Unmanned Aerial Vehicles: Closer at a Distance

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Introduction[1]

> Flight and squadron commanders wore bunches of long ribbons which flew back from their helmets in the slipstream and looked for all the world like bannerets of the knights of old. ... In their helmets, gauntlets and flying goggles, the pilots were truly romantic figures, and every small boy used to dream, in those days, of how *he* would look in the garb of his heroes.[2]

With a few evocative words, John Harris has captured some of the sense, some of the stereotype perhaps, of the first knights of the air. Therein lie romantic notions of duelling men of honour, trusty steeds on boggy fields replaced by soaring contraptions framed with fabric and wood. Almost a century after World War I, these partial conceptions of the soaring warriors and their self-sacrificial actions above the trenches are embedded in our history, an oft-repeated cultural memory that has taken on a reality of its own.

From that era of dog-fighting biplanes to the age of fly-by-wire, twin-engine fast-jets with stealth technology and satellite-guided weaponry, each iteration of technological advancement has seen its associated Royal Air Force (RAF)[3] aircrew – especially the pilots – construct their ethos in the shadows of those early pioneers. The heritage and heroics of their forebears have been claimed and selectively incorporated in the ethos of each new generation who would apply the increasing utility

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[1] At the request of the conference organizers, this chapter is extracted in large part, with Copyright permission, from the author's article 'Remoteness, Risk and Aircrew Ethos', *Air Power Review*, Vol. 15, No. 1 (Spring 2012), pp. 1–20.

[2] Harris, John Norman (1958): *Knights of the Air*. London: Macmillan, p. 12.

[3] This observation clearly applies to other air forces as well, but this chapter will focus on the RAF.

of air power in combat operations. However, the advent of the unmanned aerial vehicle[4] (UAV) in recent years has brought a new dynamic to the aircrew/aircraft nexus, with the former being removed from both the cockpit and the battle space. Understandably, given the rapid technological advances that are being made and the nature of counter-insurgency operations in Afghanistan in particular, debate is dominated by the art of what is technically and militarily possible, both today and in the future. Correspondingly, and encouragingly, debate is already taking place about the associated moral issues that are raised by the remote operation of the Reaper[5] today, as well as the moral challenges that increased autonomy might bring in the future.[6] Further, research is already under way on both sides of the Atlantic to monitor and assess the psychological impact of remote operations on UAV pilots and sensor operators,[7] given the unique juxtaposition of engaging in battle for hours on end and a 'normal' domestic life outside of the working environment.

Three strands of thought will be explored in the following discussion: the place of personal risk in the formation of aircrew ethos and both the utility and morality of air power in some of the ways it has been deployed in the past and continues to be deployed in the present. The first part of this chapter will explore aspects of the historical emergence of aircrew ethos since World War I, paying particular attention to the physical location of aircrew to their targets, before going on to look at some of the ways in which the ethos of Reaper pilots and sensor operators still utilizes aspects of those historical discourses. In the process, there will be references to personal interviews and written exchanges with current and previous British UAV crews. The chapter concludes with the following points: first, that while the use of UAVs presents us with new variations on old ethical concerns – such as non-combatant immunity – they should not be deemed as somehow inherently evil or insurmountable; second, though geographic separation from the battle space all but removes the need for physical courage (for now) in UAV crews, the need for moral courage may well be

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[4] The term unmanned aerial vehicle (UAV) is the conference's preferred term. The RAF, which operates the Reaper, opts for remotely piloted aircraft system (RPAS). Other terms currently used in wider debate include remotely piloted vehicle (RPV) and 'drone'. These labels have been avoided as far as possible – especially the latter – because they connote higher degrees of autonomy and de-humanization than may be the case with the currently operated Reaper and because they are often used to describe small and micro (including battlefield) aerial vehicles.

[5] In the author's research, he has been assisted by both Reaper pilots and sensors and Predator pilots. To make it easier for the reader, the reference will be to the Reaper throughout.

[6] See, for example, Arkin, Ronald C. (2010): 'The Case for Ethical Autonomy in Unmanned Systems.' *Journal of Military Ethics*, Vol. 9, No. 4, pp. 332−341; Lin, Patrick (2010): 'Ethical Blowback from Emerging Technologies.' *Journal of Military Ethics*, Vol. 9, No. 4, pp. 313−331; Dipert, Randall R. (2010): 'The Ethics of Cyberwarfare.' *Journal of Military Ethics*, Vol. 9, No. 4, pp. 384−410; Singer, P.W. (2010): 'The Ethics of Killer Applications: Why Is It So Hard to Talk About Morality When It Comes to New Military Technology?' *Journal of Military Ethics*, Vol. 9, No. 4, pp. 299−312; Strawser, Bradley Jay (2010): 'Moral Predators: The Duty to Employ Uninhabited Aerial Vehicles.' *Journal of Military Ethics*, Vol. 9, No. 4, pp. 342−368; Sharkey, Noel (2010): 'Saying 'No!' to Lethal Autonomous Targeting.' *Journal of Military Ethics*, Vol. 9, No. 4, pp. 369−383.

