Incomputable Drives:

On Founding Violence and Computational Ordering

Bethan Mckinnie

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MA Research Architecture

Department of Visual Cultures

Goldsmiths, University of London

INTRODUCTION

Privacy has historically been the grounds on which concerns about computation and its effects on subjectivity are raised. Privacy can be understood as a foundational aspect of identity, essential for the development of a sense of self, but one that relies heavily on the affordances of the subject's environment. As such, privacy has been shaped by information technologies as far back as the printing press.[1] Computational systems follow in this history, with their ability to record and store information on individuals at scale, how that apparatus is structured and used by institutions, and how those institutions then address individuals with this information. Computers are built upon what Donna Haraway terms the 'God trick'- they 'represent while escaping representation'.[2] A fantasy of pure objectivity justifies computational systems in how they assign identities to the real world entities being computed (be they people or objects) - flattening them down to a representation. With computational systems increasingly involved in mediating relationships between individuals, between individuals and institutions, and between a given individual and themselves, this system is flawed and insufficient, as well as prone to error and susceptible to fraud.[3] Whilst privacy is still fundamental to subjectivity, the significance of discussing privacy as it pertains to computation has changed. The internet, and the state-like entities that predominantly run and organise it, have structured contemporary life so that there seems to be no other way to complete basic tasks: booking a flight or a hotel room, filling in tax forms, moving money. Privacy as it has been historically understood is no longer an option. Instead, what is at stake politically is the kind of subjectivities that this constant computational ordering and interaction brings into being.[4] So if privacy has been relinquished to computational ordering, other understandings of subjectivity and computation must be brought into play.

The use of language around computational forms is plagued by issues of clarity and accuracy of definitions, a mark of its complex relationship to the process of signification. The architecture of computation is made up of layers of representation, each further abstracting from its most irreducible element: a change in voltage.[5] In the example of personal computers, hardware is obscured by BIOS software, BIOS software by an operating system and an operating system by programmes, like the one

[1] Hildebrandt, Mireille. "Privacy As Protection of the Incomputable Self: Agonistic Machine Learning." *SSRN Electronic Journal*, 2017: 2, https://doi.org/10.2139/ssrn.3081776.
[2] Donna Haraway, "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective," *Feminist Studies* 14, no. 3 (1988): 581, https://doi.org/10.2307/3178066.
[3] Agre, Philip E. "THE ARCHITECTURE OF IDENTITY: Embedding Privacy in Market Institutions." *Information, Communication & Society* 2, no. 1 (January 1999): 8. https://doi.org/10.1080/136911899359736.
[4] Bernard E. Harcourt, *Exposed: Desire and Disobedience in the Digital Age* (Cambridge, MA: Harvard University Press, 2015), 32 - 35.
[5] "CTHEORY: There Is No Software," accessed December 5, 2022, https://web.stanford.edu/class/history34q/readings/Kittler/There_is_No_Software.html.

used to write this essay.[6] Necessitated by licensing and trademarking, a one-way process of encryption occurs that locks users out of the fundamental elements of machine software, and attempts to render hardware invisible. At the user end, softwares mimics analogue forms that have nothing technically in common with them (files, folders, recycling bins). Since the 1980's there has been serious discussion of the consequences of what is termed 'simulation' - the graphical endpoint of this process of abstraction, that constitutes the vast majority of interactions with computers today.[7] This is in contrast to the 'rational' use of computing, such as in early scientific work with computers, where the raw numerical nature of computation was interacted with directly. This essay will use the term 'computation' to refer to a broad set of processes and ideas, both simulative and rational. From the definition of computation as arithmetic performed by human actors, through to electronic computation and the machines, programmes, and networks that constitute contemporary 'Information Technology'. It is intended to encapsulate the use of algorithmic processes that interact across different scales: the programmes and softwares dictating global logistics, the algorithmic attunement of social media platforms; whilst acknowledging the material outcomes of the ideologies that drive technologies such as AI and the blockchain.[8] The use of this deliberately vague and all encompassing term aims to centre the unconscious and subconscious forces at work across multiple computational registers, while attending to computation as it functions within institutional frameworks.

The organisational complexity that computation engenders has been a driving factor in increasing wealth inequality, market instability, and the stripping of workers rights - as well as allowing for predatory algorithmic practices in institutions ranging from social media platforms to law enforcement.[9] This essay takes for granted that the general form of computation as it is currently used causes harm to individuals and groups across different scales and severities without delivering on its promises of increased productivity, efficiency or living standards for all.[10] By attempting to situate different computational processes in how they are operationalised by institutions and power structures, it addresses the buried logics that manifest these complex and various forms of harm. It contends that a psychoanalytic theory of computation can help to explain the inadequacy of computational ordering, particularly in attempts to apply it to the irreducible nature of subjectivity. Through Zizek's theory of

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[6] BIOS software is the software that controls the basic hardware operations of a computer, allowing it to turn on.

