

**DRONE MEDIA: UNRULY SYSTEMS, RADICAL  
EMPIRICISM AND CAMERA CONSCIOUSNESS**

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Our fields of experience have no more definite boundaries than have our fields of view. Both are fringed forever by a *more* that continuously develops, and that continuously supersedes them as life proceeds. (William James, 1912: 38)

The relatively short history of satellite technology has illustrated the fact that the space stretching from earth to about 60,000 km above, from traversable airspace through low earth orbit (LEO) up to geostationary orbit (GEO), has become a highly contested and inequitably regulated site of 'international public affairs' (Parks, 2013). This space may be considered a 'natural resource of advanced global civilization', but it is one without 'an equally advanced public order for its regulation' (Wiessner cited in Parks, 2013: 65). Regulation of earth's vertical publics, for Lisa Parks, has been tied to the often competing interests of scientific innovation, national security, telecommunications and the reconfiguration of 'the televisual'. Inevitably, what may have been considered by legal scholar Sigfried Wiessner as a natural resource in 1983, has seen successive waves of colonization by wealthy nations and powerful global corporations. Opaque transnational treaties and governing bodies secure decisions far from public scrutiny about how access to the infrastructures of telecommunications and visibility from above is to be allocated and controlled.

The tumult that has followed these technological and social developments since the first satellite was launched in 1967 has quickened in recent years through the proliferation of aerial drones – those variously named camera mounted or remote sensing aircraft also known as Unmanned Aerial Vehicles (UAV) or Systems (UAS), or Remotely Piloted Aircraft (RPA) (Chamayou, 2015). Where 'systems' are emphasized, recognition is given to elements beyond the object – radio frequency spectrum, data link and video down

link, first person view (FPV), ground control systems, wireless local area networks and the chipsets and hardware that enable them. However, drones have entered the popular imaginary and regulatory discourse as a thing of risk and opportunity, an object of both fear and desire. The lack of standard nomenclature across regulatory bodies, manufacturers and user organizations flags the competing conceptual terrain in which drones operate.

Like satellites before them, drones have moved beyond their military uses to reshape our vertical publics, raising fears about catastrophic aerial accidents and heightening public concerns about optical surveillance and personal or commercial privacy invasion. There is an increasingly urgent debate amongst state aviation authority review committees, industry organisations, law reform bodies, privacy activists and individual enthusiasts or entrepreneurs seeking to adapt and put drone technology to use, with equal measures of enthusiasm, uncertainty and anxiety following. Practical uses are lined up against techno-failures and risks. New personal uses have arisen to take their nadir in the notion of the 'dronie' – the use of drones in social media practices of self-imaging (Jablonowski, 2014). Just as selfies can only be understood through the uses to which they are put within social networks (Horning, 2014), dronies indicate the distributed ecology within which drone media now works. There has thus been significant movement in drone visuality, from the tropes of military drone vision and the sense of weaponized sight, or Haraway's notion of the 'God trick' of the surveillant gaze that remains beyond view, and the enlightenment roots of this objective 'view from above' (Haraway, 1991; Stahl, 2013: 664; Jablonowski, 2014; Andrejevic, 2015).

Commercial applications are also looking to alter technical communications networks in interesting ways, with drones used to relay goods or wireless network signals. In addition to Amazon's planned drone delivery services or uses by emergency services during disasters, internet corporate giants Facebook (Internet.org) and Google (Project Loon), along with DARPA, have plans for developing balloon or drone-based wireless networks to bring internet connectivity to remote or poorly serviced places around the globe (Richards, 2014). This includes, perhaps most importantly for DARPA, war zones. In these contexts the capacities and limits of wirelessness, and its politics, come sharply into view (Mackenzie, 2010; Parikka, 2013; Munster, 2014).

