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# Watching the watchmen: resisting drones and the “protester panopticon”

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**Abstract.** The skies as sites of protest are opening up. Protester-operated drones are beginning to appear in the skies above protests: watching the watchmen, installing an additional layer of surveillance, increasing accountability and self-discipline amongst the police. In this way protester drones could be seen as establishing a “protester panopticon”, with the police as subjects. This article explores the potential panoptic effect of the gaze upon the police, drawing on sousveillance theory, before using counter-surveillance as a way to explore potential options for police resistance to the gaze of the protester drone. These resistive efforts are broken down into four categories, legislation and regulation, obscuring the gaze, electronic countermeasures and kinetic and physical force.

## 1 Introduction

The protest has long been the site of changing power relations, with protester adoption of new technologies, such as cameras, mobile phones and social media, all prompting reaction and resistance from the police (Bradshaw, 2013; O’Rourke, 2011; Neumayer and Stald, 2014). This article takes this contestation of power from the terrestrial dimension and lifts it to the aerial, exploring not the traditional police utilisation of the aerial but the protester adoption of the aerial domain for surveillance of the police through the use of drones. As such, the article offers an account of the potential regulatory impact of aerial surveillance upon British and American police forces and the resulting emerging and potential adaptive attempts at resistance. In doing so, the article is framed by the theoretical work of Foucault (1991, 2002, 2004), and his engagement with Jeremy Bentham’s panopticon; the architectural mechanism of power designed to internalise self-regulation amongst its occupants. Critically, however, the article proposes that the use of drones by protesters constructs a panopticon, in which the police are the subject. In constructing this “protester panopticon”, the article draws inspiration from work on counter-surveillance and sousveillance, by authors such as Monahan (2006), Wilson and Serisier (2010) and Mann et al. (2003), but critically applies it to the police-resisting surveillance by protesters

rather than protesters resisting surveillance by the police. While there are discussions and debates over the continuing relevance of Foucault’s analysis of Bentham’s panopticon to modern technology and society (Lyon, 1994; Boyne, 2000; Yar, 2002; Wood, 2007), this article opts to use the panopticon as a tool to facilitate exploration of self-regulation, visibility, power and accountability of police forces, while recognising its limitations. In doing so it highlights Lyon’s (2007:61) stance that “[t]he panoptic idea still has some merits for surveillance theory in that ... the uncertainty of being watched may still act as a deterrent to deviance”.

In the process of exploring the changing power relations between protesters and the police brought on by the introduction of drones and the establishment of an aerial “protester panopticon”, the article seeks to heed the call of academics such as Elden (2013) to consider territory volumetrically rather than merely focusing on the terrestrial or aerial plain, for as Crampton (2010:96) also reminds us, “territory is not just horizontal.” The article approaches the protest as a volume, with power operating across multiple dimensions. Rather than solely examining the impact of the aerial gaze on the terrestrial, the article also explores the way in which terrestrial police resistance can impact upon the aerial dimension through a range of methods, including the electronic spectrum and radio waves. The aerial dimension of the protest volume offers a unique perspective, which his-

torically has been reserved for police and the media but is now beginning to open up due to the increasing commercial availability of drones, thereby broadening opportunities for aerial surveillance. In this way, civilian drones are adding to what Thompson (2005) described as the “new visibility”, the uncontrollable rendering of the invisible visible, and could therefore be an answer to the age-old question, “quis custodiet ipsos custodes?” (Who will guard the guards themselves, often interpreted as who watches the watchmen?)