[7] 'Sensor operators' are responsible for operating surveillance and weapon systems on remotely piloted aircraft systems such as the Reaper.

greater than ever; because, third, extended loiter time, pattern-of-life observation and post-strike assessments can bring *greater*, not lesser, visual and emotional engagement with an enemy target.

Knights of the Air

Paul Robinson, in *Military Honour and the Conduct of War*, says of modern war: 'One area in which people did feel that the old ideals [about honour in battle] did survive was air warfare.'[8] He was referring specifically to the rise of aerial combat in World War I as the benefits of using aircraft for artillery spotting and reconnaissance inevitably led to the fight for control of the air. Robinson's observation is not a twenty-first–century idealization of the role of pilots from almost a hundred years earlier. He cites Bennett Molter, an American pilot, who wrote in 1918: 'In many ways the fighting aviators are living much like the lives of the heroes of chivalry. Their warfare is that of man to man.'[9] According to Molter, pilots would occasionally invite an enemy into single combat, a romantic notion that he compared with knights of old.

As the war progressed, the German, French and British authorities were keen to publicly exploit the growing legend of the noble fighter ace in the terms that Molter set out. Newspapers were complicit in the romanticizing of the Knights of the Air. In a book of that title years later, John Harris used similar discursive constructs in capturing the exploits of World War I Canadian fighter aces: 'Rain and intense cold often added discomfort to the dangers of flight, but on the other hand there was a grand sensation in handling the light responsive biplanes. ... In their helmets, gauntlets and flying goggles, the pilots were truly romantic figures.'[10] However, the figures were much less romantic than Harris's description of them. Starkly contrasting and more realistic was British pilot – and ace – James McCudden's recollections of aerial combat.

Taking into account his understated writing style and his preference for factual detail over displays of personal emotion or reflection, McCudden's effective and at times distinctly unchivalrous approach to the enemy shines through. Along with all other pilots, he was required to give himself the greatest possibility of killing his opponent in the air while maximizing his own chances of survival. He described an encounter on January 13, 1918, when he was flying at 17,000 feet, 10 miles beyond his own lines over German-occupied territory. He spotted an enemy two-seater aircraft several thousand feet below heading west and set out to ambush it. He set his engine to idle

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[8] Robinson, Paul (2006): *Military Honour and the Conduct of War*. Oxford: Routledge, p. 155.
[9] Molter, Bennett A. (1918): *Knights of the Air*. New York and London: D. Appleton & Company, p. 121, cited in Robinson (2006), p. 155.
[10] Harris (1958), p. 12.

to reduce noise and kept his own aircraft 'in between the sun and the Hun'[11] to reduce his chances of being seen while gliding down to make his attack. McCudden recalls:

> [S]o when I got within good close range, about 100 yards, I pressed both triggers; my two guns responded well, and I saw pieces of three-ply wood fall off the side of the Hun's fuselage. Then the L.V.G. went into a flat, right-hand spiral glide until it hit the ground a mass of flying wreckage. ... I hate to shoot the Hun down without him seeing me, for although this method is in accordance with my doctrine, it is against what little sporting instincts I have left.[12]

McCudden, in keeping with much military practice throughout history, typically depersonalized his aerial opponents: referring to them by the generic name of 'Hun', accompanied by the type of aircraft the 'Hun' was flying. However, he did grant exceptions to this general rule. In his memoir, *Flying Fury*, he wrote almost warmly when he referred to the German fighter aces he encountered: 'The marvellous fight which Voss put up against my formation will ever leave in my mind a most profound admiration for him, and the other instances in which I have witnessed the skill and bravery of German pilots.'[13] Yet, despite his admiration for German bravery and some level of desire for a sporting fight, military efficiency in the successful application of air power took priority. McCudden was certainly aware of his own ethos as a pilot and perhaps even still retained a desire for some idealized version of it as he physically and mentally deteriorated towards the end of the war. This desire took second place, increasingly so, to his effectiveness in killing the enemy. If romance endured anywhere it was not in the minds of those pilots who achieved fame through their proficiency: they had seen, heard and experienced enough of the human cost of their military art.

Consider the following three questions with regard to the emergence of aircrew ethos, with reference to those early pilots: How does the personal identity of a pilot emerge? What does a pilot do? How does the pilot do it? Clearly, these three elements of ethos are interlinked, but the first – identity – has two further aspects to it: how pilots saw themselves and how others saw them. McCudden typified a self-deprecating understatedness that has become a hallmark of aircrew ethos in the RAF; in *Flying Fury*, his descriptions of his own actions are heavily factual and almost devoid of emotion or drama. On the privations of war and the mental and physical toll of combat, he wrote: 'There are times while flying when one experiences such hardship and suffering [especially from the cold] that one is inclined to say, "No more flying for me," but after passing that state one

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[11] McCudden, James T. B. (2009): McCudden, *Flying Fury*. Newbury: Casemate, p. 253.
[12] Ibid.
[13] Ibid., p. 282.

becomes keen again and the fascination of the whole thing begins afresh.'[14] In stark contrast to McCudden's mundane self-analysis, the perception of some of those soldiers and officers who looked upwards from the squalor of the trenches was that of a self-aggrandizing elite who were separated from the harsh realities of the front lines. Such a view was probably reinforced by the rising curiosity of a public that, as the war progressed, wanted to hear more and more about the pilots whose freedom of the skies was often enjoyed for the briefest period before their untimely deaths.

