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Air power's visual legacy: Operation Orchard and aerial reconnaissance imagery as *ruses de guerre*

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The images contained in the Operation Orchard public archive represent a convergence of technologies, politics, and warcraft that can only emerge across a century of air power. Their interpretation refers to older modes of camouflage and deceptive practices from the espionage and tactical manuals of an earlier era in modernity even as the virtual and digital practices of the twenty-first century appear to destabilize the powers of legitimation that have come to surround the iconic reconnaissance photograph. Sincerely or disingenuously, media and analysts alike accept the circulation of reconnaissance imagery as objective news imbued with the legitimating aura of documentary material. If we accept the image as full of information that can be deciphered definitively, a kind of ground truth, we close off the possibility of learning from other sources or even from the complex state of uncertainty itself. In this context, we might have to concede that deception is not so much the obliteration of facts, as Virilio maintained just after the first Persian Gulf War, but the profuse and uneven dissemination of fact as visual data.

Keywords: air power; deception; aerial reconnaissance; photography; satellite imagery; camouflage; Operation Orchard; al-Kibar

All warfare is based on deception. (Tzu 2009, 100)

In the early hours of the morning of 6 September 2007, fighter jets from the Israeli Air Force's 69th squadron crossed into Syrian airspace and, in violation of a ceasefire formally in effect since 1974, bombed a target in the Deir ez-Zor desert. Based largely on photographic evidence, US and Israeli intelligence had concluded that the site was a nuclear facility of North Korean design that was only weeks away from becoming operational. In a significantly magnified composite photograph released by the US government after the event (Figure 1), a classic "before" and "after" reconnaissance image, on the left we see a rectangular building that was purported to house the nuclear weapons facility and, on the right, is the same building immediately after the 6 September strike. Although the photographs suggested that something devastating had happened to the building reportedly located at the site now known as al-Kibar, both the US and Israel kept a tight-lipped approach to questions from the press. The first report filed by *The New York Times* (datelined Jerusalem, Sept. 6) made no mention of a purported nuclear weapons facility, citing Syrian claims that their air defences had "repulsed" Israeli warplanes and that the attackers had "dropped munitions on the ground" (Kershner 2007). Global inquiry into the incident devolved quickly around very limited intelligence

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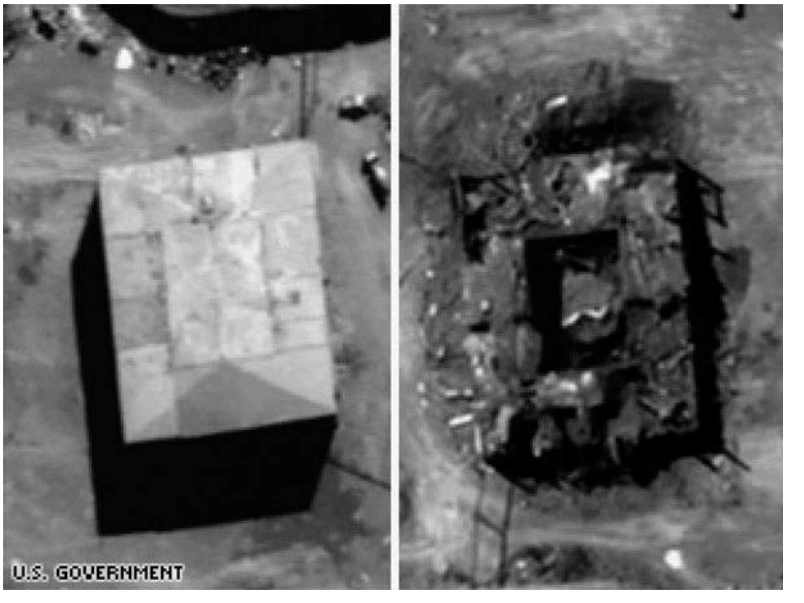

Figure 1. Operation Orchard: before and after photos released by the US government.

Figure 2. Suspected nuclear facility in Deir ez-Zor region, Syria. DigitalGlobe, compiled by the Institute for Science and International Security. 26 October 2007.

leaks and the release of highly controlled official information often centred around visual material. In another set of reconnaissance photographs of the same site published a few weeks later (Figure 2), the one on the left taken in August and the one on the right taken in October, the visual evidence of damage from the bombing raid is now somewhat ambiguous. What is apparent is that the building is no longer in evidence – the site has been bulldozed and cleared while concrete has been poured to "seal" it. The headline in *The Jerusalem Post* that accompanied the set of images read: "Alleged Syrian reactor 'vanishes'" (Jpost.com 2007). A US intelligence official, quoted in *The New York Times*

on the same day, observed: "It's a magic act – here today, gone tomorrow" (Broad and Mazzetti 2007).

Reconnaissance images like these circulate in the context of air power, the mode of warfare that was inaugurated in WWI to become a dominant feature of the military apparatus of the industrialized nation-states. A critical military studies returns attention to these largely utilitarian images lest we forget to inquire into the important work that they do to establish the truth-value of a supposedly objective representation of a specific site from the air. Closely linked to the cartographic "God's eye" view that developed over several centuries of European territorial expansion, the reconnaissance photograph, now primarily produced by satellites and drones rather than high-altitude planes, knits together diverse media and methods to generate certainty. In order to achieve this standard of absolute truth or "genuine knowledge" as an emergent technology in the early twentieth century, air power required new practices of visual interpretation and analysis of exponential amounts of proliferating data. As the century progressed, the visual scope of warfare now extended almost anywhere that the plane or satellite could "see", expanding the battlefield from the place where combatants meet to fight each other to the much broader field of staging areas and bases, even stretching to the civilian targets of morale bombing. With the advent of satellite remote sensing, the potential of ambient and continuous surveillance reconstructed the space of conflict to almost anywhere at any time. The best defence from this constitutive and ever-expanding envisioning was concealment – camouflage. Accordingly, the visual culture of air power came to include both the surveyor and the surveyed along with their mutual efforts to avoid detection and destruction through a dialectic of concealing and revealing a location or object. A critical military studies approach to the visual culture of air power aims to deconstruct this binary construction of modern warfare, by "seeking a dynamic, interrogative relation between the two" (Saint-Amour 2013, 125). This kind of critical approach "opens" the aerial or satellite image to a "range of critical practices and uses" to rework the possible meanings and uses of mechanically reproduced views from above, exploring the "paths of contradiction and ambivalence elicited by their mutual interactions" (Parks 2005, 83, 77).