[7] Sherry Turkle, ed., *Simulation and Its Discontents*, Simplicity (Cambridge, Mass: The MIT Press, 2009).

[8] James Bridle, "The Stupidity of AI," *The Guardian*, March 16, 2023, sec. Technology, https://www.theguardian.com/technology/2023/mar/16/the-stupidity-of-ai-artificial-intelligence-dall-e-chatgpt. For examples of blockchain based failures see "Web3 Is Going Just Great,", including the leaderboard detailing the $12,097,216,396 'lost to hacks, scams, and fraud since January 1, 2021': https://web3isgoinggreat.com/

[9] Cite if have time

[10] Philip E. Agre, "THE ARCHITECTURE OF IDENTITY: Embedding Privacy in Market Institutions," *Information, Communication & Society* 2, no. 1 (January 1999): 1–25, https://doi.org/10.1080/136911899359736.

the law and its founding violence, this essay argues that the issues that computation faces can be attributed to the repression of the incomputability that inheres within it, by overreliance on axiomatic approaches. Incomputability can be understood as the ‘obscene superegoic underside’ of computation, existing in the Lacanian symbolic order of the Real. Through tracing the different logics of computation, it’s possible to examine how this computational Real impresses itself upon the networks and systems that structure everyday life.

In investigating how computation functions it is possible to delineate two lines of inquiry: the political and the technical. These two categories illustrate the material factors that constitute computation as this essay understands it. It is also useful to examine the ways they overlap and constitute each other, as political motivations often influence technical decisions and the technical properties of organisational structures shape political power. This approach draws on the work of Philip Agre in his text ‘Surveillance and Capture: Two Models of Privacy’.[11] By splitting understandings of privacy into the two models of surveillance and capture, Agre provides different tools for understanding different levels of computational apparatus. He states that surveillance 'originates in the classically political sphere of state action'.[12] A better understanding of surveillance can therefore be gleaned not from investigating what it is made up of, but the conditions that gave rise to it historically - why state power would be invested in its use and development. The capture model is equally metaphorical in nature, but illustrates how philosophically mediated the rational logics of the technical are. A deference to mathematical formalism in the recording, representing, and ordering of human activity compels the capture process. In this way the effects of the surveillance model are illustrated: how ‘captured’ information is used and applied back onto those producing it, shaping subjectivity. Capture therefore can be understood as a technical way of understanding certain functions of computation, and surveillance a political one. However, as mentioned, it is just as useful to attend to the overlaps.

TECHNICAL

The term ‘capture’ as it is used in programming culture connotes a threat of violence in the process of recording and representing information. Systems of capture would be most easily recognised as how factories, warehouses and fast food chains are organised, but capture systems are distributed throughout contemporary society in both public and private spheres. They have a historical and political context that pre-dates computation as we understand it today, a history that is closely tied to capitalist accumulation and the profit motive, but that relies on technical manifestations of

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[11] Agre, Philip E. “Surveillance and Capture: Two Models of Privacy.” in *The NewMediaReader,* ed. Noah Wardrip-Fruin and Nick Montfort, (Cambridge, Mass: MIT Press, 2003), 740-760
[12] Agre, “Surveillance and Capture”, 744

philosophical assumptions. For these systems to function, decisions must be made about what information to represent and how. Agre traces the practice back to industrial time and motion studies in how they impose certain logics onto the actions of workers and the structure of workplaces. He also follows this thread forward into how knowledge is represented within the apparatuses of artificial intelligence. Both require ontological clarification. In the factory: what counts as an action, how should actions be represented? In the field of knowledge representation: what is being taken as ‘known’ in this instance, and how will the symbols used to represent that knowledge be treated?[13] Programming culture takes these decisions for granted as ontological facts, failing to question what is lost in the process of representation, or what the genealogy of computational representation could reveal.

A notable aspect of this genealogy is the use of linguistic metaphors for human action in the processes of interpretation and representation that go into creating computable systems out of pre-existing activities. Agre points out that schemes of representation rely on formalising human activities into a 'language', 'for which a good representation scheme provides an accurate grammar'.[14] If each action is a word then these systems (or 'grammars of action') inform how these words are to be ordered. These grammars get articulated on an institutional level by an outside agency and then imposed onto people, who have to make their activities 'parsable'. There is a fiction that the capture process is only ever mapping a pre-existing logic 1:1, but the enacting of these grammars onto a language already in place always involves a reorganising of it. This can be through a rearrangement necessary for the grammar to work properly or through oversimplification, where the ontological clarification is not granular enough, or elements that don't fit into the grammar are discarded completely. In order to manage these reorganisations workers develop ‘work-arounds’ so that the activity can be completed, as well as re-orienting their work towards the gaze of the capture system and whoever is making use of the data it collects. Here, a sense can be gained of the stakes involved in addressing computational ordering, when its imposition obfuscates the very logic by which it’s being implemented (that of increased productivity).

