Data Mining on the Crawl Frontier: Metaphor in Cybernetic Capitalism

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1 Introduction

One of the key functions of metaphor is to explain something abstract in terms of something concrete. In their seminal study, Lakoff and Johnson note that thinking with metaphor is a part of human nature; they stem from embodied experience, and they structure our interpretations of reality through the fundamental place they occupy in the process of making meaning. Their understanding of metaphor is connected with their work on the embodied mind (1999), understanding consciousness as being inherently about embodiment—thus putting it opposition to theories of mind developed in parallel with computing-machines, specifically cognitivism and computationalism, which reprised the Cartesian dualism from early capitalist modernity. Lakoff and Johnson also note that it is necessary to employ metaphors in order to understand and experience the intangible thing in terms of something more familiar (2003). Putting this differently, metaphors are essential to thinking and they demand an act of abstraction, a stepping back from the immediate and making connections between the known and unknown. Describing something intangible via something familiar becomes increasingly necessary and loaded as the object being described becomes more complex.

This latter point is particularly important with respects to the

quantitative transformations in technoscientific practices that began in WWII, and specifically for the sake of this article, the rise of computing-machines. These deviously complex devices first emerged within the military-industrial complex when intellectually trained workers were systematically organised into technoscientific research institutes capable of bringing forth material practices at a new level of abstraction. Across this paper, abstraction is understood as a material practice, a lived relation with the world that is shaped by patterns of social practice.[2]

The functioning of a computing-machine is intensely abstract, operating through minutely controlled flows of electricity through intricately fabricated complex of metals and plastics, which are in turn woven into layer upon layer of code—itself spread across many layers of abstraction and via interoperability, protocols, legalities, surveillance, commodification, labour regimes and intellectual property rights. These technologies are intimately bound up with multidimensional transformations and qualitative changes that amount to a new mode of practice that I call 'cybernetic capitalism' (Ström, 2022). The whole process is ecologically ruinous: it is extremely resource intensive, consuming massive amounts of electricity and producing great amounts of toxic by-products and e-waste once the computing-machines pass through their short product life of built-in obsolescence and compulsory upgrades (Cubitt, 2017).

So computing-machines are entirely material yet eminently abstract. While one can easily hold, say, a new iPhone—one of the most fetishized techno-commodity and status symbol of the 21st Century—in one's palm, their operation is fundamentally intangible: it is a black box connected via high-frequency invisible signals to a sprawling network of other black boxes, from antenna to data-centres. While plainly every technical step and component of this process is understandable to those with sufficient intellectual training, the sheer breadth, depth, density and intensity of these processes far exceed the ability of any one person's possible understanding (and this is not even getting beyond the level of technical operation, let alone the social,

historic and ontological aspects).

This combination of the everyday and arcane, the operable and unintelligible, the hyper-rational and the fetishized, make contemporary high-tech fertile ground for metaphor. For example, early in the cybernetic era, computers were often understood through mechanical metaphors, often drawn from its entanglement with the missile programs with which they were intimately involved: software can *launch* and *crash*, it operates via *engines* and *drivers*, and transmitted messages enclose the *payload* in metadata. In these cases, missiles served as a more tangible and familiar way to understand the abstract operations of software. Across the 1970s computers began to move out of military domain and become commercialized. The metaphors used for the new possibilities of software were strongly grounded within a rather dim bureaucratic imagination: a computing-machine has a *desktop* that allows access to a hierarchy of *folders within which one can s*tore *files* and *scroll* through *documents* etc. These metaphors seek to normalise and reground computing-machines, making out that they are smoothly continuous with older forms, masking the radical difference between, say, a wooden desktop and the 'desktop' simulated via a graphic user interface. In both these cases, the military and bureaucratic metaphors are rather apt, for indeed the materiality of computing-machines largely came into being via military bureaucracies and the research institutes that serviced them. More broadly, critically reflecting on them can tell us something about the world order that of cybernetic capitalism.