Major 'Mick' Mannock was accredited with destroying 50 German aircraft and was posthumously awarded the Victoria Cross (VC) on July 18, 1919. Marking the occasion, the *London Gazette* summed up his flying career and character: 'This highly distinguished officer, during the whole of his career in the Royal Air Force, was an outstanding example of fearless courage, remarkable skill, devotion to duty and self-sacrifice, which has never been surpassed.'[15] McCudden's VC citation referred to his 'utmost gallantry and skill, not only in the manner in which he has attacked and destroyed the enemy, but in the way he has during several aerial fights protected the newer members of his flight'.[16] The characteristics and skills that were attributed to Mannock, McCudden and others acknowledged the gallantry for which their VCs were conferred. The citations also created and reinforced in the eyes of fellow combatants of all branches of the armed forces and the general public the discourse of the pilot as a form of ideal warrior. Even where the dangers of combat were shared in two-seat aircraft, with very few exceptions, it was the pilot alone who was given the publicity and awards.

No matter how many gallantry citations are read, the same characteristics are called upon repeatedly in the descriptions of the pilots and their actions: skill, duty, courage, perseverance, self-sacrifice. The common thread that connected these qualities and abilities in the eyes of the public was risk: physical danger from a combination of the enemy, the elements or the aircraft that were flown at and beyond the extremes of their technical specifications. Ferdinand West's award was not given because he attacked a large number of enemy fighters; pilots on both sides regularly carried out such actions. West was recognized because he fought on in extreme pain, overcoming the limitations placed upon him by the wounds he sustained.[17] Similarly, George Barker was awarded the VC for sustained attacks against the enemy despite being shot in both legs and having his left

[14] Ibid., p. 270.
[15] *The London Gazette*, July 18, 1919, p. 9136.
[16] *The Times*, April 3, 1918, p. 9.
[17] *The London Gazette* (Seventh Supplement), November 5, 1918, p. 13190.

arm shattered.[18] Skill was essential in every pilot. Maintaining that skill level in spite of grave injuries and the threat of death gave rise to the myth of the pilot as some kind of demi-god, not only physically separated from those who looked up from the fields below but somehow morally transcendent as well. On such foundations was aircrew ethos built.

Reinforcing the public perception of pilots as somehow possessing extraordinary characteristics and capabilities was the disproportionately high number of awards they received, in contrast to the number given to the vast armies of soldiers who battled on the ground. The immense, anonymous wholesale slaughter that took place in trench warfare is difficult to comprehend but provides an important backdrop to the recognition given to those who flew overhead. From a twenty-first–century viewpoint, where individual losses in Afghanistan feature regularly in both broadcast and print media, the numbers involved in World War I are almost too great to imagine. In one week in the Ypres Salient, only one element of the Ypres land campaign, two million artillery shells were fired by the British Army, 3,000 soldiers died and 14,000 were wounded.[19] The scale of the losses and the nature of the fighting, as well as provoking questions about tactics, morality, morale and leadership, caused problems when it came to the award of decorations. How could one or two individuals out of 500 be set apart from those who shared their risks, privations and horrors?

The war in the air, in contrast, provided the canvas upon which reputations and legend could be written. Even Trenchard publicly declared (against his private disregard for the aces): 'Albert Ball was the most audacious, the most skilful and most marvellous pilot in the RFC. Every pilot in the corps considered him the perfect model and strove to imitate him.'[20] Lord Rothermere, the Air Minister, on the day the RAF came into existence, went much further in extolling aircrew, enhancing and endorsing their already burgeoning and unrealistic legend. He wrote an article entitled 'British Airmen's Daring', where he eulogized the outstanding bravery of 'the British flying man', going as far as to say that the pilots of the Royal Flying Corps (RFC) and Royal Naval Air Service (RNAS) had rewritten the definitions of bravery and daring.[21] Going further, the remarkable deeds of these airmen and their successful attacks on 'the Hun' were attributed to a combination of 'perfect physique, of matchless bravery, [and] of extraordinary quickness of brain'.[22]

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[18] *The London Gazette* (Second Supplement), November 30, 1918, p. 14203.
[19] Winter, Denis (1982): *The First of the Few*. London: Allen Lane, p. 132.
[20] Ibid., p. 133.
[21] *The Times*, April 1, 1918, p. 8.
[22] Ibid.

