Chapter 11

The eyes of God

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Introduction

OF ALL THE VISUAL ELEMENTS presented by Denis Villeneuve's cinematic spectacle, none is perhaps more significant than the eye motif. Eyes play an important role in each of the *Blade Runner* movies. Both films' opening scenes feature a dramatic close-up of an eye. The original *Blade Runner* appealed to the status of eyes as "windows to the soul." In particular, ocular responses (e.g. involuntary dilation of the iris) formed a crucial part of the Voight-Kampff test, the means to tell humans from replicants. In *Blade Runner 2049* (BR2049), different methods are employed to distinguish humans from replicants. Yet, despite the seeming obsolescence of the Voight-Kampff test, the thematic, narrative, and symbolic significance of eyes is undiminished in BR2049. Older (NEXUS 8) replicants continue to be identified by their eyes, albeit by indelible serial numbers printed below their corneas. But BR2049 extends the optic symbolism of the original *Blade Runner* film in new and interesting ways. By introducing augmented vision technology, for example, the film raises important questions about how we see ourselves and how we are, ourselves, seen in a world that is hurtling at breakneck speed towards an era of surveillance capitalism (see Zuboff, 2015).

This chapter will examine three issues, two of which have as their locus the character of Niander Wallace. One of the things that makes

Wallace interesting as a character is his eyes. Wallace is biologic-
ally blind, but he is able to see thanks to a prosthetic vision system
consisting of six artificial drone "eyes."[1] Such forms of biotechno-
logical pairing, bonding, and merger raise many interesting issues,
including those relating to human enhancement, embodied cognition,
brain–machine interfaces, and the technological transformation of
the self.[2]

The second issue concerns the surveillance capabilities of new tech-
nologies. Issues of surveillance surface at a number of points in BR2049.
Initially, the holographic Artificial Intelligence (AI) avatar, Joi, appears to
serve as a surveillance device for Wallace Corporation, providing infor-
mation about the location of her replicant companion, K. The link with
the surveillance capabilities of contemporary computing devices (e.g.
smartphones, ubiquitous Internet of Things technology, and so on) is
all-too-clear: Just as Joi's portable emanator enables Luv to track K's
movements, so contemporary mobile devices enable corporate agencies
to track the behaviour of their customer base. This link is further
reinforced by the character of Niander Wallace: As we witness Wallace
enjoying a panoptic view of his surroundings, courtesy of his six artifi-
cial eyes, we cannot help but be reminded of our present-day concerns
about the all-powerful, all-seeing commercial organisation and the sur-
veillance potential of its technological offerings.

Which brings us to the third, and final, issue. Despite the thematic
preoccupation with surveillance, both *Blade Runner* films have at their
heart the possibility of deceptive manipulation, false memories, for-
getting, and the elimination of experience through death or the deg-
radation of digitally stored content. The visual technology systems and
data stores of the *Blade Runner* universe are enormously powerful. Yet they
are also revealed to be highly fragile, capable of being destroyed in an
instant (as detailed in the prequel 2022: *Black Out*). In both films, there
are fundamental gaps in informational omniscience, and the plot lines
achieve much of their power through what is *not* known—what remains
opaque and obscure.

The eyes of God, Part I: the augmentation of Niander Wallace

Wallace is, to say the least, an unusual character. He evidently regards
himself as a god of sorts. But he also acknowledges his limitations,

especially when it comes to his capacity to emulate the achievements of his predecessor, Tyrell:

> WALLACE: I cannot breed them. So help me, I have tried … Tyrell's final trick: Procreation. Perfected, then lost.

Wallace also shows little in the way of empathy (or, indeed, any emotion) for his replicant creations. In this respect, Wallace matches the description of the archetypical replicant, as envisioned by Philip K. Dick. As noted by Davies (2015),

> [a] lack of empathy is described as one of a replicant's defining conditions—it "ha[s] no regard for animals … [and] possess[es] no ability to feel empathic joy for another life form's success or grief at its defeat" (Dick, 2007: 30) [and] "no ability to appreciate the existence of another" (ibid. 40).
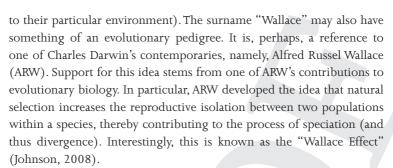>
> (Davies, 2015: 137)

Does this mean that Wallace is a replicant? That seems unlikely. But what is he then? A human psychopath and narcissist? A cyborg? A personification of our concerns about corporate power and control? It is, perhaps, hard to say for sure, for Wallace defies our attempts at conventional categorisation. Indeed, it is not obvious that Wallace is *any* sort of being that we humans can relate to. Wallace is perhaps intended to represent something new, strange, or different, but exactly what he represents is far from clear.