While there has been academic work on the adoption of drones by police for surveillance (Clarke, 2014) and the subsequent implications for civil liberties and privacy (Finn and Wright, 2012; Jenkins, 2013), the reversal of this arrangement, the ability of drones to watch the police, remains undeveloped. In order to develop this subject area, the article engages critically with a range of surveillance, counter-surveillance and sousveillance literatures, particularly Lyon (1994, 2007), Marx (2003, 2009) and Mann and Ferenbok (2013), to examine the potential impacts of the “protester panopticon” and theorise police attempts to resist. The theory is supplemented with a range of primary sources, notably House of Lords and House of Commons testimonies and reports and Civil Aviation Authority (CAA) and Federal Aviation Administration (FAA) documents. Additionally, due to the current dearth of academic literature for this new field of study, the article draws upon a range of British and American media sources to highlight recent technological advancements and contemporary examples of efforts to resist the gaze and restrict the presence of drones in the skies.

As the rules and regulations that govern the use of drones are still evolving, so are the official responses to the technology. The resistive element of these responses, however, is currently limited, with the official guidance from the British National Police Chiefs’ Council (2015:8), for example, primarily being to wait for the batteries of the drone to run out. Official insights into more active efforts at resisting drones are, however, also limited. When testifying to a House of Lords investigation into the civilian use of drones in the European Union, for example, sections of the evidence provided to the investigation by the European Unmanned Systems Centre (EuroUSC), the National Air Traffic Services (NATS) and the CAA were heard behind closed doors (Clot et al., 2014:52). As such there is a current silence surrounding official insights into the active official active resistance of drones, meaning that police responses are speculative within this article and based on police responses to similar surveillance technologies, such as cameras, or on responses which have been proven to neutralise drone technology, albeit outside a protest setting. In time, once the police have had to resist the gaze of drones on a more regular basis, the police responses to drones may become more transparent, and more work in this area should be undertaken.

The article consists of two parts. Firstly, it explores the work of Foucault (1991) on the panopticon, proposing that the protester adoption of drones could be conceived as con-

structing a “protester panopticon”, designed to hold the police to account and induce self-discipline. Having introduced the potentially panoptic effects of protester-operated drones at protests, the article then draws on counter-surveillance as a way to explore ways for the police to resist the gaze of the drone. This second half systematically breaks these resistive efforts into sections including legislative and regulatory, obscuration of identities, electronic countermeasures and kinetic and physical force.

At this point a clarification and caveat are needed. The terminology surrounding drones is contested, with more technical terms and acronyms, such as remotely piloted aircraft system (RPAS), unmanned aerial system (UAS) and unmanned aerial vehicle (UAV), arguably better reflecting the sophisticated level of the technology and the inclusion of a human in the loop. Despite the unpopularity of the term drone with the military and parts of industry (Boucher, 2014), this article uses the term due to its saturation within the media and the public. The Conservative MP Robert Goodwill (2015), for example, highlights that “while we may endeavour to keep everybody calling these things RPAS, ‘drone’ is the word that has now come into common parlance”, with the then Chair, now Honorary President, of the All Party Parliamentary Group on Drones, Labour MP Tom Watson (2013), observing that the term drone is “more accessible than some of the more technical terms”. On a technical level it is also important to establish that when this article talks about protester- and media-operated drones it is referring to small rotary aircraft, such as the popular DJI Phantom and Parrot AR quadcopters, as opposed to large fixed wing models, such as Predators and Reapers being used in Afghanistan, Pakistan and Yemen.

## 2 Surveillance

Surveillance is, at its core, about power. As Lyon (2007:23) highlights, “[w]hatever the purpose of surveillance, to influence, manage, protect or direct, some form of power relations are involved.” The utilisation of drones by protesters to watch the police and to conduct surveillance should be seen as a clear intention to exercise power in order to modify the behaviour of the police. In order to unpack this attempt to exercise power, this article draws upon Foucault (1994:329), who observed that “in order to understand what power relations are about, perhaps we should investigate the forms of resistance and attempts made to dissociate these relations”. While power relations between protesters and police at the terrestrial level of the protest have been unpacked by academics such as Goldsmith (2010) and Bradshaw (2013), for instance, this article builds upon this work by adding the aerial dimension to the protest volume.

