. https://en.wikipedia.org/wiki/Network_effect

[26] "There are approximately 5,392 cryptocurrencies being traded with a total market capitalisation of $201bn (as of April 22, 2020)." Rick Bagshaw, *Coin Rivet*, April 22, 2020: https://finance.yahoo.com/news/top-10-cryptocurrencies-market-capitalisation-160046487.html

[27] Venture capitalist Chamath Palihapitiya refers to this phase of the technology's development as a "ghetto of day traders and speculators." Kyle Torpey, "Former Facebook Executive Makes The Case For A $1 Million Bitcoin Price," *Forbes*, April 5, 2020: https://www.forbes.com/sites/ktorpey/2020/04/05/billionaire-explains-the-path-to-a-1-million-bitcoin-price/#475241312c79

like Google et al..[28] Staking is only the beginning of this transformative approach to online life, one that in future will include users owning and profiting from the data that accrues from their activity online.

Decentralized Autonomous Organizations (DAOs):

DAO is a generic term that means decentralized autonomous organizations. Collective decisions need to be made periodically about the management of a blockchain, meaning that all blockchains are in essence DAOs. The first era blockchains evolved through node operator voting, implemented in practice via software downloads. The process has often been chaotic. Differences in philosophies about the future of a chain resulted in so-called "forks"—the splitting of a blockchain into two or more different versions, each chain with its own dedicated community. On chain voting—first made possible by Ethereum smart contracts—ups the stakes, so to speak, in how blockchains can be collectively managed. Just as networks contain the seeds of blockchains, blockchains contain the seeds of networked virtual communities. Staking can be seen as a user investment in the proper management of a chain for the purposes of positive investment return. This is like any financial investment, except that the user participates in the management of their investment. Arguably, DAOs are the next step in this form of coordinated online behaviour. The web has proven to be an excellent tool for coordinating groups online, to good and bad effect, from fan communities to bullying. DAOs have the potential to formalize this activity further, but with the added glue of incentivization that cryptocurrencies make possible. In the view of Polychain Capital's Olaf Carlson-Wee, longer-term DAOs set the stage for what he calls "programmatic finance."[29] Smart contracts on blockchains have the potential to create fully autonomous network-based business entities. A fantastical notion, but also not a huge leap from today's internet, which seamlessly makes use of many AI automations. DAOs set the terms for new forms of mass collaboration on the internet.

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[28] That is, the dominant global tech companies collectively referred to as FAANG: Facebook, Amazon, Apple, Netflix and Alphabet (formerly known as Google).

[29] Cade Metz, "Bitcoin Will Never Be a Currency—It's Something Way Weirder," *Wired*, June 1, 2017: https://www.wired.com/2017/01/bitcoin-will-never-currency-something-way-weirder/

221A and the Crypto Internet

The UGC internet is the result of an ongoing mass collaboration. This starts with the router that connects users to the network, through to the posting, commenting and sharing of daily internet use. Most users don't think about the underlying network infrastructure that makes UGC possible—or they do, but only when their network stops working and they need to contact their internet service provider (ISP) to troubleshoot the problem. Outages in network service tend to be temporary and easy to fix. Similarly, most users don't think about the role they played in expanding their ISP network when they plugged in their wifi device. In this sense, everyone with an internet router runs a node on the network. However, the network is rarely thought of in this way. Instead, an internet driven by UGC agency dovetails all too perfectly with the imperatives of neoliberalism. The neoliberal ideology of self-actualization fits nicely within the UGC fairytale, which gives users a voice, an audience, and in some cases material success. This ideology disconnects users from their agency as a collective entity, however, even as users enjoy the benefits of their digital agency on a daily basis.

There's an argument to be made that legacy media instills the disconnect users have to the role they play in helping the large internet platforms to prosper. No longer passive receivers of the broadcast media, the UGC internet populace nonetheless are passive about the personal cost of their internet use: free labour, daily surveillance and behaviour manipulations. Up to now, reasons to think about the role each user plays in the UGC mass collaboration have been lacking. But crypto networks, and specifically staking networks, provides a reason—and more importantly an incentive—to having a more hands-on relationship with the network. The opportunity is not to just earn interest on one's crypto but a shift in perspective. Staking offers a step forward in a much needed reorientation of users' relationship to the network. What previously was freely given away to the large internet entities becomes a new form of collective power. At its most basic, this power resides in an understanding of the role we can play in the management of staking networks and the seeds of a new agency this gives us.

As a leading art organization, my recommendation is that 221A stake on, set up and run one or more blockchain nodes. This would be the first step in an educational outreach initiative to explore what an internet underpinned by cryptocurrencies could mean for artists and arts organizations internationally. The longer-term objective would be to create a DAO as a collective experiment in online community building.

Bitcoin mining is now dominated by a few large players. Huge resources are needed to run a profitable mining operation, pricing most people out of the market. Staking offers a counter narrative. It is simple to stake on a network using an app. To run a node and become a validator on a staking network requires a more serious investment of business resources. In its own particular way, however, staking has the potential to fulfill the original vision for bitcoin: a decentralized network that rewards everyone who participates in its management.
221A would be a leader in building a stakeholder network of organizations. Beyond this, the goal could be for 221A to expand their node/staking activity into the running of a DAO. Blockchain technology enables the creation of a network owned and operated by its users. The format of the DAO adds governance mechanisms to staking-based network engagement. The potential that DAOs offer for creating new relationships, between users and the network and between arts organizations, is still at a very early stage. As an organizationally innovative arts organization, 221A is well positioned to explore the potential of this technology in the formats of staking/node operations and DAOs. Below, I propose one idea for a pilot project designed to introduce artists and arts organizations to the crypto space, with a view to securing their longer-term participation on the crypto internet.

A 221A Staking Pool Pilot Project

I recommend that 221A explore setting up a staking pool; i.e., pooling the crypto resources of participants with the purpose of earning crypto dividends on a staking network. For instance, a minimum amount of ether could be determined for participants to join a 221A-run Ethereum Beacon Chain node. Terms of participation—such as timeframe of commitment (how long the investment is locked), what percentages of revenues are (calculated in proportion to amount invested), and terms for participants to exit—could be programmed into a smart contract. Other decisions could be determined through a DAO, with investment in the staking pool giving participants voting rights (one vote per investor). Further, a pooled investment on a crypto network could be the preliminary stage of 221A setting up an artists' trust. In the trust, revenues from pooled resources could be allocated as determined by DAO participants. If it functions as a nonprofit, the staking pool and trust should not violate the terms of 221A's nonprofit status, though of course more research on this question would be needed. Overall, the project's goal would be to create better awareness about the next web and its utility for new forms of collective intelligence and network-based collaboration.

ANOETIC TOKENIZATION

Community and collaboration in the new paradigm

Julian Yi-Zhong Hou

Anoesis is a state of mind consisting of pure sensation or emotion without cognitive content. Anoetic tokenization is the application of value to the embodied resonance of creative activity. This implies a shift from placing value on things to placing value on affect. With sound waves, energy diffuses from a central location and communicates by its absorption and resonance in surrounding matter and consciousnesses. Resonance reinstills the complex experiences that bodies have lost to mechanization by reminding us that conscious awareness is too a form of material awareness. Resonance is less an emotional or cognitive judgment, and more an undeniable process of communication and feeling. In contrast to the demiurge of mechanization, ergonomics appears to be the new paradigm, in that it forms an adaptive and conscious mediation between bodies and material activities. Whereas mechanization formed alongside industrial mass production, ergonomics encourage an adaptive tendency within our environment that respects our individual needs and treats us as the unique and intersectional

bodies and minds that we are. Intersectionality is the confluence of the various socially categorized forces of privilege and marginalization (disability, class, race, gender, sexuality) that reinscribe our citizenship in unique and individualized terms. They are those experiences that we work to disentangle within our psychologies and our minds to arrive at a place of respectful relation to one another as family, friend, community, nation, planet and so on. Ergonomics and customization as a principle of material adaptation to individualized bodies is consonant within the paradigm of intersectionality because it further dignifies our individuality and experiences.

When measuring resonance and attempting to give it value, we might have to ask ourselves whose spirits matter more?

The dissolution of the mechanistic model of nature is perhaps best exemplified by the use of psychedelics—plants and chemically induced trance (self-hypnosis) as empathic technology, and as the intermediary connective tissues between mind and matter. Empathy and intersectionality are not mutually exclusive, instead they are conjoined in the respect that difference affords—and the understanding that anoesis provides invisible truths about where the spirit lies.

When measuring resonance and attempting to give it value, we might have to ask ourselves whose spirits matter more? Rather than using the pyramidal or hierarchical conceptual model, we could use the concept of the spiral—outward emitting, rooted, causal and traceable—a model that seems consonant with the clarity of a technology like blockchain.

Our current model of art exchange measures desire, and treats the art object as a privately desired object-cum-traded investment commodity. The art market uses capital as a seemingly democratizing force, but ultimately belies notions about the invisibility of class distinctions. Not everyone can own an artwork that they want to have, should have or deserve to have. If we hold art to the esteem of being personally meaningful or sacred, warehouses of stored art commodities for the rich seem absurd. The measure of anoesis, however, would lean toward a model that encourages artistic expansion—new possibilities of how art can be conceived, where it can live and for what communities it could belong. This would be a model where those with

the most creative influence would have more access to having art (as opposed to simply having more accumulated capital), and would more so be able to support and encourage those artists who they feel have the potential to do great things, and would likewise be able to acknowledge how they are mutually influenced by them. Under the paradigm of intersectionality, artistic competitiveness differs from capitalist competitiveness, in that the reaching toward and expression of our own unique beings differs from the strategic pursuit of an idea of what *should* be art, or what in some sense becomes art in *dialogue* with conventional histories. This is in some ways opposed to notions of collaboration and teamwork, because dialogue assigns authorial positions—it invokes a staging or a theatre of artistic pursuit. Art becomes a construct as opposed to being a sincere reaching toward personal self-possession, innovation and expression. Consider the extent to which historical contextualization within Western art canons has thoroughly dominated the way that art is obligatorily discussed within institutional language and curatorial frameworks—to the extent that artists in the 1990s and the 2000s began to solely rely on methodologies of the "remake" and "quotation" of previous periods of art making—pastiche. Did it not feel as though most of artmaking had become simply an exercise in a kind of insecure pursuit of historical relevance? A capitalist end-of-history echo chamber? With today's transition toward an intersectional paradigm that is potentially reshaping institutional frameworks, new models of artistic exchange and education are already forming that could be thought of as a kind of new counterculture, this time embracing digital platforms and the DIY ethos of technology. I'd like to cite the numerous artists and musicians who currently run their own Patreon memberships or membership-based websites, the Linktree social media mutual aid platforms, online auctions of art toward a variety of mutual aid causes, and artists simply giving away and selling their art through Instagram. Young artists are increasingly foregoing conventional systems of art education, relying more on mutual support, self-organized reading groups and collaborative settings of truthful conversation.

If we hold art to the esteem of being personally meaningful or sacred, warehouses of stored art commodities for the rich seems absurd.

Regarding the opportunities for collaboration that exist within this new paradigm, it is at the edges of truthful difference between subjectivities that a new kind of ornamentation can

emerge. A wilderness forms at points where this ornamentation becomes entangled, and inside of this wilderness we hunt for instances of collaboration. When complex subjectivities are preserved and respected, conversations become more truthful and edges become more clear, which ultimately allow for more radical forms of understanding, empathy, learning, clarity and confident exchanges. In simple terms, anoesis provides the pathway toward valuing art with the heart rather than critical judgment.

It seems important to also imagine the various forms of anoesis that an artist can incite. Some might be invisible, organizational and structural, some are political, some are aesthetic, formal, conceptual or mystical. A monetization of anoesis would require some form of token to represent these various forms of anoesis and influence. A token is a thing that serves as a visible or tangible representation of a fact, quality and feeling.

A monetization of anoesis would require some form of token to represent ... various forms of anoesis and influence.

Measures of anoesis and influence could each be represented by a different token, which each carry a qualitatively different value. We then have to ask, how does exchange work in a system with qualitative tokens? We might risk saying that this concept naturally privileges complexity in art, in that perhaps an artwork that touches on more of these categories would require a constellation of tokens that represents each of these categories. This is to radically limit the forum of exchange to participants of this exchange, and likely would encourage the sharing of artworks or the trading of tokens between those who might primarily work within specific categories of influence. A digital auction system on the blockchain that provides access through the attainment of tokens (artistic production) rather than capital, does seem to be an ideal way of assessing the true value of an artwork and could be the way that influence is assessed. An artwork valued by those with influence across many categories would reward the artist with the most variety of these tokens. It is also possible to imagine that these tokens could be sold to prospective outside buyers whose access would potentially be limited, but it could be a way that monetary capital could form as a kind of income supplement to those artists who need it. Additionally, it would more accurately reward influence with financial support as well.

Anoetic tokenization through the blockchain has the broad potential of reshaping how artistic exchange and production can be expanded and refined, replacing the legacy formats of institutions, academia and capital with a more democratized artist-centred system that benefits creativity, uniqueness and intersectional subjectivities. Art returns to having cultural relevance in a system that directly gives influential artists monetary agency. While it cannot entirely replace the art commodity system, it perhaps could function as an alternative micro-economy that acts as a supplemental market to support artists at various stages of their careers or as viable alternatives for marginalized artists who work outside of dominant cultural institutions. In its most utopian character, anoetic tokenization functions as a way to more accurately represent the cultural value of artistic production.

THE VALUATION OF NECESSITY

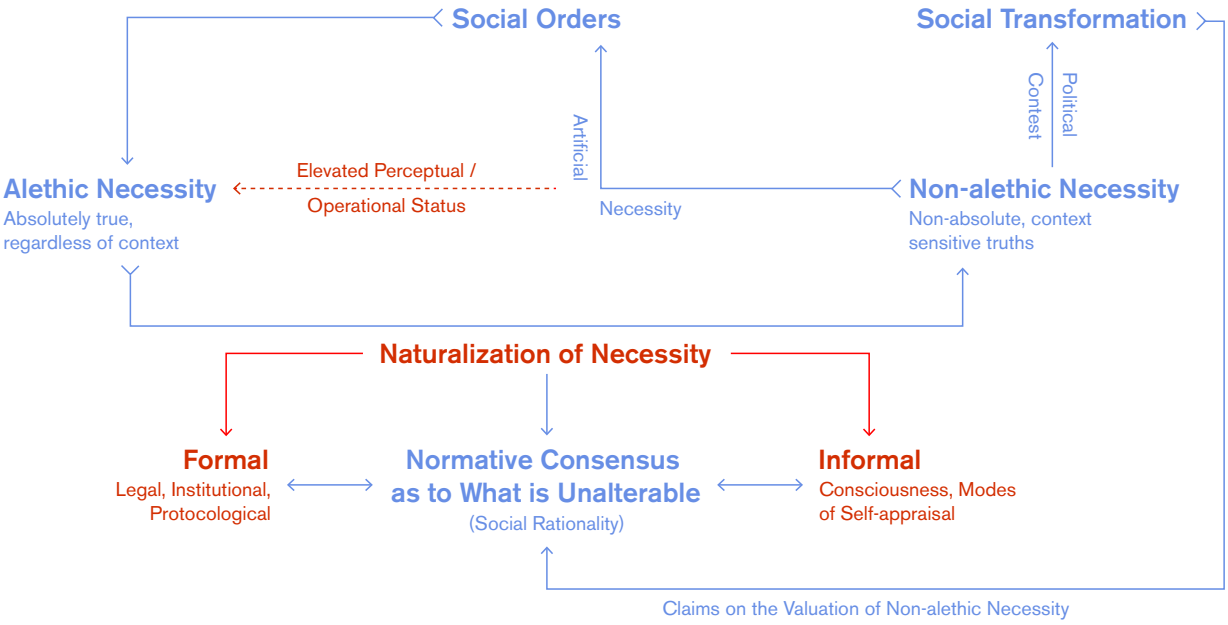
What conditions are needed to cognize worlds that do not yet exist?

Patricia Reed

> "The real necessity is only a relative necessity […]. It is relative because if we ask why A is necessary, it is because B and C are its conditions."[1]
>
> – Yuk Hui

[1] Yuk Hui, *Recursivity and Contingency* (London: Rowman & Littlefield, 2019), 100.

Part I: Naturalized Necessity and Artificial Claims



"Necessity" has a long history in philosophy. In the most abbreviated sense, necessity designates that which cannot be otherwise. Correspondingly, anything that is not necessary, is contingent, meaning it can be, or may be otherwise. Necessity is axiomatic, insofar as what is necessary remains so regardless of situational specificity, and furthermore it is resistant to contradiction, logically speaking.[2] Necessity, writ large, operates as a conceptual and/or material constraint, since it determines what is *not* freely negotiable, nor subject to alterability. Of course, in our everyday life, we usually do not use it in quite the same, definitive way. There are, in practice, *kinds* of necessity that offer more nuance and contextuality when wielding the term conceptually, and putting it to use heuristically. For example, *alethic* kinds of necessity typically pertain to metaphysics, epistemology or natural laws where the existence of the property "X," always entails the proposition of "X" is true.[3] An alethic necessity from

[2] Cecile Malaspina, *An Epistemology of Noise* (London: Bloomsbury, 2018), 53.

[3] Boris Kment, "Varieties of Modality", *The Stanford Encyclopedia of Philosophy* (Spring 2017 Edition), ed. Edward N. Zalta https://plato.stanford.edu/archives/spr2017/entries/modality-varieties/

within biology, for instance, would be to claim that the maintenance of human life necessarily requires hydration and nourishment; this claim is true regardless of context, since the absence of hydration and nourishment yields the falsity of the proposition "human life." Non-alethic necessities, in contrast, are where the existence of the property of "Y," does not always entail the proposition of "Y" is true. For instance, in the domain of law, where it may be necessary to wear a seatbelt while in a moving car, but that necessity does not entail that all car-riding people wear seatbelts as a universal truth, in every situation. Alethic necessities are absolute, whereas non-alethic necessities are context sensitive, which is another way to say they are typically fabricated, not discovered.

While the above definitions may appear a mere scholastic exercise, these distinctions are entirely relevant for the messier domain of social and political life. Since no social or political configuration is determined absolutely by either natural or supernatural (God-determining) law, any social or political claims on necessity (i.e., that one is required to behave, operate or relate to oneself a certain way) are of the non-alethic kind. Social orders can then be seen as operations of power to stabilize certain non-alethic necessities, and this is often done by elevating said necessities into an ideologically alethic status—a process we can identify as the *naturalization of necessity*.[4] Such a tendency, has long been observed by Marx, who noted that the holy trinity of production (capital, land and labour) alongside its corresponding forms of income (interest, rent and wages) is perpetuated by the dominant classes who justify their wealth based on the "natural necessity" of such a political-economic model.[5] These particular categories of production and wealth accumulation are only necessary *relative to* a non-absolute (non-alethic) historically contingent organization of production/distribution. While recognizing that the artificiality of *naturalized* necessity offers a point of leverage from which to challenge dominant social-ordering models, there is obviously much more at stake than simply announcing a given order as not alethically necessary. All social orders are of the non-alethic genre of necessity. What is important, rather, to recognize, as Conrad Hamilton has written is that "…what we define as unalterable is the consequence of a social rationality that manifests across the spectrum of reality."[6] The starting point is learning how to *witness* non-alethic necessities *as* contingent and subject to reconfiguration, demanding more than the critical agency to observe and diagnose, but also the capacity to testify as to what

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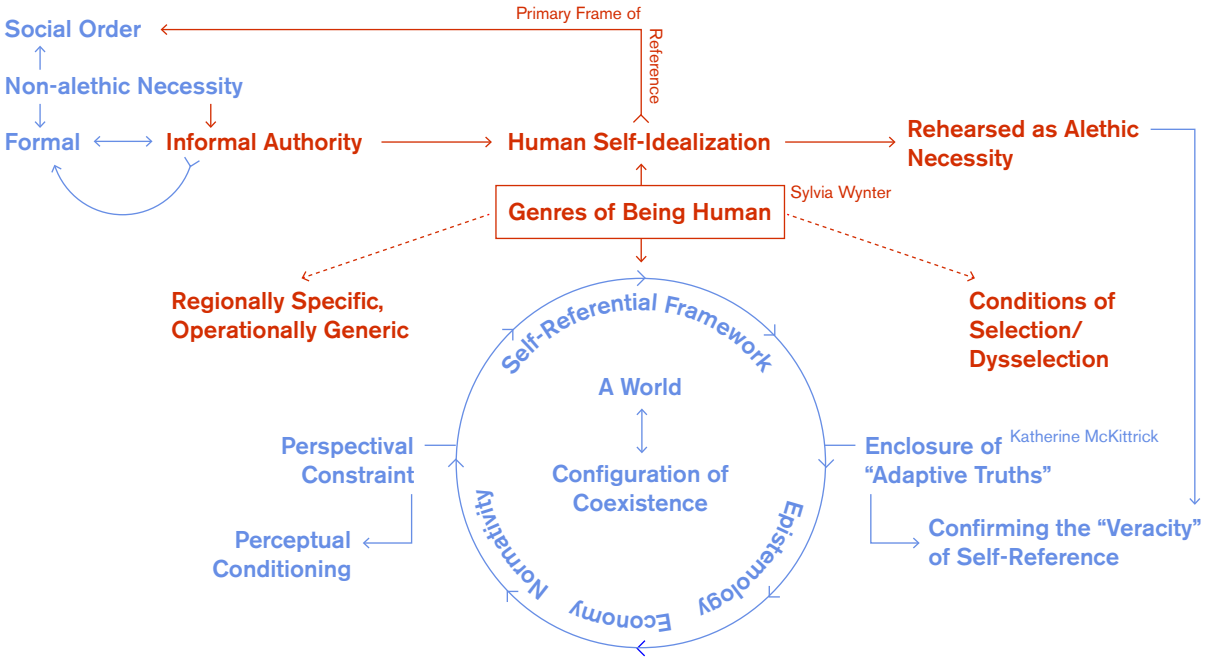
[4] As Reza Negarestani notes, stability does not equate with invariance or fixity. See "Where is the Concept: Localization, Ramification, Navigation," in *When Site Lost the Plot*, ed. R. Mackay, (Falmouth: Urbanomic, 2015).

[5] Donald C. Lee, "The Concept of 'Necessity' Marx and Marcuse," in *The Southwestern Journal of Philosophy*, 6, no. 1, (Winter 1975): 47–53.