This article frames drone technology in terms of a volatile and contested relationality hinging on the experience of 'wirelessness' more generally and shifting forms of visuality in particular. The experience of wireless networks always encompasses borders and peripheries, the blurred edges between object and subject or objective vision and subjective visualities. To call on a core concept of William James's radical empiricism, wirelessness concerns the movement between conjunctive and disjunctive relations, their patchiness and the force of their sensation (Mackenzie, 2010: 18-24). And it is in terms of the volatility of control at the edges – device and signal-control, control over 'vertical publics' and airspace vectors, and over vision and visuality – that the contest over drones has become intensely apparent. As a way of understanding the contested conceptual and material terrain of drone systems and usage, I examine the regulatory struggles that take aim at drones as unruly aerial objects with the capacity for privacy-invasive imaging. However, the aim is to consider drones beyond the 'thingness' of the object, as experience and as provocation, to reconsider wireless networks, visuality and camera-conscious sociality.

The generalized 'desire for the drone' (Noys, 2015) can in this way be understood to involve a dual disposition of augmentation and recoil. By taking the relations that drones are implicated in as a starting point, analysis can turn towards the shifting 'camera consciousness' that drones signal. This is a concept borrowed from Deleuze (1986), and points to a broader cultural condition and logic bound up in the dual sense of visual augmentation and anxiety provoked by new camera technologies and techniques, and altered modes of visibility and mediated perception. My proposition is that the figure of the drone, in regulation and thought, foregrounds the implications of a shifting camera consciousness, a concept that the experience of drone visuality helps to re-define.

The affective capacity of drone systems can be a cause for utility or even excitement and desire, but also a source of anxiety. On the one hand, drones excite for their extension of an autonomous, motile and indirect visuality that moves beyond the device-armed social media connected body, beyond the mobile phone and camera and even satellite imaging. The drone's *motility*, its 'autonomous' or self-sustaining vertical and lateral movement, differentiates it from fixed surveillance devices, or 'the surveillant assemblage' (Haggerty and Ericson, 2000), and the mobility of personal mobile phone camera (Urry, 2007; Goggin, 2006; Verhoeff, 2012). Their motility shifts the relations of object and subject, image and vision, with attenuated

and distributed modes of seeing and being seen. On the other hand, and in part as a result of these shifts, national and international aviation bodies are scrambling to formulate regulation that balances the promises against the widely felt anxiety about the proliferation of drone cameras overhead. Taken together, the components of drone media create a volatile techno-social and hence regulatory environment of object and signaletic relations, image relay and distribution.

Through all of these elements, drone media requires, but also pushes thought toward, a radical empiricism that takes the relation as seriously as the object and reconsiders experiences of and within technical assemblages (James, 1912; Mackenzie, 2010; Munster, 2013; Massumi, 2011). The critical analysis of drone regulation and drone systems presented further on in this article takes up this central tenet of radical empiricism in order to better understand the dual disposition of the new camera consciousness. I elaborate on this approach toward the end of the article.

### **Vertical Publics and Machinic Vision**

Drone systems enter an already contested and carefully regulated vertical public space or orbital zone, which Lisa Parks considers as a neglected area of media research and public scrutiny (Parks, 2005; 2013). The lack of critical attention to satellites signals for Parks the success of the Western military-industrial-information complex at concealing their most strategic technologies in the process of applying informational and perceptual control. Regulatory conventions for governing vertical publics – spaces on the outer edges of vision and conceptualization, those orbital spaces and satellite trajectories – entail a relatively opaque politics (Parks, 2013). Now, drones have emerged as a set of technologies that throw that orbital power off its axis through their more unruly trajectories, their multidirectional motility, and their accessibility to ordinary users. Where satellites work on fixed vectors, drone devices operate on directional freedom. Where satellites operate ‘on the perimeter of everyday visibilities and cultural theory’ (Parks, 2005: 7), drones force an immediate and constant double take.

However, the roots of this contested terrain are significant precisely because of the specific ways drones reconfigure it. They serve as a reminder of what is at stake: modes of (tele)visuality and telecommunication, and hence mediated publics and mediated

visibility (Thompson, 1996). Through satellites, the televisual is itself redefined beyond 'the technical apparatus or popular pleasures of broadcasting', to become 'an epistemological system derived through the alternating discursive modalities of commercial entertainment, public education, military monitoring, and scientific observation' as well as remote sensing with the array of aerial imaging possibilities that the commercial operation of satellites has opened up (Parks, 2005: 2-4; Krugan, 2013).