Discussion on surveillance, Lyon (1994:161) cautions, often “quickly relapses into the paranoid, where surveillance is viewed overwhelmingly and monolithically as a threat”.

Accordingly it is prudent to stress that this article does not seek to claim that the addition of drones and the aerial perspective to the protester arsenal creates an all-encompassing, unescapable cage of surveillance; instead it seeks to explore and stimulate discussions over the ways in which the police can resist or mitigate the gaze of drones. Due to the increased availability of the technology, the presence of drones in the skies is likely to continue to expand and the police will develop ways to respond and resist, as they have done with the advent of previous technologies, such as video cameras, smartphones and social media. Before exploring these options for the resistance of drones, let us briefly examine the potential effects of the aerial gaze of the drone upon police.

### 3 Protester panopticon

When envisioning a drone hovering above police at a protest, recording, transmitting and surveilling the police, clear parallels can be drawn with Foucault’s work on Bentham’s panopticon. In *Discipline and Punish*, Foucault (1991) describes an architectural machine of power where a prisoner is situated in a backlit cell arranged so that the prisoner cannot see into other cells, instead facing only a central tower that the prisoner cannot see into but must assume that there is a guard watching from at all times. This arrangement has the effect of rendering the prisoner “perfectly individualised and constantly visible” (Foucault, 1991:200). The un-verifiability of the guard’s attention, that constant potential gaze of the guard, impacts the behaviour of the prisoner, for as Foucault explains, “[he] who is subjected to a field of visibility, and who knows it, assumes responsibility upon himself; he inscribes in himself the power relation in which he simultaneously plays both roles; he becomes the principle of his own subjection” (1991:202–3). The prisoner knows that they are potentially being watched at all times and therefore does not engage in activity that would lead to potential punishment, despite not knowing that someone is necessarily watching at that particular moment. They internalise the self-discipline.

This paper suggests that the presence of drones in the skies above protests could be seen as constructing an aerial “protester panopticon”. The continuous potential presence of the protester drone in the skies, at heights from which their presence or gaze is unverifiable, should be seen as an aerial architecture of control. This continuous, unblinking, unverifiable gaze created a metaphorical prison cell in which each individual member of the police can be identified and their actions scrutinised, leading potentially to punishment if warranted. In this way protester-operated drones may establish a panoptic effect on the police below; that is to say that they may “induce in the inmate [the police officer] a state of conscious and permanent visibility that assures the automatic functioning of power” (Foucault, 1991:201). The police will self-regulate their own behaviour to ensure that they do not do anything that could warrant punishment, as they know

that the “protester panopticon” could potentially always be watching their actions, ready to hold them to account.

### 4 Sousveillance

This construction of a theoretical “protester panopticon” and watching of the police, as the police themselves surveil the protesters, is protesters engaging in what Mann et al. (2003: 322) call “sousveillance”: literally, to watch from below – the surveilled watching the surveillors. The objective of sousveillance is to highlight practices of surveillance and challenge their use and provoke discussion. “Acts of sousveillance”, Mann et al. highlight, “redirect an establishment’s mechanisms and technologies of surveillance back on the establishment” (Mann et al., 2003:347). Traditional sousveillance has taken the form of photography and videoing from ground level, using technology also used by the state, due to the growing use of drones by British and US police forces to conduct surveillance (Wall and Monahan, 2011; Graham, 2011), however, sousveillance by drone is a logical reflexive step; with protesters adopting the same technologies of surveillance as the state. If police have objections about the protester use of drones to watch them, then their concerns may trigger discussions about the growing use of drones by police forces themselves, potentially tempering their adoption of increasing protections from excessive surveillance.