[6] Conrad Hamilton, "The Discrete Ideology of Thomas Piketty: Successes and Failures of 'Capital and Ideology'," in *Merion West*, 2 July, 2020. https://merionwest.com/2020/07/02/the-successes-and-failures-of-thomas-pikettys-capital-and-ideology/

transformative, *realizable possibility* could be. The operations of naturalized necessity may be based on fictional ideals, but their consequences are very material, playing out in both formal and informal registers. The formalization of naturalized necessity are exemplified by legal doctrines which uphold and enforce compliance to a given, status-quo socio-economic order.[7] Yet, arguably the informal operations of naturalized necessity are the most pervasive not only playing out in interpersonal relationships conditioned by economic and social power,[8] but also within ourselves, as we are coerced into modes of self-appraisal adapted to these non-alethic necessities with corresponding rewards or punishments, whether self-inflicting or otherwise. Mark Fisher's now infamous "capitalist realism" diagnosis captures the potency of such informal constraints in conscious and unconscious ways, where behaviours, and even modes of creativity (with few exceptions) rehearse this naturalized necessity as if it was an immutable condition with no alternative.[9]



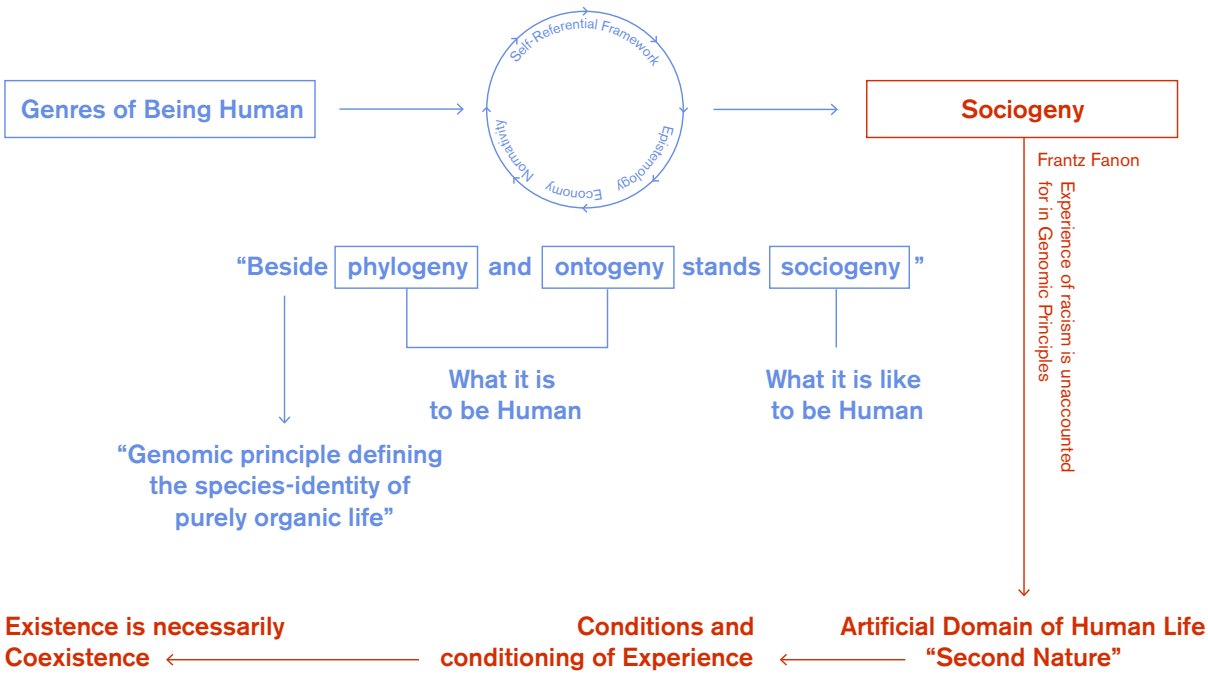
[7] Donald C. Lee, "The Concept of 'Necessity'": Marx and Marcuse.

[8] Ibid.

[9] Mark Fisher, *Capitalist Realism: Is there no alternative?* (London: Zero Books, 2009).

For Sylvia Wynter, all societies, no matter their historical and geographic specificity, are governed primarily via the informal authority of idealized human self-images (which does not mean they are "ideal" in a just or ethical sense). Said human self-idealizations are themselves not uniform, which is to say they are regionally specific, yielding vastly distinct societies, but the *function* of these human self-idealizations as a law-like, coordinating force, is, for Wynter, universal. Wynter names these idealizations as "genres of being human," and they serve as a primary frame of reference for organizing practices and norms of social life. Genres of being human set up an initial systemic-perspectival constraint (a metastable, non-alethic necessity), from which epistemic, economic and normative orders cascade, establishing both markers and conditions of selection/dysselection, conformance/non-conformance. Because this feedback dynamic externalizes a particular genre of being human in formal (institutional) and informal (normative) ways, a reproductive system of self-reference emerges that not only confirms, but incentivizes compliance with a particular genre of being human. It is from the initial perspectival constraint afforded/disafforded by each particular genre of being human that knowledge systems affirmatively correspond to the idealization of said human genre, setting the ground of positive self-reference (that may very well have "negative" implications) through which societies come to adjudicate what is upheld as legitimate, relevant, good, true or necessary. This human genre-concept is often internalized as an absolute law of nature and unconsciously practiced (making it difficult to recognize it *as* an idealization and not an unalterable fact), shaping and habituating knowledge claims and the organization of relations in social life. Such a reproductive system of self-reference, buttressed by the naturalization of necessity, bends towards both the structuring and evaluation of knowledge that confirms the veracity of said idealization, in what Wynter calls "genre confirming truths,"—or more simply, "adaptive truths" as Katherine McKittrick has named them.[10] Because of the material, structuring force of this self-referential system, Wynter asserts that there can be no paradigmatic social or political transformation without a corresponding transformation in the genre of being human. To change a social-historical world in a paradigmatic way, is to change the genre of being human that both enables, and gives navigational valence to such possibility.

[10] Katherine McKittrick, "Unparalleled Catastrophe for our Species," (interview with Sylvia Wynter) in *Sylvia Wynter: Being Human as Praxis*, ed. K. McKittrick (Durham: Duke University Press, 2015), 10.



Existence as Coexistence

"Sociogeny" is the term coined by Frantz Fanon to describe the feedback process between social structures and the internalization of them, as an indispensable category through which to account for the asymmetric *plights* of being human. Besides "phylogeny [evolutionary history of a species] and ontogeny [development of an individual organism from birth to maturity] stands sociogeny."[11] Fanon emphasizes our inescapable "second nature," an encoded, law-like milieu into which all humans are plunged, and which condition the *experience* of being human, because social structures set the *conditions for* that experience. Sociogeny names the constitutive parity of this artificial domain, alongside biological domains, that embeds and shapes human existence; "artificial" simply because it is by human efforts that any social structure comes into being, not by way of an immutable "natural" force. Where phylogeny and ontogeny may offer explanations of "what it is to be" human, sociogeny offers a framework to explain "what it is *like to be*" human, inextricably entrenched within a socially encoded milieu, setting up a space of non-uniform analysis.[12] Wynter deploys this sociogenic principle

[11] Frantz Fanon, *Black Skin, White Masks*, trans. C. L. Markmann (London: Pluto Press, 1986), 13.

[12] Sylvia Wynter, "Towards the Sociogenic Principle: Fanon, The Puzzle of Conscious Experience, of "Identity" and What it's Like to be "Black," in *National Identities and Socio-political Changes in Latin America*, eds.: M. F. Durán-Cogan and A. Gómez-Moriana (New York: Routledge, 2001), 30-66.

to both relate and contrast "what it is like to be human" with the "genomic principle defining the species-identity of purely organic life."[13] Psychoanalytically speaking, for Fanon, the experience of anti-Black racism is irreducible to phylogenic or ontogenic explanatory models that presuppose an individual "preexists the processes of socialization," and wherein any "cure" is premised on the successful adaptation of an individual to society.[14] Similarly, we see resonant claims from within certain branches of feminism at a comparable moment, namely Simone de Beauvoir's assertion in *The Second Sex* that "…in truth a society is not a species, for it is in a society that the species attains the status of existence […] its ways and customs cannot be deduced from biology, for the individuals that compose the society are never abandoned to the dictates of their nature; they are subject rather to that second nature which is custom…."[15] For Fanon, the "psycho-existential complex" of the experience of anti-Black racism manifests as a double process (following the articulation of "double consciousness" outlined by W.E.B. Du Bois in 1897): the *objectively structured* suppression of economic possibility that is predicated on, and reinforced by, the *subjective* internalization of inferiority (of the oppressed) or superiority (of the oppressor). Neither mode of internalization can be adequately diagnosed or "cured" within ontogenic frameworks, since these internalizations, while personally experienced (even when not consciously recognized), are not causally locatable at an individual, existential scale. The "cure" as it were does require adaptation of the individual to a pathologic social structure, which conditions the internalized experience of subordination/domination. What is required, rather is a "sociodiagnostic," as Fanon called it, amounting to nothing less than an "overall social transformation."[16] These Fanonian claims can be read as foundational to several (largely uncredited) more recent observations concerning the hyper-individualization of diagnoses today, when, for example, mental health is upheld as a purely personal sickness, or the experience of economic poverty is the result of one's own making. Both of these "ailments" are most commonly addressed as a consequence of individual unfitness to the social milieu (i.e., ontogenetic dysselection).[17] Or even more broadly on the question of "personal experience" itself, as Reza Negarestani has written, that the "…supposedly 'private' experiences and thoughts of participating agents are only structured as experiences and thoughts in so far as they are bound up in this normative—at

[13] Ibid.

[14] Ibid.

[15] Simone de Beauvoir, *The Second Sex*, trans. H. M. Parshley (London: Jonathan Cape, 1956), 63.

[16] Sylvia Wynter, "Towards the Sociogenic Principle: Fanon, The Puzzle of Conscious Experience, of "Identity" and What it's Like to be "Black."

[17] Mark Fisher, "Why mental health is a political issue," in *The Guardian*, 16 July, 2012. https://www.theguardian.com/commentisfree/2012/jul/16/mental-health-political-issue

once intersubjective and objective—space."[18] Sociogeny emphasizes the artificial stratum endemic to human existence as it is situated *in practice*, inferentially highlighting that existence is always, irreducibly and necessarily, *coexistence*. This perspectival shift from existence to coexistence not only stresses the artificial dimension of being human, but in so doing, deals a blow to fundamental tenets of existing liberalism, for which the individual is the paramount, atomically figured building block of any social order with little consideration given to the qualitative conditioning of its status in systemic, asymmetric relation. Consequently, such a sociogenic model of being human is dependent on debunking the impossible ideal of the lone "independent" mind, since the sociogenic model requires a "…*necessarily deprivatized* mind […] predicated on sociality as its formal condition of possibility."[19] What sociogeny offers is a non-subtractive framework for understanding the human, a view of being human that is practically and conceptually inseparable from the semantically encoded, impersonal relations that inform any and all seemingly private sensations of being a particular individual.

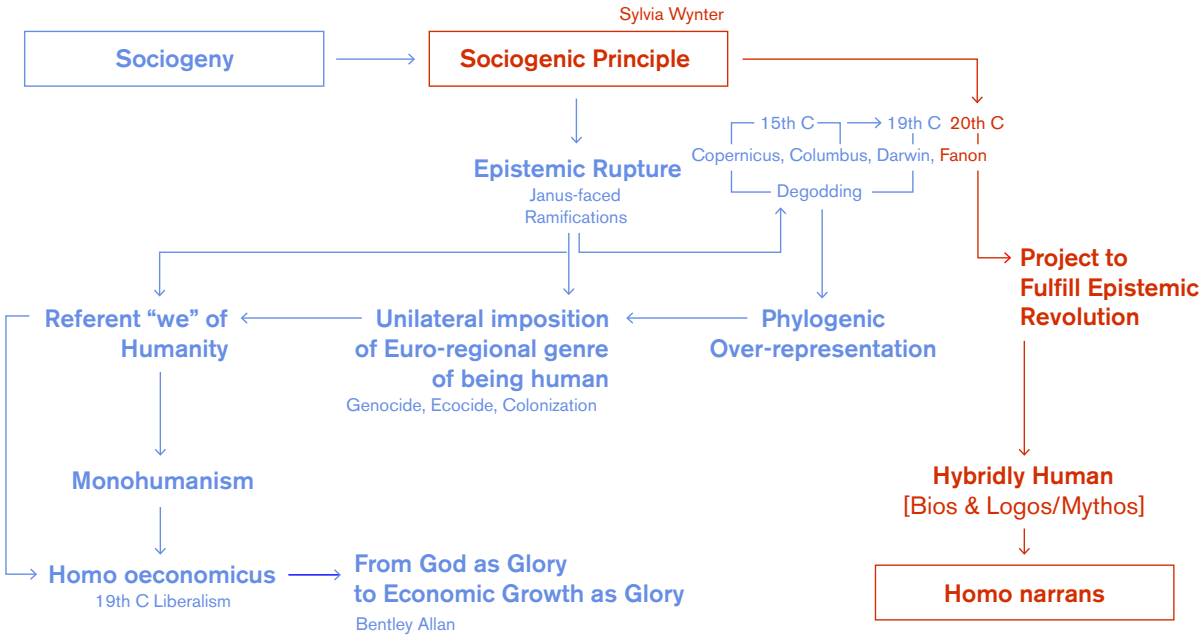
At stake in sociodiagnostics is the demonstration of collective freedom that manifests in the self-conscious *non-adaptation* to a given socio-historical configuration as it is, in contrast to what we can call "ontodiagnostics," which is premised on the unfreedom of blind *adaptation* to the givenness of a world as its primary goal, regardless of the objective harms such an adaptation entails. As a movement of non-adaptation, sociodiagnostics is the collective labour in making an incomplete, non-total picture of a particular world configuration intelligible and/or available to sensation, in a procedure that disproves the auto-reinforcing naturalization of necessity that stabilizes a social condition as complete and *given* (i.e., as unalterable). The comparative discrepancy between ontodiagnostics and sociodiagnostics hinges on the appraisal of necessity with relation to givenness. The former affirms the necessity of givenness on tautological grounds: a given condition is necessary simply because it happens to be the current state of affairs; while the latter rejects such self-referential closure of the given as necessary, struggling to both witness and realize other possible configurations. While ontodiagnostics is bound to the confirmation of what there is in a given world (and how to best adapt to it), sociodiagnostics is bound to the "practical and axiological […] intelligibility of what should be" (or how to imagine and evaluate betterment, which is decisively non-adaptive to the given here and now).[20] While necessity (as constraint) and freedom (as enablement) are typically held in opposition to one another, the question of how necessity is socially adjudicated is an articulation of deprivatized freedom, thereby shifting the locus of freedom from a purely

[18] Reza Negarestani, *Intelligence and Spirit* (Falmouth/New York: Urbanomic and Sequence Press, 2018), 1.

[19] Ibid.

[20] Ibid., 31.

ontogenic framework (as is the case of freedom within liberalism). Correspondingly, it is also a question of how necessity imprints and shapes the very constitution of "value," understood in the broadest way possible.



Wynter notably identifies "sociogeny" as part of the rare category of epistemological rupture alongside Copernicus (and more controversially, Columbus) in the fifteenth century, and Darwin in the nineteenth century (noteworthy, since she removes Freud from this succession who appointed his own discovery of the unconscious within such a paradigm-shifting lineage), adopting Fanonian sociogeny in her work using the term the "sociogenic principle."[21] Wynter has described our now globalized socio-political condition as one driven by the imposition of a *unilateral* genre of being human, or the discursive establishment of a referent "we" of humanity. For Wynter the genealogy of this Euromodern[22] unilateral genre of being human can be traced to the fifteenth century, when the heavens became degodded, and hitherto unknown seas, geographies and "nature" became subject to rational explanation and subsequent

[21] Karen M. Gagne, "On the Obsolescence of the Disciplines: Frantz Fanon and Sylvia Wynter Propose a New Mode of Being Human," in *Human Architecture: Journal of the Sociology of Self-Knowledge*, Vol. 5: no. 3, 2007. Available at: http://scholarworks.umb.edu/humanarchitecture/vol5/iss3/23

[22] Lewis R. Gordon defines "Euromodern" in the following way: "By "Euromodernity," I don't mean "European people." The term simply means the constellation of convictions, arguments, policies, and a worldview promoting the idea that the only way legitimately to belong to the present and as a consequence the future is to be or become European." See: Lewis R. Gordon, "Black Aesthetics, Black Value," in *Public Culture* 30:1, 2018, 19-34.

exploration. Such a rupture set an epistemic pathway for the consequent nineteenth-century dethroning of the human as a godly sanctified creature, marking it as indistinct from other species, from an bio-heavy evolutionary perspective. Wynter's framing of such a genealogy describes a "Janus-faced reality": at once an epistemic achievement of universal human cognitive activity to reason and navigate the world, yet an "achievement" that also precipitated particularized genocide, enslavement and ecocide that persists in the present, in institutional, normative and epistemic structures.[23]

What was once a regionally bound, European genre of being human, has historically become an inflated monohumanism that manifests in the more familiar figure of *homo oeconomicus*; the discursively foundational figure endemic to nineteenth-century European liberalism.[24] While the modern *cum* globalization project may be operationally, logistically, and communicatively expansive, its hegemonic governing rules, norms and semantic encodings, are, and largely remain, highly local. According to Wynter, this human genre-concept is a result of phylogenetic over-determination or over-representation, where *homo oeconomicus* is based on the self-storytelling that we humans (as a species description), are "motivated primarily by the imperative common to all organic species of securing the material basis of their existence; rather than by the imperative of securing the overall conditions of existence."[25] Otherwise said, a non-alethic necessity raised to the status of alethic necessity serves as a "supreme source of legitimacy" for current political-economic structures.[26] For Wynter this is a consequence of an instrumentalized parsing, and neo-Darwinian understanding of evolutionary theory (on the part of the oppressor class who exploit it to justify economic domination as a fact of "natural," winner-take-all competition)—a consequence, to recall, Wynter traces back to the long process of degodding Europe culminating in the social metamorphosis from theodicy to biodicy.[27] (A similar observation has been made by international relations scholar Bentley Allan, whose work traces the cosmological shift in Europe from sixteenth-century stately purposes of serving "God and glory," to the post-Second World War neoclassical ideals of economic growth *as* glory.)[28] The persistent legacy of such an overly bio-determined genre of being human has generated "the lived and racialized categories of the rational and irrational,

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[23] Ibid.

[24] McKittrick, Sylvia Wynter: *Being Human as Praxis*, 10.

[25] Sylvia Wynter, "No Humans Involved: An Open Letter to My Colleagues," in *Forum N.H.I.: Knowledge for the 21st Century* 1, no. 1: Knowledge on Trial (Fall 1994), 42-70.

[26] Sylvia Wynter, "On How We Mistook the Map for the Territory," in *Not Only the Master's Tools: African American Studies in Theory and Practice*, eds.: L. R. Gordon and J. A. Gordon (Boulder: Paradigm, 2006), 107-169.

[27] Ibid.

[28] Bentley B. Allan, *Scientific Cosmology and International Orders* (Cambridge: Cambridge University Press: 2018), 4.

the selected and the dysselected, the haves and the have-nots as asymmetrical naturalized racial-sexual human groupings that are … increasingly subordinated to a figure that thrives on accumulation."[29] Wynter's project to cross reference the bios (phylogeny, ontogeny) with the sociogenic (mythoi, logoi), does not succumb to facile inside/outside, scientific/fabulation dualisms, pitting the human neurochemical mind as an autonomous, self-contained, fixed organ against a socially constructed world, but examines the interaction between the two, whereby the artificial, semantic level of the social imprints the "neurochemistry of our brain's opiate reward / punishment system to act accordingly."[30] To be clear, the charge of bio-overdeterminism is not an "anti-biology" position, but rather a critique of *socially* injurious abuses enacted the name of biology that falsely conflate it with a progress-oriented telos (downplaying the role of contingency in morphological processes) and where "natural selection" becomes a defense for eugenic superiority (in the exclusive human genre model of the "well-to-do white men").[31] As Ben Woodard highlighted, the demonization of biology as a "state-funded threat" and its sadistic instrumentalization can be traced to the strict separation between the sciences and the humanities from the mid 1800s—at which point significant blind spots emerge as to the "limitations of each other's field relative to its domain" of study.[32] This is precisely the type of epistemological segregation that Wynter labours *against*. What is critical to extend from Wynter's project is her insistence on the human as *homo narrans*; that is, as a *discursive* creature that is irreducible to biological explanation alone, whose historical narrations drive not only objective social configurations, but also the subjective, experiential internalization of those stories as they leave traces on neurochemical operations. As part bios, part mythoi/logos-driven creatures, Wynter identifies the human as an "auto-instituting" hybrid animal (nature-culture, or skin-masks), demanding emancipatory escape from the narration of bio-centric overdetermination, whilst not disavowing ethology in the process.[33] It's because of this, that "necessity" in its alethic and non-alethic *genres* serves as a useful framework, not because there is the suggestion to pit the alethic (nature) against the non-alethic (artificial, mythic, semantic-representation), or vice-versa, but rather to study how these genres of necessity are intertwined in the construction of coexistential *conditions*, and the *conditionings of* human forms of life. The violent illogicality of the biologically over-determined, auto-instituting genre of *homo oeconomicus*, is that, socially speaking, it coordinates coexistence in such a way that it is unable

[29] McKittrick, Sylvia Wynter: *Being Human as Praxis*, 10.

