

AIR POWER REVIEW

Volume 13 Number 1 Spring 2010

Network Enabled Capability, Air Power
and Irregular Warfare: The Israeli Air Force
Experience in the Lebanon
and Gaza, 2006-2009

Group Captain Alistair Byford

The Psychological Use of Air Power: A
Growth Area for The Future

Wing Commander Kevin Marsh

Air Power's Early Development in America
and Italy

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The Impact of the Changing Strategic
Environment on the Delivery of Air Power

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The Maritime Perspective of Air Power

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Viewpoint

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Book Reviews

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Historic Book Review

Air Commodore Neville Parton

Letters

Group Captain Ian Shields

Air Commodore Alistair Monkman

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Print:

No1 AIDU, RAF Northolt



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RAF Harrier GR7A part of the new 904 Expeditionary Air Wing based at Kandahar, Afghanistan 2007.

Foreword

The lead article in this first edition of *Air Power Review* in 2010 is a thought provoking article by Group Captain Al Byford. Networked Enabled Capability (NEC) has been heralded as a potentially transformational capability for the effective delivery of air power, but the benefits have not always been clearly articulated. Group Captain Byford's paper uses an analysis of the Israeli Air Force's employment of networked capability in irregular warfare to argue that it can be used to either facilitate time critical targeting, or alternatively, to underpin mission sensitive targeting, where the speed of prosecution is less important than the effects that may be generated. It argues that, whilst context remains important, it is possible to draw generic lessons; most notably, the Israeli Air Force's recent operations clearly demonstrate that while NEC is essential to share the information necessary to conduct an effective air campaign in the cluttered complexity of irregular warfare, technical and tactical excellence by itself cannot deliver campaign success unless linked to coherent strategy.

Wing Commander Kev Marsh provides an article examining the ability of air power to produce psychological effect, in which he contests that this aspect of air effect remains underrated in British air

power thinking. He argues that in the current strategic environment where collateral and proportionality concerns constrain kinetic air operations, air power's psychological effect can be as important, if not more so, than its physical effect. Using information presented in academic and government literature, internet articles and current British and American doctrine, the article analyses coercion, the asymmetric advantages of air power, including PSYOPS and the idea of combining physical and psychological air strategies, and finally strategic paralysis in order to show where British air power doctrine could be updated. It concludes that influence dominates current operations and therefore the psychological use of air power needs greater profile in future British air power doctrine.

Moving back in time, Group Captain O'Neill provides a view of the early development of air power (pre-World War One) and considers why, although the United States pioneered the development of heavier-than-air aviation, it was the Italians who first applied the emerging technology to the conduct of war. It considers how the vastly different geopolitical situations in each country influenced each nation's approach to the aeroplane's use and how, in Italy, the new technology captured

and defined the political and public imagination. The unique combination of technology, necessity and creative vision was focussed in Italian minds on the aeroplane's fragile frame. This harnessing of science and artistic vision made the difference and enabled Italy to provide the aeroplane with its first opportunity to demonstrate its potential as a weapon of war.

A further doctrinal view of air power is offered by Wing Commander Stu Hatzel who submits an article taking a broad look at the utility of air power and the current strategic environment. He suggests that, emboldened by the apparent war winning use of air power throughout 1990's conflicts, the US believed its hegemonic status granted it the power to transform warfare, utilising vastly superior military technology. Poorly equipped non-State actors of the newly recognised global village begged to differ. The article examines factors which influence the strategic environment, in order to determine how air power must evolve in order to ensure continued utility; not just in terms of physical effect but also the need to win the information battle. It examines the maturity of air power doctrine as an independent military arm. Finally, it concludes that air power is not yet fully mature but that with careful

communication of the political aim and public understanding of the proportionate use of modern weapon and surveillance systems it can be decisive in all types of conflict.

The final article in this edition to some extent breaks the mould of peer reviewed articles as it is not written in that deliberate academic style, but is nevertheless, certainly worthy of inclusion. It is not an entirely personal point of view so it is not offered as a viewpoint but as an article intended to foster debate and to expose the reader to an alternate perspective. The author is Commander Nick Walker, currently serving in the naval staff, and it is a truly fascinating insight into the Maritime perspective of air power. It takes a conceptual look at air power and brings out the naval view of its use, utility and management. The article contends that from the very earliest days of powered flight, air power as a capability has been incorporated and blended into maritime operations and this deep sense of integration shapes the maritime perspective of air power to this day. The air is a vital dimension of the maritime environment which helps explain the integral nature of the employment of air power in maritime solutions. It develops several themes and uncovers the differences in approach that set

maritime aviation apart from land-based air operations. Aspects such as support, logistics, technology, mobility, flexibility and air and sea-mindedness are investigated together with exposing the controversial issues of command, control and ownership. Aimed to promote debate, the article offers an alternative perspective of air power that is complementary to, but subtly different from, the views others involved in its execution might hold.

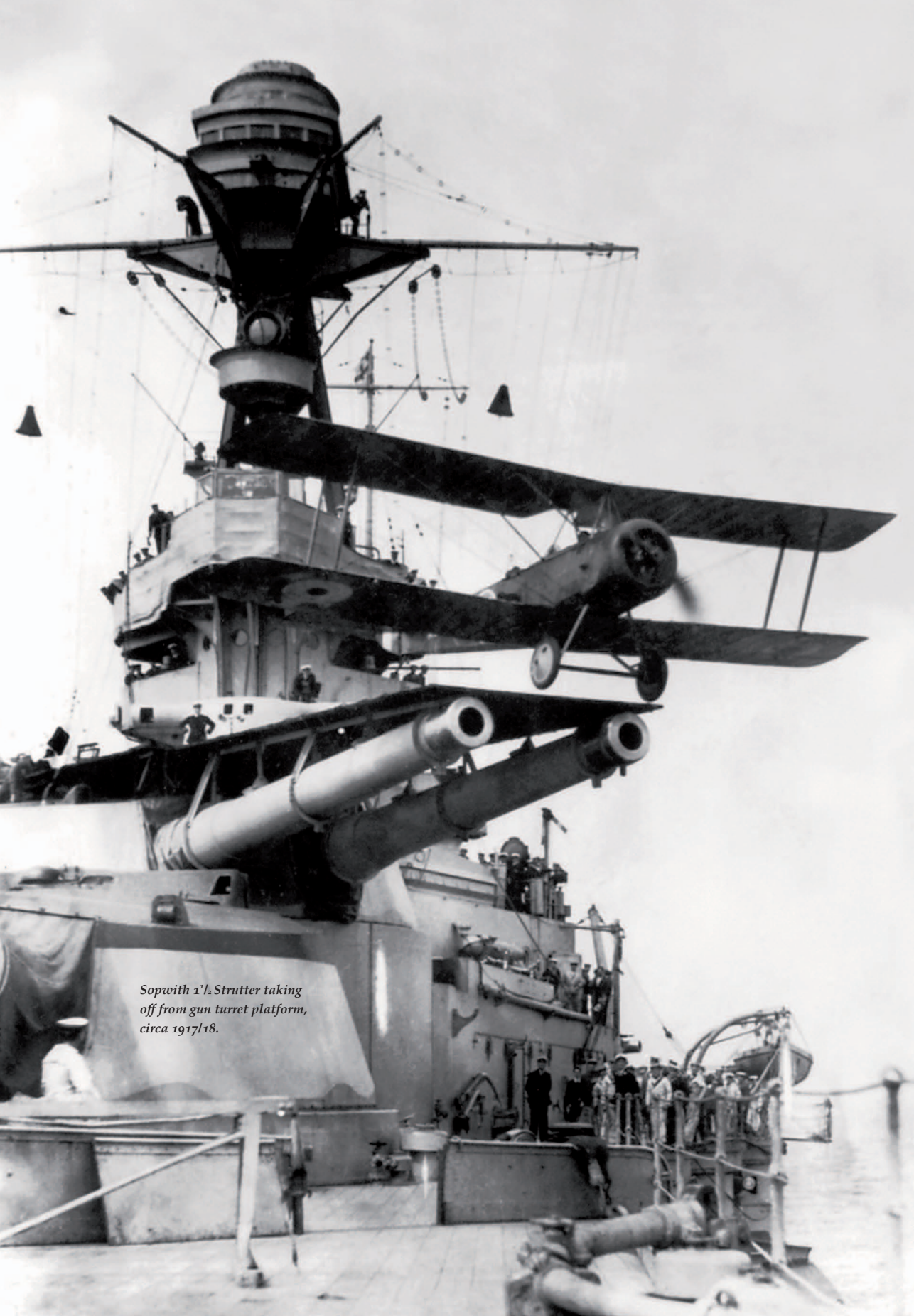
The viewpoint in this edition of *APR* is an amusing and fascinating expose of life across the Atlantic as a Defence Attaché, specifically the Defence Attaché in Washington DC. The piece explores the reality and explodes some of the myths of what an Air Attaché does and the challenges they face. Written from a very personal perspective, Air Cdre Ian Elliott is informative and entertaining in equal measure in offering his views of this privileged position.

Group Captain Shields offers a letter discussing the conduct of future wars and the particular challenges that may emerge, both in terms of equipment choices and doctrinal/structural configuration. An apparently whimsical, but actually very serious letter on finding time to have fun within the work place is submitted by Group Captain Al Monkman. His contention that 'fun' is an essential factor in morale, despite the busy pace of life will no doubt strike a chord with many readers.

The two book reviews in this edition are followed by a further excellent historic book review by Air Commodore Neville Parton who offers a review of John Warden's 'The Air Campaign'. This is an unusually long review but it is entirely worth

its length as it has to cover both the content of this important air power work and also provide some understanding of Warden himself, without which, invaluable context is lost. The review offers a glimpse into the mind of the author and provides a fascinating view of the content. Parton's conclusion is that the book is extremely worthy and, for the uninitiated, a relatively easy read as it is not too academic in style or content.

Finally, a further plug for the 2 major air power conferences that will take place during the remainder of the year. The Royal Air Force Air Power Conference 2010 – 'Meeting the Challenge: Optimizing the Air & Space contribution to national security' will take place at the Victoria Park Plaza Hotel on 17 and 18 June 2010. Secondly, the Royal Air Force Centre for Air Power Studies and King's College London Conference, entitled 'Twenty Years in Iraq: Royal Air Force Operations in the Gulf since 1990', will take place at the Defence Academy, Shrivenham on the 29 and 30 September 2010. Articles are now welcome for the summer 2010 edition of *APR*, potential contributors may also wish to be aware that as 2010 marks the twentieth anniversary of the RAF's deployment to Iraq, the autumn/winter edition will be devoted to an analysis of the two decades of continuous air operations conducted in and over that state. As there must be few serving personnel who have been unaffected by Iraq there should be no shortage of contributions and viewpoints, which should be submitted in accordance with the guidance at the RAF Centre for Air Power Studies (RAF CAPS) website, www.airpowerstudies.co.uk.



*Sopwith 1 1/2 Strutter taking
off from gun turret platform,
circa 1917/18.*



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- Royal Air Force Centre for Air Power Studies (RAF CAPS) website at <http://www.airpowerstudies.co.uk/casfellowships.htm>,
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Notes on Contributors

Group Captain Alistair Byford is the RAF's Director of Defence Studies. A Tornado strike, attack and reconnaissance pilot, he has flown over 4,000 hours in an operational career that began with the first Gulf War and has included twelve operational detachments, command of No. 31 Squadron and, most recently, No. 904 Expeditionary Air Wing in Afghanistan. He has taken post-graduate degrees in International Relations at Cambridge as an RAF Tedder Fellow and in War Studies at Kings College London. He is the author of the current edition of *AP3000 - British Air and Space Doctrine*.

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Wing Commander Kevin Marsh is a serving RAF Officer. He is a pilot with 3000 hours on fast jet aircraft, mostly flying the Jaguar and has served on operations over Iraq. He was recently awarded an MA in Defence Studies by Kings College London following studies at the Joint Command and Staff College, Shrivenham. He is currently serving in the Theatre Airspace Capability Area in MOD, London.

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Group Captain Paul O'Neill joined the Royal Air Force as an Administrative Officer in March 1992. His experience on operations includes Ops BANNER, WARDEN, VERITAS and TELIC. Having graduated from ACSC in 2006, he was appointed as OC BSW at RAF Leeming before being selected as a CAS Fellow where he completed the MPhil in International Relations at the University of Cambridge: his thesis addressed civil-military co-operation from an organisational culture perspective. He is currently the Deputy Assistant Chief of Staff Personnel Strategy at HQ Air Command.

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Wing Commander Stuart Hatzel joined the RAF in 1985. A Tornado ground attack navigator by origin, he also enjoyed tours as an instructor on the Tucano and Hawk aircraft before serving in the A3 area of a coalition CAOC and on a US E3-B AWACS as a mission director. He enjoyed an extensive and varied tour in RAF accident investigation, gaining professional qualifications from Cranfield University and the University of Southern California before taking command of 76(R) Sqn. Studying on ACSC at JSCSC, Shrivenham, he was awarded the Best Joint Air Student prize and gained an MA in Defence Studies from King's College, London. Wg Cdr Hatzel is currently an MOD desk officer

responsible for UK engagement on military transformation and future concepts within NATO and the EU.

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Commander Nick Walker joined the Royal Navy as a General List Warfare Officer in 1987. After initial training, he was selected to attend The City University, gaining a degree in Management and Systems in 1991. His first appointment was as the Gunnery Officer in a minesweeper after which he applied for and was accepted into flying duties, completing two tours as a Sea Harrier FA2 pilot before a back injury prevented further flying. Since then, Cdr Walker has undertaken a series of aviation appointments, including two years in Nos. 3 and 1 Groups at RAF Strike (now Air) Command and four years in sea-going posts as the Aviation Officer in an amphibious ship and the Operations Officer of an aircraft carrier. Operational experience includes Bosnia, The Gulf (Iraq), Sierra Leone, the Lebanon and most recently Afghanistan where he spent six months in the Divisional Headquarters in Kandahar. A graduate of the Advanced Command and Staff Course, Cdr Walker's current appointment is the Carrier Strike Future Concepts post at the Navy Command Headquarters.

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Network Enabled Capability, Air Power and Irregular Warfare: The Israeli Air Force Experience in the Lebanon and Gaza, 2006-2009

By Group Captain Alistair Byford

Networked Enabled Capability (NEC) has been heralded as a potentially transformational capability for the effective delivery of air power, but the benefits have not always been clearly articulated. This paper uses an analysis of the Israeli Air Force's employment of networked capability in irregular warfare to argue that it can be used to either facilitate time critical targeting, or alternatively, to underpin mission sensitive targeting, where the speed of prosecution is less important than the effects that may be generated. The Israeli experience in the Lebanon and Gaza indicates the enduring importance of context, although it is possible to draw generic lessons; most notably, the Israeli Air Force's recent operations clearly demonstrate that while NEC is essential to share the information necessary to conduct an effective air campaign in the cluttered complexity of irregular warfare, technical and tactical excellence by itself cannot deliver campaign success unless linked to coherent strategy.

Introduction

The concept of Network Enabled Capability (NEC), or Network-Centric Warfare (NCW) as it is termed in the United States and Israel, has been heralded as a potentially transformational capability for the effective delivery of air power, but in the United Kingdom at least, the translation of the rhetoric into practical reality has proved to be slower and more problematic than was originally envisaged: the Ministry of Defence has even felt compelled to argue defensively in its own official handbook that 'NEC is not a pipe-dream'.¹ This paper aims to examine the potential benefits of NEC in the prosecution of irregular warfare, based on an analysis of the experience of the *Hel HaAvir*, the Israeli Air Force (IAF), in the conflicts with *Hezbollah* in the Lebanon in 2006 and *Hamas* in Gaza in 2009. It will be argued that at the tactical level, the shared situational awareness conferred by NEC may broadly be used to either facilitate time sensitive targeting, or alternatively, to underpin mission sensitive targeting, where the speed of prosecution is less important than the outcome and the effects - both intended and unintended - that may be generated.² However, the IAF's experience demonstrates that while effective NCW is an absolute necessity in the 'cluttered, complex and congested' environment typical of today's 'Fourth Generation Wars',³ by itself it cannot be a sufficient condition for mission success; unless driven by a sound strategy and coherent campaign plan, operational excellence, however well facilitated by even the most comprehensive NEC architecture, will still result in campaign failure.

The context for the development of the IAF's NCW Capability

NCW is not new: in 1940, Fighter Command famously benefited from an integrated air defence system based on a network concept dating back to 1917. This was developed into a genuine, networked capability as technologies such as Radio Direction Finding (radar) and radio-telephony (R/T) became available in the interwar period, enabling data to be collected, filtered, fused, analysed and disseminated via a network of land-lines and ground-to-air radios. This early example of NCW provided shared situational awareness and resulted in battle-winning decision superiority.⁴ What has changed subsequently is the extent and complexity of the NEC requirement, especially in expeditionary warfare, which is inevitably joint and combined - and where the international element may well be based on bespoke coalitions, rather than on long-standing Alliance partnerships benefiting from established equipment and protocols. Therefore, the United Kingdom's must develop an approach to NEC that seeks to integrate national and multinational force elements across all environments, using disparate operating systems, information resources, communications media and software tools, raising issues of ownership, protocols and security.

In contrast, the context for the IAF is significantly different and, in many ways, far simpler. Israel is a small state lacking strategic depth and the *Hel HaAvir*'s disposition is compact and geographically concentrated; expeditionary warfare is not anticipated and operations are

invariably conducted by the Israeli Defence Forces (IDF) acting alone, from its well-established bases and infrastructure. For the IAF, this means that centralised command and control – and more than an element of centralised execution – is both possible and effective; for example, all of Israel's territorial borders are within line-of-sight airborne radio contact of the central air command post at normal operating altitudes. Consequently, the IAF has developed a tradition of centralising command at the highest level, particularly as it has a history of conflicts where tactical dilemmas have strategic impact. In the so-called 'War of Attrition', conducted between the 1967 'Six-Day' and 1973 'Yom Kippur' wars, Egyptian aircraft were often flown by Soviet pilots and tactical engagement decisions therefore created significant political consequences. Accordingly, the IAF chief of staff routinely manned the air command post personally, taking control of tactical operations and establishing a precedent for active tactical decision-making at the highest military level that continues today.⁵ Additionally, Israel's well developed aerospace and electronic industries have developed many of the technical systems used by the IAF indigenously and, with little requirement to network with allies or coalition partners, the threshold of difficulty for establishing a genuine NEC is much lower than is the case for the United Kingdom.