"The ultimate eyewitness": photography's ruse

> A photograph captures everything in that it reveals nothing. (Shell 2012, 9)

Operation Orchard, like so many covert actions, was shrouded in secrecy and obsfucation on the part of at least three governments. Accordingly, as is also common in supposedly secret operations, especially after the event, rumour and speculation ran the gamut from mild questions about timing or which Air Force did what to whom to sensational claims generated by the full spectrum of political positions. Bloggers and commentators from around the world proposed that the Israeli Air Force managed to avoid Syrian anti-aircraft fire by jamming the Russian-made Pantsyr-S1 defence system or, more spectacularly but not inconceivably, that something like the US-made "Suter" airborne network attack system was used to invade Syrian communications networks, taking over as systems administrator (Carl in Jerusalem 2007[1]; Fulghum 2007). A right-wing blog claimed that it was not the Israelis but the US Air Force that had led the raid and that they had used a nuclear weapon to destroy the alleged reactor site. The blog attributed these "facts" to an Al Jazeera report that does not seem to exist (Allahpundit 2007)[2]. A more comprehensive conspiracy theory linked the attack to a massive disinformation campaign by the Bush administration to cover up the so-called "Kennebunkport Warning"[3] – a manifesto that

called for the immediate impeachment of Dick Cheney based on the charge that he was behind a plan to use a nuclear weapon on a US city and blame al Qaeda (Tarpley 2007). In a less hyperbolic tone, *The Guardian* published an article on 15 September with the headline "Was Israeli raid a dry run for attack on Iran?" to suggest a proxy war or at least a strong connection to deteriorating relations between the US and Iran at the heart of the event (Beaumont 2007). *Online Intelligence* made the argument that the facility at al-Kibar "houses a huge underground base where the Syrian army stores the long and medium-range missiles it mostly buys from Iran and North Korea" (cf. Raimondo 2007). *The Raw Story* published a related piece that claimed that these missiles were being loaded with chemical weapons including nerve agents such as Sarin (Alexandrovna 2007). Joe Cirincione, the director for nuclear policy at the Center for American Progress,[4] issued one of the strongest early critiques of the incident, claiming "This story is nonsense. Once again, this appears to be the work of a small group of officials leaking cherry-picked, unvetted 'intelligence' to key reporters in order to promote a pre-existing political agenda" (quoted in Hounshell 2007). In the absence of any official acknowledgement of the action by Israel and partial, perhaps purposely misleading, information from allies and even Syria, speculation flourished.

However, even in a climate of suspicion and proliferating conspiracy theories, the validity and political force of the "before" and "after" photographs published in the world press seemed indisputable. As Martha Raddatz wrote in a report for ABC News on 20 October, the only solid evidence available to the public that could prove unequivocally that a reactor designed to produce nuclear weaponry was under construction in a remote area in Syria and that it had been attacked from the air was the reconnaissance imagery: "the hardest evidence of all was the photographs" (Raddatz 2007). Yet, over the months that followed, serious questions began to be raised about the provenance and validity of those images as well as those contained in a briefing video that was released to the public in the spring of 2008. It is, perhaps, the importance of the imagery in this case – to fill in for other kinds of information, to make the case for or against the attack, to legitimize a military option over diplomatic efforts – that is indisputable. The matter of what a specific image can convey, how authentic or real, and where, when, and how it was produced only rarely becomes the subject of public discussion. When documentary images that circulate in the mainstream news like those linked to Operation Orchard do become controversial, they raise questions about the truth-value of photography in general as well as the link between mechanically reproduced imagery and the *ruses de guerre* (ruses of war).

The official line on the reconnaissance and intelligence imagery linked to Operation Orchard is that it constituted objective information, collected through accepted practices of statecraft and espionage. As Elliot Abrams, the Senior Director of the National Security Council for Near East and North African Affairs and Special Adviser to the President during George W. Bush's second term, has written: "The facts about al-Kibar were soon clear, and about those facts there was no debate" (Abrams 2013, 19). In his retrospective article on the "secret" bombing of al-Kibar published in *The New Yorker* in 2012, David Makovsky described one way those "facts" were obtained – a "daring" Israeli intelligence agency raid on the computer in the residence of Ibrahim Othman, the head of the Syrian Atomic Energy Commission who was in Vienna to attend a meeting, yielded "roughly three dozen color photographs taken from inside the Syrian building, indicating that it was a top-secret plutonium reactor" (Makovsky 2012, 34). Makovsky reported that President Bush and his top aides spent months in the spring and early summer of 2007 considering the Othman computer data first provided by Mossad, the Israeli intelligence agency along with the satellite reconnaissance imagery:

> A CIA crisis task force was established, and, according to the same official, the CIA compared "handheld" photographs of the site with "overheads" taken by American satellites. The photographs were then given to the National Geospatial-Intelligence Agency, which analyzes imagery and map-based intelligence for policymakers and the national security community. (Makovsky 2012, 35–6)

As a small echelon in the US government considered their options – whether to order a US Air Force strike on the site deep inside Syrian territory, or to sanction an Israeli operation, or to discourage any action at all – an Israeli special-operations unit reached al-Kibar in June and took additional photographs as well as soil samples (Makovsky 2012, 37). The political situation during this period (in the run-up to a presidential election in the midst of an already unpopular war) included an open conflict between Vice-President Dick Cheney (who advocated immediate US action) and Secretary of State Condoleeza Rice (who was in the midst of negotiations to bring opposing parties to the table for an international conference on Israeli–Palestine issues and therefore argued for diplomatic efforts over military options) as well as an erosion in support at home for Israeli Prime Minister Ehud Olmert that may have increased pressure on him to take a hawkish position on the question of the facility at al-Kibar (Abrams 2013, 21; Mazzetti and Cooper 2007). No one was certain how Syrian President Bashar al-Assad would respond to an air strike, but none of the parties involved in a potential action wanted to trigger a full-on war between Israel and Syria. The images brought to the table in presidential and ministerial offices by the relevant intelligence agencies in the spring and summer of 2007 were compelling and provocative – but what did they represent?