Satellite imagery and remote sensing provide an important prehistory to drones in their use by states, scientists and broadcasters, to disembodify vision and construct 'seemingly omniscient and objective structures of seeing and knowing the world, or worldviews' (Parks, 2005: 14). They have established new perceptual forms and aesthetics of aerial imaging and hence logistics of war zones, ancient ruins, landscapes and so on, and they are in this way also emblematic of Haraway's 'gaze from nowhere' (cited in Parks, 2005: 14). The new form of visibility that drone vision generates and alters is both highly technical and broadly imagined. Once again we see the disruption of 'the balance between mass, distributed, participatory media tools, and totalitarian ones' in Virilio's terms (Virilio cited in Armitage and Bishop, 2013: 1).

Drone imaging systems and camera setups vary greatly. Large and small scale models make use of video recording and streaming relayed to a ground control location and monitor system via wireless radio frequency transmitters, in combination with satellite GPS tracking and location information. GoPro cameras are commonly used to transmit full 1080p high definition video image, often in wide-angle and taking a kind of spherical, orbital global image of ground activity below. This movable camera functions both as one of the primary purposes of drone operations in its aerial media production, *and* as its mode of remote visual control through first person view (FPV). Signal strength varies depending on the hardware and network systems, but for civilian drone systems usually ranges from around 1 to 6 km. As with the early stages of many new technological systems, a great deal of DIY and community activity through countless forum pages goes into adapting and evolving the capabilities of drone gear. The results of their early use by enthusiasts and early adopters are everywhere to be seen across social media sites (YouTube, Vimeo) and within many social settings including protest sites, the 2014 Burning Man festival, within a large-scale city fireworks display, above sporting

events and so on. This social context is vital to understanding the new visuality forming in relation to drone use.

Paul Virilio has provided a critical pre-civilian-drone approach to machine-vision and it is tempting to take his ideas as a model for drone visuality. His work foregrounds the visual as 'a critical site of theory and contemporary cultural action and intervention' (Armitage and Bishop, 2013: 1). Virilio's entry-points to this politics of the visual are oblique and could easily incorporate an account of drones as 'seeing machines'. Who or what 'sees' and what it means to be seen is certainly central to the politics of drone use and control; their fuzzy indetermination is previewed by Virilio through many other spheres of contemporary techno-sociality.

Popular and regulatory narratives for drones often imply fears regarding what Virilio calls the '*industrialisation of vision*', and through the '*splitting of viewpoint*', or 'the sharing of perception of the environment between the animate (the living subject) and the inanimate (the object, the seeing machine)' (1994: 59-60). With drones, the seeing-control link remains in place, but its distributed transmission through social media also creates a heterogeneous assemblage that places perception outside of a singular, fixed perceiving subject. This indicates the threat and the obvious military application, but also the promise of points of resistance or media innovation.

Virilio takes his cue from artist Paul Klee: 'Now objects perceive me'. For Virilio, even in the mid-1990s: 'This rather startling assertion has recently become objective fact, truth' (1994: 59). Automation of perception hence brings about an 'optical imagery with no apparent base, no permanency beyond that of mental or instrumental visual memory' (59). Within Virilio's techno-dystopian scenario, instrumental virtual images are like the foreigner's mental pictures: exclusive and inaccessible. This is the fear of the drone as mechanized vision machine hovering above urban spaces, surveilling and thus affecting relations of public visibility and private seclusion. Military satellites have had this power for some time with lower image resolution and limited public access. The enigma of the drone lies not just in its precision remote flight capacities, but also in its reconfiguration of remote sensing, and the often palpable disruption of the scene in which it enters (military, policing, search and rescue, landscape mapping, or public cinematography).

By nature, drones dislocate and put in motion the camera operator's vision; at the same time they take camera vision beyond its function of recording to seeing and streaming (again, camera vision is a necessary part of the machine's mode of control and movement). With these developments consciousness itself shifts, enfolding a mental image or object outside of the individual perceiving subject to create an often problematic 'event-space', to use Virilio's term, a relative and relational space that brings together heterogeneous human action, machine movement, perception and location. Despite their varied uses, drones are inseparable from their camera and media function, hence the dual nature of the contest over control, regulation and usage.