However, despite the enduring emphasis on centralised control and the relative ease with which a comprehensive NEC could be implemented, the IAF's approach to NCW initially followed a bottom-up, tactics-led approach. This had its

genesis in an early, Israeli-developed equivalent of the Link 16 network, designed to share situational awareness between fighters in air-to-air combat at the tactical level. The stimulus was provided by the small size of Israeli forces in relation to the numerical strength of actual and potential foes, driving an acute sensitivity to avoidable 'friendly-fire' incidents and a concomitant requirement for the best possible access to shared information to mitigate risk. This aversion to casualties was also one of the drivers behind the IAF's early investment in Uninhabited Air Systems (UAS) for 'dull, dirty and dangerous' tasks. This provided an additional impetus to develop networked systems, as the drone operators found that the limited field of view available from on-board cameras provided insufficient situational awareness to enable effective operation, especially in urban environments, without further information provided by off-board sensors; a sensor-to-shooter link was, in any case, necessary, to engage targets, as these early UASs could not be armed. The final tactical imperative to develop an effective NCW capability was provided by the need to develop the best possible intelligence, derived from all sources, to enable air operations within the very dense surface-to-air missile belts that were likely to be encountered in certain operating areas. For example, the IAF had to counter nineteen missile batteries in its operation to suppress the Syrian defences in the Bekaa Valley in June 1982, destroying seventeen immediately, and the remaining two the next day.⁶

Consequently, while there was never an overarching IAF NCW

programme, a number of compelling tactical imperatives combined to drive a bottom-up requirement that had produced a functioning NEC by the time of the Lebanon campaign in 2006.⁷ The IAF's objective was to develop this into a capability that was useful across the three-step spectrum of conflict facing the IAF: low intensity operations, such as counter-insurgency tasks in Gaza; high intensity operations, such as air strikes against neighbouring states well-equipped with conventional forces, exemplified by *Operation Orchard*, the raid on an alleged Syrian nuclear facility in September 2008; and the most taxing mission, 'no joint border' operations against states elsewhere in the region, geographically separated from Israel by third party nations. Examples would include *Operation Babylon*, the air-strike against the Osirak nuclear reactor in Iraq in June 1981, or the mission reported in the open press that was conducted in January 2009 against an arms convoy in Sudan that was allegedly smuggling *Fajr-3* rockets into Gaza.⁸ The *Hel HaAvir* aimed to employ its developing NCW capability primarily to underpin its centralised command and control philosophy while enhancing both its air-to-air capabilities, to counter potential opponents armed with fourth generation Western and Russian fighters in the *Flanker* or *Eagle* class, and its air-to-ground capabilities, with a particular emphasis on urban operations and the ability to engage time-critical targets, particularly rockets, pop-up surface-to-air missile threats and larger, ballistic missiles in the *Scud* class. In the event, it was the requirement to prosecute time

sensitive targets that really shaped the IAF's employment of NCW in the Lebanon in 2006.

The Lebanon, 2006

The Israeli incursion into Southern Lebanon faced a new challenge in the guise of *Hezbollah*, pioneering what has subsequently termed 'hybrid warfare'.⁹ *Hezbollah* is neither entirely a military force nor a terror group, instead mixing conventional, high-technology capabilities – Iranian C-701 anti-ship missiles, suicide unmanned air vehicles, command and control nodes, remote sensors and intelligence posts – with asymmetric and terrorist strategies. The most critical requirement for the IAF was to destroy *Hezbollah's* arsenal of some 13,000 rockets before it could be effectively deployed against Israel's civilian population in retaliation to IIDF military action. The missiles ranged from short-range *Katyusha* and *Shahins*, through the *Fajr 3-5* series, with a seventy-five kilometre range, to the long-range, *Scud*-like *Zelzal 2s*, which could strike Tel Aviv from Southern Lebanon.¹⁰ The IAF was well aware of the time-critical nature of this task and entered the conflict with the 'one digit concept', mandating that the sensor-to-shooter cycle had to be completed within nine minutes or less.¹¹ Although this was considered challenging, it proved to be completely inadequate to engage the smaller, portable and mobile rockets that were fired and then moved or hidden immediately in 'shoot and scoot' tactics, often using civilian buildings, schools or mosques for cover. In practice, the requirement had to be reduced to just twenty seconds. Before the start of the conflict, this was only considered

possible if sensor and shooter were integrated within the same platform, but under the pressure of operations, the IAF demonstrated the agility and adaptability to develop its existing NEC into a system able to link multiple platforms, and routinely achieve the new target time, within just two days.¹²

There were specific circumstances that made this possible. The relatively confined geographic area of Southern Lebanon meant that a shooter, usually either a fast jet or attack helicopter, was omnipresent, on call at all times for an immediate hand-off from the sensor, usually carried onboard a unmanned air system, or based on the ground as a radar or electro-optic device. Additionally, rules of engagement were sufficiently relaxed to permit third party targeting by sensor operators of targets not positively identified by the shooter at the point of weapon release. This is a luxury that is unlikely to be available under the much more restrictive rules of engagement that exist in most Western discretionary deployments, where sensitivity to collateral damage is acute, because the maintenance of popular support - indigenous, domestic and international - is paramount. In contrast, the campaign in the Lebanon was not regarded by the Israeli public as optional, because the state had suffered 26,000 separate attacks at the hands of *Hezbollah* in the preceding six years, including 12,000 rocket firings and 1,700 improvised explosive device strikes, and the deaths of some 1,100 of its citizens. Consequently, there was a robust attitude to targeting errors and civilian casualties. It should also be noted that the twenty second sensor-to-shooter cycle was not always defined

by detection to weapon release; the requirement was for the shooter to be locked on to the target within twenty seconds, which could then be tracked and prosecuted at leisure, in compliance with extant rules of engagement and often with final authorisation, at the highest-level, from the central air command post.¹³

In the Lebanon in 2006, NCW proved a tactical-technical success, underwriting the IAF's operational excellence. During the thirty-three days of the conflict, in excess of 10,000 combat sorties were flown without loss, average bombing accuracy was assessed at less than ten metres and *Hezbollah's* infrastructure was significantly degraded; it is estimated that half of its rocket stock was destroyed and upwards of 500 of its fighters killed as a result of air attack.¹⁴ Little of this would have been possible without the networked capability that was developed adaptively at the beginning of the conflict. However, while the IAF largely neutralised the threat from long and medium-range rockets, destroying the *Zelzal 2* arsenal, for example, in a devastating and highly efficient air operation at the very beginning of the conflict, it was completely unable to prevent *Hezbollah* from continuing to use short-range rockets against the Israeli civilian populace, and an estimated 3,970 firings caused forty-three civilian deaths in Israel.¹⁵ This eventually precipitated an unplanned, unforeseen and ill-executed land assault into Southern Lebanon, when the original strategy had been to use air power, assisted by Special Forces, to minimise the Israeli footprint on the ground and therefore reduce casualties; the original *casus*

belli had, after all, been a retaliatory action in response to the kidnapping of two Israeli soldiers. *Hezbollah's* Director General, Hasan Nasrallah, astutely manipulated the media to maintain popular support, and the international community increasingly questioned the proportionality and discrimination of the Israeli application of lethal force, as more than 900 Lebanese civilians were estimated to have died.¹⁶ Therefore, despite the tactical successes of the IAF in NCW-facilitated, time-critical targeting, the joint campaign faltered at the operational level, and the end result was – arguably – strategic failure. This illustrates the limits of even the most capable, technologically-based use of force, if it is applied within the bounds of a conceptually flawed plan; ultimately, ideas and strategy will always matter more than the capability or equipment. As Uzi Rubin, the founding director of Israeli Missile Defence put it:

There is no reason to disbelieve the Israeli Air Force's claim that towards the end of the war every launcher that opened fire was quickly eliminated. Yet...it may well be that all the effort that has been made to achieve this impressive technological feat was misdirected.

Operation Cast Lead - Gaza 2009

While the IAF's employment of a networked capability in the Lebanon was primarily driven by the time sensitive targeting requirement, during *Operation Cast Lead*, conducted against *Hamas* in Gaza between 27 December 2008 and 18 January 2009, the IAF sought to employ its NCW capability primarily to achieve mission sensitive targeting. Cognizant of the international

outcry that had proscribed its operations in 2006, it aimed to use network capability facilitated shared situational awareness to control damage and, in particular, limit unintended effects. The extent to which it was able to achieve this would not be acceptable in current Western discretionary interventions, if legitimacy and 'campaign authority' are to be maintained,¹⁷ but the Israelis regard the operation as a success within the terms they set themselves and believe that it could not have been conducted at all without the use of NCW.¹⁸

There were significant differences between the two conflicts: while the Southern Lebanon is primarily rural, Gaza is one of the most densely populated urban environments on Earth, with a population of 1.4 million confined in an area just six kilometres wide and forty kilometres long. The IAF was aware that *Hamas* would deliberately fight, in Rupert Smith's words 'amongst the people',¹⁹ seeking to use civilians as human shields in a bid to negate the IAF's asymmetric superiority. The IAF's objective was to demonstrate publicly that it could and would engage *Hamas* operatives despite the presence of non-combatants, and it believed that NCW provided the means to accomplish this by fusing and distributing an all-source intelligence picture to share awareness and thus minimise collateral casualties. Although actual casualty figures are hotly debated, Major-General Yoav Galant, Officer Commanding Southern Command, claimed that the Israelis killed 800 *Hamas* fighters while admitting the deaths of 200 non-combatants, proclaiming this to be an 'unprecedented ratio of success' in

this type of warfare.²⁰ Certainly, it was better than the results achieved in the Lebanon, but would still fall short of what would be acceptable in the majority of Western discretionary interventions.

Given the nature of the urban terrain in Gaza, operations were much lower tempo than those conducted in the Lebanon in 2006, and were predominantly intelligence-led, with most targets identified by human sources. The extent and depth of the Israeli intelligence operation is indicated by their detailed knowledge of the numbers of people using buildings in Gaza City and, sometimes, even their phone and mobile phone numbers. *Hamas* fighters often used one floor of a house, with civilians located above and below, so where possible the occupants were called by phone or texted to be warned of attack, typically being given ten minutes to vacate; sensors were used to count the numbers leaving before a strike was authorised. *Hamas* allegedly often encouraged civilians to move on to the flat roofs typical of most Gazan houses when they sensed, or were warned, that an attack was imminent. The IAF therefore developed the 'knock on the roof' tactic, where a small yield, non-fragmentary, anti-tank type weapon (typically a *Hellfire* missile with a 25lb warhead) was used at the extremity of the roof to coerce non-combatants to disperse, before 500-lb or 1000-lb class precision weapons were used to destroy the target of interest.²¹ Clearly, this required the highest possible levels of networked coordination between the different agencies involved, including the ground commander and human intelligence source, usually two

shooter platforms, often more than one aerial sensor platform and the air command post, which ultimately made the decision to engage. NCW was, therefore, absolutely essential in developing the shared situational awareness required to make this system work.

Unlike operations in the Lebanon, where time was the key and NCW was used to accelerate through Boyd's OODA Decision Loop²² from 'observe' through 'orientate' and 'decide' to 'act' within twenty seconds, mission sensitivity was far more important in Gaza, so NCW was used to share and deepen awareness at each step of the cycle, rather than being used merely to increase the tempo. The requirement was not just to identify the right target and strike it at the right time in the right place, but also with the right weapon with the right fuzing; on one occasion, a *Hamas* leadership target was successfully attacked, but the *Mk 84* bomb used was disproportionately lethal, and also killed fourteen civilians in an adjacent building.²³ The complexity of NCW, which tends to be sensor-hungry, also threw the necessity for effective battlespace management into sharp relief. The Gaza strip is only six kilometres wide, and this space was filled with up to eighteen sensor platforms at any one time, in addition to the fast jet aircraft and helicopters acting as shooters. This lesson was also evident to the United Kingdom in Afghanistan, where the deployment of No.1 ACC in 2007 proved critical in providing radar coverage and air control throughout the Helmand Valley, ensuring the effective coordination and deconfliction of the many air assets that gathered whenever NATO troops came into

contact with the *Taliban*.

The IAF had learned about the pre-eminence of information in the Lebanon campaign in 2006, and took innovative steps to link proactive information operations to its kinetic activities in a bid to get on the front foot in the media war. Operational security was afforded a high level of importance: the international media was barred from the Gaza Strip and IDF personnel were not permitted to take mobile media devices into the area. However, the downside of this policy was that 'indigenous media reporters' filled the void, lacking the balanced approach that more professional news media may have brought to bear. Perhaps more interesting was the secondary campaign fought in cyberspace. Israeli civilians were recruited into active blogging teams, such as 'helpuswin.org', which set up social media war rooms to promote the Israeli cause by influencing online discussions.²⁴ The IDF launched its own YouTube channel to deliver a positive spin on its activities, and the site was visited more than five million times in its first week of operation. Finally, to reinforce Israeli messages and, specifically, to spread awareness of *Hamas* rocket attacks, a 'twitter' service was implemented to send 'tweets' announcing each attack.²⁵

Unsurprisingly, *Hamas* information operations centred on the exploitation of collateral damage. This included the widespread staging of events for the benefit of the visual media and the use of 'fauxtography': the digital manipulation and enhancement of images. The employment of these techniques undermined *Hamas'*

credibility and drew considerable criticism from the mainstream media, but despite this, and Israel's implementation of both traditional and novel approaches to information operations, it was widely accepted that Israel lost the war of perceptions at an early stage of the conflict. The key failing was centred on humanitarian issues: Israel did not permit the first delivery of aid until 5 January, nine days into the conflict, and several high visibility collateral events brought widespread condemnation from the international community.²⁶

Generic Lessons

The IAF has been able to field a pragmatic and effective NCW capability quickly, by adopting an evolutionary approach rather than aiming for large-scale, transformational change. This is far from perfect, and the IAF system of integrating separately developed, discrete systems means, for example, that there is still no joint capability, with only limited connectivity available to Army helicopters. But it does mean that a workable capability has been implemented; the danger of aiming for a coherent, conceptually-driven, top-down approach is that by the time standards and protocols have been agreed, technology may have moved on again. Clearly, the implementation of NEC for the IAF is relatively simple, in that most of the systems involved have been indigenously developed and there is an existing degree of compatibility. In the United Kingdom, the issue is less clear-cut, with the necessity to network with Alliance and Coalition systems, and the concomitant problems of ownership and security protocols that this brings. However,

it would appear preferable to implement a capability early and then develop it as the concept is refined and protocols agreed; this is essentially the route that the IAF is now taking, with a tradition of platform-centred procurement being gradually superseded by a system where Command, Control, Computers and Intelligence is now being given precedence in the Equipment Capability process, building on the extant networked capability now available.

The second significant lesson from the IAF's experiences in irregular warfare is that NEC is only ever a means to an end; what is important is how it is subsequently used. Typically, this may be to either facilitate command processes or to achieve 'decision-superiority'. Essentially, at the tactical-level, networked capability can be used to either speed up the decision cycle, or to enhance it, by increasing understanding at each step. The United Kingdom's conceptual thinking still tends to emphasize the benefits of speed above all else; its vision for future operations states that 'network-enabled warfighting force elements will have the ability to operate at higher tempo.'²⁷ While this is patently obvious, the IAF's experience of operations in irregular and hybrid warfare indicate that in some circumstances, the speed of decision-making may be less important than the accuracy of the decisions made. This is explicitly recognized by the new fourth edition of AP 3000, which notes that:

There is a danger that compressing the decision cycle may in itself result in undesired consequences if observe and

orientate are truncated in order to move as quickly as possible to decide and act; in this context, a focus on time-sensitive targeting (where speed is essential to prosecute fleeting targets), as opposed to mission-sensitive targeting (where the ultimate outcome is more important than the speed of prosecution) may be counterproductive.²⁸

The Improved shared situational awareness facilitated by NEC is also by no means a panacea for difficult targeting decisions in irregular warfare. While NEC has huge utility in gathering and fusing the multi-source information that is required to begin to develop genuine understanding from situational awareness, the final judgment will be the choice of a decision-maker, whose perceptions will be shaped by a context involving factors including culture, strategy, legality and an understanding of the kind of war being fought and the stakes involved. Clearly, in both the Lebanon and Gaza, the IAF took risks in term of collateral damage that were acceptable in what it considered to be an unlimited war, where there was a direct threat to its own citizens, and it mitigated these risks, to some extent, by its use of NCW. However, these levels of collateral would still be unacceptable in the discretionary interventions currently conducted by the West, where popular support must be maintained.

Although the IAF's primarily tactical-led approach to Network-Centric Warfare has tended to focus this paper at the level of targeting decisions, the flow of information and awareness produced and shared by NCW may be used to enhance air command and control.

As has been indicated, the IAF's philosophy, based on its tradition and shaped by the peculiarities of its geographic circumstances, is to use this capability to enhance centralised control by providing a high-level commander with the best possible awareness to make often tactical-level decisions. However, the Western concept in irregular warfare is to take advantage of NEC to promote awareness from the top down, so that the commander's intent is more broadly understood, facilitating decentralization and a more meaningful level of genuine mission command than is currently possible.

Additionally, excessive enthusiasm about the effectiveness of NEC in irregular warfare must be tempered by the knowledge that adversaries will react – 'the enemy has a vote'. *Hamas* and *Hezbollah* have already adapted physically, by improving their anti-unmanned air system capabilities, constraining the IAF's freedom to operate - to some extent - and degrading the intelligence picture, and also through the development of single-shot, throwaway 'fire and forget' rocket launchers, which puts the onus on detection before launch, a far more difficult problem as the infra-red bloom from rocket-firing is one of the best detection cues currently available. Deepening networked integration also potentially increases vulnerability to counter-network operations, and the IAF takes this threat seriously. The whole issue of security with regard to NEC is, however, ripe for review; the IAF takes the view that the security of networked imagery is itself time-sensitive and is only secret for the period of sense to shoot, which may be limited to as little as twenty

seconds. An instructive comparison would be with the *Wehrmacht's* use of radio in the *blitzkrieg* in the West in 1940; in a very fast-moving campaign, the risk of transmitting in clear was accepted when quick and effective communication was critical. In contrast, the British and French were extremely concerned about security and insisted on a lengthy encryption process. However, by the time their messages had been decoded, the situation had often changed irredeemably and the information was irrelevant. It is clear, though, that a NEC that could be routinely compromised would be a source of huge concern. Interestingly, the failure of Russia to neutralize Georgia's air defence system as quickly as expected in the 2008 conflict may be because the Georgian system was not particularly well integrated, and therefore retained a degree of resilience to networked attack and effects-based targeting aimed at its command and control nodes.