At this scale of reception in a political context, the images were required to be either true or false – they were either exactly what they appeared to be or they had to have been deliberately altered in the service of disinformation. If the images showed definitively a nuclear reactor in the final stages of construction then a strike by Israel or its allies was inevitable. If the images supplied by Mossad or other parties were falsified then such a breach of trust would upend established alliances and further destabilize the political situation in the Middle East. Yet the images also remind us that photography itself almost always involves a ruse – indeed, the power and influence of this kind of media often stem from an invested reading that ascribes certainty to what might otherwise be acknowledged to be something much less determinate. Photography, from its inception in the third decade of the nineteenth century, was received by many members of the general public as the "ultimate eyewitness", an unwavering testimonial mode of representation that could "override almost any degree of disbelief" (Goldberg 1991, 19). Along with inspiring a belief in the veracity of testimonial representation, photography as a print medium also could be produced in a materially stable form and moved to wherever it might need to go to be viewed, lending a permanency to an otherwise highly malleable and ephemeral technology (Latour 1990). This mobile, material permanency of images created by light and chemicals produced a belief in the truth-value and authenticity of the image even if the "truth" might be far more partial or selective than it might otherwise appear. As photographic historian Vicki Goldberg argues, "even today, when a large audience supposedly 'knows' that photographs lie, the most sophisticated observers instinctively believe that camera's report, at least for the brief pulse of time before the mind falls back on its education" (Goldberg 1991, 19). The key to photography's enduring power in the industrialized era, then, has been a promise to perfectly mirror reality despite ample demonstration of photography's highly constructed and mediated nature.

Is there a bedrock image that is always already subject to manipulation and alteration, or is the very process of using technology to record something viewed through the camera always selective and partial, even a ruse – a trick? Perhaps it is best to say that there is a foundational tension at work in every photograph – it pins down a view in a specific moment while also leaving open other moments in the past and future to enter into the process of looking at and understanding the image. Another way of putting this paradoxical tendency is that the photographic image creates uncertainty in the most certain manner imaginable. This dynamic of ambiguity and malleability that is inherent to mechanically reproduced images can operate as either a liability or an asset in espionage and reconnaissance practices. If an intelligence agency wishes to deceive or misdirect, photography can assist in that effort. Dino Brugioni, a former CIA officer who specializes in photographic interpretation, remembers the agency's first director, Arthur C. Lundhal, describing the invention of photography as a revolution in military affairs on the order of gunpowder:

> He lectured that it was the most important tool for recording and communicating information, and a powerful and factual way of viewing and understanding the world. It was also the most literary of all the graphic arts. Its universal appeal allowed it to convey ideas across language barriers more quickly and concisely than the written or printed word. But Lundhal always cautioned that any photo that has been tampered with, when discovered, could have the impact of exploding gunpowder. (Brugioni 1999, 3)

Specialists like Brugioni devoted their careers to uncovering (and perhaps producing) photographs that were intentionally manipulated and circulated in the service of disinformation. Therefore, in his authoritative book on photographic interpretation, Brugioni can write that photography has "always been manipulated" and photographs can always be "altered" (Brugioni 1999, 202–3). However, due to their close association with unmediated eyewitness testimony, they can also confer absolute certainty that can in turn legitimate any kind of reading or action. Such "contradiction and ambivalence" in photographic image production and interpretation speaks to the "discursive, economic, and institutional interdependence" that occurs when technologies "converge", especially in the case of visual and information media (Parks 2005, 77).

Ruses de guerre and the "obliteration of facts"

> In wartime, truth is so precious that she should always be attended by a bodyguard of lies. (Winston Churchill)[5]

In many ways, the suspicion directed toward the publication of "before" and "after" reconnaissance images linked to Operation Orchard resonated with Paul Virilio's well-known observation that the primary *ruse de guerre* is no longer conventional camouflage but the very "obliteration of the appearance of facts" (Virilio 2002, 87). Virilio wrote these words at the advent of the first Persian Gulf War in the early 1990s to argue that the growing reliance on digital technologies linked to the so-called "revolution in military affairs" did not provide more objective or precise information but instead promoted a powerful disconnection from reality that transformed the virtual image itself into a weapon against humanity. Harkening back to an earlier modern period, Virilio warned that from this point forward, "the defeat of facts precedes that of arms"; that is, all warfare now directs itself to strategic deception, to cover up what he refers to as "genuine knowledge" (Virilio 2002, 87). This claim, that a new visual culture linked to aviation

in general and air power in particular from the beginning of the twentieth century expanded exponentially into a radical break with humanistic values of truth and objectivity, echoes Foucault's discussion of the panopticon as a powerful sign of a surveillant society (Foucault 1979). Hence, in the late twentieth century, from the Marxist humanist as well as the poststructuralist schools of thought, an alarm was registered over the emergence of a technoculture of total visibility that extends the field of political and cultural conflict to all places and times.

Although we should take seriously Virilio's point that a significant shift occurred during the first Persian Gulf War in the early 1990s, western European and US military history yields many examples of subterfuge, disguise, and deception over several hundred years. Indeed, we might conclude that deception itself is foundational to warfare and that the humanistic values of truth and certainty that Virilio claims are evacuated by virtual technologies have never been of much use in the colonial spaces of the Middle East and elsewhere (Kaplan 2013; Adey 2010; Gregory 2004). In the colonies and peripheries of Europe, the kind of "genuine knowledge" that Virilio wishes to restore has been produced through modes of information retrieval that are suspect at best (Satia 2008; Spivak 1987; Said 1979). If the Western spies cross-dressed and went "native" in their efforts to gather useful intelligence in the service of empire, the deceptive practices of nation-states intent on occupying or territorializing land earmarked as "valuable" in terms of oil or other resources created a foundational geopolitics rooted in ambiguity, secrets, and lies. The entire discursive apparatus of true vs. false, real vs. unreal, and certain vs. uncertain operated to the benefit of those with military might, constructing legible certainties – facts, if you will – out of ambiguous, complex, or counterfactual information.