A key question then is: what work do metaphors do? They function as a way of coping with extreme abstractions, to make them seem more tangible, less like apparatuses of alienation, giving them a veneer of familiarity. In this essay, I examine some rather apt computing metaphors, while also noting that other metaphors can actively obscure deeper understanding. The point is not to denounce metaphor, for it is essential to thinking and necessary to get a grasp of abstract mechanisms, but rather to take them seriously and think through their implications. Metaphors risk falling into euphemism,

an easy word to replace the more confronting reality. In a society so thoroughly remade by the practices of intellectually trained workers, the prefix 'smart'. for example, suggests a self-evident social good, although its etymological roots implied the pretentious as well as the painful. A 'smart' doorbell, such as those produced by Amazon's Ring or Google's Nest, reconfigures entirely a door bell's original, highly tangible and simple functions. Through the resource intensive and ecologically ruinous ensemble of networked computing-machines, these surveillance devices are intimately bound up with empowering police, automating racial profiling, exacerbating inequality, spreading suspicion and fragmentation (Selinger and Durant, 2021). All of this is obscured by the shiny Silicon Valley euphemism 'smart'.

2 In Search of Search

Consider the trademarked verb 'Google'. This word is certainly a lot easier than saying something more technically precise, such as: 'engage a world-spanning techno-scientific surveillance apparatus that is integrated with the military-industrial complex, systematically promotes consumerism and essentially doesn't pay tax'. Here, using a corporation's name as a synonym for 'search' functions as something like a euphemism for the actual processes involved. Yet again, on closer inspection, the word, much like the corporation it names, is a compelling example of the work that metaphors do under conditions of cybernetic capitalism. The word 'Google' was first scrawled on a bureaucratic form on the 4th of September 1998 when the company's cofounders, Larry Page and Sergy Brin, having accepted US$100,000 worth of venture capitalist funds, registered their start-up company. They chose this name in reference to an obscure mathematical concept 'googol', a number represented as a one followed by one-hundred zeros, or in scientific notation as 10^{100}. The word googol was apparently coined in 1920 by the nine-year-old nephew of the mathematician Edward Kasner (Bialik, 2004). This bright little anecdote behind the word fits into the playful tone that the co-founders wanted to convey. Shortly afterwards, they said: 'we liked the spelling "Google" better',

adding 'it sounds cool and has only six letters'. Behind this, we can read a desire to trademark the name and solidify a brand.

It is worth pausing to consider the scale of 10^{100}. A googol is 10,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000. This number is absurdly vast. Through its sheer size, a googol is so abstract as to be removed from everyday human-scale comprehension. Its torrent of zeros communicates a functionally meaningless 'very big' to almost everyone. To try and put the number into some perspective, in *Cosmos,* Carl Sagan estimated that there may be around 10^{80} elementary particles in the entire universe (1981). Regardless of the accuracy of that estimate, it serves as an illustration for just how big the number that a googol represents is. Yet, while we may not be able to fully comprehend the scale of a googol with our embodied understanding, it is a specific number and can be manipulated by the rules of mathematics. According to the co-founders, the immense size of a googol 'fits well with our goal of building very large-scale search engines' (Brin and Page, 1998).

Thus, from within the name 'Google' it is possible to detect the company's nerdy humour, their calculated economic motivations and their massive, expansionist ambition. Given the tremendous scale of 10^{100}, the company's name can be seen as being based on a kind of totalizing abstraction, a number bigger than the universe. Taken together, 'Google' is an unusually apt name, that attempts to graft a 'human face' onto the inhuman apparatus of cybernetic capitalism. It is both a euphemism that conceals the eerie abstractions that are increasingly interwoven into everyday life, and more broadly a metaphor for the conjuncture.

It is worth considering in a little more depth just how Google's fabled search-engine operates, as this can reveal the work of metaphor, not only in obscuring but also in generating abstractions. The search-engine functions like a map of the web, enabling people to navigate the abstract terrain of cyberspace and locate sites of interest. Through technoscientific research, Google created ways to automate this

mapping, a breakthrough that proved particularly useful and was foundational to the company's initial surge in popularity, and growing interest of investors. On its own, however, the use value provided by its search-engine stubbornly failed to make a profit. Under pressure from venture capitalist investors, Google remedied the problem by the apparently accidental discovery that plain text advertisements inserted into search results, in combination with intense surveillance, could yield tremendous profit (Ström, 2020). Once activated, this technoscientific method of profit extraction and consumeristic manipulation lead to immense flows of money that have powered an epic expansion way beyond web indexing. In 2021, the conglomerate recorded another record-breaking revenue. COVID-19 greatly boosted their business, and the company rake in $257.6 billion, approximately the same size as the GDP of Pakistan, home to 220 million people. Page and Brin, Google's magnate overlords, each have personal wealth in excess of $100 billion; a grotesque concentration of wealth in a world where half the total population lives on less than $5.50 a day.