But Virilio's error, as Johnston (1999) points out, is to oppose human and technical vision rather than positing visibility as running through and between them. Drawing from Deleuze and Simondon, Johnston argues that 'in the current climate of accelerated technological innovation, "a new consciousness of the sense of technical objects" may be necessary if we are to be fully receptive to and engage critically with the new forms and singularities of contemporary visual experience' (Johnston, 1999: 27; Simondon, 1958). Munster also argues that: 'Signal multiplies yet its relays do not entirely replace the human, rather it passes through and around us, integrating us into its circuits while not relying on us' (2014, 22). Hence with drones we can also ask: what are the new kinds of perception and action or control made possible by our human-technical assemblages? But it is the question of the experience of these perceptual systems, our troubled camera consciousness that is most important to understanding the impact that drone vision has on the scene.

Machinic vision should be understood not as a simple matter of seeing with machines or being 'seen' by them, though in a sense this is presupposed and generally assumed, but rather 'a decoded seeing, a becoming of perception in relation to machines that necessarily also involves a recoding' (Johnston, 1999: 23). Drone vision incorporates a striving to surmount the eye's immobility, a striving that is simultaneously captured within a conceptual bind in which social relations and capacities are both augmented and radically restructured. We gain a new form of perception image – the image of the perceiving eye-camera – through its foregrounded 'dislocation' and aerial motility. This introduces an inevitable volatility and unpredictability as technology rapidly develops: 'The instability of

signal in such assemblages derives from its plurality, its heterogeneity' (Munster, 2014: 154).

Considering the role of signal and its disruptions in radical empiricist terms, Anna Munster (2014) has explored the proliferation of vernacular drone camera videos on YouTube, the thousands of uploads from enthusiasts experimenting with the aerial and visual capabilities (and limits) of civilian drones. Many of the videos revolve around the point where the drone is cut adrift from human control, where the signal is lost, and where 'we experience a sense of the nonhuman capacities of both the drone *and* the image' (Munster, 2014: 153). What drones make visible at the moment of signal failure is the conjunctive relations embedded in wireless networks as core to the culture of digital connectivity.

By pointing to the central importance of edges or the relations drones enter into and shift, we see the need to rethink the object as plural, to consider a broader understanding of the 'experience', and visuality, that drones participate in. This is the aim of Jamesian radical empiricism, a philosophy that offers a way of thinking the binding of things, thoughts, perceptions and processes. It takes relations to be as real as their terms: "and," "with," "near," "plus," "towards" (James, 1912: 121). Experience should be understood as a 'shifting platform for experimentation, not a solid foundation' (Mackenzie, 2010: 16). Without adequate consideration of the experience encompassing drone systems and visuality, the wireless and perceptual relations that drones enter into and alter, there can be no coherent platform for their regulation or adoption. But this move also offers insights into the place of drones in visual culture as a tool for social imaging.

Mackenzie opens his account of wirelessness with the observation that 'between 1999 and 2009, a "turbid" or disordered sensation of change was felt as wireless connections expanded and eroded the edges of the Internet and mobile telecommunications' (2010: 1). In the apparatus that constitutes the complex and contested relations circumventing drone systems and visuality, we can see the emergence of a wireless politics that implicates drones in those '*other publics*' of local networks, packet shifting, signal relay and data movement (Parikka, 2013: 9; Chun, 2006: 4; Mackenzie, 2010). And this is why it is important to take into account the pre-configurative role played by satellites. Like satellites and the telecommunications systems that came to contest orbital space in the second half of the twentieth century, drones and the regulatory

tussle they have entered into are the outcome of this rapid and 'disordered sensation of change' in the new aerial reach of wirelessness networks and remote sensing and imaging. The sensation or awareness that follows from drone camera use – both of the scene from above and of the camera from below or within its view – constitutes the system's media-affect, a new camera consciousness, a concept I will elaborate on in the final section of this article. The affects and implications of this motile device and camera consciousness play out and become evident in the midst of their regulatory contest.