The capture model renders visible the contortions that computation demands of whoever interacts with it. The work will 'take on a "performative" quality that belies the intendedly objective character of the representational process'.[15] Computation takes credit for the ordering already in place and forces those engaged with it to conform to its specific interpretation, performing compliance for the benefit of the institution that has implemented the system. Agre goes on to state:

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[13] Ronald J. Brachman and Hector J. Levesque, *Knowledge Representation and Reasoning* (Amsterdam ; Boston: Morgan Kaufmann, 2004), 23-27.
[14] Agre, 746
[15] Agre, 748

> 'capture is never purely technical but always *sociotechnical* in nature. If a capture system "works" then what is working is a larger sociopolitical structure, not just a technical system (Bowers 1992). And if the capture process is guided by some notion of the "discovery" of a preexisting grammar, then this notion and its functioning should be understood in political terms as an ideology.'[16]

Agre is clear that the process of capture will always misunderstand and misrepresent human activity. There are technical reasons for this, but it is crucially much to do with who has the power to decide what gets represented, and their motivations. When these processes and logics are framed as technological in nature, it is important to understand that technology is not just software and equipment, but the processes of analysis and re-ordering that the software carries out, as well as the social, political and economic motives imbued into the system. In the same way, computation generally must be understood not only as the calculations that make these systems possible, but the political, ideological and technical factors that inform how those calculations are conducted.

The inadequacy of systems that rely on computational representation, and their fiction of pure, transparent logic, point towards a computation that is repressing its own fundamental nature. Far from being independently capable of efficient ordering and organising across scales, where human action is concerned computation will always fall short. Agre's capture model offers an alternative tool for investigating computational logics as they are enacted in workplaces and beyond. Having reoriented social life further towards digital and online interactions, the ordering of day to day life based on the demands of social media platforms would be an example of this logic outside of the workplace. Users have determined that the Instagram algorithm shows a post to more people if it is posted at a specific time, so in order to 'work-around' the algorithm it is advantageous for users to structure time accordingly. This is alongside the reordering of life to the ends of 'capturing' content to post, both of which can be seen as a manifestation of an ongoing process of entrepenurialisation, as more of daily life is invaded by capitalist, work-oriented structures and orderings.[17] The political is never far from the technical, and the ways in which computation affects subjectivity can be seen in how captured information is subjected to computational logics and then imposed back onto lived experience. These logics are not purely technical, but always politically meaningful, and any fiction of computational representation as transparent and objective must be understood as an ideological project. This project is facilitated by cybernetic conceptions of computation, to the ends of repressing the Real of incomputability, as discussed in the final section of this essay.

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[16] Agre, 748
[17] Michel Feher, *Rated Agency: Investee Politics in a Speculative Age*, Near Futures (New York: Zone Books, 2018), 178-179.

POLITICAL

In order to understand how subjectivity and computation affect each other, a historical and political approach should be pursued, with special attention to surveillance as an agent of state power. Foucault's 'Panopticism' is a well worn touchpoint for this. It is a different type of model to those addressed so far, being less of a set of metaphors than a set of instructions. Foucault refers to a speculative architectural model, imagined by Jeremy Bentham, as the pure formal conditions for multiplying the effects of power. In doing so he describes how surveillance allows power to reproduce itself in the minds of those being surveilled, eliminating the need to actually exercise power through conventional means and assuring the 'automatic functioning of power'.[18] By separating out subjects and rendering them permanently visible (but unable to see the source of the gaze) the Panopticon creates an environment in which the subject knows they could be being watched at any moment. Unable to verify when they are being watched, subjects are forced to act as if they are always being watched, and thus to follow the rules of the institution watching them. Foucault traces the history of individualising disciplinary mechanisms and locates their animating force in the fear of illness and death, but stresses the differences between the plague stricken town and the Panopticon. The latter is a pure form of a political technology, able to reproduce versions itself in various different forms. The plague stricken town is a specific scenario that allowed for the most extreme exercise of power. Legitimised as a means to protect against death, it required new social arrangements and demanded visibility as an assurance that these arrangements would be adhered to. The Panopticon functions only to amplify power through *existing* social forces, ensuring that rules are followed, whether to the ends of workplace productivity or the orderly running of the prison.