Lord Rothermere's short article used the word 'bravery' four times and referred to the airmen as 'supermen'. The breathless tones in his description of aerial derring-do would appear more at home in a romantic novel than in a ministerial message published in *The Times*. Airmen were not only physically set apart from their fellow combatants by their ability to take to the skies, but they were metaphorically set apart as being somewhat extraordinary. The emergence of aircrew ethos took on a dynamic that was beyond the control or the desire of those who flew in battle. Public perception and the shaping of public perception in political and military discourse resulted in a 'reality' that did not match the experience of the aircrew in the war in the air. Since millions of people vicariously shared in the public 'reality' and only thousands knew what it was like to fly in combat, the perceived reality morphed into actual 'reality' over time. This process was helped by a wilful determination to maintain the myth, the legend of the supermen. Politicians and military leaders increasingly wanted it, the public wanted it and at least some proportion of flyers revelled in it.

How could anyone live up to the words of the Air Minister? For all the lack of realism in the tone of his article – it should be borne in mind that he was also fighting a propaganda war at the time – the foundation of aircrew ethos was set by the end of World War I and it would prove remarkably durable. Perhaps more interestingly, since Lord Rothermere was writing on April 1, 1918, aircrew ethos was already clearly established *by the time the RAF was formed*, being brought into the new organization from the RFC and RNAS. The essential elements of ethos that were set out previously – What is the identity of the pilot? What did he do? How did he do it? – were all present in Rothermere's statement. The pilot's identity as the brave superman of extraordinary physique and intelligence brought him affection from the public and envy from the trench-bound Tommy. He 'strafed the Hun', contested aerial duelling, reconnoitred enemy territory and dropped bombs, all with remarkable skill, endurance in the face of physical and mental injury, determination and cunning – usually until he died doing so.

Fighter and Bombers

After the Great War ended, aircrew ethos altered little over the decades, fliers and adoring public alike still preferring the legends to the harsh realities of policing the empire with scarce resources. If there was any risk of pilots in particular falling from public favour as the most adored and romantic of combatants, then World War II confirmed their places, *in perpetuity*, in the pantheon of military heroes. Over the summer of 1940, another generation of young men took to the skies in their Hurricanes and Spitfires to stave off the German quest for air superiority that was intended as a prelude to an invasion of the United Kingdom. Early in World War II, Churchill and the government sought to use any means to boost public confidence and morale at a time when a

country under siege needed both hope and heroes. Fighter pilots provided an ideal point of focus and optimism. Gallantry awards continued to be publicized as public perception of the pilots slipped straight into the stereotypes of the past. The VC citation of Flight Lieutenant James Nicolson captures his efforts as the Battle of Britain approached its most intense period:

> On 16th August, 1940, Flight Lieutenant Nicolson's aircraft was hit by four cannon shells, two of which wounded him whilst another set fire to the gravity tank. When about to abandon his aircraft owing to flames in the cockpit he sighted an enemy fighter. This he attacked and shot down, although as a result of staying in his burning aircraft he sustained serious burns to his hands, face, neck and legs ... this incident shows that he possesses courage and determination of the highest order ... he displayed exceptional gallantry and disregard for the safety of his own life.[23]

Aircrew ethos was perpetuated on the basis of the same characteristics and actions upon which it had been founded almost three decades earlier: skill, duty, courage, perseverance and self-sacrifice in the context of extreme physical risk. Seventy years after those immortalized aerial duels, Geoffrey Wellum, a former World War II Spitfire pilot, recalled the challenge they faced. "The effort that was being put in by the Germans and the Luftwaffe – they weren't doing it for fun and we had to stop them. That was the important thing. Not whether Jim shot down ten and Bill shot down one and poor old Sid didn't get any. It didn't matter who shot down what. It never worried me, these Germans were up to no good and they HAD to be stopped."[24]

Wellum's stark account dispensed with the romantic notions that meant so much to those who observed the pilots' actions from afar, his realism encapsulated in a single imperative: "they had to be stopped." As a combatant his emphasis was on repelling wave after wave of attack with consideration of the individual personalities or opinions of the pilots almost irrelevant. There was certainly no place for gentleman duelers. Patrick Bishop sums up the seriousness of the situation early in the war: 'Of the 2,917 men who fought in Fighter Command in the air battles of the summer of 1944, 544 were killed.'[25] On September 15, 1940, as the period commonly recognized as the Battle of Britain came to a close, Churchill reinforced the legend of the fighter pilot even further

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[23] *The London Gazette*, November 15, 1940, p. 6569.
[24] Geoffrey Wellum, September 22, 2011, Interview with John Sergeant in 'The Spitfire: Britain's Flying Past', BBC2.
[25] Bishop, Patrick, *Fighter Boys: The Battle of Britain, 1940* (New York and London: Viking, 2003) p. 398.

with his famous words: "Never in the field of human conflict has so much been owed by so many to so few."[26]

While the pilots of Fighter Command took their plaudits, the war progressed on multiple fronts, with Bomber Command aircraft able to strike directly against Germany. The dangers faced by the bomber crews took a different form to those faced by their fighter counterparts. Instead of repeated, short, intense high-speed encounters, they had to endure up to eight hours' flying over occupied territory and Germany. The constant threats posed by mechanical failure, icing, anti-aircraft batteries and interception by Luftwaffe fighters led to its aircrew suffering the highest attrition rates of any arm of the British forces. The comparative dangers also resulted in 23 VCs being awarded to Bomber Command and only one to Fighter Command. However, the extreme dangers and the associated high possibility of death or forced landing and imprisonment were not sufficient to deter those who waited to sign up for the riskiest of duties. What the Bomber Command offensives contributed to aircrew ethos was an emphasis on duty, the bearing of personal danger and a willingness to project air power with extreme prejudice in support of military and political ends: to do what needed to be done as proficiently as possible. Any thoughts of romance were firmly quelled by the deadly realities of bomber operations, whether they were called precision bombing, area bombing, carpet bombing, saturation bombing or any of the other euphemisms that were used.