### **Objects of Regulation: Domesticating Unruly Optical Machines**

The problems law reform bodies, legislators and aviation authorities face in regulating drones lies in their tendency to target objects, actions and training or licensing. There is a general blindness to experience and relations, or these only feature as the initial provocation to regulate. The rapid move to regulate signals the palpable intensities belying drones' suite of mobile and mediated technologies and recognizes the surging public interest and anxiety surrounding drone 'objects' and drone media. It is this surging intensity of experience and reconfigured relations that designates the *actual* power of drones. However, some understanding of the uneasy regulatory terrain can be valuable in determining the socio-political relations that drones have entered into.

In many nations, the operation of drones in public airspace is under review, with the Federal Aviation Authority (FAA) in the US currently working toward a September 2015 overhaul of regulation for commercial and heavy drone flights. Non-commercial or hobby flights of lightweight drones are currently able to fly under 400 feet and within line of sight range under Advisory Circular 91-57, Model Aircraft Operating Standards (FAA). The FAA's stated interest in regulating Unmanned Aerial Systems (UAS) is to guard against aircraft that are operated 'in a manner that endangers the safety of the national airspace system', and to 'protect users of the airspace as well as people and property on the ground'.<sup>1</sup> In the FAA's UAS 'Online Listening Session' in April 2013, additional public concerns were heard regarding the Administration's approach to privacy. As well as strong concerns about accidents, many submissions from representatives of user organisations or civic bodies raised privacy concerns ranging from civil liberties regarding 'the privacy implications of UAS', or surveillance uses by law enforcement

agencies, to the changing dimensions of public spaces and noise intrusions, with some demands that the FAA not treat the issues of privacy at all as outside of its remit as aviation safety authority (FAA, 2013). The blurred boundaries of regulatory and public concern that converge on the drone as object are clearly complex and volatile.

Rapid technological development and projected or actual forms of use and misuse have ignited review and contestation elsewhere too. The Australian federal inquiry conducted by the Commonwealth Parliamentary Standing Committee on Social Policy and Legal Affairs was published in July 2014. The report's title, *Eyes in the Sky: Inquiry into Drones and the Regulation of Air Safety and Privacy*, signalled the importance of privacy concerns to debates about regulation of Remote Piloted Aircraft (RPAs), with separate investigation and regulatory work undertaken by the Civil Aviation Safety Authority along the same lines as the FAA and the International Civil Aviation Organisation.<sup>21</sup>

The *Eyes in the Sky* report outlines in detail a number of current and future applications for law enforcement and emergency services, commercial and agricultural, media, scientific, research and surveying, interest groups and recreational users. When examining uses of RPAs, it also compares activist groups such as animal welfare or environmental groups, with enthusiasts filming local sporting events as contributing to the growth and complexity of civilian drone use. As one example, the Standing Committee's review of 'our drone future' considers the capabilities of the forward facing high definition cameras of RPAs for activist and environmental groups monitoring animal cruelty and environmental damage on remote properties. It highlights the productive, though legally dubious use of drones in monitoring waste discharge in waterways, capturing footage of commercial farming operations to expose animal suffering and breaches of regulations (Commonwealth of Australia, 2014: 11). Against these uses, the inquiry highlights the two key public concerns: safety and breach of privacy.

The contestations of power and control that underpin the regulatory review process as it converges on drone technologies and practices are intensified by cases of accident and breaches of safety. Drones are positioned as unruly objects of risk:

[L]ike any new technology, drones can be misused. They can pose a safety risk to other

aircraft or to people and property on the ground, and the cameras and sensors they carry can be used to invade Australians' privacy. The challenge we face is to realize the potential of this innovative technology while protecting against its risks. (Commonwealth of Australia, 2014: v)