The idea that Wallace represents something new, strange, or different receives support from an etymological analysis of his name. "Niander" is close to the Greek word Νέανδρος, or "new man," while "Wallace" is an Anglo-Saxon word whose origin denotes "stranger."[3] "Niander" could also be a reference to the Neander Valley where Neanderthals were first uncovered, the Neanderthals being an extinct species (or subspecies) in the *Homo* genus that were contemporaneous with *Homo sapiens*. In contrast to the aforementioned notion of Wallace as the "new man," this interpretation highlights the distinctive (and, perhaps, regressive) nature of Wallace's character—the fact that Wallace is portrayed as a barely human brute (although recent archaeological evidence shows that Neanderthals had bigger brains, were more powerfully built, and were better adapted

to their particular environment). The surname "Wallace" may also have something of an evolutionary pedigree. It is, perhaps, a reference to one of Charles Darwin's contemporaries, namely, Alfred Russel Wallace (ARW). Support for this idea stems from one of ARW's contributions to evolutionary biology. In particular, ARW developed the idea that natural selection increases the reproductive isolation between two populations within a species, thereby contributing to the process of speciation (and thus divergence). Interestingly, this is known as the "Wallace Effect" (Johnson, 2008).

No doubt the source of much of what is new, strange, or different about Wallace stems from the nature of his prosthetic visual system. Wallace is biologically blind, yet he is able to see via a technological implant that enables his brain to interface with the six independently manoeuvrable floating drones. The upshot is that Wallace views the world not through his own biological eyes but through the lenses of technology. In this respect, Wallace is similar to Eldon Tyrell in the original *Blade Runner* film (Tyrell, recall, was required to don thick-lensed spectacles to remedy his extreme myopia). Interestingly, neither Wallace nor Tyrell can see the world unaided; they view the world through synthetic lenses, and this perhaps alters their view of it, providing them with a technologically inflected view of reality. Wallace's technological prostheses are, of course, radically unlike Tyrell's spectacles. Tyrell's spectacles worked as bidirectional lenses, providing us with a magnified view of his natural human eyes. Wallace's floating drones, by contrast, afford no such insight. Wallace's biological eyes are, in fact, opaque, and his technological prostheses yield no insight into the nature of his humanity, if, indeed, he has any.

The peculiar form of biotechnological bonding exemplified by Niander Wallace speaks to our contemporary concerns with technological augmentation, human enhancement, and the ethics of brain–machine interfaces. It also speaks to issues concerning the extent to which technologies are apt to effect a change in the nature of our embodiment, thereby altering our perceptual and cognitive contact with reality (see, e.g., Smart et al., 2017: 36–40).

Inasmuch as Wallace's floating drones are intended to gather information from the surrounding environment, his view of the world will be profoundly different from anything that we are familiar with (or could perhaps even imagine). For a start, there are six "eye" drones

associated with Wallace's visual system, so he must be able to process at least six streams of visual information. It is clear from the movie that these streams need not be focused on the same part of the visual field, since, in one scene, Wallace is able to direct one of the drones to keep an "eye" on Luv, who is standing behind him. He therefore has a panoptic view of his surroundings; he can see all around him. In a functional (if not quite a literal) sense, Wallace has eyes in the back of his head!
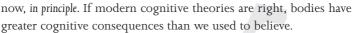
The distinctive character of Wallace's visual system is also evidenced by the so-called "halo" devices that he uses to interface with the drones. In one scene, Luv opens a small wooden container to reveal a multi-coloured array of halos. It is not entirely clear how these halos affect Wallace's visuo-cognitive capabilities. Do they enable him to have perceptual access to different parts of the electromagnetic spectrum? Is the relevant "visual" input modulated and/or augmented with additional information about the objects being interrogated? The fact that there are seven halos, each of which is uniquely identified by a combination of colour and labelling, is strongly suggestive of some sort of functional differentiation, but the precise ways in which the halos influence Wallace's perceptual capabilities is left unspecified.

There are clearly reasons to think that Wallace sees the world in a way that is radically different from our own. But, in addition to altering the nature of Wallace's perceptual reality (i.e., the content of his visual experiences), there are also reasons to think that Wallace's technological prosthesis may also alter the nature of his conceptual reality. That is to say, Wallace's visual system may not just impact the way he sees the world, it may also alter the way he *thinks* about the world, perhaps by enabling him to entertain concepts that would otherwise lie beyond the purview of his (technologically non-augmented) biological brain. Kirsh (2013), for example, argues that new technologies provide opportunities to change the nature of our embodiment and thereby alter the conceptual ingredients and infrastructure of human cognition:

Change our body enough and maybe we can even think what is currently unthinkable. For instance, a new cognitive prosthesis might enable us to conceptualize things that before were completely out of reach.[4] And not just the 10^{20} digit of pi! It would be a new way of thinking of pi; something unlike anything we can understand

now, *in principle*. If modern cognitive theories are right, bodies have greater cognitive consequences than we used to believe.