Computation has taken up the technological potential of the Panopticon as distributed networks of computational systems facilitate increased organisation and control. Akin to the example of work to rule strikes (expanded on later in this essay), the meticulous rule following demanded by the panoptic institution would have a stifling effect on productivity if not addressed. Bentham claimed that this could be avoided and the increased effectiveness of power within a panoptic institution would be a productive force if a specific set of conditions were fulfilled. Foucault explains this function:

> '... the productive increase of power can be assured only if, on the one hand, it can be exercised continuously in the very foundations of society, in the subtlest possible way… what are required are mechanisms that analyse distributions, gaps, series, combinations, and which use instruments that render visible, record, differentiate and compare: a physics of a relational

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[18] Michel Foucault, *Discipline and Punish: The Birth of the Prison*, 2nd Vintage Books ed (New York: Vintage Books, 1995), 201

> and multiple power, which has its maximum intensity not in the person of the king, but in the bodies that can be individualized by these relations.'[19]

The exercise of power, then, must also become mundane, and no longer needs the physical manifestation of power in the body of the sovereign. In the panoptic institution power becomes invisible, being represented in the least spectacular way possible by its formal apparatus: consisting not only of the tower with its steady gaze, but systems capable of categorisation and analysis, distributed throughout society. The panoptic model is able to encompass all other previous disciplinary mechanisms and subtly apply them to the messy and minute. It is possible to see here how a distributed network, while replacing hierarchical power structures and operating without the need for the sovereign, doesn't represent an alternative to systems of organisation and control. Often seen as inherently disruptive to centralised power, the robustness of decentralised networks allows them to fill in blind spots and patch holes in the apparatuses of hegemonic power.[20] As in the case of cryptocurrency, the ideological values of decentralisation obscure the reality of an even more consolidated power than can be seen in hegemonic, hierarchical power structures.[21] The current dominant mode of power is that of the distributed network of Panoptic institutions and structures. From the keeping of records of individual internet search histories, to the kinds of monitoring software installed on work computers, computation largely represents disciplinary mechanisms of surveillance and control.[22]

If the distributed network currently represents the dominant form of power, this is an evolution of the state's historical demand for visibility from its subjects. In 'Seeing Like a State', James C. Scott speaks to how governments control populations by imposing measures that increase visibility, easing categorisation. Scott's investigations into the violent and coercive methods by which governments worldwide attempt to fix nomadic populations in place led him to conclude that, because 'people who move around' are harder to govern, their treatment provides an insight into the operating principles of statecraft:

> 'The more I examined these efforts at sedentarization, the more I came to see them as a state's attempt to make a society legible, to arrange the population in ways that simplified the classic

[19] Foucault, *Discipline and Punish,* 208

[20] Alexander R. Galloway, "Protocol," *Theory, Culture & Society* 23, no. 2–3 (May 2006): 317–20, https://doi.org/10.1177/026327640602300241.

[21] David Rosenthal. "Gini Coefficients Of Cryptocurrencies." Accessed May 3, 2023. https://blog.dshr.org/2018/10/gini-coefficients-of-cryptocurrencies.html.

[22] Corbyn, Zoë. "'Bossware Is Coming for Almost Every Worker': The Software You Might Not Realize Is Watching You." *The Guardian*, April 27, 2022, sec. Technology. https://www.theguardian.com/technology/2022/apr/27/remote-work-software-home-surveillance-computer-monitoring-pandemic.

> state functions of taxation, conscription, and prevention of rebellion. Having begun to think in these terms, I began to see legibility as a central problem in statecraft.'[23]

Scott notes how the standardisation that permeates and constructs social and political life has its origins in the state's need to simplify. It spans legal processes, agricultural practices, permanent last names and so on. Populations that reject any aspect of this process are subject to severe mistreatment at the hands of the state. As in Foucault's panoptic model, visibility and analysis are mandatory. State power requires mechanisms of seeing and analysing to ensure its (productive) power, and computation, built upon these same processes of organisation and categorisation, facilitates them.

As explored through the capture model, it is important to address the process by which a state arranges its population, as the act of categorising something or someone is not a neutral process. Scott compares it to mapping, where the function of a map is not to accurately depict every aspect of the area it pertains to, only those that will aid navigation. But the nature of state power is such that the characteristics of the map get imposed back onto that which is being mapped, aided by the force of the law. This mirrors the functions of the capture model, where a computational interpretation of a process has to be forced uncomfortably back onto the reality it's supposed to be mapping. The example Scott gives to explain how formal orderings fail is that of the work to rule strike:

> 'Designed or planned social order is necessarily schematic; it always ignores essential features of any real, functioning social order. This truth is best illustrated in a work-to-rule strike, which turns on the fact that any production process depends on a host of informal practices and improvisations that could never be codified. By merely following the rules meticulously, the workforce can virtually halt production.'

The example of the work to rule strike could be argued as a mode of resistance against the ubiquitous enforcement of computational logics. By performatively projecting their own simplification back on to the system they are being forced into, workers and citizens can reject legibility and lay bare the inadequacy of organisational models. An act of malicious compliance can then be a critique and a declaration of selfhood in institutions in which, by virtue of being organised by a computational process, humans are treated like robots.[24] The kinds of ordering required by statecraft differ slightly from those of the capture process as they are not as bound up in the fiction of pure representation.