Aerial reconnaissance was designed to produce facts about terrain – drawing observable objects and people into the domain of geographical knowledge – in the name of control, security, or outright occupation (Omissi 1990). The invention of the airplane in the early twentieth century changed the ways in which wars were fought, bringing cartographic surveying and techniques of imaging production and analysis to the fore (Satia 2006). While in eighteenth-century Europe, battles were fought "within visual range" – that is, the commander had to be able to see the field of battle and the combatants in order to determine strategy and tactics – this version of command shifted when longer range weapons such as the rifle and more mobile cannons changed the ways in which soldiers were organized for battle. Standing armies dispersed over more ground and sought different kinds of concealment in the field itself (as opposed to in a fortress) and skirmishing tactics changed as well. The apotheosis of this kind of "empty battlefield" occurred in WWI as the infantry dug into trench systems and tried to remain out of sight for months stretching into years. This moment of utterly reduced visibility, of soldiers half-buried alive in holes in the ground, changed again as the airplane emerged as a mobile platform for observation. Once airplanes could overfly the trenches, fight aerial battles, and conduct reconnaissance from high above, the need for concealment changed dramatically. One of the greatest transformations in military operations augured by air power in WWI, then, was visual; strategy incorporated documentary observation and geographical knowledge in increasingly precise registers and scales while tactics began to depend on new conceptions of immediate data on troop positions and movements of materiel.

WWI marks the moment when nation-states that could afford the technological investment had the opportunity to fight each other with the combination of airplane and camera, the blending of "motor, eye, and weapon" (Virilio 1991, 56). The millions of aerial reconnaissance images produced by all of the armies involved in WWI offered

increasingly precise registers of visual documentation as the "empty battlefield" became "filled" with all kinds of useful information. In only the last year or so of the war, as many as 1,300,000 prints were produced by the US Army's Photographic Section (Sekula 1984). Considering the amount of reconnaissance imagery produced by the air arms of the militaries of Germany, France, Great Britain, and the US in Western Europe, the Eastern Front, the Middle East, and North Africa during the years of the First World War alone, the numbers are staggering (Finnegan 2006). Only a few short years after the first airplanes entered air space, a new visual culture had emerged to generate previously unimaginable imagery in enormous quantities. Interpretation of this massive amount of information became a pressing concern almost immediately: first, what to photograph; then, how to transmit the information in a timely manner; and, next, how to read it.

Building on the practices of panoramic painting and landscape art that influenced nineteenth-century photography and early cinema, as well as the emergent projects of mathematically-based mapping and surveying linked to corporate, national, colonial, and municipal interests, aerial reconnaissance photography proved itself to be adaptable for innumerable uses. In the years following WWI, the science and culture of aerial observation produced technologies of flash photography, infrared, and many other practices that became quickly incorporated into non-military arenas, especially in geography, arts, and entertainment. By WWII, the planes could fly higher and longer, the cameras were increasingly incorporated into the design of the planes themselves, and interpretation techniques drew on several decades of knowledge gained from aerial topographical surveying as well as other military projects. Ephemeral and utilitarian, the reconnaissance photographs of the two World Wars documented a specifically new viewpoint – what Paul Saint-Amour calls "applied modernism" – that made its own space and time within frames and calibrations that were unique for their period (Saint-Amour 2013, 125).

The convergence and co-constitution of camouflage and reconnaissance imaging

> Intelligence is … largely made up of the results of a fight between the camera and the camoufleur. (Solomon 1920, 52)

Camouflage and aerial reconnaissance produced each other. An entirely new vulnerability produced by the vast visual field of air power required defensive measures: from individual helmets to tanks and trucks to entire warships and, eventually, to whole airfields or factories. The word "camouflage" was part of a new nomenclature, coming into use during World War I, from the French verb *camoufleur* ("to make up for the stage"), although it also could be linked etymologically to the sixteenth-century through *camouflet*, a practical joke (Hartcup 1980, 7). By 1918, the French camouflage section employed 3000 so-called *camoufleurs*, creating illusions, masking objects, and staging performances in the hope of tricking the enemy. Following their lead, the other major national forces employed similar numbers in their new camouflage sections. Their project was to "conceal the fact that they were concealing" (Hartcup 1980, 7). Deception, rather than concealment per se, became the proper object of camouflage (Rankin 2008, 40). The performative aspects of deception came to be advocated by the more "modern" military strategists such as Winston Churchill and T.E. Lawrence. As Priya Satia has put it, "cunning and genius" became "indispensable" to the new military modes of "deception, irregular warfare, and air power" (Satia 2008, 143). The emphasis on disguise and indirect engagement that came to characterize the approach taken by British and German intelligence officers in the Middle Eastern arenas was echoed in developments on the Western

front in WWI, as the militaries rushed to understand how best to gain advantage or to minimize damage from air power. Moving from defensive concealment to outright deception, all manner of visual ruses were attempted to deflect enemy guns away from vulnerable installations or to confuse or make ambiguous otherwise obvious targets.