(Kirsh, 2013: 2)

Courtesy of his technological prostheses, then, it is likely that Wallace sees the world in a way that is distinct from humans (and replicants), and this perhaps extends to include the way that Wallace thinks about the world. This may be the source of much of what is new, strange, or different about Wallace. Perhaps, for example, Wallace's visuo-cognitive capabilities are such that it no longer makes any sense to regard those capabilities as compatible with our traditional notions of *human* vision. We might thus confront something of a technologically mediated rift in the existing cognitive order. Wallace undoubtedly started out as a human, and clearly his biological blindness posed no impediment to his membership of the human cognitive club. As a result of his peculiar form of biotechnological bonding, however, Wallace has perhaps acquired a capacity that is radically unlike anything that we can understand or relate to. The result is that his status as a human being is rendered problematic because he no longer satisfies the conditions of what we might call our *cognitive humanity*, that is, the set of criteria that define what it means to be human courtesy of an appeal to the characteristic features of the human cognitive system.[5]

In this sense, Wallace's onscreen persona resonates with the notion of a *posthuman god*: the idea that technological enhancement may one day lead to the emergence of beings so powerful as to be god-like in comparison with present-day humans. There is, to be sure, ample evidence that Wallace regards himself as a god, and of all the characters in BR2049, he is perhaps the least human-like. He is certainly one of the more "detached" characters of the movie, expressing little in the way of emotion, even as he brutally murders one of his replicant "angels."

Before leaving this topic, it is worth noting the way in which Wallace's visual system may alter the way he sees himself, in both a literal and a metaphorical sense. Consider, for example, the way Wallace is able to observe himself from a third-person perspective. This peculiar ability stems from the fact that his drone eyes are able to move independently of his biological body. The result is that Wallace can manoeuvre the drones so as to see himself pretty much as he would any other part of his environment, and he does so through the very same technological

filter that shapes (and, in a sense, defines) the nature of his perceptual (and, perhaps, conceptual) reality.

What might be the effect of this rather unusual, albeit not entirely alien (think of out-of-body experiences), ability to observe oneself from a third-person perspective? How does Wallace feel, for example, when he observes himself killing a female replicant? Does he, perhaps, experience the same sort of alleged detachment that occurs when we watch the bombing of military targets through the eyes of a remotely piloted drone?[6] Or does the sense of detachment run deeper? Does Wallace's technologically mediated view of himself lead to a profound shift in his sense of self—his sense of who (and perhaps what) he is? To be sure, Wallace witnesses himself committing various atrocities, but perhaps such actions merely serve to reinforce a view of himself that was already established by his technological add-ons: a view of himself as something external to himself, as something that is perhaps *not* himself. This is an admittedly awkward idea, but the basic point is that Wallace has a rather unique capacity to engage in a form of self-observation or self-surveillance.[7] By viewing himself from an external perspective, we might wonder whether he begins to lose sight of who he is, in the sense that he begins to see himself in the same way that you or I would see someone else.

To help us understand this in a bit more detail, suppose that your sole source of visual access to the world was a big screen that encompassed your entire visual field. Also suppose that what you saw on the screen was, among other things, yourself. Every action you perform, everything you say or do—everything is depicted on the big screen, in the manner, perhaps, of a movie—your life cinematised! Now consider how you might feel after watching yourself from this third-person perspective, perhaps from multiple angles. Would you, after a while, continue to view that person, who is perhaps just one of many individuals you see on the big screen, as the real you, or would you begin to regard that person as someone else, someone that you were able to place under constant surveillance? Would you, in this situation, continue to regard your act of watching the screen as a form of *self*-surveillance, or would it become something else: the surveillance of another person, perhaps—the surveillance of someone who was not "you"? And what of your affective responses to what you see on the screen? Do you like what you see? Does the person you observe occasionally do things that you do not

like? Perhaps you have good reason to cognitively disassociate yourself from yourself. And if you can't do that, then there is no denying the reality of who and what you are: for the person you see before you is the real you, and your sense of who and what you are needs to follow suit.

This sort of idea dovetails with a body of recent work concerning self-tracking, self-surveillance, and the quantified self. Of particular interest is the idea that by monitoring our own activities and physiological responses through a growing array of digital devices (e.g. smart watches, activity trackers, and so on) we are able to re-encounter ourselves through the "eyes" of the technological devices that we use. In other words, self-tracking presents us with a technologically inflected view of ourselves—a digital self, which may or may not correspond to the self that exists in the absence of such data. The question, then, is which self is the *real* self? Is that the real you reflected in the digital data, or are you someone else? And if the two selves do not align, then what source of information ought to inform your sense of self? Digital devices do not lie, so perhaps your best route to self-related knowledge is to accept whatever it is you see on the digital dashboard.

At this point, it should be clear that the transformative potential of technological prostheses is not limited to what we see or what we think—it strikes at the heart of who and what we are. And once we see ourselves via the technological lenses that promise (or, perhaps, threaten) to ferry us forward into our posthuman future, then who knows what we may become. Do cyborgs still see themselves as human? Does Wallace? Will we?