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[23] James C. Scott, *Seeing like a State: How Certain Schemes to Improve the Human Condition Have Failed*, Yale Agrarian Studies (New Haven: Yale University Press, 1998), 2

[24] Lyons, Kim. "Bezos Says Amazon Workers Aren't Treated like Robots, Unveils Robotic Plan to Keep Them Working." The Verge, April 15, 2021. https://www.theverge.com/2021/4/15/22385762/bezos-letter-shareholders-amazon-workers-union-bessemer-workplace.

They are, however, insidious in other ways, such as their quiet ubiquity and the threat of violence that legitimises them.

FOUNDING VIOLENCE

To understand the systems of power that bring these orderings into being, it is possible to look at the foundations of state power and to probe its origins. Taking this as a purely historical or anthropological task would likely lead to the conclusion that state ordering emerged in various and multiple forms for just as many reasons, and no cohesive founding story of hierarchical society could be arrived at.[25] But by interrogating the founding moment of the law in a philosophical and psychoanalytic sense, the law can be seen as the force that gives legitimacy to the state imposition of logics and orderings, and its founding violence as implicated within them. The Weberian understanding of the state as that which 'lays claim to the monopoly on the legitimate use of physical force' can help to draw this link between the law and the orderings of the state.[26] The legitimated threat of violence accounts for the kind of coercive and preemptive power seen in the capture and surveillance models, woven through the panoptic model and the imposition of legibility that is foundational to statecraft (though their mechanisms put different amounts of emphasis on the power of the threat vs actual acts of violence). In her text 'Žižek on Law' Jodi Dean unpacks Slavoj Žižek's different engagements with the law.[27] In Žižek's theory of law, the law is split, comprising one element that works socially and externally, and one that resides in the internal life of the subject. This internal element of the law is what Žižek refers to as law's 'obscene superego underside' and represents a necessary, constitutive inverse that animates the public, external law, binding communities through guilt, or rather the disavowal of that guilt.[28] Law's founding violence can be considered as its attempt to conceal this split, a process that must be continuously enacted to maintain law's legitimacy. If violence is turned into law by the Event that continuously founds the law and conceals its split nature, the state is imbricated in the founding violence of the law, its monopoly on the legitimate use of physical force equally supported by this concealment.

[25] David Graeber and David Wengrow, *The Dawn of Everything: A New History of Humanity* (London: Penguin Books, 2022), 21-26.
[26] Max Weber, Guenther Roth, and Claus Wittich, *Economy and Society: An Outline of Interpretive Sociology* (Berkeley: University of California Press, 1978), 54.
[27] Dean, Jodi. "Žižek on Law." *Law and Critique* 15, no. 1 (2004): 1–24. https://doi.org/10.1023/B:LACQ.0000018770.92058.29.
[28] Slavoj Žižek, *The Metastases of Enjoyment: Six Essays on Woman and Causality*, (London ; New York: Verso, 1994), 54-85.

Žižek bases his engagement on Freud's 'Totem and Taboo', as a myth that explains the role and structure of the law.[29] In it, the band of brothers kill the primordial father, gaining access to the father's monopoly on power and dividing it amongst themselves. This creates a new order in which the band of brothers can satisfy their own desire so long as they don't impinge upon each other's abilities to do so, each agreeing to restrict their own access to pleasure (the incest prohibition). Žižek considers this the founding Event of the law, which the liberal social contract functions to conceal. Dean explains:

> 'The fantasy of rational agreement founds law by concealing the violent move from nature to culture, the traumatic transmutation of the law of nature into sovereign authority.'[30]

In order for law to exist, it must have overthrown something else, and the crime of this usurpation is what must be repressed. This 'rational agreement' that protects state subjects from the Hobbesian state of nature and the tyranny of the primordial father is undermined by the fact that, in killing the father, the brothers do not in fact free themselves of his prohibitions, they only conceal his violence and elevate him to the symbolic order of the law (in the form of its 'superegoic underside'). In attempting to escape the desires of the Other, a new Other is created within the subject. Law's inability to adequately account for its own foundation reveals its incompleteness and inconsistency, which must be filled in and covered up by means of the superego. It is only through the superego and its role in facilitating belief in the law and its rational founding that the loop can be created whereby the law justifies itself as 'authentic and eternal'.[31]

Žižek doesn't see this condition as being entirely hopeless or pessimistic, and encourages seeing past the socio-symbolic order and meeting the Real in others with love and care. Without the symbolic or imaginary Lacanian orders we are left only with the Real, which presents as terrifying and confusing, impossible to look directly at.[32] This engagement requires bravery, facing desire without fear that it will contradict with or be corrupted by the desires of the Other, overcoming the pressure of law's superegoic underside. Dean posits the work to rule strike as a way of doing this:

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[29] "© PSYCHOMEDIA - JOURNAL OF EUROPEAN PSYCHOANALYSIS - Slavoj Žižek - The Big Other Doesn't Exist." Accessed May 12, 2023. https://www.psychomedia.it/jep/number5/zizek.htm.
[30] Dean, "Žižek on Law", 7.
[31] Slavoj Žižek, *For They Know Not What They Do: Enjoyment as a Political Factor* (London ; New York: Verso, 1991), 204.
[32] Jacques Lacan, Alan Sheridan, and Jacques Lacan, *Écrits: A Selection*, Repr (London: Routledge, 1999), ix-x.