Sousveillance also increases the potential for accountability, due to the capturing of another perspective of an incident – a recording which is, crucially, independent from the authority being held to account. This additional perspective may shed light on cases of abuse in situations where official footage has been “lost” or is claimed to be non-existent. In the case of the investigation into the police assault of Ian Tomlinson, and his resulting death, during the G20 protests in London in 2009, for example, the “IPCC [Independent Police Complaints Committee] had initially claimed that there were no CCTV cameras near the assault. However, on 14 April, the London Evening Standard identified several cameras in the immediate area” (Greer and McLaughlin, 2010:1052). Official technologies of surveillance, such as CCTV, cannot necessarily be relied upon to hold the police to account for their actions. Kearon (2012:418), for example, highlights that “[f]rom the beating of Rodney King to the death of Ian Tomlinson, images that have triggered significant and highly visible public criticism of criminal justice agencies have not routinely been generated by formal technologies and networks of surveillance, but by technologies of informal surveillance utilised by members of the public”. Protester-operated drones therefore add another tool to the sousveillance toolkit and allow aerial access to previously inaccessible areas, such as behind police front lines.

The police, however, will not be the only prisoners caught in the “protester panopticon”, that aerial mechanism of power for instilling self-discipline. Protesters will also be caught by

the gaze, illuminated and individualised as though they too were in a cell. The panoptic gaze of protester drones is therefore limited to potentially altering not only police behaviour but protester behaviour as well. Despite the shift of the gaze to the aerial perspective, the potential self-implication of protester-operated gaze is not new, with the use of mobile phone cameras at terrestrial level, for example, being acknowledged as being “a strategic weapon at the same time as they increase activists’ risk of being identified by authorities” (Neumayer and Stald, 2013:128). Protester footage can be transformed into a potent intelligence source for the police; indeed, Wilson and Serisier (2010:170) observe that “[o]ne of the key ironies is that in monitoring and documenting protest actions video activists may inadvertently assemble a database that incriminates those it is intended to protect”. This monitoring of protesters in order to enable self-regulation can, however, be intentional with the pilot of the Occupy Wall Street’s “occuicopter”, Tim Pool, stating that “It’s going to be monitoring everybody. If there’s a black bloc, they’re going to get caught too. It’s going to show people the truth, whether that’s wrongdoing by protesters, by police, or by anybody else in the area” (Martin, 2011). It is possible, therefore, that some protesters may also seek to develop ways to resist aerial surveillance by the drones of fellow protesters and journalists, as well as the already existing layers of police surveillance.

## 5 Counter-surveillance

The presence of protester-operated drones in the skies also could be considered as counter-surveillance against police surveillance. Monahan (2006:516) defines counter-surveillance as the “intentional, tactical uses, or disruptions of surveillance technologies to challenge institutional power asymmetries.” Protester-operated drones, as well as challenging power relations through establishing a potential panoptic effect, also have the potential to neutralise the capability of police to conduct police aerial surveillance of protests and can therefore be viewed as a multi-faceted form of counter-surveillance. Protester drones in the airspace above and around protests may restrict access to other aviation assets owing to concerns over collisions, as drones have done to other emergency services in other potentially dangerous scenarios. In California, for example, manned firefighter aircraft, scheduled to drop water and chemicals on fires, were grounded multiple times in July 2015 due to the presence of drones in the airspace above and around the fires. Explaining the grounding, Mike Eaton, a forest aviation officer, reportedly commented that if a drone “gets into our engine or hits our wings, there’s no doubt we are going down” (Medina, 2015). This restriction of access has led to the US Department of the Interior and the US Forest Service pushing the simple message, “If you fly, we can’t” (Federal Aviation Administration, 2015). As part of allowing the execution of the

democratic right to protest, British and American police are at protests to help ensure the safety of protesters and the public (Mitchell and Staeheli, 2005). The denial of police access to the aerial dimension of the protest may, therefore, stimulate action by the police in order to re-establish their own aerial surveillance of protests in order to ensure safety at the protest and control.