The eyes of God Part II: the panopticon of Niander Wallace

In Greek mythology, Argus Panoptes, is a many-eyed giant whose epithet "Panoptes" (meaning "all-seeing") resonates with fears about the surveillance potential of technologies. The term "panopticon" was, in fact, used by the philosopher and social theorist, Jeremy Bentham, to describe the architecture of the perfect prison—a prison in which all the inmates (pan-) could be observed (-opticon) by a single watchman without the inmates being able to tell whether or not they were being watched. In this section, we will consider Wallace's status as a many-eyed "giant": an individual whose "visual" capacity extends far beyond the confines of his watery, womb-like abode in Wallace Towers. We will also

explore some of the surveillance-related issues raised by BR2049 and assess their relationship to current concerns about the surveillance capabilities of existing (or emerging) digital technologies.

A prominent cinematic element of the original *Blade Runner* film was the use of shaft lighting, that is, powerful beams of light that penetrated the murky gloom of a variety of interior spaces. These beams typically emanated from airborne vehicles that hovered above the city. The lights interrogated the darkness in much the same way that searchlights monitor a prison. They also penetrated spaces that we would typically deem to be private, such as the interior of Deckard's apartment. This is how Jordan Cronenweth, the American cinematographer, described the use of shaft lighting in the original *Blade Runner* movie:
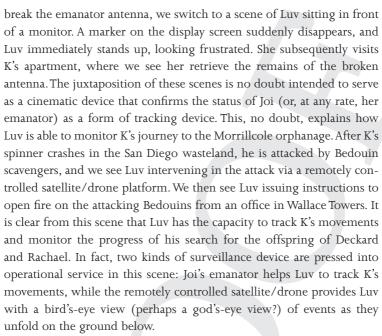
> In the futuristic environment, they [airships] bathe the city in constantly swinging lights. They were supposedly used for both advertising and crime control, much the way a prison is monitored by moving search lights. The shafts of light represent the invasion of privacy by a supervising force; a form of control. You are never sure who it is, but even in the darkened seclusion of your home, unless you pull your shades down, you are going to be disturbed at one time or another.[8]

Surveillance and privacy violation were thus important, albeit subtle, thematic elements of the original *Blade Runner* movie, and they continue to be so in BR2049. How private can one be in the exterior world or, indeed, the interior world of one's thoughts? In BR2049, the searchlights of the original movie have been replaced by less obvious—although no less potent—forms of surveillance that speak to contemporary concerns about the capacity of the technological environment to monitor and model each and every one of us (O'Hara & Shadbolt, 2008). Perhaps it is only a question of time before the reach of surveillance technology is able to penetrate the inner sanctum of the mind and monitor our thoughts, feelings, desires, attitudes, and opinions (Shadbolt & Hampson, 2018).

A number of forms of surveillance are evident in BR2049. Throughout the film, the AI avatar, Joi, appears to monitor K's conversations, particularly conversations with female characters. Joi's portable emanator also provides the means by which Luv is able to track K's movements. Note, for example, that when K finally acquiesces to Joi's demands to

break the emanator antenna, we switch to a scene of Luv sitting in front of a monitor. A marker on the display screen suddenly disappears, and Luv immediately stands up, looking frustrated. She subsequently visits K's apartment, where we see her retrieve the remains of the broken antenna. The juxtaposition of these scenes is no doubt intended to serve as a cinematic device that confirms the status of Joi (or, at any rate, her emanator) as a form of tracking device. This, no doubt, explains how Luv is able to monitor K's journey to the Morrillcole orphanage. After K's spinner crashes in the San Diego wasteland, he is attacked by Bedouin scavengers, and we see Luv intervening in the attack via a remotely controlled satellite/drone platform. We then see Luv issuing instructions to open fire on the attacking Bedouins from an office in Wallace Towers. It is clear from this scene that Luv has the capacity to track K's movements and monitor the progress of his search for the offspring of Deckard and Rachael. In fact, two kinds of surveillance device are pressed into operational service in this scene: Joi's emanator helps Luv to track K's movements, while the remotely controlled satellite/drone provides Luv with a bird's-eye view (perhaps a god's-eye view?) of events as they unfold on the ground below.

As the film progresses, additional forms of surveillance come to light. Lt. Joshi, for example, is able to monitor K's movements via a console in her office.[9] (This is presumably how the LAPD were able to locate and intercept K as he left Ana Stelline's laboratory.) The same console is later used by Luv after she discovers the broken antenna in K's apartment. The plot also makes use of a tracking device secreted by Mariette, a member of the replicant resistance, in K's coat. This is what enables K to be rescued from the Las Vegas casino after a violent confrontation with Luv. At this point, it becomes clear that all the women who have in some way expressed a sexual or romantic interest in K (namely, Lt. Joshi, Mariette, Joi, and Luv) are able to track K's movements, and that they do so via some form of surveillance technology: Joi monitors K's conversations with Mariette, Joshi, and (perhaps) Luv; Luv tracks K via Joi; Joshi tracks K via his spinner; and Mariette tracks K via a tracking device planted in his pocket.