> 'What is at stake in moving beyond the law, then, is renouncing its fantastic superego supplement. One way to do this is by sticking to the letter of the law, doing precisely what it says. We might think of examples like 'work to rule'.'[33]

By reducing the law to its literal form and resigning it to the imaginary and symbolic orders alone, there is an opportunity to drain the law of the power of its founding violence and treat it as what it is: mutable and shallow. If the state's founding violence is also tied up in superegoic consensus, then the logics of work to rule may be capable of delegitimizing it. Using work to rule to confront the Real and depleting the superegoic guilt by which the state can interpolate the subject might be interpreted as sleight of hand, as Dean points out. But, when applied to computational ordering, it is compounded by revealing the inadequacy of the representational schemes being enacted and the inherent irreducibility of subjectivity. Work to rule can then reveal the founding violence of the law/state and tie computation in along with it. With this in mind, if founding violence is that which must continuously conceal its own inconsistency, there is a founding violence within computation itself, that of axiomatic maths and incomputability.

INCOMPUTABILITY

Incomputability is the theory by which the threads of this essay come together. Mathematician Gregory Chaitin developed a computational proof he called 'Omega' - a number which is infinite both in length and randomness.[34] Unlike previous work on incompleteness and uncomputability, Chaitin's Omega number can be seen as a mathematical entity that radically subverts systemic rationality. Luciana Parisi builds on Chaitin's work, explaining how incomputability is inherent to algorithmic logic, underlying and animating it.[35] To compute something was once an action undertaken by an individual - computer was a job title. Before electronic digital computation, endeavours such as predicting the weather were the work of a team of people.[36] As electronic digital computation has become embedded into contemporary life it has created recursive logics whereby these actions are automated and reinforce themselves both internally and, as discussed in relation to systems of capture, externally - back onto human action, creating a loop that, similarly to the law, justifies itself. Computational systems are insufficient not only because they are fundamentally less complex than the analog world, but because they contain within them the kernel of the incomputable, suppressed

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[33] Dean, 21.
[34] G. J. Chaitin, "The Halting Probability Omega: Irreducible Complexity in Pure Mathematics" (arXiv, November 23, 2006), http://arxiv.org/abs/math/0611740.
[35] Luciana Parisi, *Contagious Architecture: Computation, Aesthetics, and Space* (S.l.: MIT PRESS, 2022) ix-xviii.
[36] Lewis Fry Richardson and Peter Lynch, *Weather Prediction by Numerical Process*, 2nd ed. (Cambridge University Press, 2007): v-viii, https://doi.org/10.1017/CBO9780511618291.

precisely because it proves mathematics might not be less complex than physics.[37] They are limited by the story of axiomatic mathematics, haunted by their own incomplete rationality and subject to the emergent qualities of incomputability. Axiomatic mathematics requires a process of simplification and representation that can be seen as the founding myth of computation, and its superegoic underside can be considered as the in/uncomputable.[38]

The concept of the uncomputable has historically fallen into three categories:[39]

1. Rational Limits to Computation

The rational limit of computation is the most historically contested. Gödel and Turing provided proof of an incompleteness in the formal axioms of mathematics and computation, presenting a limit to the rationality of maths itself.

2. Practical limits

To say something is uncomputable can be to say that it is simply too complex for any computer currently available to solve in a knowable amount of time, so the practical limits to computation are those concerning time and computing power. An uncomputable problem is, in this sense, something a cryptographer would deploy to secure or hide information, by encrypting it with a problem that it would take too long to solve by raw computing power alone.