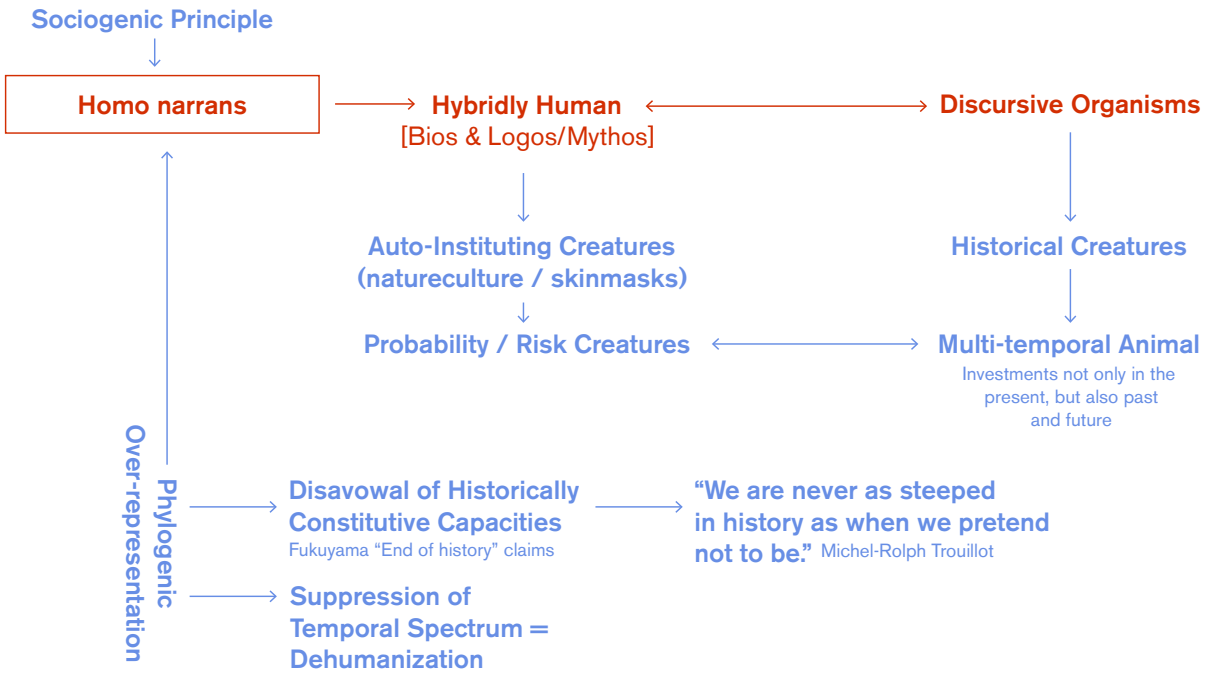
[30] Ibid.

[31] Ben Woodard, "The Biophilosophy of Epidemiological Models," in *Strelka Magazine*, 28 May 2020. https://strelkamag.com/en/article/bio-philosophy-of-epidemiological-models.

[32] Ibid.

[33] Birgit M. Kaiser & Kathrin Thiele, "What is Species Memory? Or, Humanism, Memory and the Afterlives of '1492'," in *Parallax*, 23, no. 4, 2017, 403-415.

to adequately deliver on, or maintain alethic material necessities of and for human life. The selectively narrated, "natural" justifications that uphold our always-fabulated social condition, have set a path towards the eradication of a (humanly) hospitable biosphere, where the most rudimentary requirements of human coexistence are under direct threat. The nineteenth-century European ambition to demythologize the human through ontogenetic and phylogenetic categories alone germinated an accompanying remythologization, one that continues to govern coexistence under the deceptive premise that such a configuration is uncontaminated by myth.[34]



Temporal Creatures

Homo narrans is another way of saying humans are historical creatures—temporal beings not only invested in our immediate, present situations, but infused by the past and able

[34] As Yuk Hui writes: "[e]very demythologization is accompanied by a remythologisation…," in *The Question Concerning Technology in China: An Essay in Cosmotechnics* (Falmouth: Urbanomic, 2016), 11.

to imagine and care about the future[35]—that is, creatures with the capacity to cognize the condition of worlds that do not yet concretely exist, and that we have never experienced. This is why denying access to histories through deliberate erasure or invalidation, or disabling the possibility-space to think futurity because circumstances of the present are so acutely threatening, have been long-standing, inter-human techniques of dehumanization. Capitalism itself, as Marx observed, is nothing less than the "commodification and disposal of human time."[36] Dehumanization is not just material or economic, it also manifests in the cruelty of suppressing the spectrum of temporal access, with the consequence of foreclosing upon sociogenic malleability because time is a prerequisite for the cultivation of self-determination. The justification of a social configuration under the pretense of biological overdetermination, is a way to evacuate socio-historical accountability for such configuration—it's just "human nature"—and in so doing "we are never as steeped in history as when we pretend not to be."[37] The ability to constitute history, to negate historical trajectory, and/or to repurpose it for "pathways unseen by the past"[38] is predicated on the labour of nourishing *homo narrans* in its full temporal spectrum—a spectrum, as Rasheedah Phillips has written, that is entirely restricted when cognized in a strictly hierarchical, unidirectional way, in which "…the past is [perceived as] fixed and the future is inaccessible until it passes into the present."[39] The labour of repurposing, of struggling for new historical configurations is dependent on the ability to reflect upon oneself as an artefact of a particular human genre-concept,[40] which is to self-consciously recognize one's artificiality as a vector for transformation. *Homo narrans* is historically constituted and semantically encoded, and by recognizing itself as an embedded, somatic incarnation of a particular human genre-concept, a possibility emerges to reconstruct its own self-conception as an *historically constituting* creature in praxis,[41] provided the *meaning* of a content-awareness of the past is upheld as unfixed, and not merely a monumentalized trace to be forever untouched.

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35 Thomas Moynihan, "Existential Risk and Human Extinction: An Intellectual History," in *Futures*, 116 (2020). https://doi.org/10.1016/j.futures.2019.102495

36 Nigel C. Gibson, "Fanon and the 'rationality of revolt'," in *New Frame*, 4 August 2020. https://www.newframe.com/fanon-and-the-rationality-of-revolt/

37 Michel-Rolph Trouillot qtd. in Dionne Brand, "On narrative, reckoning and the calculus of living and dying," in *The Toronto Star*, 4 July 2020. https://www.thestar.com/entertainment/books/2020/07/04/dionne-brand-on-narrative-reckoning-and-the-calculus-of-living-and-dying.html

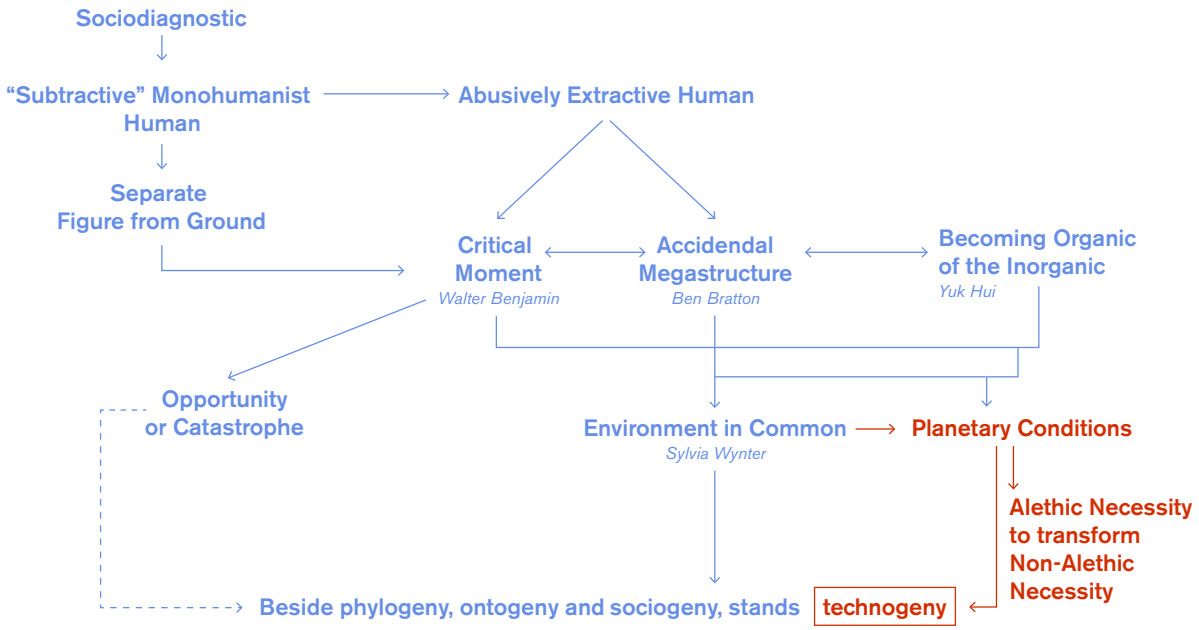
38 Reza Negarestani, *Intelligence and Spirit* (New York/Falmouth: Sequence Press, 2018), 491.

39 Rasheedah Phillips, "Constructing a Theory and Practice of Black Quantum Futurism: Part One," *Black Quantum Futurism: Theory and Practice*, 1, ed. R. Phillips (Philadelphia: Afro Futurist Affair, 2015), 12.

40 Reza Negarestani, *Intelligence and Spirit*, 25.

41 Ibid., 55.

The sociogenic principle names a doubly-founded, reciprocal process: first, the conceptual, psychological and material imprint of historical-social processes and configurations accounting for *what it is like* to be human (from the outside in, *as a social effect*); and second, the objectively structural, externalized ramifications of an idealized human genre-concept as it self-referentially institutes material, social, relational arrangements (from the inside out, *as a socially causal force*). Additionally, and from an epistemological angle, at work in the Fanonian sociogenic "rupture," identified by Wynter, is the transformation of "humanness" from a "noun" to an activity (a "praxis"), thereby drawing attention to the "central role that our discursive formations, aesthetic fields, and systems of knowledge must play in the performative enactment […] of being hybridly human."[42] When we begin to think the broad epistemological ramifications of such a rupture (as Wynter calls upon us to do, and which will be later discussed) we can see it in the seeds for a wholly different approach to "Nature;" namely that there is a poverty of analysis when approaching "Nature" as an external, isolatable, subtractable entity outside the human—a longstanding conception succinctly captured in the general Western metaphysical move to separate the figure from the ground. In this way, sociogeny in hindsight, as an epistemic rupture unto itself, can be seen as catalyzing a more recent conceptual transition from Natural to Ecological frames of reference.[43]



42 Wynter, Sylvia Wynter: *Being Human as Praxis*, 59.

43 Yuk Hui, *Recursivity and Contingency* (London: Rowman & Littlefield, 2019), 29.

To begin to speak of a "sociodiagnostic" in our present, it can be described as the effect of a monohumanist genre-concept that figures itself as masterfully dominant over, and separate from, an infinitely plentiful, passive ground that is merely there to serve the voracious appetites of a human minority. A *subtractive*, bio-centric human genre-concept has served as the idealized justification for an *abusively extractive* practice of being human. This "masterfully extractive" hegemonic mode of being human has now yielded historical and material path dependencies culminating in a unique situation: that for the first time in the varied histories of human-genres as we face anthropogenic climate change, not to mention a pandemic, humans are required to coordinate practices both *for* and *within* an environment in common, yet a common environment that is uncommonly lived, even when inhabiting the same geolocation.[44] What is at work in this momentous critical moment that must be seized as an opportunity, lest we fumble further into catastrophe,[45] is that the "accidental megastructural"[46] consequences of this centuries-long human genre-concept produce an urgent awareness of the *alethic* necessity to transform *non-alethic* human genre-concepts. This momentous critical moment demands new human genre-concepts commitments, from which to enable modes of planetary-dimensioned sociality amenable to the practicing of an environment in common. This is another way to frame the reciprocity inherent to sociogeny: that humans are not held hostage by the externalized effects of a human-genre concept that both imprint and manifest themselves upon humans in asymmetric ways, but must instead uphold these self-idealizations as necessarily artificial, and therefore subject to revision. This critical moment denotes a condition where humans are "elevated to 'a causal explanatory category in the understanding of human history'"[47] (now including geohistory) as a consequence of "…the culmination of a technological consciousness in which the human being starts to realize […] the decisive role of technology in the destruction of the biosphere and in the future of humanity…."[48] It is an historical condition driven by the proliferation of technological externalizations deriving from a particular monohumanist genre-concept, which today can no longer be held apart from any contemporary "sociodiagnostic." It is no longer sufficient to enact such sociogenic analyses without addressing the machinic or computational *intermediaries* of this hegemonic auto-instituting creature. And so it must be added to Fanon's formulation: that beside phylogeny, ontogeny and sociogeny, there also stands *technogeny*.

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[44] Sylvia Wynter, "A Ceremony Must Be Found: After Humanism," in *boundary 2*, 12 (Spring-Autumn 1984), 19–70.

[45] Walter Benjamin, *The Arcades Project*, trans. Howard Eiland and Kevin McLaughlin (Cambridge: Harvard University Press, 1999). Benjamin defined a "critical moment" as when the continuity of the present state of affairs is seen as a threat. Furthermore, he defined "catastrophe" as a missed opportunity, historically speaking–which importantly sets a distinction between tragedy and catastrophe.

[46] Benjamin H. Bratton, *The Stack: On Software and Sovereignty* (Cambridge: MIT Press, 2015), 5.

[47] Christophe Bonneuil, qtd. in Yuk Hui, *The Question Concerning Technology in China: An Essay in Cosmotechnics* (Falmouth: Urbonomic, 2016), 292.

[48] Yuk Hui, *The Question Concerning Technology in China: An Essay in Cosmotechnics*, 293.

Part II: Technogeny and Non-adaptive Perspectives

"The opposition drawn between culture and technics, between man and machine, is false and has no foundation [...] Behind a facile humanism, it masks a reality rich in human efforts and natural forces, and which constitutes a world of technical objects as mediators between man and nature."[49]

– Gilbert Simondon

"Technology reveals the active relation of man to nature, the direct process of the production of his life, and thereby it also lays bare the process of the production of the social relations of his life, and of the mental conceptions that flow from these relations."[50]

– Karl Marx

"The endoskeleton of technology […] is us, it's the social body, it's our labour, our production, our ideas, our bodies…"[51]

– Matteo Pasquinelli

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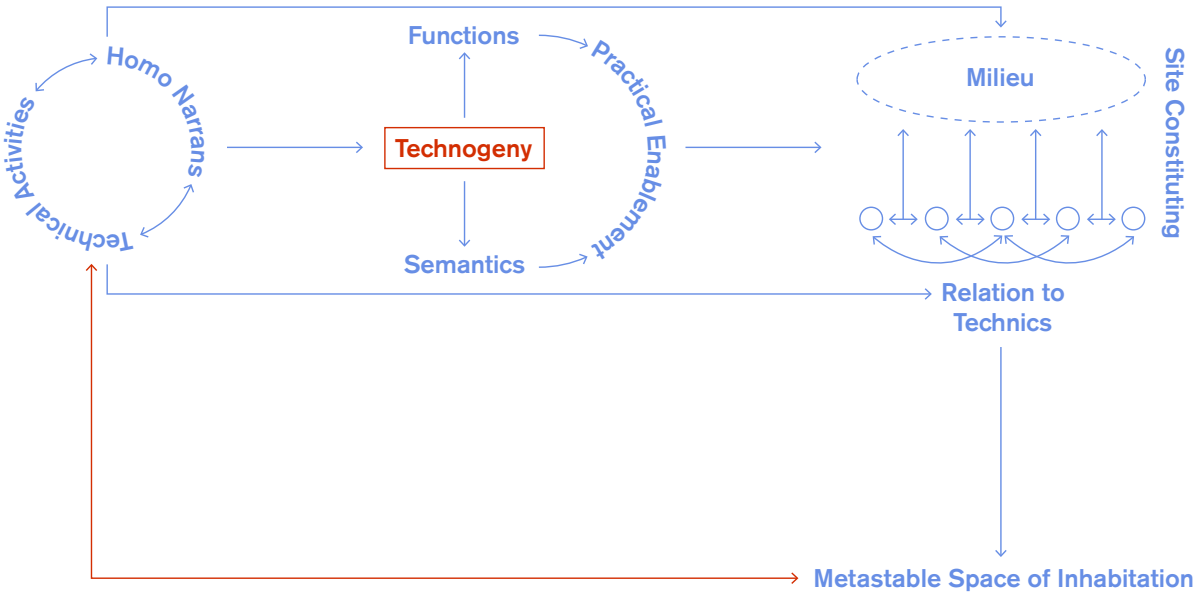
[49] Gilbert Simondon, *On the Mode of Existence of Technical Objects*, trans. C. Malaspina and J. Rogove (Minneapolis: Univocal Press, 2017), 15.

[50] Karl Marx qtd. in Bernard Stiegler, *Technics and Time 1: The Fault of Epimetheus*, trans. R. Beardsworth and G. Collins (Stanford: Stanford University Press, 1998), 26.

[51] Matteo Pasquinelli, "Tools, Numbers, Machines and Algorithms: A Social History of Artificial Intelligence," Lecture at Museum MMK für Moderne Kunst, Frankfurt a.M., 26 January, 2020. https://www.youtube.com/watch?v=NCLkgw6UmXE



If sociogeny extends an analysis of "what it is" to be human to account for "what it is *like*" to be human as an historically embedded and *mutable* condition, technogeny unfolds in a similar way.[52] Just as there is no adequate description of the human within a (selectively) bio-centric, socio-cognitively extractable framework, there is no adequate description of technology as a purely standalone entity. Nor can one properly separate *homo narrans* from its technical activities, through which socio-organizational configurations coevolve and possibilities are rendered both imaginable and realizable, for better and for worse. Modelling and struggling for stakes in the social condition of "what it is like" to be human is conjoined with the universal dependence on, and creation of, technical objects. "Technogeny" indexes such coevolutionary intermediaries through which praxes of being human are enabled and capacities for activity (cognitive and material) are transformed in productive, ambivalent and/or destructive ways, axiologically and practically speaking. As an embedded and interactive account of the technics through which genres of being human are practiced (including infra/-structures of relation), technogeny acknowledges the material externalization of a particular genre of being human (its labours and its ideas) that are optimized *in* as well as *for* its likeness and "proper" sets of

[52] While not a common term in everyday, or academic use, "technogeny" has been used (sparingly) within the fields of geoengineering, or mining analysis—typically referring to the ill-effects of technological interventions within the environment. It has been defined within a general framework of "iatrogenic ills," which can be understood as the production of morbid conditions by expert human hands (like the amplification of psychosis due to the over-prescription of drugs from a psychiatrist). In such a definition there is a unidirectional, causal force (technology in the hands of "masterful" agents) that produces effects, rather than emphasizing a feedback dynamic (See: Martin Krakowski, "Anthropogenic Ills," in *Interfaces*, Vol. 3, May 1973, 44-46). In media theory, "technogenesis" has been widely used by N. Katherine Hayles (*How We Think: Digital Media and Contemporary Technogenesis*), and by Bernard Stiegler (*Technics and Time, 1: The Fault of Epimetheus*)—although these thinkers use term differently, it generally refers to the coevolution between humans and technics, which certainly influences my use of "tech-nogeny." Given the infrequent use of the term "technogeny" specifically, however, I have taken the liberty to deploy it within the conditions of reciprocal influence instigated by sociogeny (as a response to phylogenetic/ontogenetic over-determination), and how practices of being human are entangled with means/technics of coexisting in a world.

behaviours. The acknowledgement of this technogenic-cognitive reciprocity, known as the "artifactual mind" further deflates any picture of the human bound to predetermined bio-teloi, by collapsing the "inside" (mind), "outside" (tool) dualism.[53] The artifactual mind *is* what it *does*,[54] and its doings and maneuverings in a world are in allagmatic interaction with humans, concepts, environments, other species, as well as technical objects. As with sociogency, technogeny is also the semantically encoded perception and internalization of the use / misuse of technology. In the sociogenic legacy that stresses the experiential, normatively conditioned dimension of existence (as a quality, and not just fact of biological life), technogeny also emphasizes the irreducibility of an analysis of technical objects to their sheer use, as if it is devoid of signifying properties and can be isolated from its milieu of operations (which are both functional and semantic).[55] Lastly, on this question of "milieu" within a post-industrial, computationally complex historical condition, distinctions between sociogeny and technogeny collapse, insofar as technology can no longer be thought of as a mere means to fulfill socio-cultural ends, but instead has reached a degree of magnitude where "machines are no longer simply tools or instruments but rather gigantic organisms in which we live,"[56] similar to Benjamin Bratton's model of "The Stack" that computationally operates at planetary dimensions and is described as an (accidental) "metatechnology."[57] At this gigantic organismic scale, technologies are both a human-machinic "*relation to* a milieu and a *modification* of it, with successive modifications transforming the milieu itself and therefore the conditions of action for those within it."[58] The sociogeny-technogeny continuum is a *milieu* constituting, which is to say site-establishing dynamic, that serves as a metastable (not permanently fixed) field-space of inhabitation.

It would be tempting to summarily conclude without additional scrutiny, that technology (as a human making) is simply an externalization of whatever referent human genre-concept happens to be governing a particular social configuration. While accurate to a certain degree, committing in an *absolute sense* to this position (in a unidirectional way) would be to adopt a view of technology that is totally subsumed by a given cultural context, where its particular

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[53] Ciano Aydin, "The artifactual mind: overcoming the 'inside–outside' dualism in the extended mind thesis and recognizing the technological dimension of cognition," in *Phenomenology and the Cognitive Sciences*, 14(1) March 2013. https://www.researchgate.net/publication/257636790_The_artifactual_mind_overcoming_the_'inside-outside'_dualism_in_the_extended_mind_thesis_and_recognizing_the_technological_dimension_of_cognition. Online.

[54] Reza Negarestani, *Intelligence and Spirit*, 10.

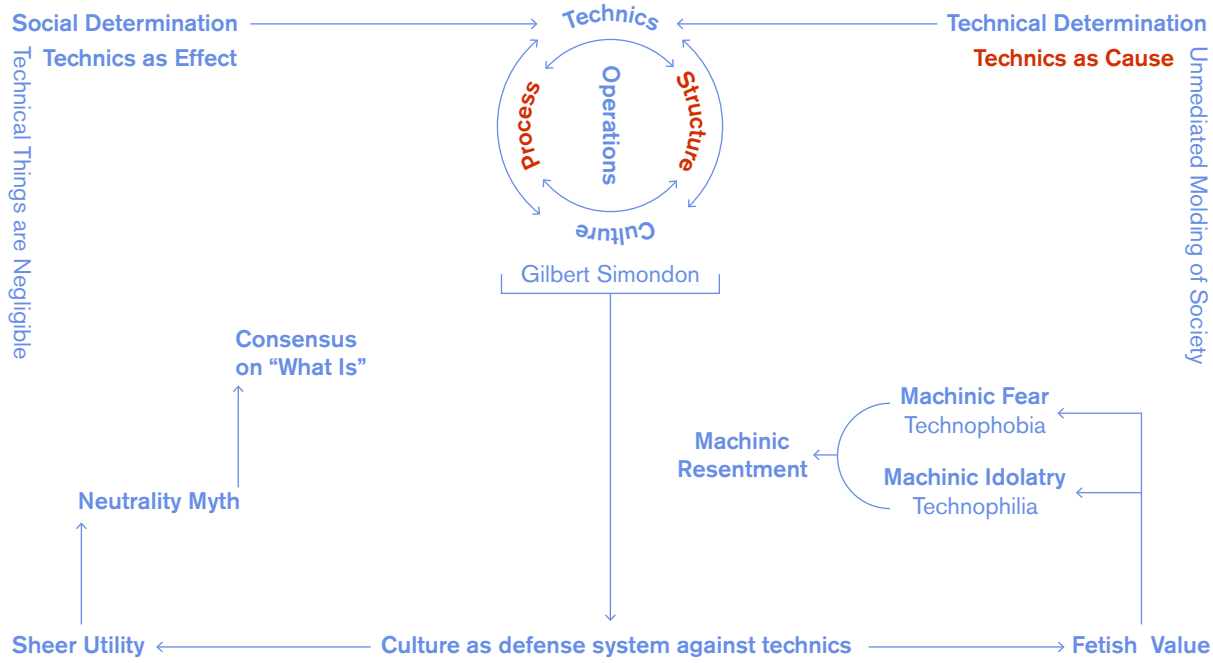
[55] Gilbert Simondon, *On the Mode of Existence of Technical Objects*, 16.