By their very nature, air forces are peculiarly susceptible to seduction by the potential benefits of new technology. The IAF's experience, however, suggests that even the best possible technology, including NCW, will not necessarily deliver campaign success unless it is directed by an effective strategy. This is a perennial lesson of history; in the Second World War, the *Wehrmacht's* operational excellence could not deliver victory by itself, while in Vietnam, America's overwhelming technological superiority was similarly negated by its flawed strategy. The IAF was convinced that air power alone could be used to achieve the strategic objective in the Lebanon in 2006, because it believed that precision

technology, facilitated by NCW, gave it a new and transformational capability to engage time-critical targets. However, although it was ultimately able to meet the targets that it had set itself by compressing the sensor-to-shooter cycle to an unprecedented twenty seconds, this impressive tactical-technical level feat was ultimately irrelevant when Israel was perceived to have lost the war in strategic terms; as Neville Parton notes, defeat 'appears to have resulted from an overstated belief in the impact of new technology.'²⁹ Similarly, while the IAF used NEC very effectively to minimize collateral damage in Gaza in 2009, demonstrating that it would not be deterred from employing its overwhelming kinetic advantage by asymmetric tactics, the short-term tactical advantage it has gained in neutering *Hamas* may well be offset strategically in the long run by the international concern that it has generated about the relatively high civilian casualty rates incurred. Therefore, the most important lesson of the IAF's experience of Network-Centric Warfare in the Lebanon and Gaza is that NEC is an absolutely necessary condition for the effective employment of air power in irregular warfare, but by itself, will never be sufficient to deliver ultimate campaign success.

Notes

¹ JSP 777 Edition 1 'Network Enabled Capability' (London: MoD, 2005), Foreword.

² AP3000 Edition 4 'British Air and Space Doctrine' (London: MoD, 2009), p. 17.

³ Third Generation warfare is conventional, all-arms, force on force manoeuvre war, Four

Generation Warfare is the networked, irregular asymmetric warfare of the contemporary operational environment. Thomas X Hammes, *The Sling and the Stone: On War in the 21st Century* (Osceola, WI: Zenith, 2006), p. 5.

⁴ *ibid*, p. 76.

⁵ Colonel Gur Laish, 'NEC and Hybrid Opponents', Lecture at Netherlands Armed Forces Conference *Future Force 2020: Are we Prepared*, The Hague, 16 March 2009.

⁶ Matthew Hurley, 'The Bekaa Valley Air Battle June 1982: Lessons Mislearned?' *Air Power Journal*, Winter 1989.

⁷ Gur Laish, 'NEC and Hybrid Opponents'.

⁸ 'Israeli Drones Destroy Rocket-Smuggling Convoy in Sudan', *Sunday Times*, 22 March 2009.

⁹ Joint Doctrine Note 02/08 'Air-Land Integration', (DCDC, 2008).

¹⁰ *Hezbollah's Rockets* at <http://www.bbc.co.uk/1/hi/world/middle-east/5187974.stm> last accessed 1 April 2009.

¹¹ Gur Laish, 'NEC and Hybrid Opponents'.

¹² *Ibid*.

¹³ Gur Laish, 'NEC and Hybrid Opponents'.

¹⁴ Kainikara and Parkin, *Pathways to Victory*, p. 76.

¹⁵ *Casualty Figures in the 2006 Israeli-Hezbollah Conflict* at <http://www.web.amnesty.org/library/index/ENGME020252006?open&of+ENG-cbn> last accessed 1 April 2009.

¹⁶ Neville Parton, 'Israel's 2006 Campaign in the Lebanon', *Air Power Review*, Vol.11, No. 2, Winter 2007, p. 86.

¹⁷ Consideration was given to adding 'Campaign Authority' as a principle of war in *British Defence Doctrine Edition 3*.

¹⁸ Gur Laish, 'NEC and Hybrid Opponents'.

¹⁹ Rupert Smith, *The Utility of Force* (London: Penguin, 2005).

²⁰ *Cast Lead Death Ratio an Achievement*, <http://www.jpost.com/servlet/satellite?pagename=JPost/JPArticle/ShowFull&cid=1237727530093> last accessed 1 April 2009.

²¹ Gur Laish, 'NEC and Hybrid Opponents'.

²² Defense and the National Interest, http://www.d-n-i.net/Richards/boyds_ooda_loop.ppt, accessed 20 February 2008.

²³ Gur Laish, 'NEC and Hybrid Opponents'.

²⁴ Air Warfare Centre Air Warfare Group, unpublished paper, *The 2008/09 Gaza Conflict – an Analysis*, 2009.

²⁵ Twitter is a free social networking and micro-blogging service that enables its users to send and read other users' updates known as tweets. Tweets are text-based posts of up to 140 characters in length which are displayed on the user's profile page and delivered to other users who have subscribed to them (known as followers).

²⁶ *Ibid.*

²⁷ Gur Laish, 'NEC and Hybrid Opponents'.

²⁸ *AP3000 Edition 4*, p. 56

²⁹ Neville Parton, 'Israel's 2006 Campaign in the Lebanon', p 88.

The Psychological Use of Air Power: A Growth Area for The Future

By Wing Commander Kevin Marsh

The ability of air power to produce psychological effect has long been proven yet it remains underrated in British air power thinking. In the current strategic environment where collateral and proportionality concerns constrain kinetic air operations, air power's psychological effect can be as important, if not more so, than its physical effect. Using information presented in academic and government literature, internet articles and current British and American doctrine, this paper analyses coercion, the asymmetric advantages of air power, including PSYOPS and the idea of combining physical and psychological air strategies, and finally strategic paralysis in order to show where British air power doctrine could be updated. The paper demonstrates that influence dominates current operations and the psychological use of air power needs greater profile in future British air power doctrine.

Introduction

For every physical action that is seen or perceived, there is an inevitable psychological reaction.¹ All military force can therefore induce a psychological reaction in an opponent, but air power's key attributes of height, speed, reach and ubiquity,² mean that it has the unique ability to target far beyond the front-line enemy troops to also target the leadership and enemy population. The Royal Air Force's first Chief of the Air Staff, Air Chief Marshal Sir Hugh Trenchard, alluded to this when in 1919 he boasted that: 'the psychological effects of bombing outweighed the material at a ratio of twenty to one'.³ This assertion was made at a time when physical destruction of an opponent was not possible due to the capability of air power that existed and therefore perhaps overrates air power's psychological effect. After the Second World War, the psychological effect of air power was largely discounted and underrated until the end of the Cold War, so it is not surprising that current British air power doctrine mainly concentrates on the physical effects of air power at the expense of its psychological aspects. Perhaps it is because it is difficult to induce a predictable psychological reaction in an opponent which has led to its lack of consideration, but lessons identified throughout the Twentieth Century indicate that air power's psychological impact should not be ignored.

This paper will show that air power consistently has been used to produce psychological effect throughout its history, but the psychological use of air power is underrated in current

British air power doctrine. In the current strategic environment, air power's psychological effect can be as important, if not more so than its physical effect, therefore it should now be given greater profile in doctrinal thinking. The paper will cover three key areas in order to show where current British air power doctrine could be updated: coercion, the psychological use of air power in operations other than war and the combination of physical and psychological air strategies in order to achieve synergy.

Coercion

The preferred method of using air power to achieve psychological effect is through coercion. Military coercion seeks to influence an opponent to alter their behaviour,⁴ and is distinct from the use of brute force. Whereas brute force is used to purely destroy, coercive force refers to the use or threat of the use of violence to persuade the opponent to change its behaviour.⁵ In this sense the essence of military coercion is, therefore, psychological in nature.⁶ The idea of coercion as a technique to persuade the opponent to alter their behaviour is apt but it is, like beauty, in the eye of the beholder.⁷ In other words it is not the intent of the coercer that is important but the perception of the coerced.⁸ This makes the outcome of a coercion strategy difficult to predict, but because results can be achieved without using force, coercion is an attractive option for military commanders.

Historically, coercion has been targeted at one or more of the following three groups: the leadership, the population, or the armed forces of an opponent.⁹ But

because these groups are different, several strategies have been used to varying degrees of success to target each of the three groups. The social scientist Robert Pape lists the four major coercive air strategies as punishment, risk, decapitation and denial,¹⁰ and each shall be analysed in turn.

The idea of punishment as a theory of coercive air power to target the population of an opponent existed from the early days of air power thought. In 1915 Germany used Zeppelins and large aircraft to drop bombs on targets in Britain with relative impunity. The psychological effect of this bombing far outweighed its physical damage and the fear mixed with anger that the bombing caused endured in the British mind for decades.¹¹ Was the fear of the bomber made worse because these attacks marked the first time in years that our traditionally secure island nation had felt so vulnerable? If so, it could be argued that it was partially in response to this sense of fear that led to the creation of the Royal Air Force as an independent force in 1918.

Immediately after the First World War, Trenchard became an advocate of strategic bombing and in particular its effect on the enemy's morale. Was this because his bomber force was too small to inflict large-scale physical damage so it had to concentrate on targeting the enemy's morale? This is undoubtedly a major factor because until the Second World War it was simply not possible to deliver sufficient ordnance by air to cause a great deal of physical destruction. It therefore fitted Trenchard's assumptions to emphasise and overrate the psychological effect of air

power at the time.

The use of British air power in the inter-war years in the colonial policing role seemed to further support the psychological effect of air power. Rebel tribes in areas such as Mesopotamia and Somalia were offered ultimatums and then bombed if they failed to comply, which was the case on the majority of occasions. The degree of success of the use of punishment as part of a coercive strategy was certainly heralded by the infant Royal Air Force, which at the time was in need of a mission to ensure its continued independence. The desire for independence saw the lessons learnt from colonial policing transported to Europe and incorporated into the Royal Air Force's doctrine. AP 1300, the Royal Air Force War Manual first published in 1928, contained inputs from lessons learnt from colonial policing as well as theories on strategic bombing: 'many of the arguments were the same: war was largely a psychological effort [and] air power was an inherently offensive weapon'.¹²

In the Second World War, strategic bombing for psychological effect had mixed results for both the Allies and the Axis forces. In Britain, the official Government message was that the German strategic bombing campaign on British cities stiffened rather than adversely affected British civilian morale. However observations of those towns that had been bombed showed the opposite effect with fear, resentment and low morale.¹³ So it is worth noting that the German campaign was having the effect that the Luftwaffe desired, but perhaps the bombing was not sufficiently intense.

This possibility was acknowledged by Winston Churchill after the war: ‘if the allied bombs of 1943 had been applied to London of 1940 ... no one has the right to say that London, which was certainly unconquered, was also unconquerable’.¹⁴

Therefore despite official reports, the Allies had evidence to demonstrate that a strategic bombing campaign of sufficient magnitude against a civilian population could have the desired effect.

After the Second World War, Thomas Schelling developed the concept of coercion through risk. Schelling was referring to both nuclear and conventional coercion through risk when he said: ‘the heart of this strategy is to raise the risk of civilian damage slowly, compelling the opponent to concede to avoid suffering future costs’.¹⁵ In the ideal application of the risk strategy, only minimal force would be required in order to succeed thus minimising collateral damage and civilian casualties.¹⁶ Conversely, however, if risk fails to coerce then it would be necessary to follow through with the bombing of civilian targets in a manner similar to a punishment strategy. Where Schelling’s theory appears to have its limitations is in its focus on civilian targets rather than military ones, thus missing an opportunity to attack the enemy’s military capability.¹⁷

The ROLLING THUNDER bombing campaigns against North Vietnam between 1965 and 1968 were seen as the greatest test of the risk theory as a coercive strategy. The campaigns have been deemed failures, but was it a failure because of the concept of risk strategy or a misapplication

of the theory? Experts disagree but the main lesson seems to be that although air power has a debilitating psychological effect on the population, it is not enough to prove the validity of risk theory. Therefore this further underlines the impression that targeting the population is not the most efficient method of using air power to achieve a coercive effect. The main effort should perhaps, therefore, be directed towards the leadership.¹⁸

The most direct way to target the leadership of an opponent is through a decapitation campaign. The concept of decapitation as a coercive strategy is most associated with the air power theorist and architect of the DESERT STORM air campaign, John Warden. The theory advocates paralyzing the opponent by one of three methods: killing the leader, creating conditions for a change in leadership or by isolating the leader from his levers of power.¹⁹ In this way, the opponent would be successfully coerced with minimum commitment of resources and minimum collateral damage. Opponents of this theory argue that it is immoral, incompatible with the political restraint faced by the West and importantly has yet to succeed.²⁰

In comparison to the decapitation strategy, the use of denial as a coercive strategy has achieved tangible results. A denial campaign can be described as: ‘air operations against enemy deployed forces, the demoralisation of which might cause the enemy cohesion to disintegrate and battlefield resistance to collapse’.²¹ The use of tactical air power against fielded forces has had proven success in achieving psychological effect. These effects

may be purely tactical in nature against enemy troop morale or may also contribute to a campaign's strategic aims by disrupting the enemy so much that it changes its war aims or brings about a negotiated settlement.²²

The trend of mass desertion following air attack has been regularly seen thus demonstrating the greater psychological effect that air power can offer rather than pure physical destruction.²³ The likelihood of the mass desertion or surrender of troops cannot be accurately predicted but can instead be an unplanned dividend for the campaign planners. For example in the 1991 Gulf War although the destruction of the Iraqi military units in the Kuwaiti Theatre of Operations (KTO) was the main reason for the coalition to use of B-52s to attack Iraqi positions, the round-the-clock bombing undoubtedly had an adverse psychological effect on the Iraqi troops. It is estimated that out of 400,000 Iraqi troops in the KTO, 160,000 troops deserted, 87,000 were captured yet only 10,000 were killed.²⁴ Having analysed the four coercive strategies, the initial conclusion is that the denial strategy has not only produced consistent tangible results, but appears to have remained morally acceptable in a manner that punishment bombing of civilians or the direct targeting of an opponent's leadership have not. But what are the current political, economic, social and technological limitations of using air power to achieve psychological effects?

Air power theorists of the inter-war years such as Mitchell and Douhet assumed that a punishment-based

coercive strategy against the enemy's civilian population would occur during a total war and would not have a great deal of political restraint.²⁵

The reality is that bombing civilian targets or assassinating enemy leaders in any conflict other than total war is politically and morally unacceptable to the West and, more importantly, does not work. Does this mean that punishment, risk and decapitation coercive strategies are not acceptable in the current strategic environment? Undoubtedly if kinetic air power is used incorrectly or causes unintended or disproportionate civilian casualties then the consequences for the political and public support can be critical. Therefore it can be concluded that a coercive denial strategy, which by definition targets the enemy's military capability, should be more compatible with today's political constraints. Indeed successful denial coercive campaigns such as Operation ALLIED FORCE in Kosovo in 1999 have underlined air power's ability to offer strategic effect at a relatively cheap price.

In addition to the political constraints, the ability to attack an enemy's economy in order to coerce the leadership is also limited in anything other than total war. Any attack on economic targets are likely to have unplanned civilian casualties, such as during the 1991 Gulf War when attacks on electrical power grids led to the contamination of water supplies which caused the outbreak of cholera and an estimated 111,000 Iraqi civilian deaths.²⁶ The negative strategic psychological effects of such 'collateral damage' obviously undermine the positive tactical success of the attack. That

said, military necessity may dictate that certain economic targets are hit but they often attract criticism that the attacks disproportionate and indiscriminate.²⁷ In summary, the economic constraints placed on an air campaign are inherently at odds with a punishment coercive strategy.

The social limitations on the use of a coercive campaign are imposed not only by one's own norms and values, but also by the opponent's and indeed those of the entire world. Colin Gray argues that war has become a 'spectator sport [where] there is a dialogue among what technology permits, what politics requires, and what society allows'.²⁸ For example the decapitation coercive strategy employed by the Israeli Air Force against Hamas leadership in Gaza in January 2009,²⁹ was widely reported which galvanised wider global condemnation of the Israeli strategy.³⁰

The examples used thus far have concentrated on major combat operations against what is often called a symmetrical opponent, but it is arguable that the Royal Air Force will predominantly be used to support operations other than war (OOTW), such as counter-insurgency (COIN) and peace support operations (PSO), in the near-to-medium term rather than be engaged in major combat operations.³¹ So how has air power's unique attributes and asymmetric advantages been used to achieve strategic psychological effect in such operations?

The Psychological Use of Air Power in Operations Other Than War

First, COIN case studies have shown: 'the use of destructive force has often been ... counter-productive to

the political end state, while being very beneficial to the aims of the insurgent'.³² This was demonstrated by the comments made by President Karzai of Afghanistan in 2008 following a series of U.S. air strikes which had caused many civilian casualties: 'I wish I could intercept the planes that are going to bomb Afghan villages ... we have no power to stop the planes, if we could... we would stop them and bring them down'.³³ This is, unfortunately, not a new lesson for air power practitioners and theorists to learn. In 1924, Sir Henry Dobbs, the High Commissioner in Iraq, noted that: 'a situation may frequently arise in which the capture or killing of a specified offender or offenders would have good effect, while the indiscriminate bombing of non-combatants associated with such offender or offenders would have a bad effect'.³⁴

The solution used in 1920s Iraq in order to minimize these negative strategic effects of the tactical use of kinetic air power was the same as that used in Afghanistan today: a non-kinetic demonstration of air presence. By 'buzzing' the targets, airmen found that they could have an effect on the insurgents and civilian population which could then be escalated into a kinetic strike if necessary. A similar approach is credited with achieving the surrender of German forces on Rhodes in 1944. A Royal Air Force squadron flew in close formation at low level over the German positions in an aggressive demonstration of air presence. The German forces surrendered without further resistance thus achieving the aim without the kinetic use of air power and the associated collateral damage that would have occurred.³⁵ Today,

such non-kinetic demonstrations are called 'Shows of Presence' or 'Shows of Force'³⁶ and are part of a graduated response to deter or coerce the insurgent without, ideally, the need to employ kinetic destructive force.³⁷ Experience has shown that, as in any coercion strategy, the threat must be credible and where necessary the kinetic threat needs to be used. That said, experience from Iraq and Afghanistan has confirmed the validity of the tactic.