The foundational algorithm PageRank was built to impose order, a task it accomplished through surveying the abstract architecture of links that weave the World Wide Web together and noting where they point – something like a greatly expanded, automated academic citation index. By functionally ignoring the content of any particular web page and focusing instead on the structure of hyperlinks, Google secured an early advantage over competing search-engines in the late '90s and early 2000s, which it leveraged to gain immense monopolistic power (Pasquinelli, 2009). PageRank is now only one component of a far more complicated cybernetic process that draws on hundreds of factors, including real-time locational awareness, emotional sentiment analysis, voice recognition, personal history, biometric information, and targeted, customised advertisements. Today, Google still describes itself through metaphors such as a 'library', or the 'index at the back of a book'. But these are increasingly distant. The 'citation index' metaphor is not strong enough to try and grasp the hundreds of algorithms that run alongside PageRank, let alone the broader scope of the tech-titan's operations, from self-driving cars to facial recognition technology.

Citations comes from the one-dimensional world of text, and while it can apply to the hypertext links of the web, cybernetics expands far beyond the indexing of words, demanding more expansive metaphors.

Using another metaphor to try and explain their abstract operations, the company states: 'We continuously map the web and other sources to connect you to the most relevant, helpful information' (Google, 2022a). This mapping metaphor is suggestive. To make a map, one must survey the terrain and abstract from it, plotting what is deemed useful onto a representation that is usually controlled by the powerful and instrumentalised to further their goals. Mapping has a long imperial history and the metaphor carries something of this inherently expansionist agenda. Today, surveillance on world-historic levels allows networked computing-machines to extract and organise immense quantities of data into a vast cybernetic map of the abstract terrain, one that is thoroughly instrumentalised in the interests of imposing control and intensifying consumerism. The company's cyber-map is not only woven out of the web. It also involves 'other sources', crucially including the person conducting the search themselves: the conversations they had in listening range of a microphone, their facial expressions, recent purchases their friends made, and so on. There is a long historical connection between surveying and surveillance, with the former often laying the groundwork for the latter (Ström, 2020).

To create the cybernetic map that their search-engine uses, Google constantly has tiny programs called 'crawlers'—also known as both 'bots', short for robots, or 'spiders"— conduct automatic surveys of the web, indexing, abstracting, enclosing. In the company's own words: 'Most of our Search index is built through the work of software known as crawlers' (Google, 2022a). There is something inherently creepy about the crawler metaphor, suggesting servile behaviour, or perhaps the uncomfortable swarming sensation captured by 'skin crawling'. Likewise, spiders and robots are also associated with creepiness, respectively ancient and modern. And yet, these words are used in a strikingly unreflective way, as if they are purely technical terms completely divorced from the history of hocus-pocus. Rather,

they are entirely focused on the deadly serious problem of granting a corporation power over the world's information. This involves vast amounts of surveillance, advertising and commodification, pushed as close as possible to what former Google CEO Eric Schmidt himself described as 'the creepy line'.

From Google's data-hives these spider-bots figuratively crawl their way through the internet and beyond, extracting surveillance data and processing it into the weave of a cyber-map which simplifies and overlays the web and many colonies beyond it. Control over the map and the weavers is central to Google's immense social power. The main crawlers are called 'Googlebots', which come in both Desktop and Smartphone iterations, but these are increasingly supplemented by a whole series of other crawlers, including AdsBot, Mobile AdSense, AdsBot Mobile Web, AdsBot Mobile Web Android, AdSense, APIs-Google, Feedfetcher, Mobile Apps Android, Googlebot Images, Googlebot News, Google Read Aloud, and Googlebot Video. Of course, Google is the biggest of many institutions whose crawlers now prowl the web. It was estimated in 2016 that slightly more than half of the internet traffic is consists of bots, not humans, a ratio that has steadily tipped further towards the machines in the years since. The report divided the bots into eight categories, which in turn were put into a questionable Manichean framework, with so-called 'good bots' composed of search-engine bots, commercial crawlers, monitoring bots and feed fetchers; and 'bad bots' including impersonators, scrapers, spammers and hacker tools (Zeifman, 2017). Considering the possible downsides of endless consumerism and the centralisation of power and wealth that accompanies it, the report's 'good bots' seem less benign.