[56] Yuk Hui, *Recursivity and Contingency*, 28.

[57] Benjamin H. Bratton, *The Stack: On Software and Sovereignty*, 214.

[58] Conor Heaney, "The disparity between culture and technics," in *Culture, Theory and Critique* 60, no. 3-4, 2019, 193-204. https://www.tandfonline.com/doi/full/10.1080/14735784.2019.1689626

technical, material and protocological properties, unto themselves, are of negligible import or consequence. In this "social determination of technology" view, taken to its logical end, "technical *things* do not matter at all," because technology is a result of social processes alone.[59] The flip side of that position would be to adopt a view that technology, unto itself, is *the* determining object-agent of social configurations, including political economy. In this view, technology develops purely through internal workings; "unmediated by any other influence, [it] molds society to fit its patterns."[60] In the former picture, technology is the *effect* of a particular social order, whereas in the latter, technology is the *causal* force of a particular order (techno-determinism). While both of these positions continue to play out in discourses on technology and within the cultures of technologists, Gilbert Simondon's influential work raises a stark warning against such an either/or understanding, elaborating rather an analysis of technics *operationally,* that is, as both cause and effect, as structure and process, similar to the recursivity at work in the sociogenic principle. Simondon's theorization is not a gesture of diplomacy to bring together opposing positions into a happy consensus, but is rather a rejection of the culture/technics separation as such. Yuk Hui's important contributions on "cosmotechnics" and "technodiversity" can be read as a working through of contextual / historical specificity to said unspecified terms of "culture" and "technics" deployed by Simondon (who assumed their general signification from a particular Euro-Greek semantic legacy).



[59] Langdon Winner, "Do Artifacts Have Politics?," in *Daedelus* 109, no. 1, M*odern Technology: Problem or Opportunity?* (Winter: 1980), 121-136.

[60] Ibid.

For Simondon, "technics" refers to the broad domain of "technologies, techniques, methods, arts and practices, at once material and cognitive, through which humans engage and reshape their environment and psycho-social milieu;" so while "technology" is an important part of "technics," its proper technicity demands evaluation (i.e., how something is functionally engineered), otherwise the constitutive operations of technology risk becoming "neutralized."[61] The sheer utility-evaluation of technology fails to account for how and why the production, perception and acceptance of the "necessity" for certain use-values arise (as socio-historically contingent), relying on the naïve pretense of "merely" answering to practical problems. It is through this naïveté that a backdoor for the perception of technology as impartial is opened, playing out in what Nora Khan calls the "simulation of neutrality"[62] that is baked into, and operationalized in technical objects (notably in software and gaming applications)—which are themselves externalizations of a naturalized human genre-concept governing the particular encoding of neutrality. The core assumption at work in the "simulation of neutrality" is the conflation of neutrality with the *configuration* of how things are (mirroring Alain Badiou's concise definition of consensus as the merging of what *is* with *what could be*),[63] amounting to a conservation of naturalized necessity, including the idealized human genre-concept *cum* unmarked, unspecified "user" within this arrangement.[64]

Simondon describes the consequences of a culture that "has constituted itself as a defense system against technics" as one that while presenting itself as "a defense of man" can only do so under the presumption that technical objects contain no human dimension within them, and such a defense manifests in "two contradictory attitudes towards technical objects."[65] The first attitude, or genre of relation, upholds technical objects as "pure assemblages of matter, devoid of true signification, and merely presenting a utility."[66] In such a "utility" relation that serves the "neutrality" myth, technical objects are also denied citizenship within the domain of culture and/or aesthetic relations, and lead to recognition of technology as impartial, as a mere means to fulfill the "kingdom of ends" of a given culture.[67] The second genre of relation, ends up

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[61] Olivia Lucca Fraser, translator note on Gilbert Simondon, "Culture and Technics (1965)," in *Radical Philosophy* 189, 2015. https://www.radicalphilosophy.com/article/culture-and-technics-1965

[62] Nora N. Khan, "Seeing, Naming, Knowing," in *The Brooklyn Rail*, March 2019. https://brooklynrail.org/2019/03/art/Seeing-Naming-Knowing

[63] Alain Badiou, *Infinite Thought: Truth and the Return to Philosophy*, trans. O. Feltham and J. Clemens (London: Continuum, 2005), 56.

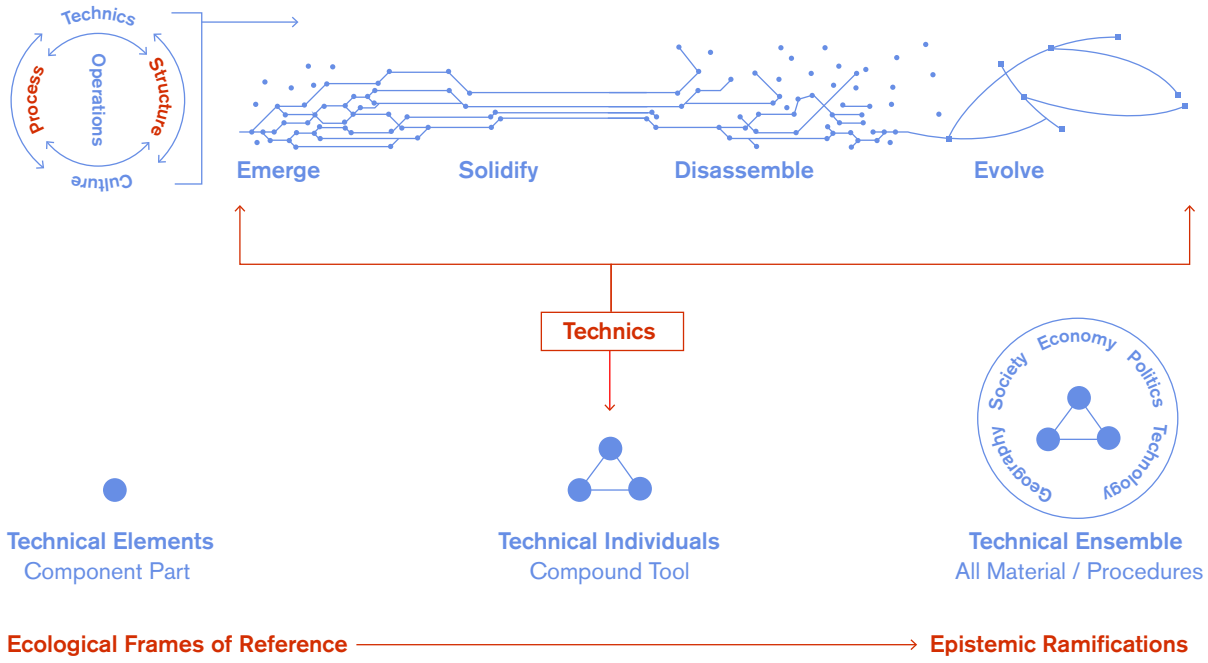
[64] Ola Hassanain, "These Walls: Grammars and Humanly Workable Geographies," lecture for *Exhibition as Site and Agent of Research* workshop (online), 26 June, 2020.

[65] Simondon, *On the Mode of Existence of Technical Objects*, 15-16.

[66] Ibid., 17.

[67] Gilbert Simondon, "Culture and Technics (1965)," trans. O.L. Fraser and G. Menegalle, in *Radical Philosophy* 189, 2015.

"fetishizing" technical objects, manifesting in a technophobic / technophilic dualism.[68] On the one hand, technical objects are imbued with "hostile intentions towards man," thereby "placing machines in the service of man" in order to prevent machinic rebellion against the human.[69] This frightful fetish of the machine leads to the desire for machinic domination on the part of the human (the etymological root of "robot," meaning "slave" from the Czech "robota" was dramatized in Karel Čapek's now infamous 1920 play *R.U.R. Rossum's Universal Robots*). On the other hand, when technical objects are denied identification as a cultural object, they get raised to the status of "sacred object"—where said sacralization plays out in a sheer "idolatry of the machine," an attitude clearly observable for those celebrating archetypes of machinic supremacy and techno-singularity.[70] While the technophobic / technophilic dualism yields contrasting genres of machinic relation, they are bolstered by the same underlying resentment due to the exclusion of technics from cultural recognition and adjudication.



[68] While Simondon does not use the term "fetish," I concur with Conor Heaney's use of the term, particularly as these attitudes play out in our contemporary setting (a substantial technological difference from the original context of Simondon's writing in 1958).

[69] Gilbert Simondon, *On the Mode of Existence of Technical Objects*, 17.

[70] Ibid.

"Technics" is the "study of how technical objects emerge, solidify, disassemble, and evolve;" in which "technical objects" are composed of three distinct categories: technical elements (a component part), technical individuals (a compound tool with component parts), and a technical ensemble (all of the material and procedural factors required to craft a compound tool).[71] While the technical ensemble draws attention to complex social-environmental structures, the technical element "shows how technological change can come about by being detached from its original ensemble and embedded within another."[72] Technical objects are always "embedded within larger networks of technical ensembles, including geographic, social, technological, political and economic forces,"[73] and because of this framework, an *ecological* conception of technology emerges. While machines may operate as an intermediary between the human and its environment, the *operations of intermediation* that flow and shape conditions in both directions place technics squarely within the domain of ecology.[74] If the study of nature, in a simplified sense, pertains to the study of organic things found *in* a living environment—that is, in separation from the human, ecology is the study of *things in non-static relation to* environments. With the same root "oikos" of "oikonomia" (economy) or the domain of the household, ecology can be broadly understood as the study of co-inhabitation, of coexistence and not mere existence. It is, as Hui has noted, a "new condition of philosophizing" with the recognition that our present technosocial condition can be described as "the becoming organic of the inorganic," meaning that it is increasingly the inorganic that constitutes an environmental condition for coexistence.[75] From the perspective of epistemic *practice*, the underlying "ecological" framework in Simondon's theory of technics can be seen

With the same root "oikos" of "oikonomia" (economy) or the domain of the household, ecology can be broadly understood as the study of co-inhabitation, of coexistence and not mere existence.

[71] N. Katherine Hayles, *How We Think: Contemporary Media and Technogenesis* (Chicago: University of Chicago Press, 2012), 87.

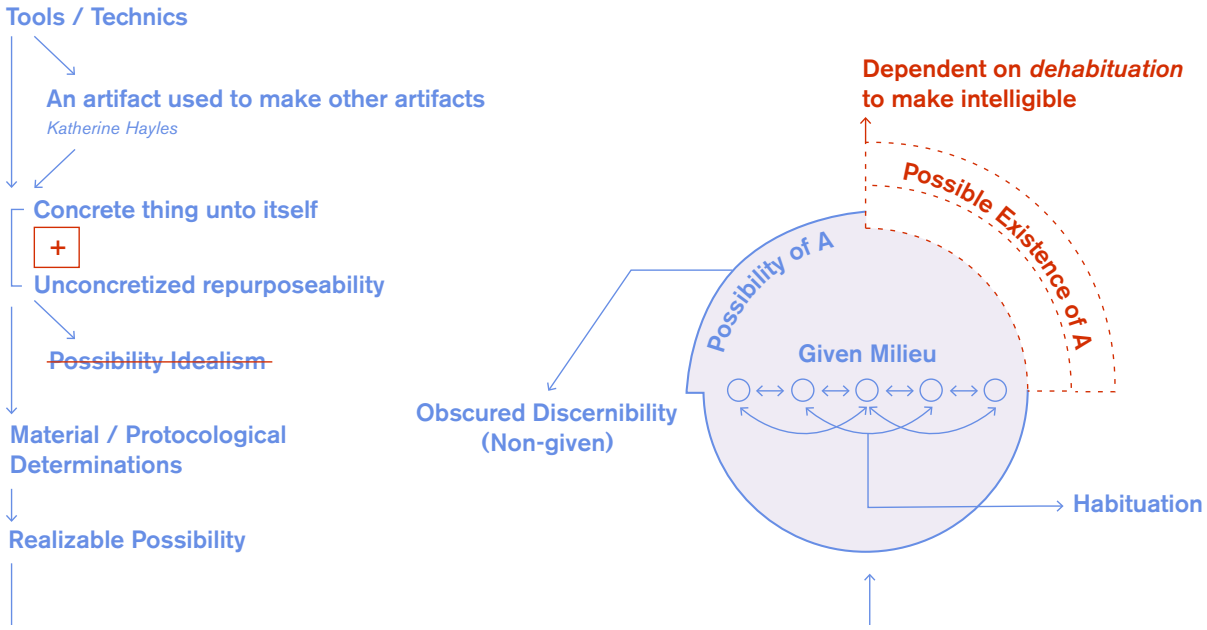
[72] Ibid., 88.

[73] Ibid., 90.

[74] Susanna Lindberg, "Being with Technique–Technique as being-with: The technological communities of Gilbert Simondon," in *Continental Philosophy Review* 52, 2019, 299-310.

[75] Yuk Hui, *Recursivity and Contingency*, 29 & 220.

as a contestation of the relevance of disciplinary divisions between the "two cultures"[76] which is largely responsible for the misunderstanding of technical objects, with the humanities on one side, and the natural, engineering sciences on the other. It's an intellectual pursuit echoing Wynter's self-conscious disciplinary disobedience, following through on her designation of a Fanonian epistemic rupture: "[o]nce [Fanon] has said ontogeny-and-sociogeny, every discipline you're practicing ceases to exist."[77]



Generative Artifacts

While Simondon distinguishes "mere" tools from technical objects, Katherine Hayles casts doubt on this distinction by reasoning on the basis of anthropological definitions, she asserts that tools are part of technics: a tool, stated generally, is "an artifact used to make other

[76] "Two cultures" originates with C. P. Snow (a scientist and novelist) in a 1959 lecture, addressing the gulf between literary-based intellectuals on one side, and physical scientists on the other. Wynter occasionally references Snow in her work; see: "But What Does Wonder Do? Meanings, Canons, Too? On Literary Texts, Cultural Contexts, and What It's Like to Be One/Not One of Us," in *Stanford Humanities Review* 4, no. 1: *Bridging the Gap*, 1995. Available here: https://trueleappress.files.wordpress.com/2020/04/wynter-but-what-does-22wonder22-do-meanings-canons-too-on-literary-texts-cultural-contexts-and-what-its-like-to-be-onenot-one-1.pdf

[77] Sylvia Wynter qtd. in Karen M. Gagne, "On the Obsolescence of the Disciplines: Frantz Fanon and Sylvia Wynter Propose a New Mode of Being Human."

artifacts."[78] It is this compounding of artifacts that lends technical objects the capacity for "catalyzing exponential change."[79] Following this logic, a house would not (typically) fit the definition of a tool, since it is not (conventionally) used to create other artifacts, in Hayles' example. The concatenation of artifacts transformed into other artifacts at work in technogeny, it is crucial to state, is not a template for linear progress since this process offers "no guarantees that the dynamic transformations taking place between humans and technics are moving in a positive direction."[80] As Simondon noted, the view of unbridled progress has its origins in the "climate of eighteenth century optimism," generating a narrative of the "constant improvement of mans lot […] which turns into the rape of nature, the conquest of the world, and the exploitation of energies," noting how the externalization of this "will to power" produces "both a prophetic and cataclysmic spin."[81] As catalyzers for exponential change, technical objects do not, by default, germinate betterment without submitting the very concept of "betterment" to social evaluation and commitment-building. This point ought not to be lost in the face of folklores surrounding Big Tech that endlessly claim "novelty" through "disruption" as betterment unto itself—a lingering dispositional *conservatism* belonging to eighteenth-century techno-optimism. There is little novelty possible in such a disposition, at best yielding only the conflation of gadgetry with the "new" and the "better."

Considering the premise that a technical object is an "artifact used to make other artifacts," we can infer that a technical object is not just the concrete thing unto itself, but also includes the not-yet concretized possibility for its repurposing, or retooling into something else. In this way, technical objects must, by definition, contain the possibility of other use and signification that may not be immediately apparent within given interactive frameworks or milieus. That said, falling into a delirium of "possibility idealism" because technical objects always contain within them a degree of indeterminacy, would be to ignore concrete and operational constraints (material or protocological determinations) also endemic to them that set limits on what is *realizably* possible. As Ramon Amaro noted, "we can be contingent, but only within the limits of the protocols that we interact with."[82] Otherwise said, the possible retooling of technical objects is not infinitely open. Anil Bawa-Cavia has elsewhere summarized such a premise in logical terms (known as the Barcan formula): "the possibility of the existence of A implies the

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[78] Ibid.

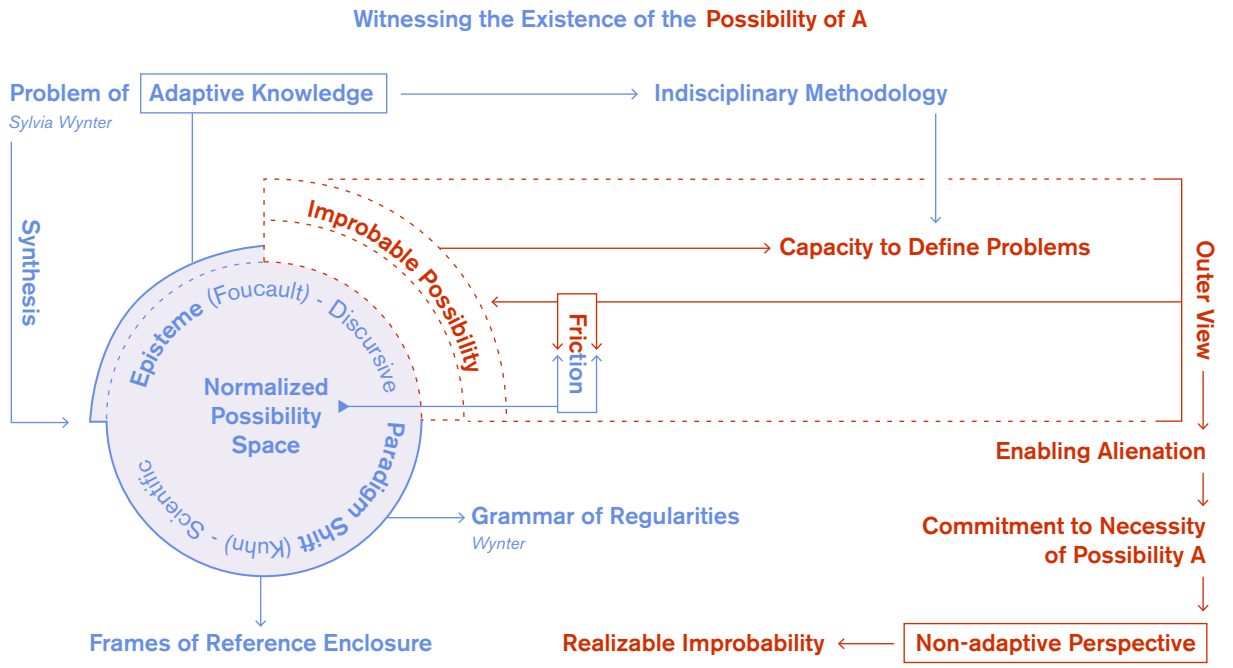
[79] Ibid.

[80] Ibid., 81

[81] Gilbert Simondon, *On the Mode of Existence of Technical Objects*, 21.

[82] Ramon Amaro, "Blockchain and the General Problem of Protological Control," lecture at *Identity Trouble on the Blockchain*, 23 November 2017. https://soundcloud.com/furtherfield/ramon-amaro-identity-trouble-on-the-blockchain-231117

existence of the possibility of A."[83] Here, the possibility of the existence A *necessarily requires* the existence of the possibility of A. However, on a practical note, it must be observed that "the existence of the possibility A" may be undetectable or difficult to recognize, because of the normative, epistemic and cognitive conditions within which humans interact with technology in habit-forming ways. For Wendy Hui Kyong Chun, habits with regards to communications technology (specifically "new" media), are described as behaviours and "things that remain by disappearing from consciousness."[84] While Chun explicitly has ambitions to work critically *with* habit-formation as a socially transformative process against the "hype around disruption"[85] (a process that has resonance with Simondon's use of "metastability" as a way to describe a temporary, processual state of stability-making),[86] her principle can also be extrapolated in the following way: that which has disappeared from consciousness impedes upon the intelligibility and/or the perceptibility of the existence of possibility otherwise. We can then say that the prerequisite conditions for the transformability of any technical object are dependent on the heuristic capacity for practical and/or conceptual *dehabituation* in order to construct perspectives amenable to making immanent possibilities intelligible.



[83] Anil Bawa-Cavia and Patricia Reed, "Site as Procedure as Interaction," in *Construction Site for Possible Worlds*, eds. A. Beech and R. Mackay (Falmouth: Urbanomic, 2020), 82-99.

[84] Wendy Hui Kyong Chun, *Updating to Remain the Same: Habitual New Media* (Cambridge: MIT Press, 2016), *x*.

[85] Ibid.