By World War II, camouflage could be said to have reached its apex – when all sides went so far as to develop elaborate material techniques to deceive the plotters of bombing raids. Entire lakes, factories, or bases were covered in painted netting in the hope of deflecting bombs toward less vital targets. New shades and kinds of paint were required as well as innovative substances like steel wool (which would resist rust and wear and could be placed into netting to be painted or to hold other kinds of materials) (Newark 2007, 114; Rankin 2008, 327–8). Scientists and industry worked closely with the military for these large-scale projects to defend sensitive installations at home as well as in the battlefields. Artists and stage designers joined other kinds of engineers and specialists to produce dummy trucks, tanks, ships, and entire towns and factories to try to confuse and deceive enemy aerial reconnaissance. The US deployed a so-called "Ghost Army" that simulated the sounds of entire tank divisions on the move by playing recordings at night in strategic locations, an impression backed up by rubber inflatable "tanks" and other decoy and imitation materiel (Gawne 2002). By the end of WWII, camouflage had become a sophisticated and widespread military practice, and deceptive operations were thoroughly integrated into modern techniques of warfare.

The inevitable uncertainty built into air power's photographic practices generated a co-constitutive challenge to uncover deceptive practices rather than explore the ambiguity and abstraction of mechanically produced aerial images. At this moment in history, despite the increasing speed of all forms of communication and the heightened potential for the manipulation of imagery, the truth-value of the analogue photograph, especially in the context of war, remained unquestioned. Therefore, the primary problems presented by aerial reconnaissance imagery were organized around questions of interpretation. Increasingly, seeing *all* through reconnaissance imagery came to require "two extremely different activities", the "taking of the pictures" and "the reading of their meaning" – that is, a separation between the acts of seeing and interpretation (Smith 1957, 1; Shell 2012, 92). WWII-era Allied reconnaissance photography interpretation was a highly specialized skill, conducted in military installations behind the lines, primarily by young female enlistees supervised by male officers. The interpretation of photographic "covers" – imagery of the same location taken from the same altitude at the same time of day on a regular schedule – involved extremely close analysis. The images were annotated, indexed, catalogued, and compared in relation to each other and to maps that were in the process of being updated constantly. This proliferation of detailed geographical knowledge for military purposes created new needs for emerging computerized production, analysis, and storage of massive amounts of data, and bolstered the argument for the development of extensive satellite programs to extend air power to space platforms for enhanced surveillance.

The role aerial reconnaissance could play in revealing deceptive operations became consolidated once and for all in the mindset of militaries and their civilian counterparts around the globe during the "Cuban missile crisis". The "crisis" occurred in the fall of 1962 when the Kennedy administration determined that the Soviet Union was installing ballistic missiles in Cuba. The Soviets insisted that no missiles were present. Proof of missile launch sites was offered first to the intelligence community and then to the general public by the strategic release of US Air Force reconnaissance photographs. These photographs, taken by high-flying U-2 spy planes as well as lower range Navy

reconnaissance aircraft, showed a breathtaking array of installations under construction or about to be operational, all within easy striking distance of metropolitan targets in the United States. In the tense negotiations that ensued, the Soviets agreed to remove missiles from Cuba if the US dismantled their own systems overseas as well. It was widely believed that nuclear war between the two nations was only narrowly averted and the role played by reconnaissance imagery was indisputably pivotal.

Reconnaissance photographs were used in innumerable ways during the entire span of the tense showdown between the US and the USSR – not only as interpretable data to inform President Kennedy, the military, and the intelligence community of what was or was not verifiable, but also as a public relations tool (for example, 50,000 prints of key images were distributed by the US Information Agency at the height of the crisis) (Lindgren 2000, 81). The most iconic moment in the United Nations (UN) Security Council hearings convened to address the matter occurred on the 24th of October when US ambassador to the UN, Adlai Stevenson, stunned the assembled diplomats by unveiling a series of U-2 reconnaissance photographs that "proved" beyond a reasonable doubt that the Soviet Union was constructing missile sites on the island of Cuba (Lindgren 2000, 82). These images, carefully labelled and annotated, entered the visual lexicon of the Cold War period, reinforcing the discourse of documentary evidence in general and photographic truth-value in particular.

By this moment in the Cold War, camouflage had lost some of its strategic and tactical efficaciousness. It moved into a secure niche in the design and coloration of uniforms, vehicles, and tents, and remained in fashion as a cyclical style in consumer goods and clothing. Following the launch of Sputnik and the satellite programs that ensued, steel wool and netting were no longer adequate to hide structures and objects on the ground from the "eye in the sky". Deceptive practices began to require completely different architectural and spatial strategies. Virilio argued that in the new modes of warfare inaugurated by the first Persian Gulf War in the early 1990s, it "no longer suffices to camouflage a plane"; instead of masking the object itself, "its path must be camouflaged to conceal its movements by means of disinformation (deception) that fabricates false random trajectories" (Virilio 2002, 33). In this context, stealth – disappearance from sight – would provide the best defence in contemporary war. Yet each new advanced stealth technology has been met by a matching method of detection and observation. Thanks to advanced remote sensing and drone surveillance programs, we have, in many ways, returned to the eighteenth century state of "near complete visibility on the battlefield" (Dewar 1989, 20; Gregory 2011).

Concealing and revealing Al-Kibar: the deceptive operations of reconnaissance imagery

> Under the law of war, deception includes those measures designed to mislead the enemy by manipulation, distortion, or falsification of evidence to induce him to react in a manner prejudicial to his interests…. (US Department of Defense)

Across the months between September 2007 and April 2008, there were three installments of reconnaissance images in the news stories about a possible nuclear weapons facility at al-Kibar, and an alleged Israeli air strike known colloquially as "Operation Orchard". The first set of "before" and "after" satellite photographs contains cropped, magnified, black-and-white images that are usually attributed to the US Government or Reuters (Figure 1). The tight focus and framing of these images limit our ability to ascertain exactly where the

structure that is being represented is located. We need to believe that the agency that offered this information was operating in good faith and that the highly magnified image of a flat-roofed building that is intact in one shot and destroyed in the other was *in fact* a nuclear reactor in eastern Syria near the bank of the Euphrates river that was about to go on-line. As we will see, analysts argued that the structure viewable in the "before" image was deceptive: that the Syrians disguised the shape of the facility by putting portions of it far underground, constructing a boxy shell around it, and misdirecting attention by absenting the usual hallmarks of secret installations such as guard houses and counter-surveillance systems (Albright and Brannan 2008).