## 6 Resistance

While the analogy of the “protester panopticon” is a useful lens for exploring the instillation of self-regulation, its application to civilian drones above protests is not without limitations. As the remainder of this article highlights, the gaze of the drone is not necessarily all-seeing or inescapable, with current technological capabilities, such as battery life and camera resolution, limiting both the permanence and sophistication of their gaze. These technological limitations mean that the current regulatory effects of drones may not be all-encompassing, with Martin Stolar, a lawyer for the Occupy Wall Street movement, for example, noting that although the presence of protester-operated drones “might have some kind of chilling effect on misconduct”, the poor resolution of footage may limit the effectiveness of its use in court (Martin, 2011). Concern over the suitability and robustness of footage in court is not limited to the aerial perspective, however, as this also affects terrestrial cameras (Goldsmith, 2010).

The remainder of this article builds upon these limitations, highlighting that protester drones do not necessarily ensure power over the police. “Control is never completely hegemonic. There is always an element of resistance” (Koskela, 2003:306). This resistance can come in many forms, for as Marx (2003:372) observes, “[h]umans are wonderfully inventive at finding ways to beat control systems and to avoid observation”. Since, as Clark (2014:299) suggests, “[g]overnment agencies generally have an interest in denying the public the right to apply visual surveillance against them”, police authorities are, accordingly, not passively accepting the impact of technological advances; instead they are resisting, engaging in what Wilson and Serisier (2010:168) describe as the “move and counter-move dance of tactical innovation engaging internal and external actors in protests”. The neutralisation achieved by each move in the dance can come in many forms, for as Marx (2009:296) identifies, “[n]eutralisation may be direct or indirect.” Having explored the establishment of a potential “protester panopticon”, the remainder of this article explores the ways in which the police may attempt to resist the effects of protester drones in the skies above them. It is important to stress that the following speculative police options for resistance are not necessary options that the police may implement, merely representing options for police resistance that are technically or theoretically possible.

## 7 Legislative efforts

Marx (2003:374) cautions that the game of tactical innovation should not, however, necessarily be considered as being between equals, noting that “the rules may not be equally binding on all players”. Unlike protesters, the police have the ability to utilise “significant asymmetry power” through legislation and regulations in order to neutralise the gaze of the protester drone (Wilson and Serisier, 2010:170). The British National Police Chiefs’ Council (2015:5), for example, suggests legislation that drone pilots could be found to be in breach of, including the Air Navigation Order 2009, Public Order Act 1998, Protection from Harassment Act 1997, Sexual Offences Act 2003 and the Terrorism Act 2000. This list, however, is not exhaustive. Access to the aerial dimension can also be denied through the relevant regulatory body, with the CAA in the UK or FAA in the USA, able to install no-fly zones over specific areas. Following the outbreak of protests and demonstrations in Ferguson in the USA after the shooting of an unarmed black teenager, for example, a no-fly zone of more than 37 square miles was erected and kept in place for 12 days, reportedly to keep media helicopters from covering the protests (Gillum and Lowy, 2014). This denial of the aerial perspective echoes police efforts at ground level of protests to restrict access, with the media prevented from filming the eviction of Occupy protesters from Zuccotti Park in lower Manhattan in 2011, for example (Sharkey and Knuckey, 2011).

On a terrestrial level, Wilson and Serisier (2010) observe that the police regularly utilise a range of legislation to counter and prevent use of recording technology at protests. The ability of cameras to take to the skies, due to their mounting on drones, does not change the fact that they are cameras and are therefore covered by existing legislation (Cremin et al., 2014). One such piece of legislation which has been used previously to attempt to stop the photography and recording of police in the UK is the Terrorism Act 2000, an amendment of which, Section 58(a), makes it illegal to photograph or record police if the images are likely to be useful to a terrorist (Terrorism Act 2000, Lewis, 2009). Due to attempted uses of this act to prevent photography of officers, the Metropolitan Police have issued clarification, stressing that “[m]embers of the public and the media do not need a permit to film or photograph in public places and police have no power to stop them filming or photographing incidents or police personnel” (Metropolitan Police, 2015).