Second, the ability to provide rapid and timely mobility has long been recognized as an important, yet often overlooked, aspect of air power in COIN operations.³⁸ Air mobility gives a freedom of manoeuvre which is not normally enjoyed by the insurgent and therefore can have significant strategic effect in COIN, PSO and stability operations. Tactical mobility and resupply through either fixed-wing aircraft or helicopters has greatly enhanced the ability of ground forces to increase their presence in a theatre and therefore deter the insurgents from undertaking operations. However, the most important area that air mobility can provide strategic psychological effect is through humanitarian relief efforts. The Berlin Airlift between 1948 and 1949 is an example of air power delivering not only physical effect to those on the ground, but also having an important strategic psychological effect. The Airlift was a strategic psychological victory for the Allies against the Soviet Union, but additionally over the population of West Berlin who came to trust their former enemies.³⁹

Third, air power's ability to provide strategic situational awareness

has links to the use of air power to project the image of omnipresence. While not a new concept, the ability to *rapidly* find, track, identify and prosecute a target has become almost a prerequisite for contemporary air operations. This ability to deliver coordinated effect seemingly at will across a theatre can have significant psychological effect as described by a Serbian soldier during Operation ALLIED FORCE in 1999:

*They knew everything about us. There wasn't anything they didn't know. If we lit a cigarette, they could see it. ... We didn't expect that intensity. We couldn't fight planes with mortars. And our anti-aircraft guys couldn't do anything. ... We spread out ... but they just picked us off. Bosnia was a spa compared to Kosovo. ... I'm going to the woods, where everything is calm. I'm going to spend 10 days there, thinking of nothing, alone. I want to be alone.*⁴⁰

Air power's unique ability to give the operational commander a theatre-level perspective from a space-based asset, or give a tactical commander detailed local information from a mini-unmanned air vehicle represents a true asymmetric advantage.

A PSYOPS campaign can also contribute to the success of operations such as COIN and PSO. The United States Air Force *Irregular Warfare* doctrine manual defines PSYOPS as operations to: 'induce, influence, or reinforce the perceptions, attitudes, reasoning, and behavior (sic) of foreign leaders, groups, and organizations in a manner favorable (sic) to friendly national and military objectives'.⁴¹ In comparison, Royal Air Force air power doctrine does not mention PSYOPS at all, yet air power

has an important contribution to make.⁴² Aircraft are used to deliver leaflets to the target audience and as platforms to broadcast loudspeaker, radio or television messages. Leaflet drops have proven to be extremely effective ever since they were first used in the nineteenth century sieges of Milan and Paris.⁴³ Not all leaders have been convinced of the success of leaflet drops. Air Chief Marshall Arthur “Bomber” Harris famously quipped that: ‘the only thing achieved was largely to supply the continent’s requirements of toilet paper for the five long years of the war’.⁴⁴ More recently, air-delivered leaflets have been used to varying degrees of success in all U.S. operations since the Second World War, but the message needs to correlate with the physical military activity in order to be effective.⁴⁵

While successful PSYOPS campaigns may seemingly offer tactical advantage by encouraging mass desertion or discouraging the enemy to fight, success is difficult to measure. This is because it is almost impossible to know whether it was the PSYOPS message or indeed something unrelated that caused the effect. For example in NATO’s Operation FALCON SUMMIT in Afghanistan in December 2006, at least 88,000 leaflets were dropped before Canadian forces entered the Taliban-held village of Howz-e Madad ‘without firing a shot’.⁴⁶ But why did the Canadians face no resistance? Was it the PSYOPS campaign that caused the Taliban to flee or had the Taliban already executed a pre-planned withdrawal to Pakistan?⁴⁷ Arguably it does not matter whether the PSYOPS campaign succeeded or not because the mission was a success. Air power

therefore has a useful role to play in COIN, PSO and stability operations in order to provide psychological effect. Importantly, since these operations concern the wider civilian society affected by the conflict and not just the combatants, then perhaps applying psychology theory to the use of air power offers a way forwards.

In order to win the hearts and minds of the population whilst also eliminating the enemy, the indirect use of air power might be a more effective measure than a direct kinetic approach. One novel method of applying the indirect use of air power to achieve psychological effect is to use it to target Abraham Maslow’s four levels of deficiency needs: physiological, safety, social and self-esteem.⁴⁸ If it is true that in COIN, PSO or stability operations that: ‘systemic political and economic reforms are likely to have as much or much more value in gaining victory ... as success on the battlefield’,⁴⁹ then perhaps by employing psychology, military power and air power in particular can offer an alternative approach. Maslow’s needs are often depicted as a hierarchy with each one needing to be fulfilled in turn, but how can air power be used to address these needs?

The first level consists of the physiological needs of food, air and water.⁵⁰ Air power can be used to fulfil these needs through the role of humanitarian airlift. The ability to address the physiological requirements of the local population may have the desired strategic effect of gaining support for those giving the aid and assistance. Air power would not likely be the only method of fulfilling these needs, but

its inherent speed and reach mean that it can be effective in getting the support quickly to the problem thus preventing a potential worsening of the situation.

In attempting to address the second need of safety, air power can be used in a constabulary role against potential threats. ISTAR can be used to target criminals, insurgents and terrorists and then direct ground forces to apprehend them, much in the same way that police helicopters are used in the UK to direct police officers to arrest criminals.⁵¹ Alternatively targets can be directly targeted by kinetic air power but it is worth noting the possible negative unexpected consequences of such attack as discussed earlier in the paper.

The third need, social, is concerned with the desire to have a sense of belonging and community.⁵² The fulfilment of this need is most likely to be achieved through stabilisation operations delivered through the employment of a comprehensive approach by land forces and other agencies in order to help rebuild communities. Air power does not have an obvious role in this task *per se*, but it can be used indirectly to assist civil projects, such as providing airlift or increased mobility to those in the community.

The final deficiency need, self-esteem is the desire for achievement, strength and confidence.⁵³ The presence of air power over polling stations in Iraq and Afghanistan gave the population a sense of reassurance and confidence so that they could go out and vote. In the longer term, by helping to teach the local population how to use air power thus leading

them to developing an indigenous air capability, air power can play a significant role in achieving this need. This would be a long term effort, but as in the case of Iraq, the long term consequences of redeveloping an air power capability have proven to be an important factor in the nation's self esteem. This was reflected in the recent media coverage of the graduation of the first Iraqi Air Force pilot trained in the UK thus demonstrating the rebuilding of Iraqi air capability.⁵⁴ Therefore it is arguable that a strategy should be in place to train local air forces as part of an overall COIN doctrine.⁵⁵

When looking at the contribution of airpower to COIN, PSO and stability operations as a whole, all of the tasks identified above: the non-kinetic use of air power for strategic effect, rapid mobility, ISTAR, PSYOPS and the employment of psychology for strategic effect are valid, but is the Royal Air Force configured and able to undertake them? In 2005 the then Chief of the Air Staff, Sir Jock Stirrup commented that: 'we are in a period when the challenges we face, and the means of meeting them, are changing so fast and so dramatically that nothing short of transformation will allow us to keep pace'.⁵⁶ But arguably this transformation has not taken place. The focus of the Royal Air Force towards delivering kinetic air power over the past twenty five years has shaped today's force structure and COIN operations in Iraq and Afghanistan have highlighted deficiencies in the UK's air mobility, battlefield helicopter and ISTAR capabilities in particular.

Air mobility, both strategic and tactical is required in line with the

UK's National Security Strategy to: 'tackle threats to our national security at source'.⁵⁷ The UK's high level of operational tempo since 2001 means that the Royal Air Force's Air Transport fleet have been used at a rate far higher than originally conceived. A National Audit Office report in June 2008 commented that: 'Most nations do not have sufficient airlift assets to meet all their requirements and the United Kingdom is no exception'.⁵⁸ Importantly though: 'while the [MOD] is meeting current operational requirements there are significant risks to the availability of the tactical fixed wing airlift capability in the future'.⁵⁹ The situation of UK's helicopter fleet has not escaped the National Audit Office's gaze either. Its 2004 report into battlefield helicopters noted: 'that [Joint Helicopter Command] is some 38 per cent short of its required battlefield helicopter fleet, a shortage not expected to be overcome until 2017'.⁶⁰

The UK's ISTAR capability gap has been mitigated by a mixture of new capabilities and by using aircraft and other equipment for roles other than they were intended. New capabilities have been provided by the introduction of the advanced stand-off radar (ASTOR) system and by short-term off the shelf solutions procured under Urgent Operational Requirements such as the REAPER UAV. The use of Nimrod maritime patrol aircraft as overland communications relay platforms, and the use of fast jet aircraft targeting pods to provide reconnaissance (non-traditional ISR) are examples of equipment pressed into ISTAR roles to fill capability gaps, but both are only stop-gap solutions

to a wider problem.

Taken separately these shortfalls and lack of capabilities may be manageable, but they are symptomatic of the Royal Air Force's focus towards having capabilities to fight major combat operations rather than having a balanced force structure to face a variety of operational scenarios. Is it because the Royal Air Force believes, as a senior unnamed U.S. Air Force General did in the 1990s, that it does not need to think about: 'those kinds of wars since we can always muddle through'?⁶¹ If that was the case before recent operations in Iraq and Afghanistan then it is likely that current operational context has changed those views. The Royal Air Force's current doctrine manual, AP 3000 Fourth Edition, has only recently been updated to include thinking concerning COIN and PSO but the Royal Air Force requires a reappraisal of priorities and perhaps a return to its roots of being able to conduct: 'operations against wild men in wild places'.⁶² At the heart of these operations is the need to gain the trust and support of the population; this can be thought of as a psychological task which is supported by physical action. Air power can be instrumental in achieving this hitherto underrated aspect of operations but this task is currently of secondary importance when compared to using air power to support kinetic operations.

One of the key problems of pursuing any form of psychological campaign is how to measure its success. The enemy's will to fight or the amount of support of the local population cannot be assessed by traditional battle damage assessment (BDA), perhaps that is

the reason why the psychological effects have been overlooked and underused. Traditional measures of effectiveness of an information or PSYOPS campaign include polling of the population and interviewing prisoners of war to obtain results, but these are long, slow processes when commanders today expect almost immediate BDA.⁶³ The lack of response to a psychological air campaign, such as the early stages of Operation ALLIED FORCE in Kosovo in 1999 can lead to suggestions that the campaign is not working and that another approach is required.⁶⁴ Conversely, in the current operating environment with campaigns being judged in years rather than days or weeks, the need for immediate feedback is less than during high-intensity operations and the traditional methods obtaining BDA which can give the long-term psychological response remain valid. Therefore despite the difficulty in measuring the effectiveness of any psychological effects of the use of air power in a campaign, it should not be discounted in doctrine.

The Combination of Physical and Psychological Air Strategies

Since air power's physical and psychological effects are linked, how should they best be combined? One option is through the concept of strategic paralysis. Basil Liddell-Hart stated that: 'paralysis, rather than destruction, is the true aim in war, and the most far-reaching in its effects'.⁶⁵ This theory accorded with his friend J.F.C. Fuller who suggested that like a body, 'the physical strength of an army lies in its organisation, controlled by its brain. Paralyse this brain and the body ceases to

operate'.⁶⁶ Two relatively modern-day theorists from the USA, John Boyd and John Warden, have advocated the concept of strategic paralysis but they differ as to whether the best way of using air power to achieve paralysis is through its physical or psychological application.⁶⁷

John Boyd's theory includes the assertion that all human and organisational behaviour can be described as continually cycling through an 'Observe, Orientate, Decide, Act' (OODA) loop.⁶⁸ If the speed of one's own actions disorients the enemy's decision-making process then the result is *psychological* paralysis of the enemy. This theory advocates a fast-moving form of warfare that denies the opponent time to mentally cope with the situations that he faces. The 'Shock and Awe' opening to the 2003 Iraq War demonstrated that by manoeuvring quickly (or moving quicker around their OODA loop) the US-led coalition was able to paralyse the Iraqi leadership which led to a swift military defeat.

In an extended COIN operation where success is measure in years rather than days, such as faced in Afghanistan today, how applicable is Boyd's approach? It can be argued that the theory may be useful in delivering tactical success but it is less applicable at the strategic level where there is less need for rapid decision making and action. An alternative view is that rather than being less valid in today's complex operations Boyd's ideas are in fact more valid.⁶⁹ This deduction is based on the assumption that in such a complex operating environment, the side who eventually wins is that

which observes the enemy, learns and adapts its tactics accordingly before the opponent can react.⁷⁰ So although Boyd's theory therefore has its limitations, the concept of psychological paralysis of an opponent remains valid. In terms of attempting to achieve the strategic paralysis of an opponent, Boyd's psychological approach can be contrasted to Warden's more direct physical approach.

In 1988, John Warden described his five-ring targeting model. This model is based on the analysis of the opponent (or any organisation) as a system which can be broken down into five component parts: the leadership, processes, infrastructure, population and fielded forces.⁷¹ Warden's assumption is that all organisations are constructed in the same way: the leadership gives the organisation direction and causes it to respond to external and internal changes. It is therefore the leadership which is the most important of these component parts.⁷² In order to demonstrate the relationship between the five component parts, they can be depicted as a set of concentric rings with the most important, leadership, at the centre and the remainder extending outwards in descending importance.⁷³ The idea is that each of the rings should be simultaneously physically targeted in what Warden calls parallel attack.⁷⁴ The main effort of this attack should be towards the leadership at the centre in order to cause *physical* paralysis of the system. The theory goes on to explain that targeting of the outer rings of the circle in order to achieve partial physical paralysis, may also in turn produce a psychological reaction in the leadership.⁷⁵ The most famous

application of Warden's theory is the 1991 Gulf War air campaign.⁷⁶ This campaign arguably proved the theory against a conventional military opponent, but does the theory remain applicable in the current operating environment against disparate non-state actors?

The 2006 Israel-Hezbollah war provides an interesting case study since it involved a nation state using kinetic air power in an attempt to cause strategic paralysis of a non-state organisation. Israel used air strikes to mount an intensive parallel attack on a diverse set of targets including the leadership, infrastructure (bridges and fuel depots) and fielded forces of both Hezbollah and the state of Lebanon.⁷⁷ Instead of achieving the planned paralysis, Israel found that Hezbollah was an enemy that: 'not only defied the standards of conventional war making, but also proved to be sophisticated and prepared'.⁷⁸ As well as failing to paralyse and thus defeat Hezbollah, the negative psychological effects of the air campaign helped to galvanise anti-Israeli opinion in the wider international community.⁷⁹ So where does this leave the notion of achieving the physical paralysis of an insurgent group or terrorist organisation? Using J.F.C. Fuller's 'body' analogy that was mentioned earlier, the non-regular enemy can be considered a 'germ' that has no central 'brain' that can be attacked directly in the way that Fuller suggested.⁸⁰ In summary, Warden's physical approach is less applicable against non-state actors since not only does the organisational structure of the opposition not fit the five rings model, but attempts to physically target key elements of the opposition can cause negative

strategic psychological reactions.⁸¹

When comparing these two approaches: Boyd's psychological paralysis through the use of processes to operate within an opponent's OODA loop and Warden's physical paralysis through direct, parallel attack, they initially appear to be non-compatible. Both however, offer options to a commander as how to approach the question of achieving strategic paralysis and can be applied in different situations. In a conventional 'force-on-force' conflict, an air campaign strategy which combines aspects of psychological attack (Boyd) and physical attack (Warden) is likely to achieve synergistic results since both elements would contribute to the strategic paralysis of the adversary. In other forms of operations such as COIN, or as faced by Israel in 2006, then the notion of strategic paralysis is less applicable. Nevertheless, technology has enabled air power to be applied rapidly where it needs to be thus allowing the commander to move quicker around his OODA loop and therefore the Boyd's notion of psychological paralysis remains valid. An alternative approach called Joint Action has been recently articulated in British Defence Doctrine and merits analysis.

Joint Action is defined as 'the deliberate use and orchestration of military capabilities and activities to realise effects on other actors' will, understanding and capability, and the cohesion between them'.⁸² The doctrinal framework was published in 2008 and recognises that the proper application of both physical (manoeuvre and fires) and psychological activity (influence) is

important. It is implicit in the title that Joint Action involves all aspects of military force, or the threat of force, to achieve the desired outcome,⁸³ but for air power the approach has particular potential. Air power's inherent speed, reach and ubiquity mean that it has the capability to influence events on a vast scale. Therefore the need to fully integrate physical and psychological planning is clear to ensure that the targeting of the *will, understanding, capability and cohesion* is effective.

The Joint Action approach theoretically allows campaign planners to adopt a mixed physical or psychological strategy to either directly or indirectly influence the opponent according to the effect desired and the context of the action. As part of psychological influence activity to target the opponent's will, Stephen Hosmer advocates the use of a strategy that makes demoralisation an air campaign objective.⁸⁴ This approach, which brings influence to the fore of the commander's mind, is in line with emerging British thinking that, 'where information operations once supported combat operations, influence can now dominate the contemporary approach [to operations]'.⁸⁵ Hosmer's approach recognises that in the past, the psychological effects of air attacks were largely unplanned. Thus deliberate joint coordination is required to ensure that the influence message that the commander wants to convey is supported by air power's physical use, whether it is kinetic or non-kinetic, and vice-versa. Nevertheless, Joint Action offers a potentially effective yet flexible approach that would be applicable across the spectrum of warfare from

major combat operations to COIN and PSO.