What the bombers did – try to defeat Germany and its Nazi regime – took priority over the personal feelings of the aircrew and whatever preconceived notions of what it was to be an aviator. It also took precedence over their views of the means they used: the destruction of large swathes of German cities with the associated burning and death of child, shopkeeper, firefighter and munitions maker alike. Mark Wells summed up the character and achievements of the bomber crews: 'British airmen of Bomber Command ... faced a daily routine that pointed to the inevitability of combat death. Their response, which was to cling together, overcome their fears and to go on, is a tribute to man's ability to survive almost any hardship.'[27] Having explored a number of historical aspects of the emergence of aircrew ethos, the chapter now turns to examine how the ethos of UAV crew has emerged in recent years as they have operated the Reaper in combat operations.

Closer at a Distance

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[26] Churchill, Winston, September 15, 1940, quoted in Hart, Liddell, *History of the Second World War* (London: Pan Books Ltd, 1970) p. 107.

[27] Wells, Mark, K. (2000): *Courage and Air Warfare: The Allied Aircrew Experience in the Second World War*. London and Oregon: Frank Cass & Co Ltd, p. 132.

In an era of instant global communications via the Internet, 24-hour scrolling TV news and an increasingly sensationalist print media, the line between perception and reality in the domain of war is as blurred as it has ever been. Once a 'narrative' has been established in public discourse and a widespread degree of acceptance achieved, it becomes almost impossible to subvert or change it. On the one hand, this means that no matter how many revisionist books are published about the Battle of Britain, they are unlikely at this stage to cause any major shift in the public's view of what took place. On the other, it is very difficult to transform negative impressions, and much of the public discourse surrounding the use of the Reaper in Afghanistan has negative connotations. Consider these contrasting newspaper stories concerning two events that took place in March 2011:

> 'RAF Top Guns launch Libya raids'
> - BRITISH Top Guns last night launched a series of precision bombing raids on Colonel Gaddafi's armoured vehicles as they were poised to attack civilians.[28]

> 'Afghan civilians killed by RAF drone'
> - Four Afghan civilians were mistakenly killed and two others injured in an attack by a remotely controlled RAF 'drone' targeting insurgent leaders in Helmand province.[29]

The first story was illustrated by a photograph of an RAF Tornado GR4 and went on to discuss 'guided Brimstone missiles', describing how they were used in 'precision bombing raids' against military targets, all with the aim of saving civilian lives. The article referred to 'the "herculean" efforts of our brave crews', a reference that could have come from a government description of aircrew in either of the world wars. The piece concluded by highlighting the risk to the personnel involved, mentioning 'the wreckage of a US F-15 fighter that crash-landed in Libya'.[30]

The second story appeared alongside a photograph of a US Air Force (USAF) Reaper taken in a hangar at Creech Air Force Base, Nevada. The accompanying article referred to Afghan civilians being mistakenly killed as a result of poor intelligence on the ground. The basing of the crew in Nevada was discussed before a journalistic link was made to the Central Intelligence Agency (CIA) operating 'drones' in Pakistan. The repeated use of words like 'drone', 'unmanned drone' and 'remote-controlled aircraft' implied the de-humanizing or de-personalizing of combat operations

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[28] *The Sun*, March 24, 2011, p. 1, located at http://www.thesun.co.uk/sol/homepage/news/3487789/RAF-jets-launch-raids-in-Libya.html, accessed September 28, 2011.
[29] *The Guardian*, July 5, 2011, p. 1, referring to an incident on March 25, 2011, located at http://www.guardian.co.uk/uk/2011/jul/05/afghanistan-raf-drone-civilian-deaths, accessed September 28, 2011.
[30] *The Sun*, March 24, 2011, p. 1.

and the taking of life. The article quoted Chris Cole, from the Drone Wars UK website, who stated: 'The secrecy and lack of accountability surrounding the use of British armed drones is a matter of great concern.' Perhaps not surprisingly, given that the deaths of four civilians were being reported, the tone of the item was sombre. Notably, however, in contrast to the description of the Tornado strike, the Reaper, its *modus operandi* and its aircrew were described in an almost entirely negative light.

When these stories are juxtaposed in this way, the difficulty of developing a UAV aircrew ethos with which the pilots and sensor operators can identify *and to which the public can relate* becomes clearer. The consistently negative tone applied to remotely piloted aircraft systems and those who operate them also has implications for the way this particular capability is viewed both by other branches of the armed forces and by the crew themselves. The most commonly identified feature of Reaper operations in current public discourse is that they are operated from Nevada (though with the addition of No. 13 Reaper Squadron at RAF Waddington in the United Kingdom), with an emphasis on the physical separation of the operators from the battlefield in Afghanistan. The implication is that they are not sharing the operational risks that are being faced by those on the battlefield below or the inherent risks involved in flying a fast-jet low and fast over hostile territory.