Alongside legislation affecting cameras there exists a raft of regulations that specifically applies to operating drones, although the legal and regulatory framework surrounding the civilian use of drones varies from country to country and is evolving over time, with regulators attempting a balancing act between safety and privacy concerns and stifling an emerging industry (Cremin, Goodwill et al., 2015). Despite the legislative and regulatory differences between countries, there are also similarities, with both the Civil Aviation Au-

thority (2016) in the UK and the Federal Aviation Administration (2016a) in the United States forbidding the flying of hobbyist drones over 400 feet or over crowds of people, for example. Despite the existence of regulations, however, there have been numerous examples of violations, with the Federal Aviation Administration (2016b) receiving more than 100 reports of violations a month. The enforcement of drone regulations, however, has encountered difficulties in both Britain and the United States, partially in identifying the pilot, even after an incident. Chief Inspector Nick Aldworth (2014:336) of the British Metropolitan Police, for example, highlights that “[t]he big challenge is in the application of the legislation and actually finding the person responsible for that offence. When this material appears on the internet, for example, it cannot necessarily be attributed to the pilot or the person flying the machine”. In summary, “unless we can get there and then and identify the pilot or the person flying the machine, subsequent intervention becomes far more challenging than it would be otherwise”. More generally, concerns have also been raised about the practicality of actually implementing drone regulations, especially when judging distances in the air and proximity (Aldworth, 2014). These difficulties may well be compounded in an active, fast moving environment, such as a protest.

## 8 Obscuring the gaze

The adoption of drones is known to have had an effect on the subjects of surveillance. “People who are aware of adversarial monitoring from the skies also engage in tactics to evade the drone state. Specifically, subjects of drone surveillance have tried to be stealthier and camouflage themselves better than they have in the past” (Wall and Monahan, 2011:247). In *Cities Under Siege*, Graham (2011) suggests that the boomerang effect described by Foucault (2004:103) in *Society Must Be Defended*, the transferal of mechanisms of power from colonies back to the West, is clearly visible in the way in which drones originally designed for overseas military use are being adopted for use in the West; indeed, “Israeli drones designed to vertically subjugate and target Palestinians are now routinely deployed by police forces in North America, Europe and East Asia” (Graham, 2011:xviii). This article proposes that not only have drones, as a mechanism of power, returned from the battlespace and been appropriated by protesters in order to watch the apparatus of the state, as visible from online protester drone footage from protests in Bangkok and Kiev to New York and Warsaw (Noack, 2014), but also it is possible that attempts to resist the gaze of the drone may eventually follow drones from home from the battlefield.

Insights into potential police effort to avoid identification by drones can be drawn from previous police efforts on the terrestrial plain and efforts to resist traditional sousveillance tools, such as cameras. In order to obstruct success-

ful identification of officers by protesters with cameras, there have been multiple cases of police removing, or covering, their identification numbers, a practice referred to by Marx (2003:379) as a “blocking move”, thereby hindering a central tenet of the panoptic gaze: the identification and illumination of the individual so they can be held accountable for any potential action. These efforts by police officers to obstruct or mask their identification and evade being held to account for their actions has led to criticism from the IPCC (Bingham, 2009; Greer and McLaughlin, 2010). As the sophistication of drone cameras increases over time, potentially being able to capture and record the identification numbers of police at a distance, the IPCC may find themselves investigating similar attempts to obscure the aerial gaze of the drone.

Even if individual members of the police remove their identification numbers and manage to defeat the identifying ability of the protester drone, the police may find it harder to hide the more general movements of officers. The aerial perspective of the drone may allow the relaying of police movements and operations through social media and smartphone applications such as the anti-kettling app Sukey, allowing protesters to escape police efforts to restrict their movements (O'Rourke, 2011). In order to resist the gaze of protester drone and counter this loss of operation secrecy, the police may have to alter their tactics and attempt to engage in misdirection, potentially utilising tactics from the battlefield.