Conclusion

This paper has shown that the psychological effect of air power should now receive greater prominence in British air power doctrine. Despite a great deal of evidence supporting the theories that show that the effect air power can deliver to an opponents' morale outweighs the physical effect, this element of air power has remained underrated since the Second World War. In order to remain relevant, military thinking has to adapt with the times and be subject to 'constant and critical interrogation',⁸⁶ and British Air Power Doctrine, AP 3000, has recently been updated to reflect current operations. That said, although the context of conflict changes over time, Colin Gray reminds us not to: 'misread recent and contemporary trends in warfare as signals of some momentous radical shift'.⁸⁷ Arguably though, complexity of the contemporary strategic environment demands a rapid continual update of doctrine to ensure its relevance.

The lessons learnt from the application of the four coercion strategies; punishment, risk, decapitation and denial during the Twentieth Century have led Pape to argue that denial is the only strategy that works.⁸⁸ It is important though to apply a contextual filter to any lessons since the constraints faced by early air power protagonists differ greatly from those of today. In terms of addressing the changes in the doctrine of coercion, the U.S. Air Force offers its commanders clear guidance.⁸⁹ It is likely that a coercive

strategy will play a role in future major combat operations therefore British doctrine needs to be amended to address this shortfall.

Air power offers operational commanders a significant asymmetrical advantage in COIN and other operations other than war. Deployed tactical commanders understand this and apply the psychological effect of air power, but these lessons need to be captured in doctrine and be supported by the capabilities to put the theory into practice. Unfortunately the Royal Air Force's capabilities in the areas where physical effects could have significant psychological effect in winning the support of the population, in particular air transport and ISTAR, require enhancement in order to remain credible. The application of air power to address Maslow's hierarchy of deficiency needs could offer a potential approach for air power's future application in PSO and stability operations in particular and merits further investigation.

The need to reflect the possibility of achieving synergistic effects by combining a physical and psychological air strategy is long overdue in British doctrine. The emerging British joint doctrine which puts influence to the front of a commander's mind appears to have utility across the spectrum of warfare.⁹⁰ Additionally it appears to recognise that air power's physical and psychological use cannot be separated.⁹¹ The concept of strategic paralysis may have less utility in current COIN operations than in major combat operations, but should not be discounted out of hand. Therefore the possibility of achieving

synergy by applying air power to paralyse an opponent's ability (physical) and will (psychological) to wage war is significant, and should be reflected in British air power doctrinal thought. Since the future use of British air power is likely to be uncertain and varied, thinking should cover the diverse possibilities. The new doctrinal framework of Joint Action offers a potentially flexible and effective approach to combining the physical and psychological elements of air power. Thus future air power doctrine should reflect the possibility of achieving synergy with combined psychological and physical air power strategies.

Air power can sometimes appear to be the best means of delivering psychological effect, especially strategically, but it may not always be appropriate: 'the fact that air power appears so obviously to be the natural military instrument of coercion does not mean that it is automatically the right instrument to choose'.⁹² Nevertheless, air power offers an asymmetric advantage which has for a number of years been underrated and underused. The physical use of British air power in operations today is constrained by concerns about collateral and proportionality, therefore the further development of non-kinetic options for the use of air power is required. Air power doctrine should articulate the need to use a mixture of kinetic and non-kinetic means to influence an opponent and thus the recent update to AP3000 is welcomed. Air power is more than about the application of force and thus the shift towards describing airpower's ability to influence is a good sign. It is important to remember that

doctrine offers guidance and that airmen pride themselves on the ability to be flexible and adapt to the situation faced at the time. Meilinger reminds us that: 'Airmen, from any country, have seldom been accused of being thinkers, and precious few have taken up the pen to write down their thoughts on how air power should be used'.⁹³ Perhaps now is the time to capture airmen's thoughts, which have been shaped by recent operational experience, and develop air power's potential psychological use for the future because, like the concept of influence as a whole, it is a growth area for the future.

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Air Power's Early Development in America and Italy

By Group Captain Paul O'Neill

The article looks at the early development of air power (pre-World War One) and considers why, although the United States pioneered the development of heavier-than-air aviation, it was the Italians who first applied the emerging technology to war. It considers how the vastly different geo-political situations in each country influenced each nation's approach to the aeroplane's use and how, in Italy, the new technology captured and defined the political and public imagination. The unique combination of technology, necessity and creative vision was focussed in Italian minds on the aeroplane's fragile frame. This harnessing of science and artistic vision made the difference and enabled Italy to provide the aeroplane with its first opportunity to demonstrate its potential as a weapon of war.

Introduction

Aerial warfare was foreseen by artists, poets and novelists such as Leonardo Da Vinci, Tennyson and Jules Verne long before the technology leading to powered flight was mature, and whilst today air power's military utility is undisputed, at the start of the twentieth century, the aeroplane's contribution to warfare was not an inevitable consequence of powered flight.¹ In the years immediately after the Wright Brothers' first successful flight at Kitty Hawk in December 1903, American inventors dominated the aeroplane's early development, rapidly improving the range, ceiling, speed, reliability and payload of this nascent technology.² Within five years, the aeroplane had improved sufficiently for American aviators to visit Europe and triumphantly demonstrate their technical supremacy. However, the first aviators were largely focussed on the aeroplane's practical development and were less concerned with its use as foreseen in the visionaries' flights of fantasy. Consequently, despite America's technological lead, the US was slow to exploit the aeroplane's military potential. The early European enthusiasts on the other hand, were able to ignore the technological constraints, and consider how the aeroplane's military potential could be exploited in that continent's less stable geopolitical environment. Thus, it was in Europe, and notably in Italy, that American technological progress first turned into the nightmares of writers and artists.

In Italy, Giulio Douhet was quick to advocate the use of the aeroplane as

a weapon of war and, by 1911, Italy had fought the aeroplane's first war against the Ottoman Empire. In this short, but intense conflict, the Italians experimented with the majority of roles with which we associate air power today. It took the US until April 1917, when it entered the First World War, to forge its air power doctrine, which it did in the fires of that conflict.

This paper argues that the reasons why the US was slow to develop air power as a weapon of war compared to the Italians was both a function of the different geographic and political conditions, and a result of the different attitudes to the use of the technology. The paper starts by examining the development of aviation in North America before exploring the geopolitical and associated factors that influenced the development of air power doctrine in the US and Italy. In considering the Italian perspective, the paper looks at the social and political movements that made Italy such fertile ground for nurturing the idea of aerial warfare.

Development of American Aviation

American inventors pioneered heavier-than-air flight and led the aeroplane's early development but, by 6 April 1917 when the US joined the First World War, Hudson observes that it had no aviation units trained for war and no air officers in Washington who 'had ever seen a fighting plane'. Moreover, of the US Army's fifty-five training aircraft, General Pershing commented that 'fifty-one were obsolete and the other four were obsolescent'.³ To suggest that this lack of preparedness reflected a lack of knowledge about

air power's utility would be wrong. As early as 1794, the French had used reconnaissance balloons for observing enemy troops in its war against Austria which, given the close links between France and the newly independent America, probably meant that this revolution in warfare was known to the US. By the mid-nineteenth century, air power had also been used offensively, by the Austrian Empire in the First Italian War of Independence. In 1849, unmanned balloons with time-fused bombs were despatched against Italian forces in Venice, although the mission failed when the wind changed direction and the balloons were blown back over Austrian lines. On the other side of the Atlantic by contrast, air power was not received with such enthusiasm. In 1840, during the Second Seminole War in Florida, part of the long-running American-Indian Wars, Colonel John Sherburne unsuccessfully sought to convince the War Department to use balloons for spotting Seminole campfires at night. Although the Secretary of War, Joel Poinsett seriously considered the idea, he was persuaded by a sceptical Army commander in the field that the terrain was not suitable for balloons and rejected the proposal.⁴ Similarly, in 1846, John Wise failed to gain the War Department's approval to use balloons to bomb Vera-Cruz in Mexico during the US-Mexican War.

It was not until the start of the American Civil War in 1861 that the American military formally embraced aviation with the creation of a civilian Balloon Corps under the Union Army's Bureau of Topographical Engineers. The Balloon Corps, operating under Chief Aeronaut Thaddeus S Lowe, used

tethered reconnaissance balloons to observe Confederate forces and direct artillery fire onto the enemy's positions using the newly developed telegraph system. Lowe also created the world's first aircraft carrier, the *George Washington Parke Curtis*, a converted coal barge, from which Union forces could launch, tow and recover reconnaissance balloons. At the same time, John LaMountain was, unofficially, invited by Major General Benjamin F Butler to use untethered balloons in support of the Union cause, and in July 1861 he made the first successful observation of Confederate forces. The use of balloons in this way, by both sides, had a physical as well as a psychological impact. Scarce troops were diverted from the front-line to deceive the aerial enemy by applying camouflage to positions and the creation of dummy encampments/gun emplacements, whilst commanders regularly changed their battle plans once they thought they had been observed.⁵ The systematic use of air power during the Civil War attracted European attention, and Count Ferdinand von Zeppelin travelled to America to become a military observer for the Union Army.

Despite air power's positive contribution to the conduct of the American Civil War, however, balloons were withdrawn from the military inventory of both sides in 1863, two years before the War ended. On the Union side, the decision to phase the balloons out was taken amidst a background of rivalry between Lowe and LaMountain over technology sharing, changing financial priorities on both sides and the biases/interests of key military and civilian personalities

(all features that would hamper the development and early use of heavier-than-air flight).⁶ When General McClellan, a supporter of the use of balloons, was relieved of his command of the Union Army early in 1863, the civilian Balloon Corps' funding was cut by Captain Cyrus Comstock, who had been appointed to oversee its activities. Inevitably, the reduced funding impacted on the Corps' effectiveness and by August 1863, the Union's Balloon Corps was disbanded. The disbandment formed part of General Ulysses S Grant's reorganisation of the Union Army because, given the Union's vastly superior human and material resources and the unreliability of aerial observation, Grant preferred to conduct an attritional campaign to one that was intelligence-led.⁷ The Confederate Army's abandonment of air power was more prosaic. Having always operated at a disadvantage in aviation terms, and with its technological and resource disadvantage, it had only managed to muster two balloons during the War. By the summer of 1863, both had been captured and the Confederacy lacked the resources to replace them. Balloons were not reintroduced to the US inventory until 1891 when a military Balloon Section was formally established within the Army's Signal Corps.⁸

The organisational inertia that had delayed the formation of the Balloon Section did not stop the US War Department secretly providing Professor Samuel Langley of the Smithsonian Institute with \$50,000 in 1898 to produce a flying machine. Unfortunately, Langley's tests ended in failure when he crashed into the Potomac River in 1903, attracting

widespread press condemnation and public ridicule that created a Departmental mistrust of aeroplanes lasting years. Moreover, this crash was merely the first in a series of very public disasters that undermined official enthusiasm for the aeroplane in the early years of US military heavier-than-air aviation. Worried about the crash's impact on Congressional funding for their other projects, the War Department decided to withdraw support for aviation and refocused on more pressing (and more conventional) issues like modernising the army's field artillery. The political fall-out of Langley's crash affected the government's confidence in aeroplanes to such an extent that a 1904 report by Howard Taft, then Secretary of State for War, contained no mention of aircraft at all, even though the Chief of the Signal Corps (and thus *de facto* Head of US Army Aviation) was singled out for his commendable foresight and energy in other respects.⁹

The American attitude to flying oscillated between hostility and ambivalence for many years. When an officer from the Royal Aircraft Factory at Aldershot sought to buy aeroplanes from the Wright Brothers in January 1905, the Brothers approached the US War Department and offered them the first purchase of the Wright Flyer. The suggestion was met with apathy, even though the Wright's aeroplane had a range of over 3 miles and had achieved speeds of 35 miles per hour. It was to take another three years for the US to overcome its mistrust and buy its first aeroplane.

In 1907, the US realised that it was falling behind military aviation's

rapid progress elsewhere and, galvanised by President Roosevelt's interest in the subject, the US Army's Board of Ordnance sent an officer to Europe to shadow European developments. By 1908, some parts of the American establishment had recognised the aeroplane's potential and the Secretary of State for War predicted that the aeroplane would 'profoundly affect modern warfare'.¹⁰ In the same year, the Signal Corps bought its first powered aircraft to add to the three balloons already in its inventory and created an Aviation Force of three officers and ten enlisted personnel.¹¹

Officialdom's lukewarm enthusiasm for aviation cooled further when Lieutenant Thomas Selfridge was killed on 17 September 1908 in the world's first fatal aeroplane accident at Fort Myer, Virginia. The incident, which occurred during acceptance trials in front of 2000 spectators, had unpleasant overtones of Professor Langley's failed 1903 experiments and prompted fears of further the public/media ridicule. These two very public failures made politicians fearful of the political consequences of another expensive aviation humiliation and undermined whatever Congressional support there was; Congress refused to approve the aeroplane's purchase in that year's appropriation, or indeed fund aviation at all in 1909/10 (it probably did not help that the Signal Corps could not specify an operational requirement for the purchase). By 1911, therefore, whilst the Italians were preparing to fight against the Ottoman Empire in Africa - the aeroplanes' first conflict - the US Army still had only one aeroplane and one pilot in service.¹²

Despite official hesitancy over the aeroplane's prospects, an enthusiastic group of US Army and US Navy officers was exploring air power's potential for war. In the Navy, Captain Washington Irving Chambers USN became the first American officer responsible for naval aviation and in 1910-11 he organised experimental flights from ships and established the first permanent naval flying base at Annapolis, Maryland.¹³ In the Army, the Signal Corps was trying to pioneer the development of military aviation under Major General George Owen Squier, but still faced considerable institutional reluctance towards its attempts to embrace the new technology. Despite this hesitancy, US aviators were still experimenting with the aeroplanes' military utility. Lieutenant Thomas de Witt Milling tested an aerial bombsight in 1911 and the following year, he and Captain Charles de Forest Chandler first fired a Lewis gun from an aeroplane.¹⁴ However, the aeroplanes' practical developments were largely pursued by junior officers, who lacked experience of doctrine writing and were thus unable to formalise their experience or influence their conservative institutions to the same extent that Douhet did with the Italians.¹⁵ The fact that American military aviation developed within the Signal Corps almost certainly influenced its early conception and, even in March 1914 when the Army Field Service Regulations included aviation in its guidance for combined arms warfare, the aeroplane remained limited to an observation role.¹⁶ Despite small pockets of openness to the possibilities of the new technology, therefore, the

development of US military aviation remained slow and manifestly failed to match the aeroplane's rapid technological progress.

The first operational deployment of US Army aviators occurred in February 1913 when a small force (organised as the 1st Aero Squadron) was sent to Texas to work in support of the US Army's 2nd Infantry Division during another period of tension with Mexico. Ironically, Mexico had spent more on aviation in 1913 alone (\$400,000) than the US had in the previous six years and, by early 1914, the US had only six airworthy aeroplanes and fourteen pilots.¹⁷ By August 1914, the US could field eight serviceable aircraft from the thirty it had purchased to that date: of the twenty-two no longer in service, one was in the Smithsonian Museum and the others had been destroyed in accidents or condemned.

Deeply dissatisfied with the state of US military aviation compared to that of Europe, a Congressional inquiry was launched into the Signal Corps' handling of military aviation that was to move US aviation forward. The 1913 Congressional Inquiry into 'Aeronautics in the Army' by the House of Representatives Committee on Military Affairs, followed the 1912 Presidential elections that brought President Woodrow Wilson to office and gave a progressive Democratic Party control of both Houses of Congress. Wilson and his Party favoured policies of neutrality and isolation and opposed the idea of large standing armies, which they saw as more likely to provoke war. Against this political backdrop, the aeroplane must have seemed an attractive way of providing for

US defence without the cost and risk associated with maintaining large numbers of troops against a relatively remote threat. Moreover, the Inquiry followed shortly after the Italo-Turkish War, and the US had access to translated versions of the Italian General Staff Reports into the War.¹⁸ Despite this, only Captain 'Billy' Mitchell, Captain Beck and Mr Scott spoke convincingly of the aeroplane's offensive capability.¹⁹ The Inquiry led to an "Act to Increase the Efficiency of the Aviation Service" that received Presidential approval on 18 July 1914.²⁰ The Act formalised the creation of an Aviation Section within the Signal Corps, meaning it could no longer be abolished by the Branch Head and, amongst other things, introduced the concept of flying pay for its aviators.

Notwithstanding the official recognition underlying the formation of the Aviation Section, the aeroplane had still not won the battle for wholesale acceptance. As late as December 1914, the Head of the Signal Corps testified to the House of Representative Military Affairs Committee that 'as a fighting machine the airplane has not justified its existence'²¹ despite the fact that he was the Army's aviation champion and had received favourable reports from Major Squire, one of his own officers in Europe. Squire, the American military attaché in London, reported that

'for strategical and tactical reconnaissance's the aeroplane is at present simply indispensable. In the present form of trench warfare the aeroplane is used to watch, sketch and plot the development of the enemy's trenches by day, and in most cases it is the only method of

keeping informed of the day to day progress of their preparations.’²²

Further evidence of official reluctance to commit to the aeroplane was evident the following year when the Chief Signal Officer’s appropriation request for \$1,000,000 in 1915/16 was reduced to \$300,000 by the Secretary of State for War before being further cut to \$250,000 by Congress – yet even this was twice that of the previous year’s budget.²³

The Signal Corps continued to use what aeroplanes it had and, in 1916, the Aviation Section was deployed to Vera Cruz in the hunt for Pancho Villa. A squadron of eight aeroplanes supported the mission, but their fragility was ruthlessly exposed when, after six weeks, all the Squadron’s equipment was consumed or destroyed. By the time the US joined the First World War in April 1917, it was still a long way behind the Europeans in the application of heavier-than-air aviation to war; aircraft played an insignificant role in US mobilisation plans, with little funding and almost no air power doctrine. The extent of the underfunding was clearly revealed by the fact that in May and June 1917, Congress appropriated over \$54m for aviation,²⁴ rising by the end of the year to \$640m for aircraft manufacture and the expansion of the Aviation Section.²⁵ The lack of funding was only matched by the paucity of American thinking on the application of air power, so that three days before the US declared war, the National Advisory Committee for Aeronautics (the forerunner to NASA) sent a telegram to all aircraft manufacturers asking “Can you provide training reconnaissance airplanes? If so, state

type ...”. As Holley observes, this ‘effectively left the determination of aeroplane types to industry’.²⁶

America’s aviation pioneers and early industrialists were predominantly practical men who, although pushing the bounds of the technology, were also its servants because they could not outrun that which they were seeking to create. As pragmatists, concerned not only with technical issues but with staying alive – one quarter of early US fliers were killed in aircraft crashes – they perhaps were less able to see air power’s full potential than the Italian fantasists who brought a vision unconstrained by technology’s limitations.²⁷ Tellingly perhaps, the US Army saw the dirigible’s proven technology as more useful for warfare long after European visionaries had switched allegiance to the aeroplane as having greater potential.²⁸ However, whilst these factors clearly influenced the early development of US aviation, the primary reason why the US was slower than the Italians in developing military air power can be found in the different geopolitical circumstances.