The nature of remote operations highlights one problematic area for the ethos of pilots and sensor operators: aircrew ethos, as described earlier, has always been built on the bedrock of courage in the face of danger or death and the capacity to perform at a high skill level under great pressure or whilst injured. Therefore, what is UAV aircrew ethos built upon in the face of only minimal, irregular threat from the enemy? In addition, the generalization about the absence of risk cannot be extended to those pilots who carry out the visual take-offs and landings of UAVs within an area of combat operations such as Afghanistan.

I have explored this issue at length with a number of UAV pilots and sensor operators, some of whom previously operated the Predator or Reaper and some of whom continue to do so. The opening question that I have asked every one of them is: 'When asked, how do you describe what you do in the RAF?' Those who transferred from piloting another aircraft type – Tornado, Harrier, Hercules – gave almost identical answers that can be summarized thus: 'I am a pilot who now flies the Reaper', as opposed to 'I am a Reaper pilot'. (In contrast, one of their colleagues was very clear in his identification with the UAV type: 'I describe myself as a Reaper Sensor Operator.')

The emphasis of the replies was on 'pilot', with Predator or Reaper added on as appropriate. The reasons given for this emphasis varied and included the following: the kudos associated with being an RAF pilot, a preference for manned flight and not having a real choice about transferring to Reaper when another aircraft type was taken out of service. All the exchanges also addressed the preconceptions of the pilots themselves as they moved into this new and rapidly developing field, some of which were initially very negative. Interestingly, they also spoke of being 'convinced by' the capabilities of the Reaper and its role once they started to engage in combat operations. A key motivator for this was outlined: 'In the Tornado we trained for most of the year and deployed on active operations for a few weeks each year. On the Reaper every sortie is a combat sortie.' For some, there was a clear disjuncture between how they viewed themselves ('I am a pilot [as opposed to a UAV pilot] at heart') and their enthusiasm for what the Reaper could achieve on the battlefield. Those without prior operational experience as a pilot appeared more comfortable with and confident about their identity as a Reaper pilot or sensor operator.

In *Wired for War*, Peter Singer explored a number of aspects of what it means to belong to a UAV squadron. On the relationship between the combatant, risk and bravery, he wrote: 'The courage of a warrior, then, is about victory over fear. It is not about the absence of fear. By removing warriors completely from risk and fear, unmanned systems create the first complete break in the ancient connection that defines warriors from their soldierly values.'[31] As far as Singer is concerned, the UAV crew is 'now fully disconnected from war'.[32] On a physical level, his argument appears unassailable. Even if a small-arms round or shoulder-launched rocket-propelled grenade happened to strike and bring down a Reaper, the immediate physical response from its pilot will be visual and limited, an acknowledgement of a blank screen where previously there had been moving images. However, while there is no danger of that round or grenade hitting the Reaper pilot or sensor operator thousands of miles away, the individuals cannot fully be said to be without a physical response. Adrenaline, the body's fuel for 'fight or flight', still surges when a Reaper crew is tasked to provide close air support to allied soldiers or marines on the ground. An overabundance of adrenaline experienced over an extended period can have a debilitating physical affect on the human body – including the brain – regardless of its proximity to war.

Peter Olsthoorn explores respect as a crucial dimension of military ethics and makes a bold point about remote pilots and the psychological impact of physical separation from the battlefield. He writes: 'It's hard to imagine how one can respect the local population, as said a vital element of the

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[31] Singer, Peter, W. (2009): *Wired for War*. New York: Penguin, p. 332.
[32] Ibid.

hearts and minds approach, from, for instance, a control room in Nevada (where pilots of Predators and Reapers mostly work from). With such a distance – physical, but also psychological – between soldiers and the horrors of war, it has to be feared that killing might get a lot easier.'[33] Like Singer's similar claim about UAV crews being fully disconnected from war, intuitively, Olsthoorn's argument appears sound. How can someone thousands of miles away in a temperature-controlled environment properly engage – physically, psychologically or emotionally – with a battle in Afghanistan when they cannot feel for themselves the searing heat, taste the impenetrable dust and smell the stench of sweat and fear? When they cannot 'sense' the hostility of local tribesmen and their guts are not doing somersaults waiting for the first incoming sniper round or the deadly thump of an IED?

When I put this question to Reaper crews, including individuals who have flown missions from Nevada and also carried out take-offs and landings during operations in Iraq and Afghanistan, the consistent answer was not what I expected. While Olsthoorn's point has some merit, it should be generalized with great caution because it overlooks the counter-intuitive point. Far from providing only disadvantages, the emotional and physical separation of the remote pilot from events on the ground brings the benefit of increased objectivity. The number of available visual inputs through multiple screens provides a breadth of perspective not available to a crew travelling in a fast-jet at high speed and having to be continually rotating their heads to carry out checks, maintain spatial awareness and stay safe in the air. Furthermore, if fatigue sets in for the Reaper crew, there is always the option of being temporarily relieved and coming back to the situation rested and with renewed concentration.