Accounts of drone technology failure are common and reflected in sensationalist headlines such as 'When Drones Fall from the Sky' (Whitlock, 2014). And techno-failure also encompasses major security flaws or aerial based WLAN attacks and the like. As one industry commentator puts it: 'We think we know our logical and geographical borders, and have a sense of how vulnerable we are to social engineering and insider threats. But drones have the potential to change all of that' (Badman, 2014). One manufacturer has experimented with pre-installing software to warn operators when the drone approaches restricted airspace around airports or government buildings, and shuts down the system if it continues (Corcoran, 2014). Attempts at encoding control follow the expectation of both mechanical and signal failure with drone systems (Whitlock, 2014). The aero-robotics required to stabilize a small (or large) unpiloted object is considerable. But, more significantly, the complexities of wireless systems embeds volatility into the process. Thus systems are often set up to return 'back to home' automatically with major signal interference or when out of range. As Whitlock puts it in an investigation of US military drone operations and failures: 'Drones are dependent on wireless transmissions to relay commands and navigational information, usually via satellite. These communications can be fragile. Records show that links were disrupted or lost in more than a quarter of the world's crashes' (2014). The relational experience of drones, the source of their desire and risk runs across their physical capacities (and incapacities) and visual assemblages. For this reason the risks posed by drone camera use are also foregrounded, if not well defined or understood.

RPAs are identified alongside Google Glass and other camera wearable devices as a new range of 'privacy-invasive' technologies with which regulation has not kept pace. The *Eyes in the Sky* report flags in its opening paragraphs the significance of the camera to what makes the drone a matter for urgent legislative concern. It quotes the 2012-13 annual report of the Office of the Australian Information Commissioner as the reference that prompted the Standing Committee's inquiry into RPAs:

Two pieces of technology that have caught the community's attention during the year because of their potential for [collecting and using private information] were aerial drones, with the capacity to film while being controlled, and Google Glass, a wearable device that allows the user to collect, access and transmit information. (Office of the Australian Information Commissioner, 2013: xv)

One of the difficulties when it comes to regulation in this area involves delimiting personal information in the capture and use of a person's image as photograph, film or video, and the appropriate regulatory instruments that govern those acts. In Australia, it has been noted that privacy is inadequately protected by a patchwork of Federal and State laws, rights protections and remedies (ACMA, 2013; Lindsay, 2005; Meese, 2015). 'Privacy-invasive technologies' pose wide-ranging questions regarding the relative significance and status of privacy in personal information, confidence and the consequences of its breach, a privacy tort or harm to personal freedom from public identification, protection of reputation and esteem in the eyes of others, or sanctioned and unsanctioned forms of surveillance alongside changing expectations regarding freedom from observation and visual exposure. The vexed and layered concept of privacy is highly contextual (Nissenbaum, 2010), and this extends to the kinds of relations of visibility that drones reconfigure through their varied civilian uses.

Given the sight- and visual-specificity of drone systems (as well as satellite optics and wearable camera devices), it is a mistake to point solely to privacy law and rights as the source of generalized public protection, let alone for remedy or redress. The *Eyes in the Sky* report makes clear in its recommendations that while privacy law reform is vital for dealing with privacy-invasive technologies (through 'technology-neutral' principles), the immediate focus for addressing the problems posed by drones lies in unifying, updating and harmonizing federal and state-based surveillance legislation for listening devices, optical surveillance devices, data surveillance devices and tracking devices (Commonwealth of Australia, 2014: 36-37). But it is the specific capacities that drone systems bring to the revisioning of vertical publics and processes of optical surveillance that regulatory bodies could do more to understand and incorporate. What constitutes surveillance is itself thrown open by

the use of drones in everyday contexts *and* contested social situations.

These systems also offer opportunities for ‘productive misuse’ as tools for DIY tactical media in combination with social media modes of exchange and distribution. In recent civil and political turmoil in Poland, Turkey, Thailand and Hong Kong, drone cameras have been deployed by protesters and activists to negotiate attempts from ruling regimes to conceal protest, censor news industry journalists and shut down access to messaging services and popular social network sites such as Twitter, Facebook and YouTube (McCosker, 2015; Tufekci, 2014; Hookway and Parnell, 2014). Drone use in these protest zones offers some context for considering both the disruption and expansion of state control over public spaces (including vertical publics). In so many situations of usage, what matters much more than the control of unruly motile vehicles in public airspace are the mental connections they enter into with regards to modes of imaging and visibility. Clearly at stake here is the governance of vertical publics, visibility and social imaging reaching beyond the remit of Aviation Authorities.