Should you wish to verify that the Googlebot crawling your website is the real thing, rather than another spider-bot fraudulently pretending to be Google—a regular occurrence—then one must speak its language. The following will confirm its true identity:

> host 66.249.90.77

77.90.249.66.in-addr.arpa domain name pointer rate-limited-proxy-66-249-90-77.google.com.

Such occult communications are utterly alien to the vast majority of people. Indeed, Google's success has been in making them part of the background everyday rhythm of life. Surreptitious practices and alien abstractions are hidden behind slick web design.

The corporation sends forth its swarms of spider-bots to constantly crawl through cyberspace. Their expansion follows the dictates of the 'crawl frontier,' a creepy colonial metaphor that refers to the encoded logic of how the spider-bots process the websites they encounter. As they go, the crawlers engage in 'scraping', the extraction of data from websites in order to weave their map-web. This scraping is a key moment in 'data mining'; the ability to extract patterns and knowledge from large data sets is central to how Google functions. Again, the recurrent colonial and extractive metaphors in computer science subconsciously reveal the power structures that have sponsored and enabled their development, and that they work to intensify.

The mechanics of Google's fabled search algorithm—in practice hundreds of overlapping algorithms—are of course one of the firm's most closely prized possessions, protected by much corporate secrecy and fortified by regimes of intellectual property rights. Spider-bots carry out abstract enclosure movements. Outsiders are granted access to it one level: you can search it, navigate with it or even add to it. But beyond that, it is inaccessible and unintelligible: Google's jealously guarded private property. It is possible to pay money for better advertising placements or web analytics, and this may lead to greater insights being provided by Google and a strategic advantage vis-à-vis one's competitors. Nevertheless, the cyber-capitalist corporation firmly controls the means of abstraction.

While the inner workings of Google's apparatus are black-boxed, it is possible to communicate with it via the spider-bots, to promote or to deter their advance; either way, one must negotiate on their terms. On the promotional side, many people work hard to get their business/website the best listing possible through Google and their maps, for success is closely bound up with their automated processes. One can—to use the technical phrase—'submit a crawl request' to Google, with this

highly subservient language giving a glimpse of the power relations at play. The engineering of self-serving submission has become big business. A whole industry of consultants, agents, spam-farmers, and self-help gurus help people to game Google's systems. Meanwhile, the corporation plays a counter-strategy, seeking to limit the gaming of their systems so as to pressure websites and businesses into outbidding their competitors on Google's advertisement system.

Alternatively, some websites may wish to stop the crawl of Google's bots on their websites, or to place limits on where the tech-titan can map within a site. One does this through updating a website's 'robot.txt,' a component of metadata that can communicate with crawlers as they scurry through the web. There, one can encode a request like this (note the use of 'meta' in the formal language of the code):

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<meta name="robots" content="nofollow"><meta name="googlebot" content="noindex">
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Properly encoded, this abstract incantation can hold the spider-bots at bay, albeit at the cost of one's listing on the search-engine. Such is the contract of cybernetic capitalism: operate according to the terms unilaterally offered by the tech-titans or wallow in obscurity.

Spiderbot activity, moreover, extends far beyond the internet and reaches deep into the nooks and crannies of everyday life. Crawlers extract and analyze immense streams of data across multiple communication technologies and 'internet-of-things' devices . These data traces, too, are processed by extremely energy-intensive and world-spanning networks of computing-machines with the goal of manipulating people into engaging in more techno-mediated and consumeristic patterns of practice.