Singer's and Olsthoorn's assumptions about the disconnection of UAV crews from war should be qualified further. Physical separation from the combat zone does not, for example, automatically lead to emotional disconnection. The crew of a Tornado flying at low level above an enemy contact may be *more* emotionally disengaged than the Reaper crew depending on the personalities of the pilot and weapons systems officer (WSO) and the intensity of the tasks they are carrying out in the air. This point was stressed by a Reaper pilot who had previously flown the Tornado GR4 in combat operations. Let us consider some of the actions of the crews of these respective types of aircraft.

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[33] Olsthoorn, Peter (2011): *Military Ethics and Virtues: An interdisciplinary Approach for the 21st Century*. New York: Routledge, p. 126.

Many fast-jet targets are pre-planned and as long as the necessary legal authorization is granted, attacks will be carried out under the relevant rules of engagement unless a forward air controller or some other individual in the 'kill chain' highlights a change of strike parameters. However, whether it is a planned strike or a response to an in-air tasking, the fast-moving Tornado crew has only a few seconds to acquire and attack a target. Then, having hit the intended target, the aircraft will depart the scene as rapidly as it arrived, some 800–900 feet per second. Consequently, the results of the strike are not immediately seen by the pilot or WSO, sparing them the instant emotional impact of the physical destruction of life and materiel below.

In contrast, a Reaper crew can spend hours or even days confirming the identity of an enemy combatant. Long loiter times enable a pattern of life to be established in considerable and mundane detail, with meal times, prayer times, toilet habits, friends and even relatives being identified. A much greater degree of emotional engagement with an intended target becomes possible when aspects of his personality and lifestyle become familiar, in contrast to the high-speed interventions of a manned fast-jet. Consequently, as one Reaper, former fast-jet, pilot summed it up: '[UAV] targets are much more personal.' Numerous studies have been and are being undertaken to examine physical, emotional and psychological factors involved in the operation of UAVs and only the passing of time will reveal how many of their crews will develop symptoms associated with combat stress or post-traumatic stress disorder/syndrome.[34] These will eventually be compared and contrasted with the experience of their fast-jet counterparts.

The relationship between courage and risk at the heart of the emergence and maintenance of aircrew ethos since the advent of air combat in World War I has been discussed at length, and for the most part, the emphasis has been on what might be more specifically called physical courage: the ability to persevere with a high degree of skill in the face of mortal danger or physical injury. There can be little doubt that with regard to the need for physical courage, Singer, Olsthoorn and others are correct about the remoteness of Reaper crew rendering this aspect of their characters and ethos obsolete. However, there is and always has been more to the place of courage in aircrew ethos than

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[34] See the following examples from a large and growing body of literature: Barnes, M.J. and Matz, M.F. (1998): 'Crew Simulations for Unmanned Aerial Vehicle (UAV) Applications: Sustained Effects, Shift Factors, Interface Issues, and Crew Size.' *Proceedings of the Human Factors and Ergonomics Society 42nd Annual Meeting*, pp. 143−147; McCarley, J. S. and Wickens, C. D. (2004): 'Human factors concerns in UAV flight', located at http://www.hf.faa.gov/docs/508/docs/ uavFY04Planrpt.pdf, accessed October 14, 2011; Trimble, Stephen: 'Flying Predators Bad for Pilot's Health', The DEW Line: '"Distant Early Warning" for the Defense Industry,' April 15, 2008, located at http://www.flightglobal.com, accessed October 14, 2011; Tvaryanas, A. P. (2006): 'Human Systems Integration in Remotely Piloted Aircraft Operations.' *Aviation*, *Space*, *and Environmental Medicine*, Vol. 77, No. 12, pp. 1278−1282.

the willingness to physically confront the dangers posed by an enemy, and that is having the *moral* courage to kill, or refrain from killing, as circumstances and rules of engagement dictate.

It is moral courage, combined with a determination to protect allied troops and kill enemy combatants while going to great lengths to avoid the unnecessary deaths of non-combatants that already provides, and will increasingly provide, the basis of the RAF's UAV aircrew ethos. An example of the seriousness with which Reaper pilots and sensor operators approach their operational art came in a candid submission to the author's research, part of which is reproduced here in full:

> I sleep soundly at night because every person that I have killed was a clearly identified enemy combatant engaged in hostile actions as described in the rules we work to. I utterly refute the concept that we are capable of reducing the taking of life to a 'play-station game' just because we are 12000 miles from the people we kill. I feel that the certain knowledge that everything we do is being watched by many others: general officers, legal advisors, operations officers, etc. in the command centre makes us more, rather than less, aware of the consequences of the actions we take. We have the capability to see (unlike in a fast-jet) the effect of our weapon strikes in relatively close-up detail. Also, if the troops on the ground take photos of the strike effects they often send them to us as feedback. No matter how explicit these photos are I personally look at them all. Not because of some voyeuristic tendency but because I believe that if you cannot face the reality of what you do in killing a human being then you should not be part of that process.[35]