The second set of images was produced by DigitalGlobe, a commercial satellite imagery company, for the Institute for Science and International Security (ISIS) on 26 October and published in T*he Jerusalem Post* that same day, in conjunction with the "Syrian atomic reactor 'vanishes'" story (Figure 2). ISIS, a non-governmental organization located in Washington, DC, addresses science and policy issues in relation to "international security", with an emphasis on nuclear issues, and is regarded by some as "more important than some US federal departments" (Follath and Stark 2009). The director, David Albright, holds an MA in physics and served on the team that inspected Iraq's nuclear program in 1996 for the International Atomic Energy Agency (IAEA). Some progressive anti-nuclear activists and academics who work on non-proliferation have argued that Albright advocates for the US to hold the dominant or deciding role in otherwise international projects, and that the position of ISIS vis-à-vis Middle East politics leans toward Israel. For example, in a series of posts on the *emptywheel* blog, Jim White charges that Albright and ISIS consistently put forward an anti-Iran agenda cloaked in the appearance of objective science (White 2014). ISIS does incorporate the truth-value of both science and photography, utilizing reconnaissance imagery to convey the impression of objective witnessing and analysis in their public communications. The ISIS homepage[6] superimposes the tag line "Employing Science in the Pursuit of Peace" over an aerial reconnaissance image and includes "Satellite Imagery" as one of their primary pages – all markers of the legitimating symbolism of aerial imagery in the fields of political science, international relations, and non-governmental organization advocacy. The drop-down menu for "Satellite Imagery" offers a list of countries that ISIS monitors – all "security" hotspots: Algeria, India, Iran, Iraq, Japan, the Korean Peninsula, Myanmar, Pakistan, South Africa, and Syria. All of the nine articles accessible through the ISIS link to satellite imagery of Syria ranging from 2007 to 2013 address the purported reactor at al-Kibar either as the primary focus or as part of a larger discussion of Syria's nuclear programme – there are no recent articles or analyses of the last several years of rebellion and civil war in Syria. In focusing on al-Kibar, ISIS signals its emphasis on nuclear proliferation and security threats linked to secret or "dark" reactor sites. In the absence of any other information, it seems that the satellite imagery commissioned by ISIS has become the legitimate photographic public record of an event at a site which is otherwise completely classified.

The images released on 26 October 2007 by ISIS, that were commissioned from DigitalGlobe as well as by SPOT Image Corporation, were widely circulated and cited in the world press. ISIS director Albright, almost always referred to in the press as a "former United Nations weapons inspector", argued that "it looks like Syria is trying to hide something and destroy evidence of some activity" (Broad and Mazzetti 2007). *The New York Times* concluded its reporting on the photographs by citing ISIS as the source for images taken in August and October, that "effectively confirms that this site was indeed the target of the Israeli raid in September" (Broad and Mazzetti 2007). The rhetorical

emphasis on certainty obscures a slip in the account from an absolute confirmation of a facility capable of producing nuclear weapons to an assertion that the evidence of an aerial strike on a structure appears to be a fact – something far less debatable.

In the case of Operation Orchard, the Israeli and allied intelligence agencies had to analyse and present evidence of a site that was both visible and possibly camouflaged – observable from space but resistant to interpretation at the standard of absolute certainty (at least to some). Several commentators have pointed to the reluctance of the Bush administration to sign on to photographic evidence of "weapons of mass destruction" after their earlier political and public relations disaster in relation to Iraq (Follath and Stark 2009; Abrams 2013, 22). The third set of images included in a briefing video addresses this conundrum directly to create a visual and textual narrative of secrecy, intentional deception, and extraordinary espionage and reconnaissance to justify the incursion into Syrian airspace in order to destroy the target at al-Kibar. Yet the certainty of this supposedly ironclad visual "proof" is not very difficult to destabilize.[7] Just for example, the provenance of some of the images that made their way into the intelligence briefing video is riven with contradictory timelines and murky storylines. In his *New Yorker* piece published in 2012, David Makovsky relates that Mossad agents extracted data from the laptop of the head of the Syrian Atomic Energy Commission, Ibrahim Othman, when he carelessly left the device in his residence while attending a meeting of the IAEA in Vienna in March 2007, triggering Prime Minster Olmert's convening of a secret group to analyse the evidence (Makovsky 2012, 34; Zetter 2009). Yet Eric Follath and Holger Stark, in their lengthy piece on Operation Orchard published in *Der Spiegel* on 2 November 2009, relate the more commonly told story of a Mossad operation, this time in London, that planted a "Trojan horse" program to secretly stream data directly from the laptop belonging to a Syrian government official (also carelessly left behind in a hotel room) to Israeli intelligence – an ongoing surveillance project that happened to scoop up intel on the project at al-Kibar (Follath and Stark 2009). Adding to the laptop intrigue and espionage derring-do, Follath and Stark report that the timely defection of Iranian General Ali-Reza Asgari yielded relevant information about Iranian support for a Syrian nuclear program and the al-Kibar facility, not only from his verbal debriefing but from *his* laptop (Follath and Stark 2009). It is probably safe to assume that a great deal of data from many covert and open sources, including interior and exterior photographs, exists and that the public has been privy to only a fraction of the information.

This lends a particular power to the imagery that has been released to the public primarily through official press releases, or via influential think tanks such as ISIS, or by news organizations. In the case of "one of the great mysteries of our time", as Follath and Stark refer to Operation Orchard, a relatively small visual archive is asked to do a lot of work to convey and legitimate policy or political messages (Follath and Stark 2009). The conventions of photography in general and aerial reconnaissance photography in particular assist in the delivery of "certainty" in establishing the kind of proof needed not only for presidents, prime minsters, and other officials in the government and military but for public opinion. As David Albright and Paul Brannan write in their ISIS report on the occasion of the release of the briefing video on 24 April 2008, although the video does not "settle all the major questions", they conclude that this media production does "address the fundamental purpose of this facility" (Albright and Brannan 2008). Drawing on the video's imagery to support their contention that "Syrian engineers and architects" went to "astonishing lengths" to mask "commonly expected attributes" and to "conceal the building's true purpose", the authors call for more efforts to be put into the early detection of nuclear facilities (Albright and Brannan 2008).