Take for instance the seemingly endless audio recordings made by Google's Assistant (or Amazon's Alexa, or Apple's Siri, etc.). This audio surveillance data is mined by various speech recognition bots, emotional sentiment analysis algorithms and so forth in order to offer its 'convenience'. Video-streaming live meeting apps, such as Google Meet (or Zoom, or Skype, etc.), not only mine our data for speech, but

refine their emotional sentiment analysis with the aid of bots trained in facial recognition by crawling across the images of our bodies. Beller describes a world of 'libidinal strip mines' (2018). 'Wearable' computing-machines—Google Fit, Apple Watch, Fitbit, etc.—extract data traces of our heart beats, sleep patterns, calories expenditure and so forth. All of it is processed by various bots and algorithms. Wearable surveillance technologies transform the lived experience of embodiment, encouraging us to relate to ourselves in more abstract ways via the disembodied, instrumental functioning of computing-machines.

Given the rapid uptake of such fetishised surveillance machines, it seems that abstracted practices flourish in a deeply alienated society, lorded over by immensely powerful techno-elites, and driving the rest of us headlong into an ecologically ruinous, techno-totalitarian catastrophe. Euphemistic metaphors like the prefix 'smart' actively obscure meaning and function more like propaganda (Sadowski, 2020). The 'smart' metaphor actively conceals the central operations of technology; the swarms of crawling spider-bots working tirelessly to mine our lifeworlds, extracting and abstracting them to give structural power to distant interests. Beneath the 'smart' we find metaphors that are more fitting, and whose creepy, colonial resonances better enable us to grasp the power relations that characterise the abstract order that enframes us.

3 Enclosing Knowledge

Shifting the analysis from the actual operations of networked computing-machines and the metaphors that surround them, this section looks at another line of metaphoric power that animates cybernetic capitalism. Back in 1998, Google's co-founders, Sergy Brin and Larry Page, were busy on the production of a search-engine, piecing together an algorithmic architecture to 'bring order to the web' (1998). Informally dubbed PageRank, the algorithm was encoded into a patent application called 'Method for node ranking in a linked database' which Page filed as soon as possible (2001). This patent was foundational to Google, and enormously influential. Indeed, as of the end of 2021, it

has been cited by 878 other patents. Under conditions of cybernetic capitalism, it is hardly surprising that the budding entrepreneurs immediately sought to fortify their intellectual property rights. The allocating of exclusive possession of intangible material has long been central to capitalism's ownership and control structure. Patents allow for property boundaries to be drawn around abstract knowledge, a legal assumption that is as imperialist as it is capitalist.

Aggressive intellectual property regimes were central to the foundation of cybernetic capitalism in the labour of intellectually trained workers. These dynamics were forged in the emergent military-industrial complex during and after the Second World War and the rise of the 'power elite,' to use C. Wright Mills' phrase (2000), it presaged. In *Science, The Endless Frontier*, Vannevar Bush claimed that patents make new industries possible; they 'generate new jobs and new products, all of which contribute to the welfare and strength of the country' (1945). The emergence of the techno-sciences, with universities and research institutes playing a key role, and their intimate relation with both the military and the market was fundamental to the rise of cybernetic capitalism (Cooper in Hinkson et al., 2016, Ström, 2022).

In this context, intellectual property functions to 'dephysicalise property', situating abstract legal rights as the true object and value of property relations. By means of this logic, knowledge is first turned into a metaphor of real things, and then into a commodity available for circulation and accumulation. As Nicole Graham notes, the process of abstraction stems from a desire, to transcend the material conditions of human life within embodied nature, that is bound up with environmental destruction, indigenous dispossession and intensifying inequality (2021).

In the decades following the Second World War, there was growing traffic between academic science and the private sector, public funding and commercial interests. These dynamics reached new heights in 1980 with the passage of the Patent and Trademark Amendment Act in the USA, also known as the Bayh-Dole Act. It allowed private contractors to take exclusive ownership of inventions that had been made possible

through public funds, allowing them to apply for patents and therefore to determine who could exclusively profit from the new knowledge. This was a key development in the rise of the 'knowledge economy'. It gave rise to 'a new academic personage, the scientist-entrepreneur, and a new form of public-private alliance, the joint-venture start-up, where academics and venture capitalist come together to commercialise the results of public research' (Cooper, 2008). From computing-machines to biotech, intellectual property rights are a crucial component in the concentration of power and knowledge at the apex of cybernetic capitalism. Indeed, some of the tensions around this have been laid bare during the COVID-19 crisis, in which the reliance of our public health systems on—and its vulnerability to—patented, profit-driven vaccines has become increasingly apparent.