## 9 Electronic countermeasures

Alongside utilising legislation to resist the gaze of the drone there are also more technical solutions to mitigate the presence of drones above police, utilising the other dimension of the protester volume: the electronic and radio spectrum. One potential solution to drones is a technique known as geofencing, whereby, simply put, a drone “can have geographical information stored in its GPS navigation system to prevent it from flying in selected areas” (The British Airline Pilots Association (BALPA), 2014:105). Geofences can be created in a short period of time. For example, days after a DJI Phantom drone was crashed into the lawn of the White House in Washington, DC, the drone manufacturer DJI issued a software update that established a geofence around downtown Washington, DC, preventing the operation of any of their drones in the area (Bi, 2015). This mandatory software update does, however, highlight one of the limits of the current status of geofencing: the software is not universal in all commercially bought drones, nor is it necessary to include it on home constructed versions.

It has been shown to be technologically possible to electronically interfere with, and neutralise, drones. The same week that Amazon announced intentions to use drones to deliver packages, for example, plans were posted online on how to hack Parrot AR drones (Kellon, 2013). It is, however, unnecessary to seize direct control of a drone in order

to neutralise its gaze. Many drones have a software routine in place which allows it to return home if it loses contact with the pilot or GPS signal. Therefore, in order for the police to remove a drone from the airspace all they need to do is obstruct the drone's access to signal. GPS jamming technology already exists and is in widespread circulation. Indeed, despite their operation being illegal, there were estimated to be thousands of GPS jammers in circulation in the UK in 2013 (Arthur, 2013; Ofcom, 2015). One of the hazards of the police using jammers in order to neutralise protester drones from viewing and recording their actions, however, is that jamming technology is not specific in its targeting. The use of jammers would create a bubble, affecting everything using GPS, potentially including police equipment. A poignant caution of jamming technology comes from Newark airport in New Jersey in 2009, when a jammer on a nearby truck repetitively interfered with an airport navigation system. While there were not any serious accidents caused from the jamming, it highlights the unintended risks of the technology (The Economist, 2011). Hacking and jamming drones, however, are not the only options to electronically interfere with a drone. A third technique, spoofing, involves tricking a drone autopilot into thinking that it is the wrong position, leading the autopilot to correct the location of the drone, moving away from its original, intended position. In June 2012, for example, a team from the University of Texas tricked an USD 80 000 drone into thinking it was gaining altitude, resulting in it descending and nearly crashing into the ground before the team intervened (Whitlock, 2014). Spoofing was also the technique that Iran claimed to have used to bring down a US RQ-170 Sentinel in 2011 (Rawnsley, 2011). While it is prudent to stress that not all drones currently possess autopilots, as technology advances spoofing may become an option for neutralising protester drones. The hacking, jamming and spoofing of drones highlight the need to approach protests as volumes with multiple different dimensions, including electronic, so as to not overlook power relations.

## 10 Kinetic and physical force

In the scenario where all other efforts have failed to neutralise the gaze of the drone it is possible that physical force may be applied towards drones or their operators. Although police can arrest drone pilots who are deemed to be flying illegally, or dangerously, they may encounter difficulties in the actual identification of the pilot and the execution of the arrest as drone pilots do not necessarily carry or use controllers that might render them easily visible to the police, with smartphone apps offering the capability to discreetly control drones. Even the successful identification of protester-operated drones and their pilots, however, does not necessarily result in the breaking of the aerial gaze. Uncooperative or hostile protesters may restrict or hinder police

access to said operator and upon reaching a pilot the police may have to attempt to land the drone themselves, which may be dangerous. Three police officers in the UK, for example, even in a non-protest environment, struggled to safely land a drone after arresting a photojournalist pilot in 2014 (Quinn, 2014). Uncontrolled landings could pose a risk to those on the ground so it may well be that police likely to encounter drones could be given basic training in order to allow them to land drones safely.