[86] Ramon Amaro and Murad Khan, "Towards Black Individuation and a Calculus of Variations," in *e-flux Journal*, no.109, 2020. https://www.e-flux.com/journal/109/330246/towards-black-individuation-and-a-calculus-of-variations/

The problem of witnessing the existence of the possibility of A traces back to Wynter's general engagement with the question of historical-discursive and scientific paradigm shifts; the former influenced by Michel Foucault's concept of the "episteme,"[87] and the latter via Thomas Kuhn's theory of scientific revolution.[88] While these theories are distinct, the broad similarities between them lie in the way both thinkers grapple with the reinforcement of discursive or scientific normativity, and the difficulties posed to thinking and doing otherwise because of these enclosures of habituation (to recall from Wynter's analysis, behaviours and epistemologies are incentivized to adapt to—or derive habits from—configurations modeled on a referent human genre-concept). A paradigm can be understood as the cultivation and discursive conditioning of a historic milieu that enables certain general trajectories, whilst disabling others. Furthermore, discoveries and inventions within that particular configuration can be bracketed as belonging to a certain period. As Kuhn wrote: "One of the things a scientific community acquires with a paradigm is a *criterion for choosing problems* [my emphasis] that, while the paradigm is taken for granted, can be assumed to have solutions. To a great extent these are the only problems that the community will admit as scientific or encourage members to undertake."[89] Additionally, Derrick White adds "practitioners of scientific paradigms, avoid, evade, and occasionally adjust to maintain normative status in the face of anomalies and crises," not because a paradigm has "superior explanatory power" but simply in order to "save" the framework.[90] Despite the normative recursion enforcing the maintenance of a paradigm, they do, of course, change when there is enough insistence that anomalies and crises are better accounted for within another framework, a transformation that also, notably, unfolds into new criterion for defining problems. Wynter's body of thought is effectively a synthesis of the episteme and scientific paradigm change as applied to cultural systems through an "indisciplinary"[91] methodology, and as we have seen from Simondon, these cultural systems are also technical systems.

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[87] The "episteme" was coined by Michel Foucault in *The Order of Things: An Archaeology of Human Sciences* (London: Routledge, 2005). David Scott succinctly defines the "episteme" as the field conditions that enable and shape knowledge in a specific way; as that which "determine[s] the rules of formation of concepts, theories, objects of study." (From David Scott, Preface to "The Re-Enchantment of Humanism," (Interview with Sylvia Wynter), in *Small Axe* 8, 2000, 119–207)

[88] Thomas S. Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1962, 1970).

[89] Thomas S. Kuhn qtd. in Derrick White, "Black Metamorphosis: A Prelude to Sylvia Wynter's Theory of the Human," in *CRL James Journal* 16, 2010, 127-148.

[90] Derrick White, "Black Metamorphosis: A Prelude to Sylvia Wynter's Theory of the Human," in *C.R.L. James Journal* 16, 2010, 127-148.

[91] "Indisciplinarity" was defined by Jacques Rancière as not merely going between or across disciplines, but "breaking them" as a way to "escape the division" between them. Jacques Rancière, "Jacques Rancière and Indisciplinarity," interview with M. A. Baronian and M. Rosello, trans. G. Elliot, in *Art & Research: A Journal of Ideas, Contexts and Methods*, 2, no. 1, 2008. http://www.artandresearch.org.uk/v2n1/jrinterview.html

The Improbable and Non-Adaptive Perspectives

Parsed through Wynter's synthetic analysis, the problem of witnessing the existence of the possibility of A within a given paradigm that obfuscates the perceptibility of possibility A, is a problem tied to the perception of "the grammar of regularities" that institute a boundary condition enclosing *normalized* possibility,[92] in contradistinction to possibility as such. "Normalized possibility" can be more concretely translated as "probability," specifically the hegemony of probability calculations that govern much of technosocial reality today, for which probability operates as "the entropic tendency towards the elimination of the diverse," in the words of Bernard Stiegler.[93] For Wynter, the question of witnessing emerges from the perspectival category of the liminal, insofar as a "structural contradiction" can be understood or experienced between the representational order that prescribes parameters of behavioural coexistence, and lived or empirical reality that is unaccounted for within that representational grammar. Mapped onto Stiegler, the "liminal" corresponds to the category of the "improbable" insofar as the improbable resists calculation within a given framework, which, furthermore, deals a blow to the concept of "information" as a mere result of calculation.[94] In Wynter's words, "[t]he liminal frame of reference, therefore, unlike the normative, can provide…the 'outer view,' from which perspective the grammars of regularities of boundary and structure-maintaining discourses are perceivable…."[95] In other

> Epistemic or paradigm shifts occur not only as the critical *recognition* of the existence of possibility A, but as the risky *realization* of possibility A, driven by the historically constituting figure of "*homo narrans*"; an impossible task for a purely bio-centric genre of being human with a predefined, fixed "nature"...

[92] Sylvia Wynter, "A Ceremony Must Be Found: After Humanism."

[93] Bernard Stiegler, "Noodiversity, Technodiversity: Elements of a New Economic Foundation Based on a New Foundation for Theoretical Computer Science," in *Angelaki* 25, no. 4, 2020, 67-80.

[94] Ibid.

[95] Ibid.

words, the enablement of liminal witnessing is tied to the capacity of making intelligible the existence of a boundary condition that constrains realizable possibility, opening a space of intervention *through* the discursive enclosures of self-reference. This "outer view" is not a view from nowhere, but a comparative perspective that grapples with a double position: one of structural implication (discursively inside and therefore within given configurations of probability), while making "claims that are irreducible to current social configurations"[96] (discursively in excess, introducing improbable systemic information that is incalculable within existing configurations of probability). It is through this immanent conflict with a discursive, or operational border enclosing a system of self-reference (an inner view), that new concepts emerge through which to perceive frameworks beyond said border (an outer view), and where in this frictional, comparative procedure the discursive camouflage obfuscating the "existence of the possibility of A" is undressed, yielding a form of "enabling alienation"[97] from given and probable-given configurations. This procedure is not without risk since committing to the possibility of A entails a demonstration that what is currently risked, namely "self-identification within a given constitution," is not essential, is not necessary, while risk taking *for* the possibility of A, becomes or emerges as *necessary*.[98] This particular depiction of risk, as Negarestani notes, is not the disavowal of risks "that can and should be mitigated by increasing the sophistication of our theoretical and practical knowledge," (like the risk mitigation of wearing masks in public during an aerosol-transmitting viral outbreak), rather this is "risk as the figure of time itself, the figure of its formlessness and contingency," where all given, historical "totalities disappear."[99] The labour of *homo narrans* is conjoined with such a figuration of risk as it struggles for historical-discursive *incompletion*, or systemic detotalization—that is, of demonstrating the self-referential closure of a system to be unnecessary, unjust, or untrue (especially its adaptive truths)—in an onerous process without guarantee. Epistemic or paradigm shifts occur not only as the critical *recognition* of the existence of possibility A, but as the risky *realization* of possibility A, driven by the historically constituting figure of *homo narrans*; an impossible task for a purely bio-centric genre of being human with a predefined, fixed "nature," essence or telos. The term for such transformative shifts in referential frameworks is an "otherworld" (as a generic, non-qualitative variable), and its nontrivial coming into existence is dependent on the risky process of constructing an "outer view," an *improbable* vantage-point that is never given in advance and is isomorphic with what is, initially, a *non-adaptive* perspective.

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[96] James Trafford, "Reason and power: Difference, structural implication, and political transformation," in *Contemporary Political Theory*, 2019, 227–247.

[97] Reza Negarestani, *Intelligence and Spirit*, 180.

[98] Ibid., 488.

[99] Ibid., 487.

Part III: Information Value and Mutuality

"The true progressive perfecting of machines […] corresponds not to an increase of automatism, but on the contrary to the fact that the operation of a machine harbors a certain margin of indeterminacy. It is this margin that allows the machine to be sensitive to outside information. Much more than any increase in automatism, it is this sensitivity to information on the part of machines that makes a technical ensemble possible."[100]

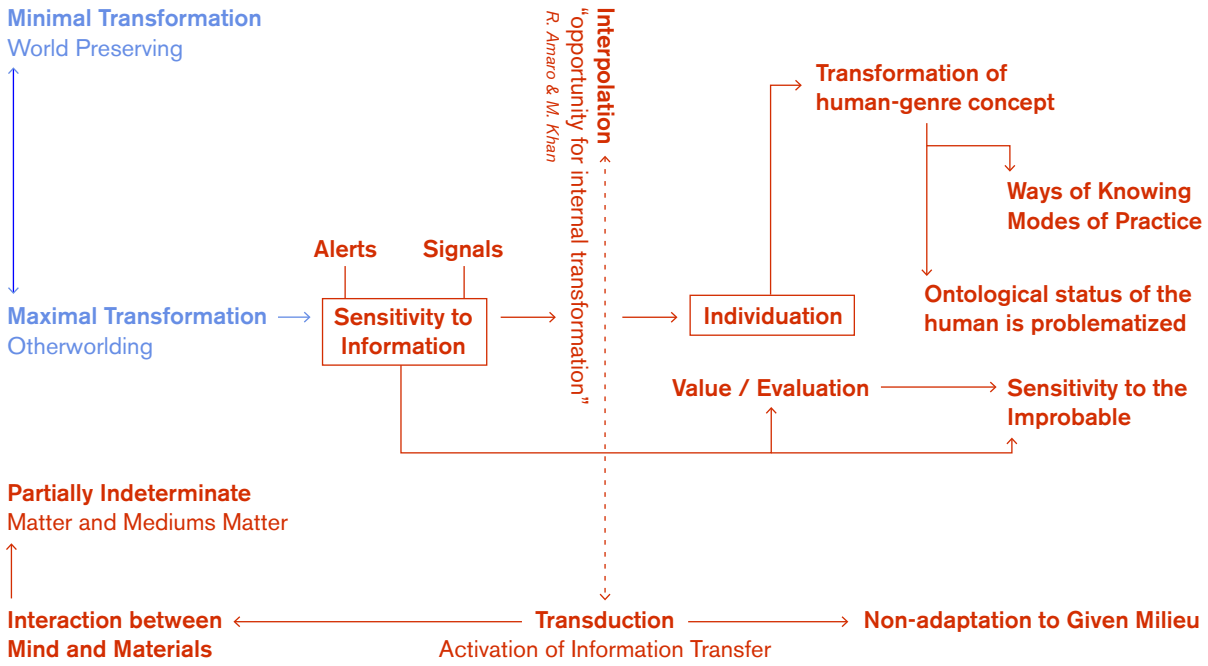
– Gilbert Simondon

"Sometimes technologies emerge for one purpose, but in fulfilling that purpose, they come to reveal not only that the purpose is not what we thought it was, but that the world in which that purpose exists is also different too."[101]

– Benjamin Bratton

[100] Ibid., 17.

[101] Benjamin H. Bratton, *The Terraforming* (Moscow: Strelka Press, 2019), 35.



The possibility of transformation with regards to human-technical relations hinges on the interplay between the partially determinate, partially indeterminate condition of *all* material entities as a milieu or world constituting *operation*. However, one cannot speak of transformation without speaking of a magnitude of transformation. In other words there are minimum changes, probable changes, or "relative deterritorializations"[102] that are paradigm or *world preserving*; and maximum changes, improbable changes, or "absolute deterritorializations" that are paradigm shifting and introduce a process that can be described as *otherworlding*. The threshold between the minimum and maximum transformation can be evaluated by the degree to which frames of reference that underwrite the metastability of given paradigm are upheld, rendered dubious or outright irrelevant. The absolute making-irrelevant of given frames of reference signals a rupture with former schematics of orientation and their governing codes of structural ordering, with ramifications on epistemic, axiological, aesthetic and socio-political registers. Minimal transformations can be seen as testing the threshold of variation within the contours of a given systemic paradigm, a kind of probing of the borders in a search-space for the existence of possibility A. The effectiveness of such probing is dependent on an "sensitivity to information," that is, on the indeterminate receptivity to re-cognize "signals" or "alerts"[103] without the habituated reflex (namely, unthinking) to *necessarily force*

[102] Anna Longo, "Escaping the Network," in *Open Philosophy*, no. 3, 2020, 175-186.

[103] Amaro and Khan, "Towards Black Individuation and a Calculus of Variations."

said information within the confines of existing systemic referential frameworks. If, as Amaro and Khan assert, values "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 takes on the property of an informational catalyst wherein worlds or systems in which "a purpose exists" *can* be witnessed and realized *as different*. It is through such cognitive-informational receptivity that an "expanded picture" of interpolation can be understood, beyond its more familiar, pejorative guise "grounded in racial subjugation and the proliferation of political and economic ideology within existing power structures," but also as "that which drives opportunity for internal [human self-referential] transformation."[104] The possibility for internal transformation, akin to Wynter's demand to reengineer human genre-concepts, is "individuation" in the vernacular of Simondon, which is predicated on the indeterminate status of being human—a picture of being human only conceivable through *praxis* and not as a pre-existing, predestined individual state. To cognize the human individual through the lens of individuation raises the "ontological status of the human to that of a problem,"[105] and following Kuhn's description of epistemic revolution, it is precisely this agency to construct, invent or choose "problems,"[106] that the relevance or legitimacy of paradigmatic frameworks of thought can be challenged and reconstructed.

Sensitivity to Information in Conditions of Desensitization

The process driving the possibility of individuation goes by the name of "transduction." It can be understood as the interactive contact between mind and materials activating an informational transfer; "a physical, biological, mental, or social operation by means of which an activity propagates itself from one location [this world] to another [an otherworld]."[107] As a generic process, transduction can be applied to processes of differentiation and concretization, ranging from the growth of crystals, to "the growth of an embryo, to the learning of a concept."[108] Within a paradigmatic register, transduction is enabled by a sensitivity to information where the existence of the possibility of A—an otherworld, which introduces a constitutive difference

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[104] Ibid.

[105] David Scott qtd in Amaro and Kahn, "Towards Black Individuation and a Calculus of Variations."

[106] Thomas S. Kuhn qtd. in Derrick White, "Black Metamorphosis: A Prelude to Sylvia Wynter's Theory of the Human."

[107] Gilbert Simondon qtd in Steven Shaviro, "Simondon on Individuation," blog post on *The Pinocchio Theory*, 2006. http://www.shaviro.com/Blog/?p=471

[108] Steven Shaviro, "Simondon on Individuation."

upon enclosures of self-reference belonging to a given world—can be generatively interpolated and made intelligible. Informational transfer within transduction, however, as in the question of possibility within the Barcan axiom, is not absolutely indeterminate—matter and mediums matter. Information cannot be abstractly dissociated from the milieu or "medium in which it is instantiated, or across which it is transmitted," since mediums have protological or material constraints that impose operational limits on *how* informational propagation can take place and become re-cognized in individuating ways. As Amaro and Khan claim, invention is driven by the application of transduction (as a practical and axiological commitment) "across all levels of being," in a process of concretizing *non-adaptation* "to the individual's [given] milieu."[109] The making of otherworlds, as transductively enabled processes of maximizing individuation are "inherently ways of knowing, and are therefore intrinsically sensitive to the principles required for knowing,"[110] including the mediums of information transfer—*as value*, through which frameworks of thought can be productively unsettled by the sensitivity to improbable difference. This sensitivity to information transfer—*as value* "becomes both difference and the possibility of difference whereby the conditions of the process of individuation are triggered."[111]

[109] Amaro and Khan, "Towards Black Individuation and a Calculus of Variations."

[110] Reza Negarestani, *Intelligence and Spirit*, 425.

[111] Amaro and Khan, "Towards Black Individuation and a Calculus of Variations."

The key difficulty of our monohumanist-driven technosocial system is that this very information-as-value transfer potential has become semantically and operationally subsumed by what Anna Longo calls the "global game," where "what we know is what we do and what we do feeds back to us *as information*" [my emphasis].[112] Similar to Wynter's diagnosis of the paradigmatic space of the present as bound to phylogenic/ontogenic overdetermination in the construction of an econo-centric referent "human" of humanity, Longo's "global game" has its origin in evolutionary game theory (a framework for modeling evolving biological populations introduced in 1982) that, unlike classic game theory, does not require rational agents as players in the game-space.[113] As Longo notes, the central tenet of game theory is utility, so players (not exclusively human) behave strategically so as to maximize utility and influence the probability of a future beneficial situation—not unlike conceptions of technology that descriptively neutralize/naturalize it as a "mere" utility as well. Novel strategies that are put to practice in game space and become recognized as "successful" are then imitated by other players, eventually concretizing as norms (predictable or probable information) among a network of interacting agents. The global game *as* paradigm, privileges or selectively favours far from equilibrium dynamics—the rapid adaptation to significant changes through the invention of new strategies endemic to unnaturally endowed creatures such as humans—as an extrapolation of the "biosphere" into what Stuart Kauffman named as the "econosphere."[114] As Longo writes: "the global evolutionary game is a becoming reality which reproduces itself by producing new information; this is evident in our economic system where new information is the most valuable good."[115] Within the econosphere-game "sensitivity to information" is incentivized and performed at scale, but by the "necessary" constraint of "utility" of competitive advantage determined by wealth accumulation, upon which value is evaluated, and where networks are weighted towards monopoly clustering. This monopoly clustering indicates an agent (or meta-agent, like a corporation) with a higher magnitude of connectivity to other agents within a network, thereby enabling the opportunity to collect more information, and articulate power in the spreading of new strategies of action—what McKenzie Wark has identified as a "vectoralist class" as a new proprietary actor within her updated Marxian analysis, highlighting a class that owns the data (and its platform value-extraction substrate).[116] Central here is to note that this monopoly cluster has authoritative "connective" influence to *make* strategies of action true "where 'truth' is isomorphic with the value of a replicated strategy which is adopted as

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[112] Anna Longo, "Escaping the Network," in *Open Philosophy*, no. 3, 2020, 175-186.

[113] Ibid.

[114] Ibid.

[115] Ibid.

[116] McKenzie Wark, "The Vectoralist Class," in *e-flux Journal*: *Supercommunity*, 2015, http://supercommunity.e-flux.com/texts/the-vectoralist-class/.

a norm."[117] "Truth" value within such a scheme is adjudicated by sheer, imitative uptake, and not, "truth in general," as Wynter distinguishes it. This far from equilibrium game implies the reproduction of the market as an asymmetric space that structurally depends on this uneven access to information and opportunities for inventing strategic novelty because some meta-agent (a cluster) is granted the network-weighted authority "to do what others cannot expect," like the "creative" behaviour in the financialization of the American housing market leading to the extreme volatility of the 2008 global economic crash).[118] Additionally, there is a hollowing-out of what "information" even is by severing it from transformative conceptual interpolation, that is, by subordinating its possible transductive operativity to a stagnant utility-value that is thoughtlessly preserved for the sake of "saving" the paradigmatic econosphere framework. By stripping "information" of any other possible condition of use beyond performing the framework, what is sacrificed is uncertainty or improbability. While many equate information with a reduction of entropy Cecile Malaspina (citing the work of Claude Shannon), notes that "information" in the guise of entropy, or noise reduction, corresponds to the certainty of a message, yielding no novelty (i.e. minimal transformation).[119] Whereas information tethered to entropy actually yields maximal transformative possibility, because of its unpredictable, improbable or "noisy" status. At work in the evolutionary game theoretical account of the econosphere is, pace Wynter, the overextension of bio-evolutionary models upon the artificial domain of political economy, facilitating the apprehension of this arrangement as a "natural" or a law-like neutral system. As with human bio-overdetermination, such descriptions serve to legitimize given asymmetries, because they are explained within semantic and epistemic frameworks pertaining to the domain of necessary configurations, and are thereby elevated to an unchangeable status. As Longo rhetorically asks in her essay, are we to affirm the "chaotic volatility" of the market as a natural progressive effect of increased historical complexification, or should we come to see that the "game's theoretic evolutionary model is the story which is told to make us accept the uncertainty and the increasing risks to which our lives are exposed for the sake of a 'creativity' that is advantageous only for the happy few information monopolists?"[120]

To put it bluntly, descriptions and representations of systems matter. As Steven Shaviro notes, since the dawn of cybernetics in the 1940s there has been an epistemic tendency to seek out (and thus see) the same patterns of behaviour across distinct complex systems, regardless of

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[117] Anna Longo, "Escaping the Network."

[118] Ibid.

[119] Cecile Malaspina, *An Epistemology of Noise*, 15.

[120] Ibid.

their constituent parts and specific material arrangements.[121] One may even observe that the representational emblem of the network diagram itself, ubiquitous in our era, has become equally inflated, providing visual compressions for an array of diverse phenomenon, from the functioning of our brains, to urban plans, to economic supply and distribution chains, not to mention its iconic operation to "connect the dots" in whatever conspiracy theory is currently trending. All can (seemingly) be explained or representationally captured by such a diagram, and while edges connecting points may show *what is* in relationship, they convey nothing of the *quality* of those relations—namely, the conditions of what those relations *are like*. Such diagrams can only be described as *a-sociogenic* representations. The over-application of the network diagram has the effect of representationally translating *distinct complex* systems (premised on interactive emergence, irreversibility and nonlinear cause-and-effect relations) into simplified *complicated* systems (premised on deconstructability, closedness and linear cause-and-effect relations). Such over-application of a model or framework of thought has nothing to do with an "ecology of practice" as Isabelle Stengers names it, where disciplinary practices cannot be uniformly apprehended as "like any other" and where the study of relational transits between fields is vital.[122] The over-application of a model of thought forces divergent phenomena and their attendant practices into the same schema at the debilitating cost of stripping disciplinary domains of their specific investigative aptitudes.[123] An ecology of practice must resist such an habituated (unthinking) tendency; of seeking modular sameness, and rather learn to grant power to the particularity of situations or phenomena, the catalytic impetus to make one think[124]—that is, submitting to the transductive possibility of improbable thought and the non-adaptive perspectives enabled by it.

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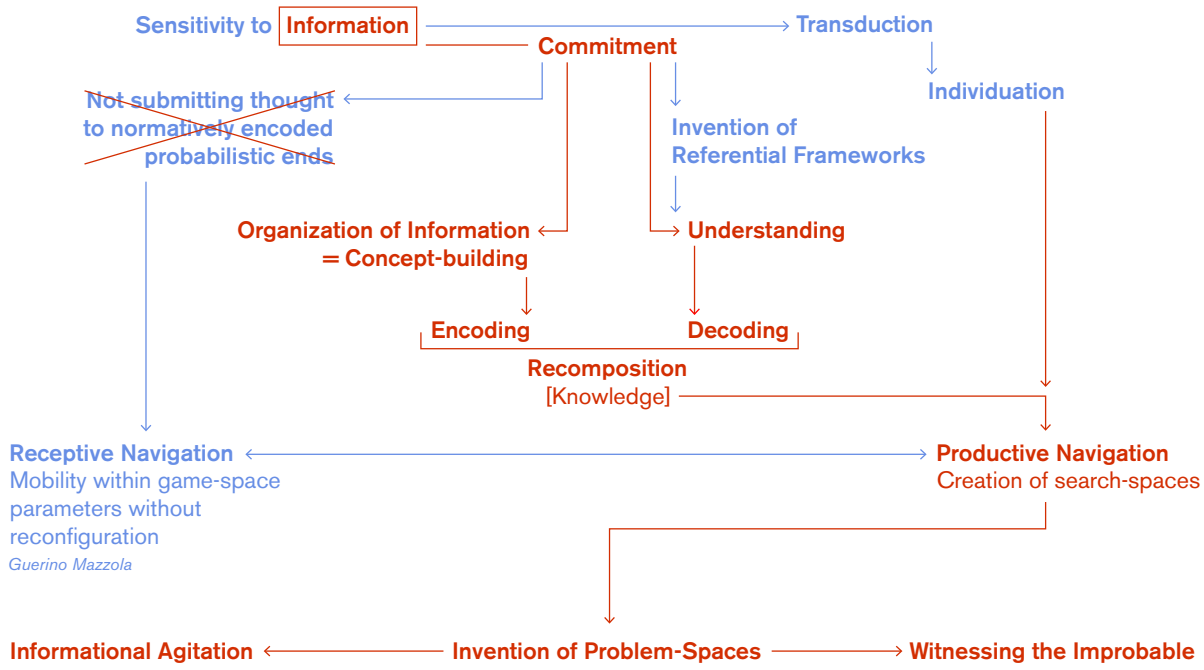
[121] Steven Shaviro, "Simondon on Individuation."