### **From Seeing Machine to a New Camera Consciousness**

In their provocation to think (or re-think) relations, drones open a new front on a process of ‘making the camera felt’ that has accompanied early developments in cinematography (Deleuze, 1986: 74; Pisters, 2003). In contrast to Haraway’s critique of the objective God-like image from above, Deleuze points to the ‘semi-subjectivity’ of the cinematic image in his discussion of the perception-image. One element of the perception image is the notion of a camera-consciousness which simultaneously splits the point of view or vision of the world (of characters and cameras) in a transformative process: ‘We are no longer faced with subjective objective images; we are caught in a correlation between a perception-image and a camera-consciousness which transforms it (the question of knowing whether the image was objective or subjective is no longer raised)’ (Deleuze, 1986: 74). The camera acts, and presents its semi-subjectivity through its motile, transmissible and sharable image.

Another way of considering this transformation of vision is through the force of its sensation, at the point where it makes itself felt, which

in the contemporary technological environment has become common and fraught: 'It's a kind of perception of the event of perception *in* the perception. We experience a vitality affect of vision itself, or a 'thinking-feeling' in visual form (Masumi, 2011: 44). In practical terms, this camera consciousness is also connected with the feeling that makes us pause, hurry past or turn away when a camera is held up and takes aim through a crowded street or before a notable object, event or subject. The sensation of cameras at the ground level is multiplied and intensified as the camera takes to the air on a nimble motile vehicle.

On one level regulators are attempting to deal with a cognitive apprehension of the privacy-invasiveness of aerial cameras as they move over suburban yards, public parks or commercial premises. The more generalized experience relates also to what Alfred North Whitehead called 'prehension', the 'act by which one actual occasion takes up and responds to another' (Shaviro, 2009: 28); or the 'uncognitive *taking account of* an as-yet-indeterminate apportioning out' of difference amongst objects (Manning and Massumi, 2014: 23). In addition to natural perceptions, the awareness of time passing, an aversive affect, or the sensation of wirelessness, 'our lives are filled with experiences of "non-sensuous perception"' which constitute the prehensive events and processes of life (Shaviro, 2009: 28; see also Whitehead 1933/1967: 180-181; Mackenzie, 2010). We think-perceive with and through the drone, with or without direct control over, or even access to, its first person perspectival vision.

By taking into account the camera consciousness within which drones enter and alter, we can also rethink the drone image as process, object, event and experience. The image of drone vision emphasises the spatial relations and the camera's semi-subjectivity, its motility. And the image-experience is bound up in this relational movement. This is a move towards a pragmatics of visuality in the still little understood ecology of social imaging, or imaging as the increasingly central basis for new mobile, located and social media connectivity (van Dijck, 2013). Drone video has a value within social networks as objects within social media systems that take vision outside of its bounded or fixed points of view, generating the new possibility at least of unfixed, motile imaging. Theories of visuality and networks both seek to understand 'shared experience' as a factor of enhanced or affective networked media. These approaches to networks and the social often, however, take the network as given (Munster, 2013: 7), and tend not to allow for the

kinds of fuzzy heterogeneity and unevenness that follows from the volatility of wireless connections and systems (which drones encompass). The distributed access to drone vision provided via social media links, and within social media events, differentiates this new camera consciousness from the cinematic version Deleuze wrote about in the 1980s.

Drone vision, between the processes of image capture, downlink, FPV, streaming and social media distribution, signals the extension of personal photography and imaging via handheld mobile phone cameras or satellites toward the more ubiquitous and free-floating idea of any-camera-wherever. If 'networked publics' are those formations brought into being by the digital tools and platforms that connect us (Varnelis, 2008; boyd, 2011), they are increasingly circumscribed by modes of dynamic, pervasive and newly motile visuality. In this way, the reflexive circuit between camera-experience and social media action-reaction and counter-action is further reconfigured by drones. As the camera acquires the power to break away from the clichés of ordinary experience and natural perception, the motile image itself 'thinks', as a kind of thoughtful or cogent imaging process following the new functionality of the camera (Moulard-Leonard, 2008: 111).