Legal scholar James Boyle notes a parallel between the great expansion of intellectual property rights in recent decades and the land-enclosure movement that was foundational to the rise of capitalist modernity (2003). 'Enclosures,' Polanyi noted in a passage that continues to be relevant today, 'have appropriately been called a revolution of the rich against the poor.' (2001). Boyle notes that a second and more abstract enclosure movement has begun, involving commons of intellectual activity rather than land. He details the web of legal and legislative transformations that have seen intellectual property rights expand intensively and extensively, with patents colonising more and more ideas that would have been, prior to the 1980s, considered unpatentable (2003).

During this time of rampant privatization and deregulation, rigid intellectual property rights have been understood as so central to the governing order that they were a critical plank of the so-called Washington Consensus: 'Legal security for property rights' (Williamson, 1990). Much of the post-Cold War order was encoded during the controversial Uruguay Round of the General Agreement on Tariffs and Trade (GATT), specifically the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). This agreement saw intellectual property go global. A Euro-US model was

imposed on the rest of the world, and enforced by the World Trade Organisation, a vast global bureaucracy dedicated to the defence and extension of private property relations. These rules enabled intellectual property rights to reach into the very stuff of living beings. Suddenly it became possible to possesses genetic material, seed plasma and techniques of reproductive control. Vandana Shiva has long drawn attention to the violent abstractions that colonise life itself, critiquing the patenting of genetic material, the engineering of organisms, and the locking up indigenous knowledge in patents (2016). The point is broader than a critique of neoliberalism. Cybernetic capitalism as a social formation, has used technological and legal abstractions to fundamentally reconstitute our subjectivity, materiality and everyday life.

Building on Boyle's work, Mark Andrejevic has further theorised 'digital enclosure', noting how the internet is a vast 'interactive realm wherein every action, interaction, and transaction generates information about itself.' This information is subjected to processes of enclosure—'a variety of strategies for privatising, controlling, and commodifying information and intellectual property'. As Andrejevic explains, 'when we go online, we generate increasingly detailed forms of transactional information that become secondary information commodities: data that may eventually be sold to third parties or used by marketers for targeted advertising campaigns' (2009). This is essential to understanding the frontiers of power and profit in the twenty-first century, a line of argument that long precedes Shoshana Zuboff's celebrated account of surveillance capitalism and has the advantage of connecting it to deeper historical trends (2019).

While very useful, the metaphor of 'enclosure' has its limits when too easily applied to the abstracted domain of networked computing-machines. Notwithstanding the public funds that were poured into the military-industrial complex to lay the foundations of cybernetics, Robert Hassan notes, 'virtual space, by contrast, was *created* as an enclosure, created as a privatised virtual space whose primary function was to be a space of accumulation', and that it '*needs people to come to it*'

(2020). The enclosure movements of capitalist modernity concerned the use of common land, and all the practices, relationships and processes that enmeshed people in the web of life. Enclosure tore apart traditional and customary relationships with land, displacing peasants, forcing them to migrate or to become wage-labourers in mills and factories. This is very different from cyberspace. Cyberspace was not a public 'commons' that was later enclosed. Rather the very possibility of an abstract commons was foreclosed by the twin imperatives of the Cold War and capitalist accumulation. What collectively produced spaces have been created within it have been extensively mined by the tech-titans and their imitators. Google's operating system Android, itself based on the open source Linux kernel, is a case in point.

As such, cyberspace itself was constructed as an enclosure. Through sensors and surveillance it *projects possessiveness beyond itself*, using crawlers to extract data traces from an expanding array of everyday life: this browsing history, these coordinates, this pulse rate, the words from this automatically eavesdropped conversation. If, like the enclosure movement, it displaces people, it does so very differently, drawing their attention away from their immediate, embodied surroundings and relations, and instead into the addictive-by-design abstractions of cybernetics. At this level, ordinary web travellers are made into the landless peasants of cyberspace. But on another level, we have become the key resource of the entire process of accumulation, the raw material out of whose relentless surveillance data is extracted for automated monetization and manipulation—like the soil from which the capitalist cash crop springs.