Given the surveillance capabilities of technology in BR2049, are its denizens aware of the reality of surveillance, or are they oblivious? Perhaps they are aware but just indifferent. There are, as already noted, a number of parallels here with contemporary concerns about surveillance
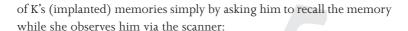
and privacy (O'Hara & Shadbolt, 2008). Portable devices, such as smartphones, enable companies to track our location and activities in unprecedented detail, and this tracking often occurs without our knowledge. Joi's emanator is perhaps similar to devices such as the Amazon Echo, which is, in effect, a networked microphone that is always on, always "listening." While such technologies are visible, it is not always clear that people are fully aware of their surveillance capabilities. In this respect, the transition from *Blade Runner* to BR2049 might be seen to reflect a shift in the "visibility" of surveillance capabilities—from overt to somewhat more covert forms of surveillance. The surveillance potential of the searchlights in the original *Blade Runner* movie is, for example, relatively explicit; in BR2049, however, surveillance is undertaken in a much more surreptitious manner. As with our ever-growing arsenal of portable, networked devices, the technological artefacts of BR2049 often serve a multiplicity of purposes, and their surveillance potential is seldom appreciated by their user base.

In our world, there are a number of forces and factors that contribute to the widespread adoption of surveillance technologies. A very large part of our digital economy is predicated on turning personal data into marketing insights and opportunities. It is data that can be repurposed in a multitude of ways. Personal data can, for example, be used to ensure our safety and well-being. It can also be used to support the creation of personalised services that speak to our individual interests and concerns. Finally, personal data is a prominent target for national governments, providing new opportunities for social-policy formulation. The sheer scale of the capitalist surveillance society we are building is not widely appreciated or understood by either consumers and citizens, or politicians and regulators. The concentration of data in a few powerful platforms is just now being estimated, the variety of pathways our data take as they flow from our phones just now being visualised (Van Kleek et al., 2018). And it shows hyper concentration: A few organisations with phenomenal oversight—Wallace-like in their extent.

Surveillance of our exterior selves is one thing, but surveillance of our inner mental lives is quite another. In BR2049, we see technologies being used to "look inside" K—to survey his cognitive innards. In the scene with Ana Stelline, for example, Ana uses a memory-scanning device to visualise K's memories. She appears able to access the content

of K's (implanted) memories simply by asking him to recall the memory while she observes him via the scanner:

> ANA: Now, think about the memory you want me to see. Not even that hard. Just picture it. Let it play.

This suggests that the technology of BR2049 is able to access the inner cognitive states of test subjects … at least when the test subjects are replicants.

A similar form of surveillance is perhaps evident during the course of the second baseline test. Here, the baseline test appears to provide some insight as to what K looks like on the inside. Note, for example, what Lt. Joshi says in the aftermath of the test:

> LT. JOSHI: Scan said you didn't look like you *on the inside*. Miles off your baseline [emphasis added].
>
> LT. JOSHI: Do you know what that means?

From a surveillance perspective, this suggests that the technology of BR2049 has advanced to the point where it is possible to penetrate the cognitive innards of a test subject—to peer inside their "soul" (or at least their inner selves).

Neuroscience has always been fascinated by the notion of being able to "read out" our neural and mental states. Dramatic recent advances originate from Jack Gallant's lab at the University of Berkeley. In a series of papers, his team have shown how characteristics of images and movies shown to human subjects can be reconstructed at the time of viewing and also in the act of recall (Kay et al., 2008; Naselaris et al., 2015; Naselaris et al., 2009; Nishimoto et al., 2011). These remarkable studies rely on high-resolution fMRI and Bayesian algorithms that learn the associated encodings. Gallant himself is circumspect about the ability to decode neural signals with enough resolution to be useful in legal or forensic contexts. Nevertheless, advances in neural recording technology and machine learning are likely to improve our capacity to penetrate the inner realm of percepts and mental pictures—to look not just into the biological eye (as was the case with the Voight-Kampff test), but to go deeper: to peer into the inner eye, the mind's eye, the true window, perhaps, to a person's "soul."
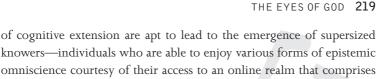
It thus seems that science is about to provide the means for particularly intimate forms of what might be dubbed *cognitive veillance* (see Smart et al., 2017: 83–85)—forms of surveillance that are able to "look inside us" and provide public access to previously private mental states and processes. The implications are, perhaps, as disconcerting as they are striking. Scientific and technological advances appear to portend an era in which it will be possible to reveal something about our innermost thoughts and feelings—the erstwhile private realm of our mental lives stands to be revealed as a public space, available for observation, analysis, and scrutiny by all manner of external agencies.