For Deleuze, going beyond the movement image toward the time image in post-war cinema, camera consciousness is no longer 'defined by the movements it is able to follow or make, but by the mental connections it is able to enter into' (1989: 23). It is active beyond the subject as point of view, an excess that introduces to the scene a 'questioning, responding, objecting, provoking' and so on, or in accordance with the functions of thought (23). This is also the excess of our 'fields of experience' that William James describes as noted in the epigraph of this paper (1912: 38). My point here is that in the social image and camera-sense set up by drone media, and in the unfolding vision of the drone's motile FPV and HD video streaming capabilities, the view from above is 'fringed forever by a more' that indicates the source of both its desire and recoil. Again, the camera-object 'perceives me', but in a more complete sense of entering into new mental relations that displace the centrality of the human operators in favour of a collective both within and beyond the field of vision.

A new camera consciousness designates a critically important tension within the proliferation of new forms and modes of mediation. We have unprecedented capacity to create, communicate

and connect with and through images, with multitudes of intimate and widely public camera phone snaps and video grabs, wearable, autonomous and remotely operated camera images distributed endlessly as the prized content of social network sites. As the new basis for networked media content, the autonomous or semi-subjective drone camera vision doesn't simply represent, but acts, relationally, to reformulate the social image. The point now is to better understand the actions of drone media along dispersed lines of consciousness (awareness, attention, self-formation, knowledge), across and beyond bodies and machines, within dynamic networks and publics.

### **The Indirect Regulation of Visuality**

Drone systems enter into and extend the wireless networks that pervade everyday locations and spaces, and 'effervesce on the edges of media change, activating and catalysing experiential modifications' (Mackenzie, 2010: 3). In this milieu technological failure, misuse and debates about regulation often show up those edges, or the conjunctive and disjunctive relations of techno-social experience. Negotiating this process takes place through regulation of the new device as it enters, for instance, airspaces, flight paths and urban skies, but it should also involve rethinking experience and socio-technical relations themselves. This includes modes of seeing and being seen, a more pervasive camera consciousness that signals the shifting grounds of public visibility.

Moves to determine and regulate drone use contain the implicit or even explicit aim of regulating visibility. This is why steps taken so far by aviation authorities to define the boundaries of usage and operation for drones raise concerns and provokes debate about the kinds of experiences that are enfolded into the terms of those regulations. These negotiations implicate and jar against shifting cultural logics that remain undetermined. What becomes evident in the negotiations is that the material quality and intensity of the perceptual relations entangling drones and people is felt as forcefully as the content of those perceptual relations, the images, videos and aerial mapping as they are captured, recorded or transmitted as streamed media and distributed through social networks. Ironically, these are the same processes that intensify the feeling of connectivity, beyond the immediate context of the camera, in the broader sphere of networked visibility and visibility.

With the proliferation of camera technologies now incorporating drone media, and opportunities for social imaging through visual social media platforms, the job of regulation and cultural and media theory alike might be to account for the new modes of visibility and social relations brought into being, in a way that addresses the concerns and promotes the potential of the new camera consciousness. Though he was writing in a very different technological era, one of the key manoeuvres that William James made was to reconsider consciousness as it has been thought for millennia, to attend to consciousness as ‘a kind of external relation’, not as a special stuff or way of being (that is, private, personal, mystical and inaccessible). This is evident in the particularity of experiences: ‘They not only are, but are known’, with public or shared awareness of their qualities. Camera consciousness is perhaps misnamed if it implies an insignificant internal and personal effect of camera and image relations. Its material and affective qualities drive the multitude of innovations and uses – both commercial and non-commercial – and are tangled up in the regulatory negotiations playing out in states wishing to modulate their use.

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### Notes

1. FAA, ‘Unmanned Aircraft Systems’, <http://www.faa.gov/uas/>.
2. Civil Aviation Safety Authority, <http://www.casa.gov.au>; International Civil Aviation Organisation, <http://www.icao.int>.

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