Geopolitical Situation

At the turn of the twentieth century, Italian and US geopolitical circumstances were vastly different. America was the pre-eminent regional power and was increasingly seen as a world power, whilst Italy was a fragile state, vulnerable to attack from more powerful neighbours against whom it could do little.²⁹ Moreover, Italy was surviving in a continent in which the balance of power was precarious: at the turn of the twentieth century, and in a reversal of Kagan’s famous assessment of the two continent’s

modern natures,³⁰ the Europeans came from Mars whilst the Americans were from Venus, at least in relation to US relations with the world beyond their own 'near abroad'.³¹

The United States

Having isolated itself (and much of Latin America) from the rest of world behind the walls erected by the Monroe Doctrine in 1823, the US was somewhat remote from global politics. Its land borders were secure in the south thanks to its overwhelming strength over Mexico and the defeat of the Spanish in the 1898 Spanish-American War, whilst the American-Canadian frontier was protected through agreements with Great Britain.³² Simultaneously, US sea borders and trade interests were protected by a powerful navy, built around Admiral Mahan's belief (borrowed from John Evelyn) that 'whoever commands the oceans ... commands the world'.³³ Consequently, whilst aircraft lacked the range to cross the Atlantic or Pacific Oceans, the US had little to fear from its enemies. Living in a secure geopolitical space and safe from attack, America did not suffer from the same nationalistic and militaristic pressures that were rife in a Europe whose nation states lived in a constant state of existential angst. This lack of a credible threat and political isolation meant that the US was also relatively isolated intellectually and thus had little knowledge of European air warfare.³⁴ Conversely, European states watched each other closely, ever alert to the development of new ideas that might impact on their security. Something as radically new and potentially threatening as aviation was unlikely

to remain the preserve of any one state for long. Air power's technology and doctrine (such as it was), therefore, rapidly spread throughout Europe as states invested in aviation to avoid being outpaced by potential enemies.

Threat-free, the Americans tended to view international relations through a liberal/idealistic lens in which the world was ordered through pacific mechanisms.³⁵ The 1899 Hague Conferences on the conduct of war saw the US try to minimise the military use of aerial devices by proposing a five-year prohibition on the 'discharge of projectiles or explosives from balloons or by other means of a similar nature'.³⁶ Given the immature state of the technology of the day, European states supported this but, by the 1907 Hague Conventions, the security situation in Europe had worsened and aeroplanes had become more capable of being used as weapons. Most European powers now rejected the American attempt to renew the prohibition on aerial bombing but, whilst the US remained isolated and threat-free, it had no strategic imperative for developing, funding or even debating the utility of military aviation.

The lack of government funding for aviation limited industrial interest and American aeronauts were forced to generate enthusiasm, sales and thus income by performing at public airshows. This elevated American civilian aviation priorities to a much higher level than was the case in Europe. For a country as large as the US, aeroplanes promised more rapid communication than land travel, even the railways, and the US National Advisory Committee on Aeronautics

initially looked to aviation as part of a domestic airmail service rather than as a means of warfare. In contrast, the relative open-handedness of European governments towards aviation - by 1914, the Italian Government had spent more than eight times that of the US on aviation - encouraged American aviators to cross the Atlantic to sell their aircraft, spreading the technology and fuelling the growth of European aircraft manufacture. The importance of a strategic imperative as a generative force for military aviation's early growth was clearly shown once America became embroiled in the First World War; having entered the war, the US developed its military aviation doctrine with as much ingenuity as its engineers had developed the aeroplanes themselves in the preceding fourteen years.

Italy

In late nineteenth century Europe, the balance of power was precarious. The agreements ending the Franco-Prussian War had created modern Italy and Germany in 1871, which generated an atmosphere of instability in which states were under constant threat. This sense of danger was particularly acute for the Italians and prompted them to join the Triple Alliance with Germany and Austria in the hope of preventing invasion from her most dangerous neighbours. Italy had been vulnerable to invasion through the Alps for centuries; Napoleon called them Italy's 'splendid traitors' because they provided a less effective protective border than the topography might at first suggest. Armies heading south into Italy enjoyed easier invasion routes thanks to the more gentle northern slopes

and a semi-circular shape that made invasion paths converge near Turin ready for the attack. Italian forces had a more difficult passage and would be dispersed by the mountains and valleys on the northern side before reaching their objective.³⁷ Jorge Chavez Darnell's crossing of the Alps by aeroplane on 23 September 1910, therefore, overcame Italy's topography inequality and offered the prospect that she might deter or attack her neighbours on an equal footing. Indeed, Douhet makes explicit reference to the advantage of air power in freeing the State from the confines of its geography in his writings from 1910 onwards.

Italy was intensely nationalistic by the start of the twentieth century, a sense made more acute by the damage suffered to her prestige through the loss of Tunisia and Algeria to the French and her failure to seize Ethiopia in 1896.³⁸ Industrially backward compared to other European nations, Italy had a relatively small population of less than 35 million, of whom over 50% were employed on the land and lacked the skills needed to support the large-scale industrialisation necessary to reverse Italy's economic fortunes. Moreover, deep societal inequalities meant that Italy was riven with class-hatred and was susceptible to popular mass revolt along the lines predicted by Karl Marx.³⁹ In this regard Douhet's early advocacy of aerial bombing of civilian populations as a means of inciting revolution amongst one's enemies can probably be seen, in part, as an awareness of Italy's own vulnerability to class revolt at this time.

That Italy had a maritime tradition is

also significant; land powers typically think in terms of contiguous zones of occupation and control around central points, whilst sea powers conceive of controlling points and connecting lines of communication.⁴⁰

Air power's inherent mobility but lack of persistence conceptually made it closer to seapower, which may explain why, within the European context, it was Italy, rather than land-power Germany, that pioneered air power's application to war.

Italian Attitudes to Aviation

With US and Italian geopolitical positions differing markedly, so too did official attitudes to technology. Whereas the US War Department was (excessively) cautious about the aeroplane, new ideas and technology were welcomed in Europe, and particularly in Italy, where the aeroplane offered many the hope that the country's recent humiliations could be overcome. This general enthusiasm was reflected in the generous allocation of funds from both government and public: in 1910 the Italian Government allocated ten million Lire for aviation, enabling Caproni to produce the first indigenous Italian aircraft in his factories,⁴¹ whilst a public appeal in 1912 raised three million Lire in public gifts and subscriptions to purchase aeroplanes for the Army.⁴²

The Italian Futurist Movement capitalised on the populist mood, arguing that Italy's greatness could be recaptured by the wholesale acceptance of new technology that would lead to the radical transformation of society. The reverence for technology was encapsulated in Marinetti's 1909 'Futurist Manifesto', in which he

wrote passionately about the love of danger and the beauty of speed:

- '1. *We want to sing the love of danger, the habit of energy and rashness.*
2. *The essential elements of our poetry will be courage, audacity and revolt.*
3. ...
4. *We declare that the splendour of the world has been enriched by a new beauty: the beauty of speed. A racing automobile with its bonnet adorned with great tubes like serpents with explosive breath ... a roaring motor car which seems to run on machine-gun fire, is more beautiful than the Victory of Samothrace.*
5. *We want to sing the man at the wheel, the ideal axis of which crosses the earth, itself hurled along its orbit.'*⁴³

The aeroplane was an especially powerful totemic symbol in Futurist thinking, because it offered to lift man - literally and figuratively - above nature and give life to Icarus' dream.⁴⁴ Its significance was such that later, in the 1920s and 1930s, the aeroplane gave rise to a uniquely Italian art form - Aeropainting - which reflected the Fascist period's obsession with this machine. Ironically, however, despite claiming to look forward to a new age of Italian greatness, Futurism's (and latterly Fascism's) lauding of individual heroism and chivalry was strongly reminiscent of the medieval era and Chaucer's *parfait knight*, with aeroplane nose-art in World War One resembling the markings on a medieval knight's shield.⁴⁵ The sense

of chivalry and heroism that formed around the Italian aviators in the Libyan War promoted a mystique that was only dispelled by the Italian Air Force's poor performance in World War Two.⁴⁶

The Italian fascination with technology, however, was not confined to a populist and artistic movement, but was intimately connected with Italian politics through individuals like d'Annunzio who had both a passion for technology and close political links with the Socialist and right-wing parties.⁴⁷ Mussolini, who learned to fly in 1919, enthusiastically embraced the idea of technology as the path by which Italy could reach its destiny and, after the First World War, embedded a reverence for technology within his Fascist Party's manifesto. Like Nietzsche's 'superman', therefore, aviators became heroic figures; an aristocratic elite that would lead Italy back to greatness. Mussolini's vision echoed Douhet's own hero mythology of 'uncertain machines struggling in the wind, guided by steady hands, as if made of bronze, and hearts steadier than bronze. Man and his machine with one strong pulsation in one single heart; a single tangle of nerves and steel shrouds'. The narrative similarities, however, are perhaps unsurprisingly given Mussolini's and Douhet's mutual friendship and shared political beliefs.⁴⁸

Crucially, however, technology was not valued for its own sake but was inextricably linked with battle. This vision glorified militarism and patriotism, but most especially war, as the Futurist Manifesto made clear.

- 7. Beauty exists only in struggle.
There is no masterpiece that has
not an aggressive character.*

*Poetry must be a violent assault
on the forces of the unknown, to
force them to bow before man.*

8. ...
9. *We want to glorify war - the only
cure for the world - militarism,
patriotism, the destructive
gesture of the anarchists, the
beautiful ideas which kill, and
contempt for woman.*
10. ...
11. *We will sing of the great crowds
agitated by work, pleasure
and revolt; the multi-coloured
and polyphonic surf of
revolutions in modern capitals:
the nocturnal vibration of the
arsenals and the workshops
beneath their violent electric
moons: ... and the gliding flight
of aeroplanes whose propeller
sounds like the flapping of a
flag and the applause of
enthusiastic crowds.
It is in Italy that we are issuing
this manifesto of ruinous and
incendiary violence, by which
we today are founding Futurism,
because we want to deliver Italy
from its gangrene of professors,
archaeologists, tourist guides
and antiquaries.*⁴⁹

The enthusiastic embrace of Darwinian and Malthusian ideas, where war was not merely positive but generative, made Italy the perfect environment in which to combine air power and warfare. At a time that writers like H.G.Wells were writing fictional accounts of aerial warfare in his 1909 *War in the Air* (which was also the title of the official history of British Military aviation in World War One), and the Americans restricted aeroplanes to reconnaissance and

support duties, Douhet published *'The Problems of Air Navigation'*. Far from being a technical report on navigation, the paper provided a coherent military treatise for the conduct of aerial warfare.⁵⁰ Crucially, however, Douhet's military and scientific background was combined with a creative streak as an amateur novelist, poet, painter and playwright, hence he was able to indulge in flights of fancy without being constrained by the rigid technical or doctrinal orthodoxy of the day.⁵¹ His ability to harness emerging (if immature) technology with a vision of the future of warfare enabled him to see the need and argue for the mechanisation of the Italian Army in 1902, and recognise as early as 1910 that 'the skies are about to become a battlefield as important as the land or the sea'.⁵² According to Segrè, it was this ability to create a compelling vision of the future, which he likens to that of an 'Old Testament' prophet, that represents the Douhet's greatest contribution to air power rather than any claims that Douhet was an air power strategist in the Clausewitzian mould.⁵³

It did not take long to put Douhet's new ideas about aerial warfare into practice. When Italy declared war against the Ottoman Empire in Tripolitania, Fezzan and Cyrenaica in September 1911, it despatched a small force comprising aerostats, dirigibles and the First Aeroplane Flotilla, with nine machines, mainly monoplanes, and eleven pilots.⁵⁴ In October 1911, Italy became the first State to use aeroplanes, alongside airships, in reconnaissance and on 1 November it used its aeroplanes in direct combat tasks by attacking troops on the ground when Lieutenant Giulio

Gavotti bombed Turkish positions at Ain Zara and Tagiura.⁵⁵ By the end of the war, aircraft had also been used in psychological operations (leaflet dropping) and photographic reconnaissance tasks. The Official Report of the War noted that, whilst the bombing 'did no material damage', its 'moral effect' was significant and claimed the Italian pioneering experiment in air power's military potential as 'a treasure for the future'.⁵⁶ Keen to capitalise on air power's potential, the Italian Staff appointed Douhet to command the Aviation Battalion in Turin in 1912. Douhet enthusiastically pressed the case for aviation and wrote a new publication entitled *'Rules of the Use of the Aeroplane in War'*, but perhaps pressed his case too energetically and was removed from post at the end of 1914 for ordering aircraft from his friend Caproni without authority.⁵⁷

The enthusiasm for aeroplanes that inspired Douhet and the Futurists, however, was not universal and, just as in America, officialdom was sceptical. The Italians had been particularly pleased with the performance of their dirigibles in the Libyan War and Colonel Maurizio Moris, who had been Head of the Aviation Inspectorate in 1908 and had offered to buy aeroplanes from the Wright Brothers, still favoured the airship's proven technology. Even as late as 1914, 75% of Italian aviation funding was allocated to airships.⁵⁸ Despite this, the aeroplane's potential was recognised, and Italian expenditure on aeroplanes still dwarfed that of America; by 1914 Italy had four times more aircraft in its inventory than the US. Shortly after Italy joined the First World War in June 1915, Douhet advocated

air power as the most promising route to victory, criticising the Italian military and urging the creation of a 500 bomber aircraft armada to strike at the Central Powers. His criticisms, and somewhat cavalier approach to the chain of command, made him numerous enemies within the Italian military and, when he left some classified (and highly critical) documents on a train, he was sentenced by court-martial to one year's detention.

Douhet continued to lobby for an Allied air offensive from his cell, arguing that the priorities should be to win command of the air by bombing aerodromes and aircraft manufacturing before attacking the enemy's rear. His emphasis on the deep battle and the use of what is essentially counter-battery fires in his advocacy of attacks against enemy aerodromes to the rear of the battlespace hinted at his background as an Artillery Officer, which can be contrasted with the images of military aviation developed by supporting arms, such as the US Signal Corps. Douhet also urged the creation of an independent air force to control this new weapon in a memorandum of 3 July 1917 co-signed with d'Annunzio and Caproni.⁵⁹ The Italian Army's disastrous defeat at Caporetto - it suffered over 30,000 casualties and 265,000 captured - confirmed Douhet's critical predictions carelessly left on the train and, when he was released from detention shortly afterwards, Douhet was appointed as the Central Director of Aviation and the General Air Commissariat.⁶⁰

The Italian lead in applying air power

to warfare did not last long as other nations forged their own military aviation doctrine in the heat of the First World War's battles. By 1917 the American Bolling Aeronautical Commission visited Europe to learn from the Allied experience and recommended buying Italian biplanes after Major Edgar Gorrell visited Caproni's factory. Gorrell left Europe with more than aeroplanes, however, and was armed with Major Lord Tiverton's plans for strategic bombing that heavily influenced the development of early US air power thinking.⁶¹ With equipment from France, Britain and Italy, and help from European air power theorists, notably those of Italy and Britain, the US quickly developed its own doctrine through the Bolling Commission and innovative thinkers like 'Billy' Mitchell, so that by 1926 Douhet was citing American military air power approvingly in the second edition of his seminal text, *The Command of the Air*.⁶²

Conclusion

From the Wright Brothers first successful flight in December 1903, aviation's early development was dominated by the Americans, but the US was slow to imagine the aeroplane's military impact. In contrast, and with a very different geo-political situation, Italy rapidly embraced the aeroplane's potential and developed approaches for applying air power to war.

By the twentieth century, the US was a secure nation, free from external threats and following an isolationist policy that separated it from European influence. America was also a growing economic power that viewed its navy as the primary means

of protecting its security and trade interests. Italy on the other hand was a fragile state, threatened by powerful neighbours and constrained by geography. She was in decline and had lost her status as a great European power. Believing that Italy's destiny lay in industrialisation, the Futurist movement, with its influence on Italian fascism, captured the Italian *zeitgeist* in which war and technology were glorified. Italy's popular and political culture thus enabled innovation to flourish and the aeroplane, the pre-eminent symbol of modernity, synthesised the fascination for both technology and war. This combination ineluctably encouraged Italian thinkers to apply the new American technology to modern warfare so that, by 1911, Italy had become the first nation to use air power in combat and had grown, in Douhet, the first generation of air power visionaries and theorists. What, therefore, is clear from the early development of air power is that the effective exploitation of technology depended, and still depends on an imperative for action and a willingness to embrace both pragmatists and visionaries within the organisation: C.P. Snow's nexus of the two (scientific and intellectual/artistic) cultures.⁶³ In the US, therefore, the pragmatic scientific approach saw the aeroplane's limitations, whilst the Italian romantic approach (bolstered by a compelling geo-political situation) saw its potential. An air force or nation, therefore, that fails to make space for both scientific and artistic groups, and denies a place to dissenters who can challenge technological or doctrinal orthodoxy, prejudices its chances of maximising its operational relevance.

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Notes

¹ C. Builder. *The Icarus Syndrome. The Role of Air Power in the Evolution and Fate of the US Air Force* (Santa Monica CA: RAND/Transaction Publishers, 2003) at 41.

² The United States' Aeronautical Annals of the late nineteenth and early twentieth centuries were comprised largely of articles by

European writers, even though the Annual's heavier-than-air flying records were dominated by American aeronauts until Blériot's 1909 crossing of the English Channel - see J. Means ed. *Epitome of the Aeronautical Almanac* (Boston MA: W.B. Clarke Company, 1910).

³ J. Hudson. *Hostile Skies. A Combat History of the American Air Service in World War I* (Syracuse NY: Syracuse University Press, 1968) at 2-3.