[122] Isabelle Stengers, "Introductory Notes on an Ecology of Practices," in *Cultural Studies Review* 11, January 2005, 183-196.

[123] Ibid.

[124] Ibid.



Sensitivity to information *as value* is only as "transductively" operational as the commitments that can be invented as a result of its generative interpolation: in the empowerment to make think. While the global game may be premised on volatility and the structural capacity to constantly evolve emergent network norms and behavioural trajectories, the price of admission within such a network that may "include" heterogenous players and evolving activity is contingent on "the acceptance of the rules of the global game"—a fundamental consensus as to the value of information-production that does not imply shared values of meaning in communication, but the value of communication as such, leaving global game players ensnared in a structural process *without* content.[125] Such a process *without* content echoes Friedrich Hayak's market organizing ideal of "catallaxy" in which markets are figured as emergent and efficient price calculators that operate independently from commonly shared interests, social-values and goals "…characterized by decentralization, observance of general rules, coordination through prices, and connections across vast distances."[126] It is here where we can see the processual, game-preserving convergence of Jodi Dean's "communicative capitalism"[127] (it only matters *that* we communicate and generate data/information, not *what* we communicate), and Wendy Chun's succinct observation that our existing technosocial

[125] Anna Longo, "Escaping the Network."

[126] Andrew Gamble, "Neo-liberalism and Fiscal Conservatism," in *Resilient Liberalism in Europe's Political Economy*, eds. Vivien A. Schmidt and Mark Thatcher (Cambridge: Cambridge University Press, 2013), 65.

[127] Jodi Dean, *Blog Theory: Feedback and Capture in Circuits of Drive* (Cambridge: Polity Press, 2010).

configuration is predicated on "updating to stay the same."[128] In order for the global game to reproduce itself and to be included as a co-constituting agent within it, information is stripped down to *normative* probability calculations within given conditions (in which we are incentivized to be "Bayesian learners," as Longo writes).[129] These calculations are impossible without calculating tools (along with decisions as to what gets calculated), as well as the ontology of the global network (as a technical ensemble) that is constituted by human-*calculative* tool relations which co-configure the global network forming the milieu of *qualitative* coexistence.[130] The cost of admission to this global game is, ultimately, to submit to the naturalized necessity that the activity of thinking is, unto itself, "an efficient practice whose aim is the satisfaction of a social / economic utility" (namely, influence on network clusters as an accumulation maximizing enterprise); a tendency that accounts for the popular evaluation of monopolists as somehow of superlative intelligence and therefore deserving of their gains.[131] In other words, *freedom from* such naturalized necessity is tethered to the freedom to think non-adaptively or improbably, and trace other practical commitments of activity (individuation) as a consequence of transformational informational grappling, in its uncertain definition. Sensitivity to information—as a catalyst for transductive processes—entails the sensitivity for reconfiguring frameworks of thought and making new commitments, not submitting thought to normatively encoded probabilistic ends that merely rehearse the game's consensual axioms, but the capacity to invent new rules (frames of reference) that reconfigure the governing codes of the game-space as such. While the global game produces an *quantitative* abundance of information, *qualitatively*, this informational abundance does not equal thought, or knowledge production. Rather, knowledge deals with the construction of concepts that require both information *and* its coordination, or "mental organization."[132] The organization of information as a concept-building activity is synonymous with the *encoding* of knowledge, while understanding is linked to the capacity to *decode* information in order to draw inferences as to its transductive possibility (i.e. witnessing the obscured possibility of A, or an otherworld).[133] Knowledge is not an activity of mentally archiving information, but the recomposition and organization of information so as to invent conceptual pathways for the enablement of practical navigation. In this regard, Guerino Mazzola distinguishes between "receptive navigation" and "productive navigation," where the former implies a degree of mobility within a game-space,

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[128] Wendy Hui Kyong Chun, *Updating to Remain the Same: Habitual New Media*.

[129] Anna Longo, "Escaping the Network."

[130] Ibid.

[131] Ibid.

[132] Guerino Mazzola, *The Topos of Music: Geometric Logic of Concepts, Theory, and Performance* (Berlin, Springer Verlag, 2002), 39.

[133] Ibid., 40.

without changing the configuration of it (like the alphabetic organization of an encyclopedia that may grow, but only within fixed parameters); and the latter that implies the transformation of the very organization of the game-space.[134] Productive navigation is that which enables other modes of searching (the creation of a search-space), which is another way of saying productive navigation allows for the articulation of *new problems* because it genuinely agitates upon (and is agitated *by*) information that does not necessarily fit into existing taxonomies of conceptual organization. It is within such a model of productive navigation that we can separate between the information-generation entry requirement at play in the genre of normative *probabilistically constrained* form of agency inherent to the "global game" versus the "sensitivity to information" as a transductive operator, which can be generally described as the realization of improbable navigational commitments.

The Stakes of First-Narrations

> "The challenge is how to think of the political in relation to a technology that claims to solve it– while also being attentive to how such a proposition nevertheless becomes real in the sense of mobilizing and materializing efforts, even as these materializations never fully correspond to the proposition."[135]
>
> – Jaya Klara Brekke

The advent of blockchain, first manifest in the bitcoin initiative, seems to have stuck to the technological "fetishizing" script *qua* culture elaborated by Simondon sixty years earlier. The utter celebration or total dismissal of blockchain (which, among non-experts, is often falsely conflated exclusively with cryptocurrency applications) was likely spurred on by the widespread, popular mediatization of the project. The casino-like volatility of bitcoin's spectacular gains and losses captured headlines, its utility-value for otherwise dubious marketplace transactions, not to mention the pseudonymous, mysterious authorship behind

[134] Ibid., 44.

[135] Jaya Klara Brekke, "Disassembling the Trust Machine: Three Cuts on the Political Matter of a Blockchain," PhD Dissertation, Durham University, 2019, 27.

the project, made for attention-worthy stories—the sort of hype that is fairly atypical for a computer-science innovation. From a game-theoretical perspective, the invention of blockchain is a computational response to solving a *consensus* problem. The game-theoretical problem to which blockchain responds in Satoshi Nakamoto's infamous bitcoin white paper, released in 2008,[136] is known as the "Byzantine Generals Problem" (or "Byzantine fault tolerance in computer science").[137] The initial Byzantine Generals problem was outlined in 1982,[138] (the same year as the elaboration of evolutionary game theory), and it concerns the need for reliable computer systems to "cope with failure of one or more of its components," such as the sending of "conflicting information to different parts of the system."[139] The problem amounts to the achieving of consensus in networks where misinformation may exist that would otherwise thwart a particular computational goal. Articulated in the form of a parable, the problem is illustrated by a group of generals who surround a city and must arrive at a consensus of whether to attack or retreat (as a binary option, notably not *qualitatively* as to *how* or *why* to attack or retreat, which is definitively not reducible to binary optioning). The decision is complicated by the fact that the generals are "geographically distant from one another and to communicate their decision to the others, they have to rely on a messenger," and there is no way of ensuring that said messenger will arrive at all, or if they will have preserved the integrity of the original message.[140] The distributed ledger architecture undergirding bitcoin (what "blockchain" effectively *is*), offers an algorithmic way to achieve such consensus as a *protocol*. It is through this computational consensus that terms like "trustlessness" have been used to describe such a decentralized system since it has been idealized as eliminating the reliance on human mediation (and its corrupting possibility). In practice, however, "trust" is not eradicated, but is simply swapped from humanly fallible governing institutions (and the lack of trust therein), to the need for trust in the system (to reiterate, that are idealized as a-human, mathematically backed protocols). In short, blockchain in the context of bitcoin (as the claim goes), eliminates the necessity for the backing-authority of a financial institution, like a central bank, and transactions take place in a peer-to-peer manner. In this ensemble, the computational system, supported by mathematical rigor, is said to replace humanly fallible institutions as necessary intermediaries between transacting agents.

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[136] Satoshi Nakamoto, "Bitcoin: A Peer-to-Peer Electronic Cash System," October 31, 2008. Available here: https://bitcoin.org/bitcoin.pdf

[137] Kei Kreutler, "The Byzantine Generalization Problem: Subtle Strategy in the Context of Blockchain Governance," in *Technosphere Magazine*, 2018. https://technosphere-magazine.hkw.de/p/The-Byzantine-Generalization-Problem-Subtle-Strategy-in-the-Context-of-Blockchain-Governance-8UNNcM8VShTpBGWRuob1GP

[138] Leslie Lamport, Robert Shostak, Marshall Pease, "The Byzantine General's Problem," in *ACM Transactions on Programming Languages and Systems*, Vol. 4, No. 3, July 1982, 382-401.

[139] Ibid.

[140] Kei Kreutler, "The Byzantine Generalization Problem."

In her extensive analysis on the socio-technical dynamics at work in the cultures of blockchain development, Jaya Klara Brekke poses a broader question of "how to think of the political in relation to a technology that claims to solve" the political.[141] What is the framing and context of a "political problem" that must first be identified *as* a problem, before it can be "resolved" by technical mediation? Nakamoto's white paper coincided with the global financial crash as well as the consolidation of platform economics, premised on the extraction and privatization of social data, as a wide-spread business model in the early twenty-first century.[142] This historical context catalyzed the identification of a political problem tied to "financial instability," wealth inequality and "information surveillance,"[143] which has led to the increased mistrust in central governmental authorities, as a broadly reaching social disposition—a problem space notably shared by actors on the left and right of the political spectrum. What the numerous and divergent instantiations of blockchain-based innovations reveal more generally,[144] twelve years after the spectacular (and not yet scaleably practical) "disruption" of Nakamoto's white paper, is that the political is only partially articulable through the identification of a problem, but that valences of productive orientation take shape in *how* responses to problems are elaborated in practice.

Identifying a problem as the result of a critical, diagnostic observation is necessary but insufficient in defining a prognostic trajectory of commitment—and it is in this latter path-making activity, that the political stakes are realized. As Kei Kreutler points out, when technological protocols become a mode of governance in general within our technosocial condition, and in blockchain specifically with the design of a so-called "trustless" system, who or what is responsible for making the "first-decisions" on a proctological level, "who is responsible for making the decision on how to make decisions"?[145] Kreutler's line of reasoning can be extended to infer that the political contestation over modes of governance also includes the battle to decide on the narrative trajectory of a problem, as such. The critical identification of a problem describes the "what-is-ness" of a situation, whereas the political-technical is bound to prognostic claims on what *ought* to be done in the face of what is.

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[141] Jaya Klara Brekke, "Disassembling the Trust Machine: Three Cuts on the Political Matter of a Blockchain," PhD Thesis, Durham University, 2019, 27.

[142] Nick Srnicek, *Platform Capitalism* (Cambridge, UK: Polity Press, 2016).

[143] Lana Swartz, "What was Bitcoin, what will it be? The technoeconomic imaginaries of a new money technology," in *Cultural Studies* 32, 2018, 623-650.

[144] Jaya Klara Brekke, "Hacker-engineers and Their Economies: The Political Economy of Decentralised Networks and 'Cryptoeconomics'," in *New Political Economy*, 2020. https://www.tandfonline.com/doi/10.1080/13563467.2020.1806223

[145] Kei Kreutler, "The Byzantine Generalization Problem."

Concerning technogeny, such first decisions bring with them long-standing consequences, socially, economically and protocologically speaking. One need only look to the first decision as to the gauge of railway tracks (from the width of a horse-and-buggy technology, to which magnetic high-speed railways often need to conform today) or the invention of the QWERTY typewriter which was later mirrored in the keyboard (despite the minority status of the Latin alphabet in universal practical applications), to document the enduring ramifications of technological first decisions that establish themselves as normative, structural standards, yielding path dependencies that are highly expensive—economically and pragmatically—to change, even when certain standardized frameworks present a functional engineering impediment. For blockchain specifically, the "first decisions" to set the trajectory (commitments) from a commonly shared problem space can be located in distinct (yet not completely separate) camps identified by Lana Swartz, of those who seek to deploy blockchain either in a "digital metallist" (crypto-anarchy) or an "infrastructural mutualist" (cypherpunk) trajectory as a response to a commonly diagnosed political-economic problem.[146]

The "digital metallist" trajectory, which arguably garnered the most dramatic attention in the media circus surrounding bitcoin and blockchain, can be understood as carrying forward the catallaxy ideal of Hayek and the Austrian neo-classical school of economics. The digital metallist trajectory maintains the bond to value as measurable by price, so the relative value of bitcoin is a "natural outcome of a market."[147] Bitcoin operates as a store of value and although it is functionally used as payment in some transactions (the anonymity baked into it, making it easy to hide from taxation), its uptake is more predominantly related to its operational standing as "digital gold;" and like gold, it isn't something to practically transact with on a quotidian level, but is rather a "speculative instrument."[148] The financially speculative dynamic of "digital gold" is further evidenced in the rollout format of new cryptocurrencies via initial coin offerings—directly modelled on initial public offerings of stock markets.[149] In what can be described as a politically libertarian trajectory, the digital metallist framework emphasizes the *mining* of tokens (that are unequally, meritocratically won by computationally taxing, energy-draining number-crunching operations) over the *minting* of state-backed currencies, which are ordained by a central authority. Notably, this first decision to "mine" is not functionally necessary on a technical or engineering level, but is rather an ideological decision.[150] While

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146 Lana Swartz, "What was Bitcoin, what will it be?"

147 Ibid.

148 Ibid.

149 Brian Massumi, *99 Theses on the Revaluation of Value: A Postcapitalist Manifesto* (Minneapolis: University of Minnesota Press, 2018). https://manifold.umn.edu/projects/on-the-revaluation-of-value

150 Lana Swartz, "What was Bitcoin, what will it be?"

bitcoin was initially presented as a stateless, "apolitical" system for peer-to-peer transactions, the digital metallist first decision to *preserve* adherence to the price-value neoclassical nexus makes it more suited to financial speculation, rather than a peer-to-peer currency (the unsustainable, energy-intensive computational requirements for mining tokens through the proof of work protocol have proved to be significant scaleable obstacles as well, insofar as the mining of currencies has consolidated in geo-regions with inexpensive energy). As Swartz notes, any tinkering with both the theory of, and operational adjustments to money also implies a theory of a "larger social order (or a challenge to it)," despite fanning neutrality claims on the infallibility of numbers to replace fallible human institutions.[151] In such a position, there is a tendency to evacuate the political by accepting certain valuation-norms as given, and merely relocating the seat of operations for the maintenance of said norms. At work in the digital metallist position as a speculative instrument boils down to an "investment in the future when the world's governments have either become too unstable to manage the money supply, too powerful to respect private property, or both."[152] The consensus that is ultimately protected by the distributed ledger of blockchain in a digital metallist instantiation is a consensus to the global game itself (and the impoverished role of "information" within its game-space parameters); concretized in cryptographically certified exchanges that reinforce the loyal *socio-normative* "infallibility" of private wealth accumulation.[153] From the sociogenic-technogenic perspective, the digital metallist position introduces what can be described as an "adaptive disruption" to the monetary-social order, insofar as existing paradigmatic frameworks are preserved (or, worse, further entrenched), instigating no individuating procedures upon genres of human self-conception which are conserved in the long-standing mold of an econocentric monohumanism. It is because of the neoclassical economic position of this digital metallist (as an ideal, and not technical necessity), that the concrete operations of blockchain in the bitcoin example have ended up reproducing conditions of centralized authority (network clusters through the "industrialization" of miners), despite the decentralized architectural promise of the underlying technical object. While the digital metallist position, as a computational extension and fortification of said neoclassical economical ideals has rightly received a great deal of negative attention, there are other "first decisions" worthy of focus to more robustly think the partially determinate, partially indeterminate conditions of possibility opened up by blockchain as a socio-technical object.

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151 Ibid.

152 Ibid.

153 Ramon Amaro, "Blockchain and the General Problem of Protological Control."

Notably, the "infrastructural mutualist" first decision sees in blockchain the capacity to create equal informational access to markets (i.e., to do away with the network asymmetries at underwriting the machinery of the "global game")—ideally, operating in cooperative rather than meritocratic/competitive logics. The cypherpunk allegiance to such a position locates freedom not in the catallaxic marketplace as a computer of price, but in the freedom of information, and in so doing, the possibility of *sensitivity to it*. As Swartz writes, the infrastructural mutualist position is analogous to the politics of network neutrality, wherein networks should "…not favour or block certain content, users, or websites."[154] Emphasizing that the "politics of money are rooted in its communication" and the material support-structure to institute it, the infrastructural mutualist advocates for decentralization, not only to guard against informational asymmetry as a distributed "communicative power" (i.e., against acute network clustering), but also to forge operational stake-holders (peers) within a system.[155] In this picture, peers are incentivized to be keepers of a decentralized system for common benefit and mutual determination, deprivileging privatized wealth speculation as a result. The stark contrast between these first decisions is that the digital metallist remains focused on price and existing hegemonic market configurations in order to entrench private wealth sovereignty; whereas the infrastructural mutualist focuses on "flow" and cooperative infrastructures to "ensure privacy" and place priority on transactional dynamics, over nodal accumulation.[156] Comparatively, with regards to information-*as*-value, the digital metallist reinforces the reduction of information already active in the global game to the sole function of satisfying socio-economic utility in terms of network dominance (and therefore the weighting of networked probability); whereas the infrastructural mutualist, in a ramified imaginary, incentivizes a distribution of agency through the emphasis on equal access to information (and therefore communicative power) as a systems-design priority. While digital metallist concretizations of blockchain readily nourish a degree of

In this picture, peers are incentivized to be keepers of a decentralized system for common benefit and mutual determination, deprivileging privatized wealth speculation as a result.

[154] Lana Swartz, "What was Bitcoin, what will it be?"

[155] Ibid.

[156] Ibid.

cynicism, outright dismissal of nascent technologies can be seen as the obverse of techno-solutionism (i.e. the solving of social or political problems exclusively by way of technical means).[157] Seeking immediate solutions, or diagnosing instant failure is premised on the same temporal and situational measure: that of the here and now. Such metrics of immediacy undermine technosocial entanglement as a coevolutionary, and thus durational process, ultimately rearticulating the rejection of technical objects from cultural and aesthetic domains that Simondon warned against. As the technical increasingly organizes the social as a protocol-driven force, the risk of its exclusion from cultural and aesthetic adjudication, resulting in the dichotomous subordination / idolatry of the machine, is far too great.

While blockchain-based experiments proliferate in far less spectacular manifestations that cannot be captured by volatile price-index graphs, the contrasting first-narrations of the same operational machine serve as a reminder that nascent technologies, while indeed concrete entities doing actual things in a world, also exist as *theoretical* objects. That is, as artifacts which can provoke the capacity to think improbable configurations because *possible* applications exceed those that are constrained by the normative conditions of existing logics (variant, or unnecessary constraints), but not on a functional or protocological register (an invariant constraint endemic to a technical object). While perhaps appearing as a modest intervention, the infrastructural mutualist can be seen as engineering conditions of enablement *for* informational sensitivity in contradistinction to the digital metallist who, from the first decision, is interested in further subordinating information to the dogmatic equation of value with price to incentivize network clustering. The (theoretical and not yet practical) consequences of the infrastructural mutualist ethos, would consist in the amplification of the conditions of possibility for individuation as a milieu constituting transformation by introducing a significant shift in the evaluation of what information *is* and what *it does*: from a view where information as certainty stabilizes the parameters of the given game-space of operations, to information as uncertain or improbable, catalysing the very possibility of

As the technical increasingly organizes the social as a protocol-driven force, the risk of ...idolatry of the machine, is far too great.

[157] "Solutionism" was originally coined by Evgeny Morozov.

agitation upon said game-space. Considering the information-to-price pipeline of valuation within the global game, the technologically enabled revaluation and distribution of information, turns out to be not such a modest thought experiment at all. As a *theoretical* possibility, a machine engineered for mathematically backed, decentralized consensus, could operationally germinate a dissensual apprehension of "information" as an abundant good, the value of which would be irreducible to price because it defies the logics of scarcity. The possibility for such a dissensual dynamic is what can be considered a dehabituating affordance contained within a technical object. Blockchain is not the sole technological invention architected upon a revaluation of information, such a tendency underpins countless online repositories opening access to literary, sonic, cinematic and scientific materials that would otherwise be unavailable to most. Anecdotally, but not inconsequentially, none of this essay would have been possible without the techno-informational intervention of Alexandra Elbakyan, the programmer responsible for opening the gates to academic journals with SciHub (which has received comparatively much less media attention because it refuses to play the global game of spectacular volatility. Rather, hers is a service for those without institutional validation—a rising population, not necessarily concentrated in sanctioned "geographies of reason,"[158] but a user-population, who, like any hybrid bios/logos creature, can nonetheless learn practices of non-adaptation through the cognitive and ethical frictions brought to bear by a sensitivity to information.