Herein lies the difficulties of using metaphors drawn from earlier moments in history. While apt in a number of ways, they struggle to deal with the immense abstractions of the cybernetic era and the qualitative transformations that have taken place. Peasants and soil are very grounded, yet the world-spanning networks of computing-machines under discussion here are constitutive abstract, operating at disembodied and thoroughly ungrounded levels. Thinking through such matters demands a multileveled method of critical analysis that

can draw both on the long-term historic structures and dynamics, while also being attentive to the discontinuities and qualitative differences, and always with a keen eye for contradictions that emerge between different levels (Steger and James, 2019).

The privatising dynamics of intellectual property rights were central to the creation of tech-titans, with the privatization of the internet across the late '80s-early'90s foundational to this period of accumulation (Levine, 2018). Google's co-founders received public funding from DARPA, and the Digital Library Initiative, a data-mining research program supported by money from the National Science Foundation (NSF), NASA and DARPA. They worked with DARPA funds and were supervised by CIA assets. In other words, public funding facilitated the research that lay the foundation for Google's search-engine, which was then locked up in the PageRank patent. Formally acknowledging NSF support, Page's patent contains one feeble sentence: 'The Government has certain rights in the invention'.

PageRank was classified as a utility patent; hence it was set to expire in twenty years. Predictably, in 2015, the corporation filed an updated PageRank patent, with a slightly different algorithm behind it, thus helping the monopoly control of privatised knowledge roll onwards. In the two decades since, Google's patents have increased sharply. Between 2013-19, they were granted over 10 patents for every day that the US patent office was open—a total of around 70,000 patents (Regalado, 2013; Statista, 2019). Control over intellectual property is at the forefront of the monopolistic competition of the tech-titans, as well as the geopolitical controversies between the USA and China. Under conditions of cybernetic capitalism, the control of abstract knowledge remains central to harnessing the products of intellectually trained workers in the interests of techno-scientific power. The intrinsically metaphoric function of dephysicalised intellectual property rights has increasingly become bound up with decidedly unmetaphorical bureaucracy used to enforce the dominant power relations of cybernetic capitalism.

4 Setting the Terms

A final pervasive and powerful metaphor that has become central to contemporary cybernetic capitalism is the term 'terms'. To engage with a computer program generally requires one to submit to a large number of 'terms and conditions', the acceptance of which is essentially non-negotiable. The 'terms' is also a metaphor and an analysis of this can tease out some of the dynamics of our strange historic moment. The word is ultimately derived from Terminus, the Roman god of property and boundaries who, legend has it, refused to move for the construction of the temple of Jupiter at the founding of Rome, stating *'concede nulli'* ('I yield to nobody'). Terminus became the foundation of Rome's biggest and most important temple in the heart of the citadel, with the god of property and boundaries underpinning the god of sky and thunder, and the vast empire that grew from there. Plainly, control over boundaries and property is central to imperial expansion. To set the terms is to set to the boundaries, to mark out private property, to determine, to *enclose*.

Moving forward two millennia, Google can once again serve as an exemplar of the apex of cybernetic capitalism in the way it uses terms to determine relations. Appearing on all aspects of their apparatus, 'terms' are most often indicated by a tiny hyperlink at the bottom of a page (Google, 2022b). In addition to the highest level, 'Terms of Service' functions through permissions, licenses, liabilities, and disclaimers. While working in parallel to their Privacy Policy – itself another sprawling legal beast – Google's terms of service are intimately connected to around 100 other 'service-specific additional terms' cover other aspects of the conglomerate. For example, using Google Voice, the company's desktop computer telephone platform, requires one to agree to their standard 'Terms of Service' as well as 'Google Voice Additional Terms of Service' and 'Voice Acceptable Use Policy'. All of these documents, collectively known as the 'Terms', are spread across various web pages, with numerous hyperlinks to additional related legal material.