3. The Analog

The analog is that which computation cannot get a firm grasp on because it escapes the world of symbols and signs. Experiences of affect and intuition would fall into this category, though many computer scientists dedicate themselves to trying to compute these things, such as in the field of affective computing, which seeks a computational understanding of emotion.[40]

The rational limits of computation, though not entirely extricable from the practical limits and the limits imposed by the analogue world, provide a convincing account of the flawed logic at the root

[37] Chaitin, "The Halting Probability Omega", 13
[38] Parisi refers to 'incomputability' as opposed to 'the uncomputable', so this essay refers to Parisi's thinking as 'incomputability' and the other categories of 'uncomputability' as such. This also serves to differentiate historical understandings of uncomputability - based on incompleteness - and incomputability - which represents a development and application of Chaitin's Omega.
[39] Alexander R. Galloway, *Uncomputable: Play and Politics in the Long Digital Age* (Brooklyn, NY: Verso, 2021), 3.
[40] Rosalind W. Picard, *Affective Computing* (Cambridge, Mass: MIT Press, 1997), 1-18.

of computation. As mentioned above, this is based on questions around the axiomatic method. The axiomatic basis of mathematics emerged from the view that maths is a pure representation of nature, or reality. Likely a fable, there is a story that while at sea Hippasus of Metapontum introduced his discovery that the square root of two is an irrational number, meaning it contains an infinite, non repeating sequence of decimals (1.4142135623731…). This angered the Pythagoreans so much that he was thrown overboard for denying their doctrine that all the universe was representable by whole numbers and their ratios.[41] The image of Hippasus left to die alone and adrift after breaking open the Pythagorean's system speaks to the danger of entangling oneself with the irreducible Real, risking being left without a reliable set of rules and methods for organising and developing thought. The mathematician David Hilbert formulated an axiomatic programme in the early part of the 20th century designed to resolve the foundational crisis in mathematics that was occurring at the time, precipitated by the discovery of instabilities within the foundations of mathematics.[42] Kurt Gödel's incompleteness theorems proved that this was largely impossible. Gregory Chaitin describes Gödel's proof in the form of a philosophical problem:

> Consider "I am unprovable." It is either provable or not. If provable, we are proving a false assertion, which we very much hope is impossible. The only alternative left is that "I'm unprovable" is unprovable. If so it is true but unprovable, and there is a hole in formal mathematics, a true assertion that we cannot prove. In other words, our formal axiomatic theory must be incomplete, if we assume that only true assertions can be proved, which we fervently hope to be the case. Proving false assertions is even worse than not being able to prove a true assertion![43]

It is taken for granted that a mathematical proof can only prove something that is in fact true, this solid ground remains in place to stand on. Chaitin explains Gödel's proof as being a mathematical articulation of the statement 'I am unprovable', which can only ever be true as, if maths were able to prove the unprovable (if it were able to lie) an axiomatic flaw would become a relatively minor problem. So if axiomatic maths cannot prove this true statement, then it is incomplete. Gödel's findings were largely ignored until the idea of incompleteness was picked up by Alan Turing 5 years later, in 1936. Using a similar method to Gödel's, Turing proved that there is no way to calculate whether a given computer programme will stop running (halt) or not, and in doing so proved, through more mechanical methods, that axiomatic maths is incomplete and unable to account for the operations of mechanical computers.

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[41] Morris Kline, *Mathematical Thought from Ancient to Modern Times* (New York: Oxford University Press, 1990), 32.
[42] J. Ferreiros, "The Crisis in the Foundations of Mathematics," in *Princeton Companion to Mathematics*, ed. Timothy Gowers (Princeton University Press, 2008), 142-156.
[43] Chaitin, 3.

Consequences of the uncomputable have provided an underside to electronic digital computation since its inception, the Turing machine being the predecessor to all modern computers.[44] Different schools of thought around computation have taken different approaches throughout that time. The term 'Cybernetics' was coined by mathematician and philosopher Norber Wiener at the third Macy Conference in 1947. Now called 'first-order cybernetics', these conferences introduced the idea that computational representation was sufficient, alone and self-contained, to describe any analogue process, with a particular interest in biological and social systems (Weiner understood organisms and machines as 'models of each other').[45] Second order cybernetics incorporates indeterminacy by opening the system and dynamically modelling the world, attempting to bring more of the analogue into the computational system. Both approaches are attempts at confronting the limits of computation. First-order through a belief, akin to the early pythagoreans, in the direct mathematical composition of the universe. Meaning any simulation or modelling of the mind is prevented only by practical limits, which will someday be overcome. While second-order attempts to fuse computation and the analoge so that an algorithmic process will re-programme itself reflexively in response to inputs from the analogue world. What this approach misses is that algorithmic processes are always already imbued with indeterminacy, instead of needing to borrow it from the analogue world. This is what the work of Gregory Chaitin expands upon.

Chaitin adds a 4th category by building on Turing's halting problem. The halting problem operates under the assumption of an infinite amount of time. When given a finite amount of time, it is possible to calculate the probability of a programme halting. Meaning that in order to prove incompleteness and the rational limits of computation, the practical limits of computation must be ignored. The existence of Omega provides an understanding of uncomputability outside of these historical limits. Where Gödel and Turing use 'sneaky viruses' to prove that the axiomatic system can be broken, Chaitin presents proof of the uncomputable in the form of discrete mathematical entities.[46] Chaitin describes his Omega Number (Ω) as 'an extreme case of total lawlessness; in effect, it shows that God plays dice in pure mathematics'.[47] Omega is the most compact possible way to calculate the probability of a programme halting. It is completely irreducible in its complexity - there is no way of representing it other than in its full form. Chaitin provides an encounter with the irreducible Real and proves its presence in the deepest level of computational logic.