The author of those words moved to the Reaper from the Tornado fast-jet, thereby giving credence to his comparison of the two roles. From the initial identification to the targeting and then the killing of enemy combatants there is a clear dependence on rules of engagement, comprehensive oversight of the process and a highly developed sense of personal responsibility for the taking of life that was encountered in all the subjects of the interview. The importance of ethical conduct in personal ethos was consistently emphasized, usually in quite forceful terms: 'Ethics are paramount. To take a life when it is not necessary is an act of moral cowardice.' If that ethical standard is inculcated in every new remote pilot or sensor operator, then the ethos of that particular flying branch will be set on a sure footing for all future operations. The corollary of a general observation is that any ethos, in any armed force, which does not rest on the highest ethical standards will

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[35] In accordance with the assurance of anonymity that was given to those who assisted the author with his research, the quote will remain unattributed. The individual is currently serving on operations at Creech Air Force Base, Nevada.

inexorably lead only to unconstrained violence, needless death and the moral degradation of the perpetrators.

Currently, and with a focus on the RAF, the disparate previous experience of Reaper crew members means that ethos can be more individualized than shared depending on how individuals form their own identities as aircrew. This could be especially true of pilots, with many – perhaps most – of them more closely associating themselves with aircraft that have been flown in the past than with the UAV they fly at present. This is not necessarily a bad thing, though it defers the time when remote aircrew ethos can be more commonly shared. The positive benefit is that operationally experienced aircrew, whether they are from fast-jet, multi-engined or helicopter squadrons, bring tremendous experience and air-mindedness. However, if UAVs are to provide a significant cornerstone of future RAF capability in the long term, financial strictures alone will prohibit the use of experienced aircrew from fast-jet and other squadrons. Directly recruited and trained pilots and sensor operators will probably identify more strongly with their remote airframe and an associated ethos, but they will lack the wider experience of those who pioneered this type of operational capability.

Conclusion and Recommendations

The nature of military flight has changed greatly over the past century, with established and accepted aircrew ethos and ethics being fundamentally challenged with the advent of UAVs. The utility of weapon systems such as the Reaper should always be bounded by sufficiently stringent legal and moral frameworks – set out in Rules of Engagement, for example – to ensure the safety of non-combatants in their spheres of operations, as well as the physical and emotional well-being of their crews. In the midst of overcoming technological and operational challenges in the future, the importance of the continual embedding of ethos and ethical standards should never be overlooked. Part of this responsibility will fall on military recruitment agencies. The warnings of Singer, Olsthoorn and others cannot be conveniently ignored and air forces should consider the psychological screening of future UAV pilots and sensor operators to avoid selecting those with a stronger propensity to dissociate from the violence they observe or commit through the medium of a computer screen. Furthermore, military pilots have traditionally been recruited and trained at a young age, partly because of their propensity for risk-taking and partly for their dexterity and coordination. Consideration should be given to recruiting older pilots and sensor operators for UAVs, possibly in their late twenties or early thirties, offsetting a possible reduction in physical abilities against greater life experience and reduced capacity for risk-taking.

UAV pilots and sensor operators will never be seen as the new Knights of the Air, principally and obviously because they are not in the air. Similarly, they will not be associated with that part of aircrew ethos over the past century that was forged in battle through acts of daring, courage and self-sacrifice: the absence of risk will preclude it. However, there are aspects of historical, traditional aircrew ethos that remain highly relevant. Most of the personal aircrew characteristics highlighted earlier from World War I and World War II – skill, duty, courage, perseverance, self-sacrifice – are still relevant, albeit in modified form. The need for great skill is perhaps the most obvious, especially when fighting an asymmetric counter-insurgency where the line between combatant and non-combatant has long been blurred. In the absence of physical danger, the requirement for moral courage is as great as ever and possibly more so. Those who take life from a Reaper do so with a much more intimate sight and knowledge of their targets than others before them in combat aircraft, and with a detailed and prolonged exposure to the consequences of their actions. This was acknowledged by one Reaper pilot who wrote: 'Flying a [UAV] from across the world sounds obviously detached but, due to the nature of the targets and our persistence (we watch them for hours), I feel closer to the action than I did in a fast jet.' Others who were questioned prioritized the protecting of allied troops on the ground above the killing of the enemy, their unanimity suggesting that this 'protector' role plays a significant part in their individual and collective ethos.

UAV crews no longer face the extreme and extended exposure to the risk of death, burning or capture of their World War I or World War II airborne counterparts, but there is a deep sense amongst those who operate the Reaper that they are taking the fight to the enemy in an essential, though unglamorous, way. It is unlikely that UAV crew will be admired in the way that other operational aircrew, particularly fast-jet aircrew, are admired today and will be in the future. However, from time to time a quiet word or the briefest email message will sum up the essence of what UAV crew do on a daily basis and an ethos built on moral courage, integrity, professionalism and ethical conduct. As one grateful Marine put it: 'Thanks guys, you got us out of [trouble] that time.'