Conclusion

Clearly, a different evaluation, or distribution of information is no panacea to the immensity of challenges facing the planet in vastly divergent degrees of particular urgency. The search for any single "solution" to the multi-scalar and multi-causal crises of our time is to fall into a solutionist quagmire, in a much broader sense than its technically oriented definition implies. Rather, the intention has been to extend Wynter's work on the systemic driver of human self-idealisation as it underwrites systems of self-reference that enables the "legitimacy" of economic, epistemic, social and technological paradigms—none of which can be discernibly separated today, within a technologically infused condition where the inorganic becomes the organic, or an ecologic milieu. In brief, we can say that genres of being human, insofar as they initiate a primary frame of reference, can be understood as setting conditions of *relative* necessity within a particular, historical world. Today, a central friction can be encapsulated

[158] Lewis R. Gordon, "Shifting the Geography of Reason," (interview with Madina Tlostanova), in *New Frame*, 2019. https://www.newframe.com/shifting-geography-reason/

through Wynter's sociogenic method: concerning the epistemic identification of planetary ramifications as a new type of information (the objective description of an historical world, containing post-nuclear artifacts, now facing climate crisis, not to mention a pandemic), vs. its praxes or modes of organization, namely, inhabitation, which remain bound to the bio-evolutionary "defense" upheld by the logics of econocentric, global game network dynamics. While it is true that many of us humans *know of* the information that clearly delineates a dismal future (for humans), what individuation, as a transformative process designates, is the capacity to inhabit the *consequences* of information as a catalyst for transformation, that is, to transform beyond merely "knowing of" something. Because the sociogenic principle introduces qualitative standards through which to evaluate what it is *like* to inhabit a world, and not the mere fact of inhabiting a world, it can leverage a qualitative refusal not to adapt to given configurations; that is, it can refuse the completeness of a world that it inhabits. This is what is at stake in *homo narrans* commensurate with the dimensions of the planetary, one that is indissociable from its technical activities: namely the orientation to an environment in common (largely because of technical activities). The logics of the global game that are underwritten by historical confluence (anthropogenically, biologically, chemically and geologically), come to picture this "common planetary" space as one necessarily requiring homogeneity—the flattening ethos of a monohumanist world. The task of planetary coexistence is to learn to practice the crucial difference, epistemologically, axiologically and technologically, between a common world, and a world in common. If real necessity, attributable to a particular genre of being human, is relative because of underlying conditions, it is the task of technopolitical intervention to reset, redistribute and diversify those very conditions, upon which the evaluation of necessity rests.

ENCRYPTING ENCLOSURES

Fractionalized Real Estate on the Blockchain

Maral Sotoudehnia

Across Canadian cities, like so many other places around the world, real estate and housing continue to function as illiquid financial assets available only to the equity-rich elite. Housing finance, in particular, heightens barriers to entry for hopeful homebuyers, while also limiting options for renters who are paying more for basic access to housing. Commenting on the housing affordability crisis, Maalsen states that "the rising discrepancy between house prices and average income means, for many, owning a home is increasingly out of reach."[1] While homeownership is on the decline for certain demographics, such as younger generations or what Maalsen calls "generation rent,"[2] real estate investors and private equity firms continue to purchase and control housing through profit-seeking financial instruments.

Airbnb, VRBO and other peer-based digital housing platforms streamline rent extraction and intensify displacement associated with unaffordable real estate and housing, paving the way for a "rentership society."[3] Airbnb and VRBO, for instance, create the digital infrastructure for investors to streamline and scale investment properties rentals, and across jurisdictions,

[1] Sophia Maalsen, "'Generation Share': digitalized geographies of shared housing," *Social & Cultural Geography*, (2018). DOI: 10.1080/14649365.2018.1466355; and A. Mechele Dickerson, "Millennials, affordable housing, and the future of homeownership. *Journal of Housing Affordability*, 24(3)(2016): 435–465.

[2] Sophia Maalsen, "'Generation Share': digitalized geographies of shared housing." *Social & Cultural Geography,* (2018).

[3] Desiree Fields, "Automated landlord: Digital technologies and post-crisis financial housing." *Environment and Planning A: Economy and Space,* (2019), 8; and Oliver Chang, Vishwanath Tirupattur, and James Egan, *A rentership society. Housing Market Insights. Securitized Credit*, New York: Morgan Stanley & Co. LLC (2011).

they automate portions of the short and long-term renting process, and reduce costs.[4] In doing so, these platforms facilitate the vertical integration of housing supply chains, creating operational efficiencies towards both the collection of rents and the use of housing as a financial instrument.[5] One example in which digital technologies abet the expansion of housing financialization, a process involving the transformation of real estate into financial assets, involves buy-to-let and short-term rental platforms like Airbnb. Indeed, with the world confronting the COVID-19 pandemic, some Airbnb landlords are having to rethink their use of the platform to ensure profits from short-term rentals, returning listings to the long-term rental market.[6]

A diversity of literature scrutinizing the extractive and anti-regulatory logics undergirding Airbnb exists, serving as a necessary touchstone for scholars interrogating the application's impacts on housing availability and affordability in a diversity of geographies.[7] In large part due to housing platforms like Airbnb that leverage digital applications to mediate and modify the rental process, landlords are now able to wield greater and remote controls over the rents they extract while shortening the cycles for rental payments. The digitization of housing and real estate combines the rentier capitalism often associated with home-letting markets like Airbnb and VRBO with real estate ownership to create new digital economic regimes aimed at securitizing risk, increasing profits and controlling assets. The dominance of digital housing platforms that leverage the assetization of housing through rent-seeking activities exemplifies what Sadowski calls an "internet of landlords,"[8] where digital technologies open up new modes of extraction and investment, intensifying systemic racism. These financialized assets often yield high and even guaranteed profits to investors, all the while exacerbating housing precarity for insecure and oppressed populations.[9]

Meanwhile blockchain technology, a digital record of events distributed across a network of users, continues its awkward ascent as another critical darling of technological advancement.

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[4] Desiree Fields, Ibid.

[5] Desiree Fields, Ibid.

[6] "Former Airbnb units in Toronto moving to long-term rental market," *The Canadian Press,* July 23, 2020. https://www.prpeak.com/former-airbnb-units-in-toronto-moving-to-long-term-rental-market-1.24174994

[7] Martine August, Alan Walks, "Gentrification, suburban decline, and the financialization of multi-family rental housing: The case of Toronto," *Geoforum*, 89 (2018): 124-136; and Melissa García-Lamarca, Maria Kaika, "'Mortgaged lives': the biopolitics of debt and housing financialization," *Transactions of the Institute of British Geographers*, 41 (2016): 313-327.

[8] Jathan Sadowski, "The Internet of Landlords: Digital Platforms and New Mechanisms of Rentier Capitalism," *Antipode*, No 0, Issue 0 (2020), 1.

[9] Safiya Umoja Noble, *Algorithms of Oppression* (New York: New York University Press 2018); and Martine August, Alan Walks, *ibid*; and Agustin Cocola-Gant, Ana Gago, "Airbnb, buy-to-let investment and tourism-driven displacement: A case study in Lisbon," *EPA:Economy and Space*, No 0, vol 0 (2019): 1-18. DOI: 10.1177/0308518X19869012.

Blockchains promise to create new forms of bottom-up finance, such as peer-to-peer platforms and cryptocurrencies like bitcoin. Proponents of blockchain technology also claim that it can abstract away operational frictions surrounding financial and transactional settlements across top-down financial sectors. Many financial institutions, including the Royal Bank of Canada, the Canadian Imperial Bank of Canada, Toronto Dominion Bank, Scotiabank, and Desjardins, continue to invest in blockchain products in the hopes of finding a problem for the general-purpose technology to solve. These banks, for instance, otherwise known as Canada's "big five," partnered with SecureKey Technologies to implement verify.me, an identity authentication and management blockchain aimed at improving Know Your Customer (KYC) and Anti-Money Laundering (AML) compliance, verification and customer service.[10] Elsewhere, blockchains and their seemingly endless use cases have been critiqued for being "much worse than the systems they replace"[11] or for not really implementing blockchains.[12] Blockchain hype hinges on a contradictory promise that the technology can serve any purpose—a universally digitized means to any possible end—at once accelerating finance capitalism while undermining it. Yet, as the blockchain enters its adolescent years, it has yet to live up to its disruptive potential.

Blockchain technology... continues its awkward ascent as another critical darling of technological advancement.

Despite this, many continue to invest in blockchain use cases, including a handful of initiatives claiming to leverage the technology to shake up inaccessible housing and unaffordable real estate markets. The dominant discourse surrounding housing use cases on the blockchain often echo early claims about Airbnb and other sharing economy platforms, depicted by Scholz "as a harbinger for the post-work society—the path to ecologically sustainable capitalism where Google will conquer death itself, and you don't have to worry about a thing."[13] For many blockchain evangelicals, "sustainable

[10] Brian Jackson, "Canada's 'big 5' banks launch blockchain-based digital identity service with SecureKey," *IT World Canada*, May 1, 2019. https://www.itworldcanada.com/article/canadas-big-5-banks-launch-blockchain-based-digital-identity-service-with-securekey/417406.

[11] Bruce Schneier, "There's No Good Reason to Trust Blockchain Technology," *Wired*, February 6, 2019. https://www.wired.com/story/theres-no-good-reason-to-trust-blockchain-technology/.

[12] Koray Caliskan, "Data Money: The socio-technical infrastructure of cryptocurrency blockchains, " *SSRN*, 2018.

[13] Trebor Scholz, *Platform Cooperativism: Challenging the corporate sharing economy* (Rosa Luxembourg Siftung, New York Office 2016): 2.

capitalism" is taken up through concepts like economic liberation, financial inclusion and empowerment. Much like the sharing economy, however, blockchains have yet to offer a viable alternative to finance capitalism. Similarly, and much like their cryptocurrency counterparts, blockchains do not by default democratize housing, real estate or any related asset classes. Indeed, as Scott explains of cryptocurrencies as a mechanism for financial inclusion: "Escaping weak local institutions might help individual people, but does little to empower the broader social majority who remain reliant on the existing systems."[14] Following Scott, I contend that a similar critique applies to the majority of blockchains that purport to democratize real estate and housing. The examples that do exist either remain largely conceptual or automate the consumption of housing as a financial asset that circulates in regulatory ambiguous markets, demonstrating a persistent need to interrogate real estate blockchain hype.[15]

Blockchains do not by default democratize housing, real estate, or any related asset classes.

This article therefore considers the intersection between digital technologies and housing finance through an examination of distributed forms of housing that rely on blockchains to circulate as financial instruments. Fractionalized housing applications that use blockchain technology promote real estate investment as an emergent asset class that will lead to economic liberation, making housing finance at once accessible, "democratizing," and liquid for would-be investors.[16] Yet, as I explain through a content analysis of three real estate blockchain initiatives, RealT, Reitium and DOMA, blockchain technology can create contradictory conditions of possibility surrounding housing finance. Fractional real estate blockchain applications like RealT and Reitium have the capacity to automate the consumption of housing finance, making global real estate assets liquid only to those individuals with existing access to markets, while exacerbating existing inequalities relating to housing finance. Blockchain applications like RealT and Reitium promise to "democratize real estate" in the guise of economic liberation, yet they merely repackage

[14] Brett Scott, "How Can Cryptocurrency and Blockchain Technology Play a Role in Building Social and Solidarity Finance?" *UNRISD*, February 2016. http://www.unrisd.org/80256B3C005BCCF9/httpNetITFramePDF?ReadForm&parentunid=196AEF663B617144C1257F550057887C&parentdoctype=paper&netitpath=80256B3C005BCCF9/(httpAuxPages)/196AEF663B617144C1257F550057887C/$file/Brett%20Scott.pdf, 8.

[15] Nikhilesh De, "Bee Token ICO Stung by $1 Million Phishing Scam," *Coindesk*, February 1, 2018. https://www.coindesk.com/bee-token-phishing-scam.

[16] RealT. https://realt.co.

housing finance into automated subscriptions for equity-rich users who can afford to treat housing as part of their investment portfolios. Conversely, DOMA uses the blockchain to create a network of users who can leverage collective equity to secure collective housing. To varying degrees, all three blockchain applications examined herein create platforms for real estate investment that appear to operate under ambiguous regulatory conditions, introduce digital barriers to entry, and raise questions surrounding data transparency and privacy. In addition, while the applications reviewed in this text have the capacity to streamline the acquisition and use of housing as a financial asset, it remains unclear how blockchain topologies provide singular architectural solutions to the problem of fractionalized real estate or collective property ownership.

Housing: Land, property, asset

Housing remains entangled in wider discussions about land and property. Land, in particular, can operate as a commons, become enclosed as property, and circulate as a financial asset. Indeed, as Li explains, land has a materiality—it "is not like a mat. You cannot roll it up and take it away."[17] Through its presence, land provides a diversity of "affordances" including the capacity to support life.[18] Yet land can also become commodified as property, a resource to be codified by legal frameworks and utilised for profit.

The transformation of land as a shared benefit enabling mutual aid into land as form of property depends, as Springer explains, "on coercion, exclusion, hierarchy, and, most notably, enforcement (or law) to maintain its viability."[19] While rights over property are recognized and legitimated through laws and title ownership, Li reminds us that "law plays a highly ambiguous role."[20] As property circulates across borders and as a commodity to accumulate profit and extract rents, the ambiguity of property rights and their recognition across time and space intensifies.

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[17] Tania Murray Li, "What is land? Assembling a resource for global investment." *Transactions of the Institute of British Geographers*, Plenary Lecture no 39 (2014), 589.

[18] Ibid.

[19] Simon Springer, *The Anarchist Roots of Geography* (Minneapolis: University of Minnesota Press, 2016): 10.

[20] Li, 598.

Peredo et al. offer four classifications for property: private, collective, common, and public.[21] Private property, the authors explain, involves an individual's bundle of rights over an asset. Collective property, according to the authors, functions as a subcategory of private property, where an individual has autonomous rights over a tranche of a larger, divisible asset. Common property involves shared rights over an indivisible asset and public property involves assets accessible to certain groups pending oversight and management by a regulated entity or jurisdiction.[22] Peredo et al. distinguish public property from common property, noting that the former does not function as a public good.

Peredo et al. emphasize bundles of rights and their in/divisibility to categories different property regimes, largely eliding anarchist, Indigenous and alternative forms of land tenure. The enclosure of Indigenous territories around the world into property[23] has impeded the proliferation and maintainability of alternative, Indigenous and non-capitalist forms of land tenure.[24] While the codification of private property through contracts remains a "throbbing force of colonialism,"[25] different, more common forms of land tenure exist. Community land trusts offer one such example of communal tenure, where property is nevertheless recognized through contractual means and can even be divisible, but under the guise of collective stewardship over the land.[26]

Meanwhile, housing is increasingly linked to finance. Indeed, literature on finance, insurance and real estate (FIRE) assets continues to surge in an elongated response to the 2008 global economic downturn.[27] Financialization functions as the prominent undercurrent across disciplinary investigations of financial asset classes. The process of financialization, Krippner explains, involves "a broad-based transformation in which financial activities (rather than services generally) have become increasingly dominant."[28] Krippner emplaces this shift towards

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[21] Ana Maria Peredo, Helen M. Haugh, and Murdith McLean, "Common property: Uncommon forms of prosocial organizing," *Journal of Business Venturing*, 33 (5) (2018): 591-602.

[22] Ibid.

[23] Richard Howitt, "Unsettling the Taken (for Granted)," *Progress in Human Geography* 44, no. 2 (April 2020): 193–215. https://doi.org/10.1177/0309132518823962.

[24] Andrea Rigon, "Collective or Individual Titles? Conflict over Tenure Regularisation in a Kenyan Informal Settlement," *Urban Studies* 53, no. 13 (October 2016): 2758–78. https://doi.org/10.1177/0042098015602658.

[25] "Property rights/property wrongs: Micro-treaties with the earth," *Dark Matter*, Retrieved from: https://provocations.darkmatterlabs.org/property-rights-property-wrongs-micro-treaties-with-the-earth-9b1ca44b4df

[26] Ibid.

[27] Fields, 2019, *ibid*; and Kurt Iveson and Sophia Maalsen, "Social control in the networked city: Datafied dividuals, disciplined individuals and powers of assembly," *Environment and Planning D: Society and Space*, *37*(2) (2019), 331–349. https://doi.org/10.1177/0263775818812084.

[28] Greta Krippner, *Capitalizing on Crisis: The Political Origins of the Rise of Finance* (Cambridge: Harvard University Press, 2011), 2.

financialization in the context of the United States' economy, yet various scholars invoke the term to emphasize the rise and indeed dominance of financial approaches, institutions and actors to every economic. August and Walks further describe financialization as an "increasing penetration of financial practices, logics, and strategies into non-financial sectors."[29] The transformation of practically any object into a financial asset demonstrates capitalism's "prospecting logics" to create new spaces of capital while continuing its invasion of existing ones.[30]

The mainstreaming of housing financialization often moves in lockstep with wider forms of neoliberalism and gentrification, both of which increase the mobility of global capital flows at the expense of market stability, housing access and affordability.[31] Housing infrastructure in particular, as Fields explains, opened up high liquid investment vehicles to institutional investors well positioned to benefit from "advantageous market conditions wherever they may exist."[32] The use of homeownership and housing more generally, or "asset-based welfare,"[33] has and continues to feed the insatiable hunger of finance capitalism specifically through long- and short-term rental markets. August and Walks' analysis of Toronto housing rentals,[34] for instance, demonstrates how a majority of renters are subject to extractive and displacing logics that follow in the profits from rental homes. The authors emphasize, for instance, that financializing practices associated with housing through renovations, displacement and price "squeezing" "come at a price, and that price is first and foremost paid for by tenants in affected multi-family housing."[35]

The financialization of housing infrastructure serves as one of many examples of a dominant asset class for global financial investment, yet it also portends the creation of new assets to be commodified and circulated. In particular, housing as a form of finance capitalism amplifies an underlying contradiction, where a home purportedly serves as a form of shelter while also operating as a scarce commodity prone to speculation.[36] García-Lamarca and Kaika argue

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[29] Martine August, Alan Walks, "Gentrification, suburban decline, and the financialization of multi-family rental housing: The case of Toronto," *Geoforum*, 89 (2018):125.

[30] Desiree Fields, "Automated landlord: Digital technologies and post-crisis financial housing," *Environment and Planning A: Economy and Space.* (2019): 3. DOI.org/10.1177/0308518X19846514

[31] I. Lestegás, J. Seixas, R-C Lois-González, "Commodifying Lisbon: A Study on the Spatial Concentration of Short-Term Rentals," *Social Sciences*, (2019), 8(33), 1-15.

[32] Desiree Fields, "Unwilling Subjects of Financialization," *International Journal of Urban and Regional Research*, (2017) 41 (4): 5.

[33] Ibid.

[34] M. August, A.Walks. Ibid.

[35] Ibid, 133.

[36] M. August and A. Walks, Ibid.

that housing assets in particular simultaneously serve as investment tools and consumption goods.[37] An embodied or micropolitical examination of housing finance exposes the ways by which housing operates as an asset for speculative investment and one that shapes how people consume housing.[38]

The introduction of digitizing technologies to automate and streamline the sale, rents and management of housing infrastructure was once touted for a promised ability to facilitate "sharing" or collaboration. Yet it is now evident that the sharing economy is anything but a mechanism to encourage sustainable consumption.[39] Instead, studies like Cocola-Gant and Gago's show how buy-to-let platforms like Airbnb amplify the deleterious impacts associated with financialization on precarious and financially insecure populations.[40] Buy-to-let and short-term housing rentals made possible by on-demand platforms further demonstrate the extractive and racialized logics driving digitized forms of postwork. The digitization of housing as a financial asset entrenches housing as a consumer good one can subscribe to, automating and streamlining existing property relations.

Digitizing financialized housing

In response to studies about sharing and peer-to-peer housing applications that seek to automate and abstract away the need for landlords and property managers, a number of scholars are beginning to investigate the implication of digitizing technologies on FIRE asset classes. Fields, for example, calls for political economists to focus analysis of real estate financial instruments on the logics and impacts of digital technologies so as not to "miss an avenue of analysis vital to grasping how financialization is practically realized."[41] The emergence of "disruptive" housing platforms to aggregate the management of single family rentals, for instance, intensifies the use of real estate and housing as scarce and rent-seeking assets across a variety of geographies around the world, decreasing the availability of affordable housing options for renters and those hoping to enter the real estate market.[42] As Cocola-Gant and Gago state: "Airbnb offers a new mechanism for the financialization of housing because it provides

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[37] Melissa García-Lamarca, Maria Kaika, "'Mortgaged lives': the biopolitics of debt and housing financialization," *Transactions of the Institute of British Geographers*, 41(2016): 316.

[38] Ibid.

[39] Agustin Cocola-Gant, Ana Gago, "Airbnb, buy-to-let investment and tourism-driven displacement: A case study in Lisbon," *EPA:Economy and Space*, No 0, vol 0 (2019): 1-18. DOI: 10.1177/0308518X1986901.

[40] Ibid.

[41] Fields, 2019, 2.

[42] Ibid.

an additional instrument for making investment in residential real estate ever more flexible and profitable."[43] In addition to creating new financial instruments out of rentals and real estate markets, Fields contends these platforms create an "automated landlord" that can leverage digital infrastructure like smartphones as a means to organize and streamline landlord-tenant relations.[44]

The digitization of housing finance is not only limited to wider capital flows associated with real estate investment and buy-to-let platforms. Real estate sectors also turn to digital platforms to collect data about their users, which is in turn used to inform how housing becomes and remains financialized. On the FIRE sector's recent interest in smart home technologies, Maalsen and Sadowski state that "the FIRE sector is based on monetizing information, managing risk, and maintaining assets."[45] In addition to using personal data to surveil people in their homes, real estate investors turn to smart applications to dole out "digital judgements" by recording late payments, any maintenance issues and landlord reviews of tenants.[46] This sort of digitized landlord-tenant governance has the potential to reprimand users in various ways and depending on a given application's data collection, sharing and privacy measures.

Peer-to-peer, blockchain and the financialization of housing

Meanwhile, a number of anti-capitalist and community-minded scholars and activists are leveraging alternative housing platforms to digitize finance towards more collectivist ends. Bauwens et al., for instance, call for a "P2P politics" rooted in communitarian and egalitarian relations enabled by the design and implementation open peer-to-peer technologies.[47] For Bauwens and his counterparts, decentralized digital technologies offer a way to transform the extractive relations of capitalism into generative communities, enabling "affinity-based

[43] Cocola-Gant and Gago, 4.

[44] Fields, 2019, 3.

[45] Sophia Maalsen, Jathan Sadowski, "Smart home on FIRE: Amplifying and accelerating domestic surveillance," *Surveillance and Society*, (2019) 17(1/2): 120.

[46] Ibid, 123.