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[44] Chaitin, 4.
[45] Jean-Pierre Dupuy, *On the Origins of Cognitive Science: The Mechanization of the Mind*, A Bradford Book (Cambridge, Mass: MIT Press, 2009), 73.
[46] Robin Mackay, "Notes on the Incalculable Real and Chaitin's Omega," *Robin Mackay* (blog), accessed April 27, 2023, http://readthis.wtf/writing/notes-on-the-incalculable-real-and-chaitins-omega/.
[47] Chaitin, 12.

The irreducible Real of uncomputability manifests itself through failures and inconsistencies in operations of statecraft and algorithmic control. Luciana Parisi's work on incomputability takes Chaitin's Omega number and asserts the systems and mechanisms that carry and regenerate it, specifically how algorithmic objects develop their own discursive internal entropies. According to Paris, algorithms represent not just instructive patterns of discrete binary digits, but the indeterminate space in between 1 and 0. This is the effect of Omega as it exists within all computational processes, creating a randomness that is now conditional to all programming culture.

> 'This new function of algorithms thus involves not the reduction of data to binary digits, but the ingression of random quantities into computation: a new level of determination that has come to characterize automated modes of organization and control. Far from making the rational system of governance more efficient, this new level of determination forces governance to rely on indeterminate probabilities, and thus to become confronted with data that produce alien rules. These rules are at once discrete and infinite, united and fractalized.'[48]

In contrast to the ideas of second-order cybernetics, Parisi relates how the introduction of more data and more inputs from the analogue world does not seem to be stabilising computational systems, but in fact making them more chaotic. This happens as part of the process of representation that occurs when transforming information into mathematical quantities. In making something computable, tiny quantities of incomputability get introduced that eventually start to compound. Incomputability is an inherent condition of computation, just as transgressions of the law are a condition of its stability.[49] Because of this, governance can no longer rely on electronic digital computation to order data into the kinds of legible systems that James C Scott refers to. The distributed mechanisms of the panoptic model have been partially blinded and wholly overwhelmed. Parisi points out that the concepts of transparent representation and organisation of information endorsed by cybernetics function to conceal this condition, allowing its use by systems of control and the development of the computational culture seen today.[50] This is the God trick at work - it is the same ideological and philosophical force behind the process of capture, and it is how computation continuously conceals and justifies the conditions of its own existence.

CONCLUSION

Overinvestment in axiomatic systems reduces human subjectivity to its computable form and conceals the incomputability that inheres within computation. Mathematics and the law are both

[48] Parisi, *Contagious Architecture, x*
[49] Parisi, 14
[50] Parisi, 16

incomplete and subject to superegoic logics that conceal that incompleteness. The iterative nature of incomputability, as it bubbles up between the cracks of computation, can be compared to that of the founding violence of the law, as it returns throughout statecraft in the imposition of logics and orderings. The instabilities that haunt state and computational ordering, from the personal and tedious to the macroeconomic, can benefit from being understood in this psychoanalytic sense. The counterintuitive application of methodologies concerned with the unconscious forces of the human psyche can, along with an approach to mathematics that equally strips away that which is taken for granted or repressed, provide an argument for a reassessment of computation. One that takes into account the political, historical and ideological determinants of computation, and takes accountability for the shaping of subjectivity that computation inevitably enacts.

Computation is not the stable and rational force that cybernetics conceptualises it as, it determines itself over and over with every calculation.[51] As more and more data is introduced into computational systems and networks, more indeterminacy is introduced in the form of incomputability. If computers can also be understood as constantly self determining, then the application of the computational expectation of consistency and predictability to people and their lived experiences loses some of its animating force.[52] This is not to draw an equivalence between biological and computational systems, but to echo Chaitin's call for more nuanced axioms.[53] Perhaps expanding this to suggest a more materialist and less ideological basis for computation. This is why the logic of the work to rule strike offers a mode of resistance - by taking computation and the law to their absurd reductions, the superegoic command to obey no longer produces a guilt to sustain it. Distributed networks of control become unproductive, revealing that the true power of these incomplete systems was not in their rationality, but in the irrationality of subjectivity and incomputability.

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[51] David Beer, "Explorations in the Indeterminacy of Computation: An Interview with M. Beatrice Fazi," *Theory, Culture & Society* 38, no. 7–8 (December 2021): 289–308, https://doi.org/10.1177/0263276420957054.
[52] Hannah Arendt, *The Human Condition*, 2nd ed (Chicago: University of Chicago Press, 1998), 247.
[53] Chaitin, 12

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