⁴ M. Schene. 'Ballooning in the Second Seminole War', 55(4) *Florida Historical Society*, 1977 at 481.

⁵ 'Balloons in the American Civil War' at http://www.centennialofflight.gov/essay/Lighter_than_air/Civil_War_balloons/LTA5.htm (last accessed 25 January 2010).

⁶ The bitter dispute between the Wright Brothers and the Curtiss Aeroplane Company in the early twentieth century is, in many respects, reminiscent of the nineteenth century feud between Lowe and LaMountain during the Civil War.

⁷ 'Balloons in the American Civil War', *op.cit.*

⁸ J. Cooke. *The US Air Service in the Great War* (Westport CT: Praeger, 1996) at 5.

⁹ I. Holley. *Ideas and Weapons. Exploitation of the Aerial Weapon by the United States During World War One* (New Haven CT: Yale University Press, 1953) at 25.

¹⁰ Holley, *Ideas and Weapons* at 27.

¹¹ The Aviation Force was created as a purely administrative action within the Signal Corps. As an 'unofficial' body that could be disbanded without reference to the US government, the Aviation Force was poorly placed to obtain funding or defend itself against other Army units seeking support. See Holley, *Ideas and Weapons* at 27.

¹² J. Buckley. *Air Power in the Age of Total War* (London: Routledge, 1999) at 36.

¹³ C. Gross. 'George Owen Squier and the Origins of American Military Aviation', 54(3) *Journal of Military History* at 281-2.

¹⁴ R. Futrell. *Ideas, Concepts, Doctrines. Basic Thinking in the United States Air Force 1907-1960* (Maxwell AL: Air University Press, 1971) Vol. One, at 16.

¹⁵ Builder, *The Icarus Syndrome* at 43.

¹⁶ Futrell, *Ideas, Concepts, Doctrine* at 17.

¹⁷ Compared to France's 260 aircraft and 171 pilots, Great Britain's 29 aircraft/88 pilots and Italy's 26 aircraft/39 pilots. See Holley, *Ideas and Weapons* at 29. Between 1908 and 1913 it is estimated that the US spent \$435,000 compared to France's \$22 million – Gross, 'Origins of American Military Aviation' at 287.

¹⁸ *The Italo-Turkish War (1911-12). Translated and Compiled from the Report of the Italian General Staff by 1st Lt R Tittoni USMC.* (Kansas City, MO: Franklin Hudson, 1914). The Reports were actually translated in July 1913.

¹⁹ M. Maurer ed. *The US Air Service in World War One* (Washington DC: US Government Printing Office, 1978) Vol. II at 8-17.

²⁰ Maurer, *The US Air Service in World War One* at 1.

²¹ Quoted in Holley, *Ideas and Weapons* at 31.

²² Quoted in Cooke, *The US Air Service in the Great War 1917-1919* at 7.

²³ Maurer, *The US Air Service in World War One* at 1.

²⁴ Hudson, *Hostile Skies* at 4.

²⁵ Futrell, *Ideas, Concepts, Doctrine* at 19.

²⁶ Holley, *Ideas and Weapons* at 40.

²⁷ Builder, *The Icarus Syndrome* at 42.

²⁸ Futrell, *Ideas, Concepts, Doctrine* at 16.

²⁹ T. Ropp. *War in the Modern World* (Baltimore MD: John Hopkins Press,

2000) at 291.

³⁰ R. Kagan. *Paradise and Power. American and Europe in the New World Order* (London: Atlantic Books, 2003).

³¹ America was not a pacifist nation within its own borders and fought for almost 300 years against the native American population. The American-Indian Wars lasted until the Battle of Bear Valley (Southern Arizona) on 9 January 1918, in which E Troop of the US 10th Cavalry fought with a band of Indians from the Yaqui Tribe (see 'Buffalo Soldiers at Huachuca', 2 *Huachuca Illustrated* 1996 at <http://www.gwpda.org/comment/huachuca/HI2-05.htm>). During the intermittent wars, which included savage fighting on both sides, the American military developed a considerable expertise in counter-insurgency warfare, but, the notion of fighting 'small' wars (itself a politically-charged and derogatory term), did not find favour with the US Army, which favoured a classical European (Napoleonic) style of state on state warfare in which decisive battles could be fought and won (J. Nagl. *Learning to Eat Soup with a Knife* (Chicago: Chicago University Press, 2005) at 44-45). By being institutionally focused on inter-state warfare, the US Army was less well equipped to identify and deal with the nature of the conflict in Vietnam than the US Marine Corps who's vision encompassed its role as a 'colonial' army. See the ARPA Report. *Bureaucracy Does Its Thing: Institutional Constraints on US-GVN Performance in Vietnam.* R-967-ARPA. (Santa Monica, CA: RAND, 1972).

³² The 1817 Rush-Baghot Agreement secured the Great Lakes and the 1871 Washington Treaty demilitarised the US-Canadian land borders.

³³ J. Haslam (2002). *No Virtue Like*

Necessity. Realist Thought in International Relations since Machiavelli (New Haven CT: Yale University Press, 2002) at 172.

³⁴ T. Davis Biddle. *'Rhetoric and Reality in Air Warfare'*. (Oxford: Princeton University Press, 2002) at 49-50.

³⁵ This is perhaps typified by President Woodrow Wilson's plans for the League of Nations at the end of the First World War.

³⁶ Declaration IV, I signed at The Hague on 28 July 1899.

³⁷ N. Spykman. 'Geography and Foreign Policy II', XXXII *The American Political Science Review*, 1935 at 235.

³⁸ F. Hinsley. *Power and the Pursuit of Peace* (Cambridge: Cambridge University Press, 1967) at 263.

³⁹ R. Hamilton & H. Helwig eds. *The Origins of World War One* (Cambridge: Cambridge University Press, 2003) at 358.

⁴⁰ Spykman. 'Geography and Foreign Policy' at 224.

⁴¹ Buckley, *Air Power in the Age of Total War* at 37.

⁴² J. Stokesbury. *A Short History of Air power* (London: Robert Hale, 1986) at 21.

⁴³ F. Marinetti. *The Futurist Manifesto* (1909) at <http://www.cscs.umich.edu/~crshalizi/T4PM/futurist-manifesto.html> (last accessed 27 November 2009).

⁴⁴ A. Gat. *A History of Military Thought* (Oxford: Oxford University Press, 2001) at 563-566. The section 'Futurism, Proto-Fascist Italian Culture, and the Sources of Douhetism' provides an excellent overview of the political and artistic background to the development of early Italian air power thinking.

⁴⁵ S. Poleskie. 'Art and Flight', 18 *Leonardo*, 1985 at 72.

⁴⁶ M. Paris. 'The First Air Wars – North Africa and the Balkans 1911-

1913', 26(1) *Journal of Contemporary History* 1991 at 100.

⁴⁷ However, it should be noted that limited opposition to Marinetti's vision existed amongst the section of the population that remained deeply conservative (and Catholic) and who were either unsure of, or aghast at, the extremely anti-traditional (and militantly atheistic) stance of the Futurists.

⁴⁸ Gat, *A History of Military Thought* at 575.

⁴⁹ Online. Marinetti, *Fascist Manifesto*.

⁵⁰ Gat, *A History of Military Thought* at 573.

⁵¹ Gat, *A History of Military Thought* at 571.

⁵² Quoted in P. Meilinger ed. *The Paths of Heaven. The Evolution of Air power Theory* (Maxwell AL: Air University Press, 1998) at 2.

⁵³ C. Segrè. 'Giulio Douhet: Strategist, Theorist, Prophet?', 15(3) *Journal of Strategic Studies*, 1992 at 360.

⁵⁴ Paris, 'The First Air Wars', at 98.

⁵⁵ A Harvey. 'Bombing and the Air War on the Italian Front, 1915-1918', 47(3) *Air Power History*, 2000 at 36.

⁵⁶ *The Italo-Turkish War (1911-12)* at 100 & 135. British War Office estimates placed the number of Turkish casualties from airship attacks as 26 killed and 70 wounded between March and June 1912 – see *Notes on Employment of Military Dirigibles in the Libyan War*, March 1914, Air 1/576/625, PRO cited in Paris, 'The First Air Wars' at 100.

⁵⁷ Gat, *A History of Military Thought* at 574.

⁵⁸ Meilinger, *The Paths of Heaven* at 2. Airships continued to play a part in Italian aviation, including postal services, into the 1930s, but a spate of airship tragedies, such as those of the *Hindenburg*, R101 and Airship

Italia, and the aeroplanes' maturing technology relegated their importance over time.

⁵⁹ Gat, *A History of Military Thought* at 579. At the same time, General Smuts was preparing his report for the British Government on 'Air Organisation and the Direction of Aerial Operations' that called for the creation of an independent air arm in Britain. Smuts' Report was published on 17 August 1917.

⁶⁰ Meilinger, *The Paths of Heaven* at 6.

⁶¹ Davis Biddle, *Rhetoric and Reality in Air Warfare*, at 54.

⁶² G. Douhet. *The Command of the Air*. trans. D. Ferrari (London: Faber and Faber, 1927) at 25.

⁶³ C.P. Snow. *The Two Cultures and the Scientific Revolution. The Rede Lectures*. (Cambridge: Cambridge University Press, 1959).

The Impact of the Changing Strategic Environment on the Delivery of Air Power

By Wing Commander Stuart Hatzel

Emboldened by the apparent war winning use of air power throughout 1990's conflicts, the US believed its hegemonic status granted it the power to transform warfare, utilising vastly superior military technology. Poorly equipped non-State actors of the newly recognised global village begged to differ. This paper examines factors which influence the strategic environment, in order to determine how air power must evolve in order to ensure continued utility; not just in terms of physical effect but also the need to win the information battle. It examines the maturity of air power doctrine as an independent military arm. The paper concludes that air power is not yet fully mature but with careful communication of the political aim and public perception of proportionate use of modern weapon and surveillance systems it can be decisive in all types of conflict.

Introduction

*'It used to be the custom to settle strategy in the capital, and not in the field – a practice that is acceptable only if the government stays so close to the army as to function as general headquarters.'*¹

This paper defines the strategic environment in which the military, and in particular deliverers of air power, play a role. It examines the changing nature of the strategic environment and discusses the probable catalysts of such change; particularly, strategic culture, globalisation, military transformation, the transformation of war and the profound effect of the irregular adversary. The examination will aim to isolate the chief driver in recent times, and the challenge this poses to the delivery of air power. Having examined the historical aspects of change, the paper goes on to consider whether we can validly expect recent changes to the environment to be constant sufficiently far into the future for us to plan our recruitment, training and equipment procurement programmes as a regular military force or whether we need to make urgent changes to our structure and methods to ensure maximum flexibility and agility against all possible adversaries. The role played by air power through an evolution of less than 100 years is scrutinized in order to question if it is still sufficiently young that it simply has not been exposed to all manner of warfare as a technologically advanced military arm, to be capable of reliably achieving the political aim.

The clear answer to this must be that it is still an immature arm which has yet to develop fully the doctrine required unfettered by

land-centric history and strategy. Such an approach allows us to understand the best use of air power in various situations; particularly, those that sit below general war and employ such doctrine as part of a comprehensive approach to operations. The paper explores the perceived imbalance between what proponents of air power believe it can achieve in terms of strategic effect and what is considered right and proper by liberal democratic nations when fighting lesser equipped adversaries. An analysis will thus be made of the dynamic of war's paradoxical trinity; violence, probability and subordination to policy, that Clausewitz spoke of² and whether this has value for purveyors of air power in the modern military operating environment. While the precise location of space as part of air power is a subject for debate, recent analysis suggests that "one cannot build space power theory and doctrine in general upon air power theory and doctrine."³ Whilst the air component will undoubtedly assist development of space power doctrine, as land and maritime doctrine helped air in its early days, space power requires fundamental, distinct doctrine, being as different from air as air was from land and maritime. Therefore, for the purposes of this paper, a line is drawn between them, analysis limited to the changing strategic environment to the delivery of air power alone.

What is the strategic environment and how does it change?

There are many accepted definitions of the terms strategy and environment, and it is therefore, useful to define exactly what it

is that we are referring to in this analysis. Clausewitz's view of strategy is 'use of the engagement for the purpose of war'.⁴ An 'active' environment, as this must be if we are to conduct strategic aims within it, is 'the surroundings, conditions and circumstances as affected by human activity'.⁵ Therefore, the strategic environment could be 'the surroundings, conditions and circumstances that influence or affect the military engagement'. However, given inter-relationships in the international system it must also be recognized that security goals are shaped by a complex combination of geo-strategic factors, which include geo-spatial, resource, social, political, science and technology, in addition to military aspects.⁶ Furthermore, there is constant security environment horizon-scanning taking place within the MOD with the aim of identifying possible future strategic shocks to the system of international collaboration and collective security of which the UK is a part.⁷ From this it is clear that that there are many more facets to the strategic environment than purely military and, therefore, for this paper, the working definition is 'a composite of the conditions, circumstances and influences that describe the geo-strategic situation, which affect the employment of military forces and the decisions of the chain of command.

It is acknowledged that the strategic environment changes over time, owing to uneven rates of growth and variations in technology, demography and resources.⁸ Moreover, it can be postulated that in an era of globalisation the balance of power can also be affected by non-state actors including international organisations, multi-national

corporations, non-governmental organisations, religious institutions, and politically motivated terrorist groups; all of whom are able to affect one or more decisive levers in the strategic environment. Following the cessation of the Cold War the global strategic environment has become complex, uncertain and unpredictable.⁹

By the end of the 20th Century, the British government claimed that Britons were 'an internationalist people', and from this postulated that Britain's role in the world should be as a 'force for good'.¹⁰ While this was undoubtedly intended as an altruistic statement of foreign policy, it could be seen as a direct threat by other actors and thus, risked a reaction which, ironically, endangered national security and international order more generally.¹¹ Britain fought as part of a broad UN coalition under United Nations Security Council Resolution (UNSCR) 678, removing Iraq from Kuwait in 1991, and maintained the Iraqi no-fly zones using the justification of UNSCR 688. However, from other perspectives it is estimated that since 1991, anywhere from 80 to 210 million people [globally] had lost their hopes, their property, and their lives. Such political alienation, reinforced by economic and social deprivation, tended to direct this 'underclass' toward conflict and despair terrorism.

This disillusionment and resort to violence and terrorist strategies showed in Afghanistan, Sierra Leone, and Rwanda, USS Cole, Khobar Towers, the Pentagon, and the World Trade Center.¹² In essence, whilst the state actors in the international system were seemingly predictable

and ‘under control’; it was the sub-state actors that mobilised to influence the strategic environment.

Is strategic culture the main influence on the strategic environment?

Given the virtual hegemonic status of the USA since the decline of the USSR, it could be said that the United States is also the major controlling influence within the strategic environment. It is able to wield power through the international system and bring pressure to bear, as it sees fit. Snyder theorised that ‘strategic culture’ was, in essence, ‘the sum of ideas, conditioned emotional responses, and patterns of habitual behaviour that members of a strategic community share.’¹³ If we accept the theory that ‘defence related decision making is not an abstract construct based purely in the present moment, but is steeped in the beliefs, biases, traditions and cultural identity of the individual country; feeding its strategic culture’¹⁴ and that this culture is generated through crisis periods overlaid on past experience, we might speculate that the strategic environment is primarily influenced by the strategic culture of the most powerful actors in the system; in this case the hegemonic power.¹⁵ It would appear that the former US Secretary of Defense, Donald Rumsfeld, adhered to this viewpoint if his association between military power and politics, and its manifestation at the grand strategic level is considered. The US administration demonstrated a capacity not only to co-opt support for military intervention, but also to shape the context in which force could legitimately be used.¹⁶

Admiral Cebrowski, Rumsfeld’s chosen architect of change, wanted

to transform US military power in order to transform warfare and promoted network centric capability as key to this.¹⁷ There appeared to be a belief that overwhelming superiority in cutting edge technology and network-centric warfare would transform the strategic environment, making the US military supreme in terms of technology, efficiency and intelligently precise firepower, in order to deter any challenge. Ensuing operations proved the assertion that there is a great difference between military transformation and the transformation of war.¹⁸ While Rumsfeld believed he was transforming the future nature of war, it is now clear he was merely transforming the US military. In essence, a hegemonic nation’s strategic culture does not shape the strategic environment in the manner it would like. An intelligent enemy, particularly a non-state actor with global reach, is able to analyse a nation’s strategic culture and formulate its tactics to exploit the weakness it finds and in so doing, shapes the strategic environment relevant to its political and military aims. In this case, the U.S. Military’s apparent inability to deal with guerrilla or terrorist tactics led to an increase in the use of those tactics. There is a limit to how much ‘smart weapons’ can achieve against a shadowy foe.¹⁹ As the United States learned in Iraq, defeating insurgents requires an effective counter-insurgency force that also engages in nation building. Yet it is precisely those areas in which the US remained weakest under Rumsfeld.²⁰ Moreover, in the modern strategic environment it is incredibly difficult to efficiently configure military

components to better an adversary that has an unknown or unidentifiable strategic culture.

How has globalisation affected the strategic environment?

It is clear that the major difference between the strategic environment of 1991 and today is the increasing complexity of the international system. Whilst globalisation can be defined in many ways, possibly the most pertinent to this paper is 'the intensification of worldwide social relations which link distant localities in such a way that local happenings are shaped by events occurring many miles away.'²¹ Although non-military, it accurately reflects the importance of the information operation in modern conflict. While we find ourselves in a new environment that involves the economic integration of free markets, technologies, and countries, it is also an environment of fragile peace and disarray caused by those who destabilise nation-states and frequently, espouse an ethos that rejects modernity, yet derive much of their power from the global information highway.²² It is this ability that empowers terrorist networks and connects them with the empathetic ear of a distant supporter or soon-to-be-supporter, in accord with the chosen definition. The preparations for the September 11 terrorist attacks in 2001 spanned several continents, and so did the effects: the World Bank estimated the reduction of global GDP at almost 1%.²³

Military operations since 9/11 have also seen the rise of pre-emptive action, in which air power has played a central role, as a desperate response to the perceived asymmetric threat.²⁴ A prime example of this usage

followed from the human intelligence led US targeting of Saddam Hussein and his sons.