[47] M. Bauwens, V. Kostakis, S. Troncoso, A.M. Utratel, "Commons Transition and P2P: A Primer," (Transnational Institute and P2P Foundation 2017) http://commonstransition.org/commons-transition-p2p-primer/

networks …with supportive and commons-generating solidarity structures."[48] This is precisely what the blockchain project, DOMA, a housing "platform cooperative, owned and run by its users" aims to do.[49]

Blockchain is one of many peer-to-peer technologies impacting the creation, circulation and consumption of FIRE assets. It is also lauded as one possible pathway towards more commons-oriented communities.[50] The cryptocurrency bitcoin first popularized what most now call a blockchain. The definitional boundaries of what a blockchain is and should be are often confounded by disagreement across cryptocurrency communities, sectors invoking the term, and the literature more broadly. The multiplicity of projects claiming to use blockchains stretches the concept across a wide range of architectures and topologies, yielding a diversity of interpretations that range from centralized networks sharing data across permissioned users (e.g., Facebook's Libra) to permissionless and decentralized ledgers, like bitcoin, where networks activities are visible to all and participation is limited by access to and proficiency with digital technologies.[51] In simple terms, a blockchain can be defined as a single-entry, timestamped ledger that logs network events stored in a distributed manner, or peer-to-peer, which are publicly viewable.[52] Often, network events that are recorded to the blockchain involve a digital token or representation that functions as a claim to a financial instrument (e.g., a currency). In the case of bitcoin, the digital tokens play a part in securing the blockchain's network with cryptography, making it next to impossible to corrupt or falsify the record of past events.

The blockchain effectively automates financial activities in a transparent and seemingly incorruptible manner. It is therefore unsurprising that numerous financial and non-financial sectors—such as healthcare, supply chain management, digital collectibles and real estate—are susceptible to the largely untested claims that the technology will speed up workflows, increase efficiency and minimize data loss. As Cai explains, blockchain technology "effectively severs the need for a centralised agent, which is normally provided by financial intermediaries. This trust element inherent in blockchain is the main reason that blockchain technology has the

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[48] Bauwens et al., 15.

[49] DOMA, n.d.

[50] Hannes Gerhardt, "Engaging the Non-Flat World: Anarchism and the Promise of a Post-Capitalist Collaborative Commons," *Antipode*, (2019) 0(0), 1-21. DOI: 10.1111/anti.12554.

[51] Caliskan, 2018.

[52] Satoshi Nakamoto, "Bitcoin: A peer-to-peer electronic cash system," 2008; see also M. Xue, X. Chen, G. Kou, "A systematic review of blockchain," *Financial Innovation*, (2019) 5(27), 1-14.

potential to be a transformative technology in financial services; in some areas, it may eliminate the need for intermediaries."[53]

Like so many other sectors, a number of real estate and housing outfits have recently taken up the blockchain as a technical solution to a variety of logistical impediments, such as illiquidity and slow transactability, along with its ability to broaden access to real estate markets using digital apps. In addition, the blockchain's tokenization feature—that is, its ability to digitize and subdivide assets—portends the creation of and access to new housing assets and market practices.[54] Blockchain real estate use cases and the financial instruments they spawn often circumvent spatial and jurisdictional boundaries, increase liquidity of housing financialization, and promise to democratize finance by lowering barriers to entry into the market.[55]

In particular, the emergence of fractionalized housing schemes that use the blockchain to track, record and render transparent real estate and housing transactions, while creating new financial assets by way of digital tokens, offers an entry point to surface and interrogate how the "prospecting logics" of digital technologies shape new housing assets and whether or not they do in fact democratize finance.[56]

Microphysics, access control, and finance on the blockchain

Undergirding blockchain narratives of democratization and financial inclusion is an assumption that digital technology creates pathways to economic liberation. While dominant discourses of economic liberation in blockchain and cryptocurrency communities generally lean towards anti-statist positions rooted in individualism and libertarianism,[57] there are also a number of blockchain initiatives seeking to leverage the technology towards anti- or post-capitalist and collectivist ends.[58] Oddly enough, both pro-capitalist individualists and their collectivist counterparts peg their dreams of economic liberation to the same underlying assumption: that blockchain technology will democratize finance. Or as Käll puts it in much more eloquent

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[53] C. W. Cai, "Disruption of financial intermediation by FinTech: a review on crowdfunding and blockchain," (2018), *Accounting & Finance*, 58(4), 977.

[54] George Sazandrishvili, "Asset tokenization in plain English," *Corporate Accounting and Finance*, (2019), 31: 68-73.

[55] Ibid.

[56] Fields, 2019, 3.

[57] David Golumbia, *The Politics of Bitcoin* (University of Minnesota Press: Minneapolis, 2016).

[58] Bauwens et al, 2017.

terms, cryptocurrencies and blockchains promise a "way out—of the capital-based world-order in which we find ourselves."[59] Yet, Käll draws attention to a central caveat with all blockchain discourses centred on economic liberation, noting the role encryption plays in determining and mediating access to and control over a blockchain network: "blockchain technology is also a general means for much more improved decentralized connectivity between objects through encryption—and by this (…) locked-up control over the digitalized worlds that we inhabit."[60]

Fractional real estate on the blockchain

RealT

RealT claims to "reinvent" ownership by ways of "fractional and frictionless real estate investing … powered by blockchain."[61] The company targets its product to "international investors" who are seeking to "grow a global, digital real estate portfolio" that comprises everything from fractional ownership of real estate assets to "passive rental income" by way of DAI stablecoins on the Ethereum.[62] DAI stablecoins can be summarized as a decentralized form of finance represented by digital tokens circulated peer-to-peer, in this case on the Ethereum network, that purposefully abstract away price volatility common to other cryptocurrencies. Notably, the company's promotional video frames fractional housing investment via blockchain as a method to circumvent existing barriers to entry for investors, typified by "skyrocketing home prices, administrative hurdles, and restrictive access to financing," all of which purportedly make "investing in US real estate prohibitive."[63] Within the first minute of RealT's promotional video, the blockchain is positioned as a digital technology that increases financial inclusion and access to markets, and redefines housing finance altogether. While the use of DAI stablecoins and the Ethereum blockchain are peppered throughout the aforementioned video and other documentation on the site, there is little to no explanation about how either work,

[59] Jannice Käll, "Blockchain control," *Law Critique* 29 (2018), 134.

[60] Ibid, (134).

[61] (REALTOKEN 2020)

[62] Ibid.

[63] Ibid.

especially in relation to liquidity and fungibility of assets (e.g., receiving passive rental income from DAI coins). Additionally, the promotional video explains that some user details are needed prior to subscription, yet what these details are remains unclear. This harkens back to Maalsen and Sadowski's concern over the collection of personal data by FIRE sectors as an extended form of financialization predicated on the use of data collection and dataveillance as a means to entice marginalized users.[64] This sort of "predatory inclusion"[65] promises easily accessible financial applications in exchange for access to personal and private data.

RealT's white paper further explains how the platform opens up the "potential to digitize ownership of almost any asset."[66] This, RealT suggests, "will enable new mechanisms for democratizing access to real estate previously unavailable to the average person."[67] RealT claims that the digitization of real estate assets by way of tokens will herald a democratization of finance, and RealT remits rents to token holders on a daily basis. Ironically, the collection of daily rents presumes liquidity on the part of the renter, a privilege many financially insecure populations do not have. Real-time collection of rents is promoted as a benefit to investors who can invest and collect profits daily, yet it places the onus on renters to have access to and remit funds on a daily basis. For users living paycheque to paycheque or awaiting benefits on a bi-weekly or monthly schedule, this sort of continuous payment scheme introduces logistical challenges while also exacerbating financial insecurity.

Both pro-capitalist individualists and their collectivist counterparts peg their dreams of economic liberation to the same underlying assumption: that blockchain technology will democratize finance.

Elsewhere, the white paper suggests that "fractionalization enables democratization of investment types. The 'minimum investment size' barrier can now be wholly removed, and

[64] Maalsen and Sadowski.

[65] Ibid, 122.

[66] RealT, 4.

[67] Ibid.

average investors can allocate their capital into investments previously inaccessible to them. By reducing the price of an asset by orders of magnitude, the pool of potential buyers is significantly increased. This has powerful implications when it comes to adding liquidity to previously illiquid assets, as the market size of buyers and sellers has increased to encompass anyone with any surplus capital."[68]

The above claim is complicated by the fact that participation in the scheme is limited to persons who meet the definition of an "accredited investor" under the U.S. *Securities Act*. Yet even the definitions under the *Act* introduce ambiguity surrounding compliance and how investors can and should legally participate in RealT. An "accredited investor," for instance, is defined in the *Securities Act* by a suite of eight overarching criteria including but not limited to banks or other financial institutions defined elsewhere in the *Act*, a series of specified large scale financial organizations, as well as "Any natural person whose individual net worth, or joint net worth with that person's spouse, exceeds $1,000,000."[69] Who can qualify as an "accredited investor" is therefore not easy to determine if one merely reads the application copy, a potential point of confusion also evident in the whitepaper, which also highlights the need to be an "accredited investor which, according to the *Act*, precludes involvement by any person(s) who 1) do not already have liquid assets, and 2) do not hold assets equal to or in excess of $1,000,000."[70] In other words, to even be able to access RealT's "democratized" financial platform, users need to meet prohibitive eligibility criteria.

The lack of clarity surrounding compliance and user risks is apparent elsewhere in RealT's white paper. Under a section near the end of the white paper entitled "risk factors," RealT's team outline the risks to participation in one brief paragraph: "There are many risk factors associated with any type of investment, cryptocurrencies included. These risks span operational, regulatory, market-based, and technological challenges. Prospective investors in the RealTokens should carefully consider the risk factors set forth in the RealToken LLC Private Placement memorandum dated April [*], 2019, as well as the information appearing in this Whitepaper, before purchasing RealTokens. Prospective purchasers of RealTokens should understand that there is a possibility that they could lose their entire investment in the RealTokens."

A number of questions arise from the above paragraph. The cited memorandum, for instance, that users would need to consult remains undefined and the white paper merely includes an

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[68] Ibid*, 10.*

[69] Securities Act, 230.501(5).

[70] RealT, 21.

asterisk to denote an undefined date for a seemingly inaccessible related guidance document. In addition, what sorts of "operational, regulatory, market-based, and technological challenges" should users be leery of and, perhaps more importantly, how does RealT aim to assess and mitigate these risks? The opacity of the text above, whether intentional or not, exposes end users to unspecified risk, the impacts of which could range from minimal to severe.

Ownership and Management

RealT's definition of asset and investment ownership also introduces a number of concerns. The white paper defines and even explains that each real estate asset will be owned by a Series, "a unique form of limited liability company in which the certificate of formation specifically permits for unlimited segregation of membership interests, assets, and operations into independent series."[71]

Further, each share of a Series is digitized by a "single unique digital token, or RealToken, on the Ethereum blockchain."[72] Notably, each of these tokens holds a "Unique Identification Number (UIN)" that is captured in metadata, a "Certificate of Formation of RealToken LLC." Individual UINs are also expressed in an affidavit to a particular property asset.[73] While RealT records each UIN, or fraction of an asset, in an affidavit to the deed of the property itself, there are lingering questions about how the fractions to each property are determined. For example, how many UINs are issued per asset fractionalized? What happens if a UIN holder loses access to the UIN? And what protections exist against hacks?

Additionally, each asset has a property manager that presumably oversees day-to-day maintenance of the asset being rented out. This in itself is fairly normal for real estate investments focused on rental housing. RealT also makes explicit that the corporation selects the property manager at the beginning of asset ownership: "At the genesis of a property acquisition by a Series in the RealT system, an independent or affiliated, third-party property management service will be selected by RealT."[74] A change in property management, however, introduces some challenges. The whitepaper outlines the process for property management change: "If RealToken owners elect to ever switch property management services, they will be able to do so by a unanimous decision among themselves. RealT will enable the infrastructure

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[71] RealT, 2.

[72] RealT, 11.

[73] Ibid.

[74] RealT, 17.

required to do this. This functionality provides self-sovereignty to the owners of RealTokens, enabling, under certain circumstances, the ability to take the management of their property into their own hands, if they so choose." Readers can presume that this change may entail a vote, but how this might be coordinated or what the governance model entails remains opaque to a would-be user. Given that a change in property management impacts both investor and renter, RealT's lack of detail on this matter exposes an individualist interpretation of economic liberation. Rather, the application presumes that governance will sort itself out, and does not explain how design principles will account for power asymmetries inherent to many blockchains, or address them.[75]

Data collection and privacy

RealT claims that it revolutionizes real estate investment by making the discovery process surrounding property for investment available to users and "transparent," yet the application does not make evident which personal data it collects from users and for what purposes.[76] Transparency, then, appears to be limited to asset identification and not personal data collection, use, or commoditization. Meanwhile, RealT's privacy policy makes explicit that they intend to collect and share personal data.[77] In addition, RealT's asset documents detail that the platform runs on proprietary software, which also calls into question other claims to "transparency" and intent surrounding data harvesting. Indeed the seeming lack of data privacy measures and transparency echo Maalsen and Sadowski's analysis of FIRE sectors seeking to manage corporate risk while also financializing end users by way of their data.[78]

Reitium

Reitium is a fractionalized blockchain app that claims, per its trademark, that it offers "real estate for everyone."[79] Built using IBM's Hyperledger blockchain, Reitium promises to "help … clients digitize and automate their client processes by eliminating painful manual

[75] Angela Walch, "Deconstructing 'Decentralization': Exploring the Core Claim of Crypto Systems," in *Crypto Assets: Legal and Monetary Perspectives*, (Oxford: Oxford University Press, 2019).

[76] RealT, 23.

[77] REALTOKEN.

[78] Maalsen and Sadowski.

[79] Reitium.

workflows."[80] According to the platform's website, automation "saves time and money" while ensuring "an overall better experience."[81]

Much like RealT, Reitium can be confusing to navigate from a regulatory perspective due to typographical errors in the application's copy. The mobile application, for instance, enables subscribers to create an account. Once registered, users are asked to self-assess and self-identify themselves into one of three possible investor categories: a non-accredited investor, eligible investor and accredited investor. Each category is defined in the application, ostensibly offering guidance to would-be subscribers. Notably, the definitions for a "non-accredited investor" include typographical errors that may confound subscribers. Users are informed that "to qualify as an eligible investor" one must have "(a) less than $400,000 Net Assets" with "Net assets, alone or with a spouse, exceeding [*sic*] $400,000" or "(b) less than $75,000 Net Income" defined as "net income before tax exceeding $75,000 in the previous two calendar years."[82] While typographical mistakes may seem banal to many, they have the capacity to misdirect and indeed misguide users seeking to subscribe to Reitium. These sorts of mistakes can impact the purported "streamlining" of fractional real estate investment, all the while undermining the perceived legitimacy of the application. In addition, as the various categories of "non-accredited investor," "eligible" and "accredited investor" may have legal implications, there may be significant consequences to would-be participants who proceed without identifying any errors in the application. This reveals the limits to digitized and "democratized" finance: the onus to comply with regulations, whether or not they are accurately presented, falls to the user

Ownership

Despite the relative inaccessibility of ownership documents for a given investment, Reitium does provide a list of clearly defined forms for subscribers to read over prior to execution. Reitium, however, still relies on conventional banking to enable subscription and investment into an asset. This incites some questions surrounding access to finance. Bank drafts are the sort of legacy documents the blockchain aims to replace, so why use a blockchain to facilitate payment via more conventional processes? The use of bank drafts departs from the dominant narrative of digitization claims for housing finance as a means to streamline operations. Instead of automation, Reitium's subscription process merely adds a manual workflow to a digital app.

[80] Ibid.

[81] Reitium.

[82] Reitium blockchain 2019. Reitium.com, accessed on June 6, 2020.

Bank drafts are also prohibitive since they presume that participants have access to conventional financial instruments or are "banked." The use of legacy banking documents undermines Reitium's trademarked claim of "real estate for everyone."[83] Instead, it appears that opportunities to own fractional real estate or participate in finance through Reitium remain limited to conventional investors.

Barriers to use

Despite its claims to "democratize" real estate, explanatory documents and media are largely absent from the website and only available through their mobile applications. This makes any analysis or review of legal documents challenging for potential "unbanked" or "underbanked" participants, as well as limiting access to investment to those who have experience with or an understanding of, real estate and finance. This impacts how information about terms and conditions, for instance, or legal documents outlining subscription agreements, are accessed and understood, and by whom. It also presumes that participants have access to a smartphone, which remains a technological barrier for some.

DOMA

Based on the promotional materials, slide decks and grey materials available at the time of writing, DOMA appears to remain largely in the prototyping phase, limiting the depth of analysis possible on the initiative. As a result, reflections on DOMA's capacity to bring about some form of economic liberation and how it operates under myriad juridico-legal frameworks remain largely prefatory, at best.

Unlike RealT and Reitium, the fractionalized housing initiative DOMA uses blockchain technology to enable a collective model of property ownership. DOMA endeavours to use "the new token economy" through "urban software" to create accessible and distributed rent to own and joint ownership models of real estate across selected cities.[84] By putting property relations on the blockchain, DOMA uses automation and digitization to tackle the housing affordability crisis and remodel capital flows surrounding housing finance.[85] Specifically, DOMA uses the

[83] Reitium.

[84] "Welcome to DOMA," n.d. Retrieved from: https://221a.ca/wp-content/uploads/2020/08/DomaDeck-2019Q4.pdf

[85] "Housing and Spatial Technologies," *East Meets East*, https://easteast.world/en/posts/72

blockchain's automation and tokenizing features to lower barriers to real estate assets and to redistribute financial profits.

Unlike RealT and Reitium, DOMA resembles a community land trust model. Land under DOMA's model is organized according to property rights and related protocols. For DOMA, land continues to circulate as a financial asset, yet it is nevertheless framed as shared resource requiring collective stewardship.[86] Undergirding DOMA's approach is also an explicit call to design a financial architecture centred on creating sustainable and affordable housing instead of maximizing profits. In this way, DOMA's design portends an alternative application of housing finance that could, depending on implementation, result in some form of more equitable land redistribution for participants.

Ownership and management

While DOMA shares certain attributes with other fractional real estate blockchains, such as the use of digitization to streamline and manage the distribution of property rights bundles that are divisible, the initiative differs from other blockchain real estate schemes in that it does not seek to extend the commodification of housing through digitized financial instruments merely for individual profit. Rather, DOMA purports to recognize the "tactical reality" of housing commodification and the possibility to begin decommodifying housing "from the inside,"[87] claiming an eventual goal of common ownership. DOMA's use of fractional ownership and the rent-to-own real estate model is intended to build collective equity and redistribute it across its user-base and different real estate markets. For instance, a portion of rents collected for a DOMA unit in Kyiv may be re-invested in a DOMA property held in, say, Vancouver, to both lower rents for the unit in the more expensive market (Vancouver, in this case) and to build equity in multiple markets. In this way, DOMA seeks to apply equity from one real estate market and use it to bolster their holdings in otherwise inaccessible housing markets. As a result, DOMA aims less to reduce barriers to housing finance towards individual profit and instead seeks to use the blockchain's networking capabilities to enable a community of "owners owning a network of assets."[88] DOMA aims to build equity over time and across multiple real estate markets as a communal form of revenue-generation for the communities living in those homes.

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[86] "Housing: Hacking the Crisis of Home," *Money Lab,* June 08 2020, Retrieved from: https://aksioma.org/moneylab8/session/housing-hacking-the-crisis-of-home/.

[87] "Housing: Hacking the Crisis of Home," *Money Lab*, June 08 2020. Retrieved from: https://aksioma.org/moneylab8/session/housing-hacking-the-crisis-of-home/.

[88] "Welcome to DOMA."

DOMA also relies on tokenization as a means of redistribution instead of profit. Whereas RealT and Reitium position their applications as means of entry into existing real estate investment markets, DOMA claims to use digital financial technology to create and scale alternative housing futures rooted in affordability and cooperation. DOMA's emphasis on an alternative, commons-based tenure model as the project's stated end goal sets it apart from other fractional blockchain initiatives.[89] DOMA uses the blockchain to create a topology for property relations that simultaneously leverages land as a collective and global resource while also recognizing its ability to be enclosed and circulate as an asset. Notably, DOMA's use of the blockchain to automate the sale, distribution and operations surrounding property ownership and management raises similar questions to those surrounding applications like RealT and Reitium, with analysis limited by the absence of a live application and additional documentation.

Barriers to use

DOMA's promotional materials, including a simulation of the project's conceptual framework, offer early signs of a collective property initiative that could use blockchain technology to call into question dominant logics and flows of finance capital surrounding housing, yet it remains too early to analyze the project. As DOMA evolves, one may wonder how DOMA will manage to create collective equity across jurisdictions. In addition, details about DOMA's blockchain implementation remain unclear, itself an imperative component to analyse in the context of service design, accessibility and digital inequality.

Blockchains like RealT and Reitium appear to create the conditions to organize and record claims to property, entrenching the codification of a capitalist framework of land as a resource to extract profits from. Meanwhile, blockchains like DOMA aim to reformat property relations and housing finance to enable resource extraction of land in a self-organized manner. DOMA's model, while rooted in more collectivist thinking, nevertheless functions under the auspices of capitalism and private property, where, notably, land remains an asset with a bundle of rights associated to it, that can be "owned" under statist regulatory frameworks, and divisible for sale and rentiership.

[89] "Housing: Hacking the Crisis of Home."

Conclusion

A close reading of RealIT and Reitium reveals that, despite these blockchains' purported potential to leverage technology as a means towards more inclusive finance, "decentralized" fractionalized real estate appears to merely facilitate the digitization of real estate investment for those with existing access to and understanding of banking, the market and regulations. The applications reviewed in this paper have the potential to become the next Airbnb- or VRBO-inspired real estate finance app for investors looking for a quick way into an ever-expanding market, but they also have the capacity to create new digitally mediated enclosures by intensifying rent extraction, obfuscating compliance requirements for those investors uninitiated to jurisdiction-specific real estate markets and their regulations, and introducing new forms of datafication and dataveillance.

The applications considered above suggest that the "innovation" of the blockchain may indeed be limited to creating and accelerating new economic drivers, and that neither of these "disruptive" solutions do much to solve existing housing crises, dispossession, digitally driven gentrification or inaccessible rents. Yet, the results presented above are prefatory and limited in scope. Future research on the topic would benefit from critical analysis and indeed comparisons between fractionalized real estate applications like those mentioned above, and other implementations of decentralized technologies that use the blockchain as a means to more anti-capitalist ends (see, for instance, DOMA), where what is being "disrupted" is the real estate sector and the notion of property itself. Until then, fractionalized real estate blockchain applications such as RealIT and Reitium promise to increase profits for "accredited investors," disrupting those already squeezed by the current housing crises. Fractionalized blockchain applications create digitized layers of control over who gets to profit from real estate finance and housing, who gets to access these digitally mediated "assets," and how.