Where does the briefing video come from? According to *The Washington Post*, "US officials said that Israel shared the video with the United States before the Sept. 6 bombing" (Wright 2008). But the narration of the video is obviously written after that event, pointing to a version prepared by the CIA for briefing members of the House and Senate Intelligence, Armed Services, and Foreign Relations committees in April 2008. This iteration, titled *Syria's Covert Nuclear Reactor at Al-Kibar*,[8] is about six minutes long and is composed of a combination of still photographs and animated images clearly created through computerized modelling, all tied together by voice-over narration. The video uses labels, arrows, and captions to identify specific features and to prompt agreement that what is shown is a gas-cooled graphite-moderated reactor that only North Korea designs and builds to produce weapons-grade plutonium. Satellite imagery reinforces the models and confers further documentary credibility. The video concludes with a still shot of the head of a North Korean reactor fuel plant with Othman, the head of the Syrian Atomic Energy Commission, apparently in Syria[9]. Although the video utilizes computerized graphics, it is a conventionally organized example of informational media; simple, even unsophisticated, in the structure of its narration and visual strategy.

The release of the CIA briefing video elicited scorn and skepticism in the blogosphere. The *Moon of Alabama* blog led the charge, writing of the imagery of the structure, "To me this looks like a unfinished raw concrete building in a sandy place… It is not obvious at all from these on-the-ground pictures where they were taken" (Moon of Alabama 2008).[10] This blogger concludes:

> Think about it – we have some independent aerial pictures and then some aerial pictures animated with a likely photoshopped facade. We then have pictures on the ground of a concrete box or curtain wall that fit the facade. Who says that these are the same structures? From looking at these pictures, we cannot tell. (Moon of Alabama 2008).

Jeffrey Lewis and other commentators tended to agree that the destroyed structure was probably a small reactor but that the photographic evidence raised more questions than it answered: "A couple of things don't add up yet" (Lewis 2008).

While the allegation that the video contained "fudged stuff", including outright disinformation, seems to have resonated powerfully in an era of growing dissatisfaction with official explanations and rationales for undeclared wars, some commentators argued against a quick dismissal of the photographic evidence. Cheryl Rofer, at the blog *Whirled View*, argued that *Moon of Alabama*'s charge was misplaced, stating "all three of these photos look to me like they are transformed versions of a single overhead photo" (Rofer 2008). A particularly measured and cautious analysis published by "Professor Foland" at *emptywheel* expressed serious distrust of any information issued by the Bush administration while conceding that the video shows a reactor somewhere, probably in Syria, adding that the video still does not prove conclusively that al-Kibar was a weapons facility (Foland 2008). Most importantly, in relation to the visual "proof", Foland wrote:

> In the case at hand, knowing there would be skepticism about the provenance (especially given the history), if I'd been the briefing officer, what would I have done? I would have found and presented a series of photographs that put together a traceable chain of features from the local terrain down into the reactor core. That's because the local terrain is easily independently verified, by commercial satellites and even Russian/Chinese satellites. One way (but not the only way) would be to have a series of photographs from outside, in the door, along the halls, into the main hall. They claim to have a very large volume of photographs of which only a few are shown. *It troubles me nobody thought it important to*

> *put together that chain*, because it would have reduced the space of skepticism to "it's a photoshop world". Instead, there are only a few photos, all tightly cropped. (Foland 2008, emphasis in original)

Commentators knowledgeable about geospatial imagery pointed out that satellite orthophotos are always composite animations. As "Francois" replied to *Moon of Alabama*:

> the images show a texture mapped to a 3D elevation model of the terrain, a 3D model of the building all rendered in 3D by an open GL [Graphics Library] real-time rendering engine. Describing that as a photo is misleading. . .. It is a 3D render and not photography. (Francois, comment on *Moon of Alabama* 2008)

Indeed, all remotely sensed data has to be mediated rather heavily before it achieves legibility. As David Campbell argues in his work on the satellite imagery in Operation Orchard, these kinds of digital images "do not arrive fully formed as photographs" – the "raw data" has to be "computer processed before it can be viewed in a meaningful form" (Campbell 2013, 295).

Arguably, once it has been processed and produced as a still image, the satellite digital image is received as if it is, indeed, a *photograph*. Yet there are significant differences. Analogue photographs create imagery continuously; that is, there is an "indefinite amount of information" in the photograph that can be revealed through magnification (Mitchell 1992, 6). Digital images are composed of discrete pixel units rather than continuous tones; magnification of digital images reveals nothing new, only pixelation. Reconnaissance image interpretation developed during a period of analogue photography and depended heavily on working with the continuous properties of the medium. "Reading" the analogue reconnaissance image required taking it on faith that the truth of the scene was "captured" in the shot. The goal of this kind of interpretation was to reveal what was believed to be there – if not immediately apparent due to deception or camouflage, then latent in the image. Satellite imagery also contains dormant information, but this latent data is not in the image itself but in the archive. As David Campbell argues, the satellite scans continuously but no one sees the data unless some trigger prompts an analyst to "look" at it; that is, satellite data "only becomes an image after the fact, when it is rendered, analyzed, and circulated in response to an event" (Campbell 2013, 295). "Reading" the satellite image may or may not acknowledge the "necessarily partial perspective" inherent in the great distance involved in the sensing operation as well as the programming and compositing required to create a legible representation (Campbell 2013, 294). As Lisa Parks points out, the great distance between the satellite and the target of its observation renders the image "uncertain and unstable" and therefore open to a "range of possible interpretations and political uses" (Parks 2005, 84).