Google note that these terms are modified regularly with respects to changes in laws and their services, and they rosily note: 'You should look at the terms regularly'. It is tempting to interpret this comment from Google as deeply cynical. Research has shown that reading all the privacy policies that an average person surfing the web de facto agrees to would take them around 250 working hours every year (McDonald and Cranor, 2008). In the US, the estimated value of time lost would be around $781 billion annually. Yet these estimates are incomplete. Firstly, the study only looked at privacy agreements on websites, not the extensive 'terms and conditions' that accompany software and cybernetic services, welfare payments, job applications, and the like. Furthermore, the research was published back in 2008, and only looked at the United States. The global situation in the early 2020s is sure to be far more mind-bogglingly extreme in all respects. The practical impossibility of reading these cumbersome, onerous legalities and the mindless ease of simply clicking them away with an 'agree' button, points towards a bureaucratic abyss at the heart of cybernetic capitalism, a kind of augmented Kafkaesque that is corrosive of meaning. Metaphors struggle to deal with the sheer scale and abstraction of the colossal waste.

Agreeing to the terms is a key moment in the structural subordination of cybernetic capitalism, a technically enforced hegemony reinforcing our abstract vassalage. Across the tech sector, and its colonial sprawl across so many other parts of life, thousands of people are employed to write terms that are both unreadable and unread. The administrative bureaucratic work required is surely an exemplar of a bullshit job, as David Graeber so delicately put it: totally wasteful work that doesn't add anything meaningful to society, and actively undermines any broader form of social good (2019). The terms are a component of the largely unacknowledged, impossibly vast bureaucratic colossus which stands in brute opposition to the spurious claims made by proponents of neoliberal efficiency. Decades of market fundamentalists have championed their red-tape-cutting agenda as a means to get beyond the bureaucratic practices of the welfare state. While tapping into some genuine social discontent in the face of

state-managed capitalism, the 'deregulations' that flowed from it were first and foremost about expanding the extraction and concentration of wealth and power. They are better understood as re-regulations in the service of elite interests. There are historic echoes here of the gap between the liberatory promises of 'free trade' made by nineteenth century liberalism and the bureaucratic, imperial army of inspectors, notaries, lawyers, clerks, registrars, colonial administrators and police officers needed to run these delusions (Dandeker, 1990, Mitchell, 1988). And yet, these historic functionaries seem thoroughly grounded and limited, compared to the techno-financial bureaucracy that we see around us. The tech-titans have become a central part of the rapidly expanding 'planetary-scale administrative bureaucratic system' that regulates so much social practice in the interests of extracting wealth and projecting control (Graeber, 2015).

'Convenience', consumerism, disembodied connectivity and illusions of control are offered in exchange for subordination to the regime of cybernetic capitalism, and all the concentrated power, war-machines, spiralling inequalities, vicious alienation, sprawling bureaucracies, fraying social relations, and collapsing ecosystems that accompany it. All of this functions through the devious abstractions of cybernetic technologies and by virtue of bureaucratic decree. In this, the 'terms' set limits to possibility and reinforce prevailing structures of ownership, entrenching the power relations that stem from them and the social relations enabled by them. Taken as a whole, the immense volume of these densely boring terms is a spectacularly unconcise way of saying what the ancient god Terminus managed to express in two elegant words: *concede nulli*.

Interpreting the extreme material abstractions of our cybernetically remade world is very difficult, and using metaphors is essential if we are to make sense of the intangible and familiarise the strange. Indeed, some of the metaphors that the tech sector uses are uncannily apt, tapping into bureaucratic, militaristic, extractive, colonial legacies, with an edge of the alienating creepiness, as with the creepers, spiders and bots. Other metaphors function as euphemism, as a bright empty

veneer obscuring a more disturbing reality. Fruitful lines of critique come from engaging with these metaphors, connecting them to the unequal and unjust histories of empire and extraction, while crucially paying close attention to the qualitative transformations that, within the larger history of capitalist modernity, have underpinned the exponential abstractions of the cybernetic phase.

Endnotes

1 Timothy Erik Ström is an independent writer based in Melbourne, an editor at Arena and the author of *Globalization and Surveillance.*

2 This line of argumentation builds on the work of writers associated with Arena, a radical publishing cooperative founded in 1963 and based largely in and around Melbourne. Perhaps the best introduction to Arena thinking is via the book: Hinkson J (et al) 2016 *Cold War to Hot Planet: Fifty Years of Arena*, Arena Publications Melbourne.

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