Of course, to some extent, our fears about surveillance do not rely on future forms of technological innovation; for many of our surveillance-related fears are fuelled by technologies that are available in the here and now. The Internet and Web are particularly prominent in this respect. Because of the role that such technologies play in a variety of cognitive, epistemic, and social activities, they provide ample opportunities for surveillance, including the forms of surveillance suggested by the notion of cognitive veillance. Consider, for example, the claim that the informational and technological elements of the Web may form the basis for the emergence of so-called Web-extended minds (Smart, 2012). In this case, there is no need for technologies to probe the intracranial realm in order to gain access to the machinery of the mind, because some of the components of that "cognitive machine" are already situated in the online realm and are thus available for public scrutiny. The upshot is a rather worrying vision of the surveillance capabilities of the Internet and Web, as well as the various digital devices that are connected to them. It is a worry that is perhaps best captured by the following remark of Eric Schmidt, CEO of Google: "We don't need you to type at all. We know where you are. We know where you've been. We can more or less know what you're thinking about."

We should, of course, note that surveillance-related fears are often the flipside of a technological coin whose opposing surface reveals a multitude of cognitive and social benefits. The capacity of the Web to support the emergence of Web-extended minds, for example, speaks to issues of epistemic expansion and extended knowledge (see Carter et al., 2018). If we accept the idea that cognitive extension entails a form of epistemic expansion, and we also accept the possibility of Web-extended minds, then the scene is set for a remarkable transformation: Web-based forms

of cognitive extension are apt to lead to the emergence of supersized knowers—individuals who are able to enjoy various forms of epistemic omniscience courtesy of their access to an online realm that comprises the sum of human knowledge (see Bjerring & Pedersen, 2014; Ludwig, 2015).[10]

The Web also provides important opportunities for the enhancement of socio-cognitive and socio-epistemic capabilities. Indeed, with regard to the contemporary Web, there are two ways of reading the phrase "many eyes." It could refer to the surveillance potential of the Web, or it could refer to the fact that the Web supports a capacity to harness the collective resolving power of the "many eyes" of humanity. This latter idea is epitomised by research into so-called *social machines* (Shadbolt et al., 2019). The central idea, in this case, is that the technological (and perhaps social) fabric of the Web can be used as the basis for delivering new forms of collective intelligence, including new "insights" into otherwise intractable problems, such as those posed by climate change, incurable diseases, and large-scale humanitarian crises (Hendler & Berners-Lee, 2010). In this respect, it is interesting to note that many (although not necessarily all) social machines rely on a form of collective "perception" that harnesses the visuo-cognitive capabilities of multiple human individuals (e.g. Lin et al., 2014).

The upshot is a contrasting vision of contemporary (and emerging) technology. With the advent of the Internet and Web, and the emergence of the sorts of brain-reading technology discussed earlier, we seem to encounter a form of privacy violation that is potentially more disturbing than that envisaged in George Orwell's (2004) famous dystopia, *Nineteen Eighty-Four*. It is a vision in which technology is able to probe every aspect of ourselves, including the erstwhile private realm of our minds. Such, perhaps, is the danger of being "interlinked." The relentless march of networking technologies provides us with new opportunities to monitor both ourselves and the world around us and then share this information with countless other individuals. At the same time, however, such technologies open the door to forms of surveillance that are sufficiently potent as to portend the end of privacy as we know it. For better or worse, it seems, the many-eyed Argus is also a two-headed Hydra. On the one hand, our all-seeing eyes are the gateway to a potential transformation in our individual and collective capabilities, providing us with a form of epistemic omniscience—a capacity to see (individually

and collectively) beyond the limits of our current knowledge. On the other hand, however, a technology of enlightenment is all too easily repurposed as a searchlight of the "soul"—a technology that threatens to bring an end to privacy as we know it. The path to epistemic omniscience, it seems, is only a few steps removed from the perfect prison of the global panopticon.

The eyes of God Part III: blind spots

Given that surveillance features as a common thematic element of both *Blade Runner* movies, it is perhaps surprising that both should also be concerned with issues relating to the fallibility of memory, of forgetting, data loss, and fragmentation. Indeed, the plots of both films rely on what we might call *blind spots*: gaps in the record caused by imperfect recall and disruptions to a digital infrastructure.

One of the main premises of BR2049 concerns the loss of data in 2022. An Electro-Magnetic Pulse (EMP) led to a blackout, resulting in the erasure (or corruption) of most (if not all) digital records, including the Tyrell Corporation's files on replicants. This is confirmed by the File Clerk, as he reminisces about the Blackout:

FILE CLERK:	Everyone remembers where they were at the Blackout. You?
K:	That was a little before my time.
FILE CLERK:	Mm. I was home with my folks, then 10 days of darkness.
FILE CLERK:	Every machine stopped cold.
FILE CLERK:	When the lights came back, we were wiped clean.
FILE CLERK:	Photos, files, every bit of data, pfft, gone. Bank records too. Heh.
FILE CLERK:	Didn't mind that. It's funny it's only paper that lasted.
FILE CLERK:	I mean, we had everything on drives. Everything, everything, everything. Heh.
FILE CLERK:	My mom still cries over the lost baby pictures.