Deconstructing air power's visual legacy

The images contained in the Operation Orchard public archive represent a convergence of technologies, politics, and warcraft that can only emerge across a century of air power. Their interpretation refers to older modes of camouflage and deceptive practices from the espionage and tactical manuals of an earlier era in modernity, even as the virtual and digital practices of the twenty-first century appear to destabilize the powers of legitimation that had come to surround the iconic reconnaissance photograph. Therefore, when a

blogger reminds us that the imagery in the briefing video is 3D rendering and "not photography", we have to remember that, as true as that statement may be, at least when it comes to reconnaissance imagery released to the public, the image is *received* as if it is photography. Sincerely or disingenuously, media and analysts alike accept the circulation of reconnaissance imagery as objective news imbued with the legitimating aura of documentary material. If we accept the image as full of information that can be deciphered definitively, a kind of ground truth, we close off the possibility of learning from other sources or even from the complex state of uncertainty itself. In its own way, the US briefing video poured a metaphorical layer of concrete over al-Kibar, in an effort to seal it off from further scrutiny or questioning. Offering us beautiful satellite images (and, honestly, somewhat hokey animations), the parties invested in the air strike and its justification counted on the truth-value of photography to settle the matter. In this context, we might have to concede that deception is not so much the obliteration of facts, as Virilio maintained just after the first Persian Gulf War, but the profuse and uneven dissemination of fact as visual data. In the era of the "war on terror", citizens consent to this deception via certainty in innumerable ways.

Aerial warfare's generative powers have brought extraordinary genres and amounts of information into everyday life, reshaping political discourse and reworking visual culture. In the return to the "empty battlefield" of the current moment, as combatants go to ground in bunkers and caves or in an attempt to merge into urban density, the "eye in the sky" offers tremendous scopic range, available for rendering a specific target in great detail. These spectacular powers fail to admit their limits and lapses except in the most grievous instances of catastrophic mistakes or involuntary revelations of *ruses de guerre*. If the battlefield is now expanded to any place subject to surveillance and control, it can no longer be thought of as "empty" but must be acknowledged to be a zone of conflict that is crowded with elements: bodies and objects. How this environment and its inhabitants will be sensed and represented is an evolving question in the applied arts and sciences. The reconnaissance image may be an utterly archaic mode, giving way to other inscriptions, impressions, and data transfers in the "smart cities" of the near future, and yet, it endures. The long arc from the analogue aerial photograph to the digital satellite image stretches between wars that seem more and more to be less discrete than unevenly continuous, tenaciously adhering to the conventions of visual representation that produced the era's geopolitical "genuine knowledge". The dynamic between revealing and concealing catches the attention of the viewer of reconnaissance imagery, producing truth and certainty through specific technologies that generate, as well, ambiguity and uncertainty. The issue is not so much whether an image is or is not a photograph. What we can learn from reconnaissance imagery before it becomes completely obsolete is that its ruses also signal its potential deconstruction. When we critically engage air power's visual legacy, we trouble its relentless embrace of certainty to learn how it is made and whom it serves, inspiring our claim to its ambiguity in all of its indecipherable glory.

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Notes

1. This blogger's profile identifies him as an attorney who is an Orthodox Jew: "Some would even call me 'ultra-Orthodox'". https://www.blogger.com/profile/02078096846723817117 (Accessed 4 October 2014).
2. This anonymous blogger has been linked closely to the conservative-libertarian news website *Hot Air*. http://en.wikipedia.org/wiki/Allahpundit (Accessed 4 October 2014).
3. This complicated narrative involves a "rogue B-52" and a purported mutiny amongst senior military and intelligence officers. Several of the purported signatories of the "Warning" have disavowed most of the manifesto, claiming that the "statement has been altered" to "make it appear as if we have evidence that this administration will carry out a 'false-flag terror operation'". http://www.strike-the-root.com/72/allport/allport10.html (Accessed 25 September 2014).
4. The Center for American Progress, founded in 2003, is a "liberal" think tank located in Washington DC that is now closely linked to the Obama administration. http://www.sourcewatch.org/index.php?title=Center_for_American_Progress (Accessed 4 October 2014).
5. This often-repeated quote is attributed to Winston Churchill circa November 1943. Charles Lathrop, in *The Literary Spy*, mentions that "Churchill may have borrowed this line from Stalin" (Lathrop 2004, 100).
6. http://www.isis-online.org/ (Accessed 25 September 2014).
7. The timeline of some of the events linked to the air strike on al-Kibar and its aftermath contains some conflicting or incommensurable elements. In particular, the Makovsky, Follath and Stark (F/S), and Abrams accounts contain somewhat different timelines and emphases. Additionally, these reports differ in some significant details from the accounts in the published memoirs of George W. Bush and Dick Cheney. Without the space to elaborate fully, I would point to the two different covert laptop-access stories in the Makovsky and F/S articles and the vastly different dates in their respective articles, as well as the one published by Abrams for the Israeli special ops manoeuvre that yielded more photographs and soil samples, etc. I suspect that there were any number of such actions and that different sources revealed diverse events to each reporting team.
8. Posted on You Tube by *the Global Intelligence News Portal*'s webmaster, Mario Profaca, on 28 April 2008. http://www.youtube.com/watch?v=yj62GRd0Te8 (Accessed 3 October 2014).
9. Suspicions were raised by the poor quality of this photo; Moon of Alabama wrote: "I found some parts of this photo unconvincing, marked those with red circles and zoomed one part without interpolating…. The pixelating of the outline of the person in blue seems to be rougher than the pixilation of the rest of the picture. Is this picture photoshopped or unmodified?" (*Moon of Alabama* 2008).
10. *Moon of Alabama* is produced by blogger Bernhard, who may or may not also have been known as Billmon (who had been associated with a defunct site called *Whiskey Bar* – both titles reference Berthold Brecht lyrics). Left-leaning, perhaps a little too friendly to Russia for some readers, with an emphasis on foreign policy and intelligence matters, *Moon of Alabama* seems to have shut down in the summer of 2009 but is still posting reports and commentary in 2014. http://www.moonofalabama.org/; http://www.eurotrib.com/story/2009/7/2/05155/53465 (Accessed 4 September 2014).

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