If the pilot of the drone cannot be identified or reached, it is possible that the drone itself might be targeted in order to break its gaze, in what Marx (2003:381) describes as a “breaking move”: “the crudest form of neutralisation.” Despite the relatively recent emergence and adoption of drone technology by protesters, the tactic of using physical force against more traditional forms of recording, such as cameras, is well established (Wilson and Serisier, 2010). Physically targeting drones in the skies above protests, however, is more complicated than interacting with more traditional tools of sousveillance, such as video cameras, due to the potential uncontrolled descent of the drone posing a risk to those on the ground. Despite the risks to those on the ground, drones have been filmed being shot down by police in Turkey for instance (Peck, 2013). The ongoing challenge of how to physically neutralise drones is not limited to the police but faced by militaries around the world, with various options, such as lasers, emerging as potential solutions (Vincent, 2014). Military counter-drone technology may, in time, return to the domestic home front in the same way that we have seen the return of larger drones themselves (Wall and Monahan, 2011; Graham, 2010). Current, less-sophisticated options for physically neutralising drones include using a drone to carry a net in which to entangle the rotors of another drone (The Economist, 2015). Similarly, net launchers were reportedly taken to the 2015 Boston Marathon in order to enforce a ban on drones at the event, but they were not employed by police due to a lack of training (Annear, 2015). While these options are potentially safer for people on the ground than shooting down drones, it is important to stress that any physical interaction with an airborne drone poses a risk of causing its uncontrolled descent, which is why the NPCC (2015:8) recommend the passive reaction to drones: waiting for their batteries to run out.

## 11 Conclusions

In order to contribute to the emerging study of civilian drone use, this article has sought to highlight that, while the increased civilian adoption of drones has the potential to increase the surveillance of police at protests, this gaze is not all encompassing or unescapable. The police can resist the potential panoptic effect of the aerial gaze of the drone. Resistance, within surveillance literature, cautions Bradshaw (2013:452), is “seldom explored from the perspective of

those who are surveilled”. This article has, accordingly, speculatively outlined some of the ways in which the British and American police forces may attempt to resist the contestation of power represented by protester surveillance by drones, ranging from legislation and misdirection to electronic and physical responses. Not all of the options outlined may be practical at present, and this article was meant to provide not a complete list but a snapshot – a starting point for future investigation and to stimulate discussion. As drone technology continues to develop, new and improved capabilities will become available, inevitably leading to counter-moves and new forms of resistance.

While this article has discussed potential options for resisting the panoptic gaze of the drone, it is important to remember that drones are but one tool of a larger protester sousveillance toolkit for increasing accountability amongst police, joining a repertoire that includes video cameras, smartphones and social media. In exploring the potential responses to this new tool, this article has sought to supplement valuable work on the impact of previous technologies on power relations between protesters and police, such as mobile phones (Mitchell and Staeheli, 2005) and social media (O’Rourke, 2011), and work on the terrestrial territorial element of protests (Mitchell and Staeheli, 2005; Herbert, 2007).

Finally, whether they are known as drones, UAVs, RPAS or other newly emerging terms, the technology is being increasingly adopted across society, with the sector estimated to create 150 000 jobs in Europe by 2050 (House of Lords, 2015) and 103 776 in the United States by 2025 (Jenkins and Vasigh, 2013). This proliferation and increased utilisation of the aerial space make it essential to include the aerial dimension into our thoughts and debates surrounding surveillance, society and territory – to think volumetrically. The use of drones to aid in this conceptualisation of a protest as a volume, however, should not be viewed as merely adding an aerial perspective, for the protest volume also includes a wide range of other dimensions which need to be explored and considered, ranging from social media and phone signals conveying police and protester movements to the electronic and radio spectrum used to control drones, which may be open to electronic interference and interaction. This article has only begun to scratch the surface of these additional dimensions within the protest volume and encourages further exploration and engagement.

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