As noted by the File Clerk, the results of the Blackout were catastrophic—although, as later revealed by Deckard, the Blackout did come with some

benefits: it helped to cover the tracks of rogue replicants, and probably reestablished some degree of privacy via practical obscurity:

K: You didn't even meet your own kid? Why?
DECKARD: Because that was the plan. I showed them how to scramble the records, cover their tracks. Everyone had a part. Mine was to leave. *Then the Blackout came, paved over everything. Couldn't have found the child if I tried* [emphasis added].

As a result of the Blackout, the world Wallace inherits is incomplete, at least from an informational standpoint. Although Wallace is a data hoarder, his memory vaults contain little more than the fractured remains of what has gone before. Wallace's view of the present may be hyper-acute, but his view of the past is occluded. In the movie, we see that records of the past, most notably those pertaining to the events of the original *Blade Runner* movie, are stored on glassy, crystalline spheres, called "memory bearings." These objects are clearly intended to provide a link to the past, and they thus speak to the theme of memory, which is prominent throughout both *Blade Runner* movies. In addition to this, however, memory bearings are an important reminder of the links between memory, technology, and vision. Note, for example, that memory bearings are roughly the same shape and size as human eyeballs, and their crystalline structure is somewhat reminiscent of a window or lens. The result is both beautiful and brilliant: a form of thematic convergence that is revealed (or, at any rate, brought into sharper focus) as a result of the film's utilisation of the eye motif.

On the one hand, memory bearings remind us of the observational and recording capabilities of technology—the capacity of technology to (in this case) "crystallise" our connection to the past by capturing specific moments in time. On the other hand, however, the memory bearings remind us of the fragility of memory and the hazards of data loss. As a result of the Blackout, the memory bearings are not the perfect "windows into the past" that they might otherwise have been. "All our memory bearings from the time," Luv comments, "[t]hey were all damaged in the Blackout." Such damage appears to take the form of internal fractures, which transform an erstwhile limpid "lens" into something that more closely resembles a "cataract." As noted by the File

Clerk who works for Wallace Corporation, the Blackout contributed to a form of collective amnesia or, at any rate, a loss of mnemonic connection with the past. For the inhabitants of the BR2049 world, memories of the past are fragmented and imperfect, obscured by incomplete records and the clouded appearance of the memory bearings. "Not much from then," the File Clerk says when K asks him to check Rachael's serial number. "And what's there is … thick … milky."

In the real world, our susceptibility to an event resembling the Blackout has been much discussed within both scientific academies and by national governments (House of Commons Defence Committee, 2012). Damaging EMPs could arise through extreme space weather, such as mass coronal ejections and so-called Carrington events,[11] or the detonation of a nuclear device at high altitude. Such events could disable or disrupt the elements of our contemporary computing infrastructure, leading, in the worst cases, to something of a digital Dark Age.

A different kind of digital Dark Age is envisioned by the Internet pioneer, Vint Cerf.[12] His concern is the relentless obsolescence built into so many of our hardware, software, and regulatory systems.[13] The worry is that countless datasets might be rendered inaccessible by changes to our recording technology or the introduction of software that fails to maintain backwards compatibility.

A not-altogether unrelated concern is highlighted by Rick West, a data manager at Google.

> We may [one day] know less about the early 21st century than we do about the early 20th century. The early 20th century is still largely based on things like paper and film formats that are still accessible to a large extent; whereas, much of what we're doing now—the things we're putting into the cloud, our digital content— is born digital. It's not something that we translated from an analog container into a digital container, but, in fact, it is born, and now increasingly dies, as digital content, without any kind of analog counterpart.[14]

This notion of data loss as contributing to a loss of the past, or, at any rate, a form of mnemonic disconnection with the past, resonates with the thematic and artistic concerns of both *Blade Runner* movies, particularly in relation to issues of death, decay, and the ephemerality of experience.

In the original movie, such a concern is amply demonstrated by Roy Batty's "tears in rain" monologue, which has to qualify as one of the most moving and memorable scenes in sci-fi cinematic history. As Batty sits opposite Deckard on the roof of the Bradbury building, he reminds Deckard, and us, of the fleeting character of experience—the fact that death entails the erasure of our first-person experiences, experiences made available to us by our senses:

> BATTY: I've seen things you people wouldn't believe … All those moments will be lost in time, like tears in rain. Time to die.

BR2049 extends this sense of experiential loss to the realm of technology. A particularly interesting example of such loss comes in the form of Joi. When Joi is disconnected from the console, all her "memories" are stored on a single device, namely, the emanator. There is, as such, a single point of failure for Joi. If Joi's emanator is damaged—if her digital traces of the past are in any way corrupted—then there is no backup repository that can be used to recreate her: she is gone forever, "Like a real girl."

Ultimately, of course, the emanator is destroyed, and with it are all the digital traces of Joi's past. The result is that Joi cannot be resurrected, for there is no way to recreate the particular patterns of data that marked the trajectory of Joi's digital life and that (via learning) made her unique. Joi is, in this sense, special; for she is no longer the sort of thing that can be replaced or duplicated. The Joi we see for much of the movie has been individualised as a result of the particular and peculiar experiences she shared with K, and these experiences cannot be easily recreated or reconstructed. They are, instead, like Batty's tears in rain: moments from the past that are now lost in time.

This notion of data loss as contributing to a loss of the past, or, at any rate, a form of mnemonic disconnection with the past, dovetails with the wider narrative of experiential erasure in both of the *Blade Runner* films. A drowned world is one that offers the prospect of loss. The incessant downpour that we see in *Blade Runner* and the ferment of the ocean in BR2049 are reminiscent of the capacity of water to purify but also to inundate, erode, and literally wash away. Even if the past can be replicated, can it ever be authentic?

The challenge of authentic replication is present in Wallace's corrupted memory bearings. Such memory bearings contain traces of

the past, including those pertaining to Deckard's encounter with Rachael. Ultimately, however, these records are revealed to be inadequate. Just as K's Joi is no longer the sort of thing that can be resurrected, neither can Deckard's Rachael be replicated. Despite his best efforts, Wallace is unable to produce a convincing replica of Rachael because the things that made Rachael unique, including the moments she shared with Deckard, are lost in the mists of time. As is indicated by Deckard's response to the Rachael facsimile ("Her eyes were green"), the mists in question are ones that not even the eyes of God can penetrate.

Notes

1 These are referred to as "barracudas" in the final shooting script by Hampton Fancher and Michael Green.

2 It would be a mistake to think that this potential to change ourselves through our technology is anything new. For at least 3.3 million years we and our hominid ancestors have been making tools and progressively altering the nature of the physical, biological, and cultural environments in which our minds develop. The tool-making culture that first surfaced in Lomekwi (Harmand et al., 2015) and elsewhere over the course of 300,000 generations changed our bodies, cultivated our capacity for fine motor control, shaped our cortex, and probably acted as a driver for the emergence of language and planning. We did not just make our technology, our technology made us (Shadbolt & Hampson, 2018). And so it continues into the present day. BR2049 invites us to imagine how far this capacity for technology-mediated transformation might take us.

3 See http://broethr.wikia.com/wiki/Anglo-Saxon_Male_Names.

4 Language may also work to effect a similar shift in our conceptual and cognitive capabilities. Indeed, language has, at times, been characterized as the "ultimate artefact"—a form of cognitive technology that profoundly alters the shape of the human cognitive economy (see Clark, 1997: chap. 10). This is a topic that is explored in one of Denis Villeneuve's earlier movies, namely, *Arrival*.

5 This appeal to cognitive humanity contrasts with the notions of biological and evaluative humanity, as discussed by Gaut (2015).

6 In fact, recent research with human drone operators shows that far from exhibiting a sense of carefree detachment, most operators reported feeling grief, remorse, and sadness (Chappelle et al., 2018) [CE: Updated date]. Many experienced these "negative, disruptive emotions" for a month or more.

7 This is the technologically mediated equivalent of what is sometimes called autoscopy (Blanke & Mohr, 2005). Autoscopy literally means "self watcher."

Interestingly, given the nature of Wallace's character, it is often associated with some form of psychiatric disorder, such as delirium, depression, or psychosis (Dening & Berrios, 1994). In this sense, Wallace's eye drones might be seen as a form of *technological psychotomimetic*—a technology that, in the manner of a psychotomimetic drug, yields a state of psychosis.

8   See https://www.diyphotography.net/blade-runner-cinematography-jordan-cronenweth/.

9   In all likelihood, Lt. Joshi is tracking K's movements via his spinner, although it isn't entirely clear from the movie. After Luv dispenses with Lt. Joshi, she asks the LAPD computer to locate K ("Location: Officer KD6-3.7"), but we aren't told whether it is K's location that is revealed, or simply the location of his spinner.

10   It is, of course, unclear how such claims stand to be affected by worries about information manipulation, fake news, and the emergence of a post-truth world.

11   Named after the 1859 solar storm observed by British astronomer Richard Carrington.

12   See https://www.itnews.com.au/news/internet-is-losing-its-memory-cerf-495854.

13   See https://www.economist.com/leaders/2012/04/28/bit-rot.

14   See https://theweek.com/articles/747424/scientists-warn-entering-digital-dark-age.

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