On 19 March 2003, American agents believed they had located Saddam, but it was swiftly realised that an attack with cruise missiles would be ineffective against the bunker Saddam was believed to be using. Instead, US Air Force F-117s, armed with 2,000lb EGBU-27 bombs capable of penetrating the bunker, were re-routed to carry out the attack.²⁵ In a pre-globalised age it would have been impossible to transmit real time intelligence between CIA informants and their handlers in Iraq, hundreds of miles apart, to Washington DC and then to Operational Commanders in theatre to enable a high tempo attack of this type.

Nye and Owens clearly assumed that it was this technological advantage which would see the USA hold the upper hand in any future conflict.²⁶ However, pre-emption is ultimately a means, not an end, and a doctrine of this sort which suits the US could be equally attractive to countries and non-state actors with different motives. In an era where winning the global information war may matter more than winning the battle, it becomes apparent that those who would adopt pre-emption need to be clear about the limits of such doctrine and their aims.²⁷ Lessons learned show that pre-emption would actually require better intelligence and co-operation with other intelligence services to be effective, either in the information campaign or the battle.²⁸ Thus, whilst the past decade has demonstrated the military's capability to turn intelligence into targeting action at a previously

unseen speed, utilising the modern global communications environment; the same medium is frequently used to disproportionate effect by the irregular enemy, not only in the battle winning ways of 9/11 but also in winning the information campaign.²⁹

Can we foresee the future or are we destined to assume the recent path will continue?

Where the enemy is a non-state actor or a (technologically) poor state that cannot match the military power of his adversary, he will be forced to rapidly adapt to effectively fight. The enemy's readiness and ability to adapt could be an impediment to us correctly forecasting the equipment and training requirement for his chosen style of warfare. With a procurement cycle measured in decades and an opponent that has the ability to quickly transform, it seems clear that the regular force is unlikely to be correctly equipped to fight. An array of programmes, often involving the most sophisticated military platforms (the F-22 and Typhoon, or the US Army's RAH-66 Comanche helicopter taking the air environment as just one example) seem to be subject to delays which mean that they enter service in circumstances rather different from those under which the project began. This can be held to illustrate the potential folly of embarking upon lengthy programmes which may succumb to the vagaries of change in the nature of future warfare.

However, if military strategists are correct, we know a great deal *for certain* about future warfare. What changes about war is overmatched by the eternal features of war's nature.³⁰ The RAF, for example, maintains a

stance that is capable of high end warfighting and therefore, lesser equipped adversaries will be forced to adopt an indirect or irregular way. The underlying premise of this type of assault is that the outcome will be determined by the relative ability of the attacker and the target to win the support of the people or global society in their respective favour.³¹ In fact, the inability of the opponent to match the military capability held by the UK makes the future easier to forecast, only leaving the question of whether to specifically equip as well as train to fight irregularly, or accept that by equipping as it has, the enemy is predictable. Key to this decision is analysis of the air component's performance against the enemy, equipped and trained as it is, supplemented by urgent operational requirements.

If viewed through the 'air power lens', two opposing viewpoints become apparent. One would point to the purchase of originally leased C17 aircraft, and the increase in fleet size, as an example of not correctly equipping for the fight the UK is in. However, the core programme would actually have seen A400M entering service had Airbus met the stipulated requirement³² which would have negated the requirement to purchase C17. Moreover, the present procured forces have been adequate to succeed in the modern strategic environment without failure, with the possible exception of ISTAR and persistent armed reconnaissance. Here, a minimal UOR purchase of 3 MQ-9 Reapers filled the perceived gap.³³ In short, there are issues with the procurement process, but the policy of continuing legacy Cold War programmes has seen the RAF

succeed in irregular operations, with minimal UOR gap-filling. Vitally, there is significantly less danger to the integrity of the state, maintaining a policy of equipping for high end warfare than might be posed if it equipped purely for asymmetric warfare, thereby becoming incapable of fighting inter-state war.

What role has airpower historically played in the strategic environment?

During the Great War air power was utilised in a support role for the two senior arms and the roles of close air support, transport, reconnaissance, communications, interdiction, artillery spotting, re-supply, rescue and special forces insertion, anti-submarine warfare, convoy escort, search and rescue, maritime attack and minefield survey missions, albeit in a primitive form, contributed to the campaign.³⁴ Only a minority of people had experienced military aviation, but it fired the imagination of the masses. With this rapid build-up of essential war winning roles, expectation for power from the air built and there was much debate over what it could achieve as it gained maturity.³⁵ After the Great War theorists such as Douhet, and others that had experienced the horror of trench warfare, expounded theories of strategic bombing of enemy centres of civilian population, with the aim of causing mass hysteria and public influence on the enemy government, forcing surrender.³⁶ The result of this was a rapid build up and development of aircraft between the wars, by those countries with military ambition, to ensure that when battle commenced they had a war winning capability. The RAF's experience of colonial air-policing, whilst leaving

it less than ideally trained, at least gave some operational pedigree that was an important baseline from which to start the fight.³⁷ Germany's most used lever of power in the inter-war strategic environment was military, and airpower as the cutting edge of technology, was used to its fullest effect, with the introduction of primitive ballistic missiles (V1 and V2), in addition to manned aircraft.³⁸ During the Cold War, the strategic role of air power was subject to periods of 'long operational stagnation', especially after the strategic nuclear deterrent role passed to the RN, but in every other respect air power was extremely busy.

Is air power still sufficiently immature that it is being shaped by events, finding its feet outside major conflict and writing a new doctrinal chapter?

Given the excitement generated by projection of power from the air in the immediate aftermath of the Great War, politicians and the civilian population almost certainly favoured strategic effect generated in this manner. It appears to carry less risk to friendly forces and thus, typically enjoys low casualty rates as demonstrated by the Gulf War's of 1991 and 2003, yet appears to promise decisive victory. Yet, critics categorically state that air power has failed to deliver true strategic effect on every occasion attempted; whether in World War 2, Vietnam, Kosovo, or the Gulf Conflicts. On each occasion, there was a requirement for 'boots on the ground' to achieve the political aim. As Gray comments,

"the ghosts of Trenchard et al will have approved of Hallion's judgment that air power execution caught up with air power

theory, as evidenced by the conduct and results of the 1991 Gulf war, and yet the point, is that classical air power theory often, though not invariably, postulated the wrong requirement of the air weapon—that it be capable of winning wars on its own.”⁴⁰

Moreover, these critics of air power would point to the immensely dynamic period of air role expansion during the Great War and question what new roles have been found? To some degree this is fair and despite popular perception, the RAF no longer advocates air power as a feasible independent war winner, but always as a part of a joint campaign – and has done so for some time.⁴¹ However, whilst the list of air power roles does not grow at the same rate it once did there are 2 key elements that must be considered before judging air power in the modern strategic environment.

The first is that until 1956 the RAF was commanded by men that had started their careers as RN or Army officers whose staff were also ‘in-comers’. Therefore, there is a strong possibility that developing air power doctrine came from a skewed air-surface influence. One factor that could be particularly relevant was that whilst these great leaders believed in air power, they had no real reason to measure effect in a different way from the Land or Maritime components. Under this construct, ‘winning’ means decisive victory and control of the surface, a ‘neat’ end to conflict which is most unlikely to be encountered in many of the complex conflict environments likely to be encountered in the 21st Century. If this is pertinent and had stifled truly independent development

of air doctrine, then development should have become apparent after 1956. However, by then the strategic environment was dictated by the Cold War and inflexible doctrine, for all 3 components, was the order of the day. Thus, it was not until 1990 that the RAF was able to begin a truly independent doctrinal journey.

The second related element is that only in the past three decades has technology appeared to catch up with the ‘blue-sky thinking’ of early theorists and technical boundaries now seem limitless. All-weather day/night precision-guided weapons accurate to within a metre, the ability to penetrate hardened bunkers or limit effect to one area of a building, delivery from manned or unmanned platforms, stealthy armed reconnaissance over a target for 10 hours or more; all of these capabilities are what Douhet *et al* envisaged for the strategic application of air power, yet were impossible without today’s technology. It seems reasonable, therefore, to theorise that development of independent air power doctrine is actually in its infancy. Thanks to a series of conflicts in the intervening period, exploration of its strategic effect in battle and how its use affects the wider strategic environment has again accelerated.

Is there an imbalance between what air power can achieve and the perceptions and will of the public, other military components, and the international community?

Air power clearly delivers devastating effect if unleashed on the enemy as on the Basra highway in 1991 and in Gaza in Jan 2009, but public perception is of heavy handedness when such power is let loose against

an ill-equipped adversary.⁴² First raised by Thucydides, social divisions represent a potential barrier to military effectiveness, especially in longer wars and this is especially true for societies with ethnic or religious divisions.⁴³ In the modern strategic environment, using the UK as an example of a multi-cultural society, with some unrest and division between cultures,⁴⁴ a widening gap between the civil and military classes,⁴⁵ and engaged in unpopular wars of political choice, we find 3 military forces engaged in an internecine battle for relevance in an age where there is a limited defence budget available and every military system is increasingly expensive.⁴⁶ It is no longer a case of winning the information war alongside the battle, but also winning the 'argument' with the other military components, gaining the support of politicians and public, if air power is to continue its doctrinal quest for strategic effect. The problem faced by those to be convinced is that whilst land forces are probably seen as more equitable when fighting ill-equipped adversaries, and the UK Land component clearly enjoys this perception (winning relevance and an upper hand in the 'domestic' information war) there can be little doubt that Land is less efficient at containing an enemy and also more costly in human terms.⁴⁷ The air component must therefore, become better at applying elements of its developing doctrine in the irregular fight, in order not to be seen as 'a sledgehammer cracking a walnut'. This would clearly ease the task in winning support at home and abroad, but will not be easy whilst we procure systems such as MQ-9

Reaper that allow RAF operators to enjoy complete personal safety whilst directly engaged in killing the enemy through the high tech mediums of space coupled to unmanned air systems which provide persistent intelligence feeds and armament.

Can air power ever play its full role in expected future operations, or is it too expensive and distasteful to use fully in asymmetric warfare?

The air component has played a controversial role in the use of pre-emptive action during the war against terror.⁴⁸ A glaring example must be the Israeli use of air power in Gaza in January 2009. Recognition that winning the information war was key to being militarily effective, led to a 'lockdown' of the media. This was not an attempt to win the information war but to limit the Palestinian ability to win popular support in the international community; which arguably failed with the length of conflict and the global capability of modern communications.⁴⁹ Disproportionate uses of air power do not assist its future development and moral damage is not limited to the offending user. If the dilemma of whether it is fair to fight a lesser adversary with all conventional means at our disposal is not solved, it is unlikely that air power's full utility will be unlocked in the complete range of warfare. Moreover, if air power users get this wrong, they will empower another generation of extremists to find new ways to fight.⁵⁰ If a new way can be found, air can conceivably achieve the strategic effect early theorists believed existed.⁵¹ However, the nature of air's strategic effect is likely to be different, at least in the immediate

future, than Douhet et al envisaged. They envisaged such effect to be as Land promises, decisive victory and direct imposition of your will on the enemy population.⁵² To clarify, strategic effect must be to 'achieve the effect your strategy intends' and if the containment of Iraq is taken as an example, through the imposition of UN sanctions and the utilisation of coalition air power, strategic effect was achieved between 1991 and 2002.

First, there was widespread international support, publicly and politically, for the removal of Iraqi forces from Kuwait. There was insufficient political will to extend the UN mandate to force regime change in Iraq.⁵³ In the immediate aftermath of the first Gulf War but Saddam Hussein remained a 'bona-fide villain' in the international system, with his brutal put downs of Shia and Kurdish uprisings as evidence of his evil nature. Politically, there remained worry about Saddam Hussein and his regime but there was also recognition that he counterbalanced an Iranian threat; in essence a steady triangle of regional power was shared between Saudi Arabia, Iraq and Iran.⁵⁴ This balance was important and Saddam's behaviour to his own population provided the way for this un-stated political aim to be acceptable. Thus, air power was used to deliver a decisive 'steady-state' in the Gulf utilising no-fly zones and limited bombing campaigns which allowed the Iraqi civilian population to go about its business without foreign intrusion. At the end of 2002 Iraq was stable, presented no threat to its neighbours with a vastly weakened military and no remaining WMD, there had been no friendly loss of life and minimal enemy loss of life; all

at a cost of £80 million per year⁵⁵ for the UK. In essence, aerial coercion had been successfully used in a non-war situation at no cost to our forces and relatively low cost to the Treasury. It was successful on all levels, as external to military effect, the international community and most importantly, the UK public understood (or thought they did) why air was being used and it was seen as proportionate despite Iraq's lack of credible opposition. By contrast, the use of air power for strategic effect will have to be explained more carefully to the public in the future, than it has been since 2003.⁵⁶

Conclusion

In a strategic environment as complex as that delivered by the post-Cold War globalised world, sub-state actors are no longer constrained by a bi-polar world order that threatens nuclear cataclysm as an escalation of local conflict and enjoy the technical benefits of globalisation, drawing supporters to their cause from the global village. An intelligent non-state actor empowered by global reach, is able to analyse a nation's strategic culture and formulate the requisite tactics to exploit the weakness it finds. Recently, this has had an even greater effect on the strategic environment than that wielded by the sole remaining superpower. Furthermore, it is a difficult task efficiently configuring military forces to better an adversary that has an unidentifiable or non-existent strategic culture. Pre-emption, often using air power, was an early response in the war against terror but has frequently been seen by the international community as indiscriminate and heavy-handed

and gifted victory in the information war to opponents. Looking to the future, if the public accepts the requirement to conduct counter-terrorist operations as far from their homes as possible; this paper has put forward that it is preferable for the air component to have an enemy that is more regular than irregular. As such, it could be argued that it might have been better to contain Al Qaeda within Afghanistan than force them to disperse. This would have allowed the use of airpower to strike as required over a long period, as it did over the Iraqi no-fly zones. In this way it would have worked to the RAF's strength and exposed Al Qaeda's weakness. On a 'regular to regular' basis, it would probably have been seen as a proportionate use of air power, and would have utilised assets held in numbers - fast jet and 'legacy' ISTAR - rather than having to rely on capabilities less robust in terms of numbers, such as support helicopters and air transport.

Technology is starting to address some of the weaknesses historically levelled against airpower such as lack of persistence and failure to achieve strategic effect. Importantly, air power users must educate politicians, the public and even the other Services regarding use of the air component, how to employ it and ultimately, how success should be measured when it is used as your primary lever of coercion. Possibly, the UK left Iraq in 2009 with the region less stable and more vulnerable than it was to 'undue influence' between 1991 and 2003. If so, it can only be hoped that in the lessons learned from Operation TELIC, the Chiefs of Service, PJHQ and DCDC contrast the stability delivered by coalition air power

between 1991 and 2002 and analyse the delta between the two.

This paper, therefore, proposes that in the changing strategic environment, air should finally put aside all thoughts of seeking decisive victory and recognise that such language and approach outside major war is unhelpful and unrealistic, at least in the traditionally-assumed sense of what 'decisive victory' looks like. Air power has still not fully matured and is learning how to apply itself in asymmetric warfare, which it has previously seen but not since its infancy. Equipped with new technology, air power practitioners must learn to finesse their options according to the situation and communicate what effect is being achieved, and how. It is, though, probable that air power better suits stabilisation through containment, which can in itself be 'decisive' when measured against the desired end-state; using Iraq as an example, air forces maintained the will of the international community, without the complications caused by the antagonistic presence of land forces and their associated political liability, while achieving the (un-stated) aim of safeguarding the regional power balance. It is perhaps fitting to conclude with the cautionary words of Professor Michael Clarke – in which he sees the prospect of air power at the forefront of thinking about war, but with the associated hazards of the nature of conflict being an ever-present complication:

'If airpower captures the public imagination of war in the 21st Century to the degree that it captured it in the 20th Century, airmen and airwomen will find themselves again at the forefront

of the image. That may not be such a comfortable prospect when there is so much still unclear about the nature of conflict in our new century.⁵⁷

Notes

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⁵ Concise Oxford Dictionary 9th Ed, 452.

⁶ JDP 0-01, *British Defence Doctrine 3rd Ed* (DCDC, 2008), 1-2.

⁷ *ibid.*

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¹¹ C. Gray, *Another Bloody Century* (London: Phoenix 2006), 34.

¹² M. G. Manwaring, *The Inescapable Global Security Arena* (US Strategic Studies Institute: 2002), 3.

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The Maritime Perspective of Air Power

By Commander Nick Walker RN

Cdr Walker's article, *The Maritime Perspective of Air Power*, takes a conceptual look at air power and brings out the naval view of its use, utility and management. From the very earliest days of powered flight, air power as a capability has been incorporated and blended into maritime operations and this deep sense of integration shapes the maritime perspective of air power to this day. The air is a vital dimension of the maritime environment which helps explain the integral nature of the employment of air power in maritime solutions. The article develops several themes and uncovers the differences in approach that set maritime aviation apart from land-based air operations. Aspects such as support, logistics, technology, mobility, flexibility and air and sea-mindedness are investigated together with exposing the controversial issues of command, control and ownership. Aimed to promote debate, the article offers an alternative perspective of air power that is complementary to, but subtly different from, the views others involved in its execution might hold.

*'The air's ubiquity is such that its importance cannot be in doubt. It is the concept of air power whose relevance we must question.'*¹

In maintaining a broadly balanced set of armed forces, able to operate in the land, maritime and air environments, the UK retains a number of options for the use of military force. Each has advantages and disadvantages which can be applied across the spectrum of military action and they are, quite understandably, viewed differently by those practitioners involved. The use of air power and its relationship to maritime power is an area which has stimulated debate for much of the last 100 years. These debates have exposed a number of areas in which the view of air power is different according to whether you observe it as a concept from a maritime background or an air-dominated education. It is these subtleties in perception when considering air power from the maritime world that the article will attempt to elucidate. This article does not seek to re-examine the entirety of air power as a concept, but it will investigate it as a maritime concept, what air power means, how it is employed and how it relates to maritime power. The major conclusion is that air power is an integral and vital part of maritime power and, from a maritime viewpoint, the two cannot be separated. The management of the integration then becomes an important issue, but what the article makes clear is that there needs to be a maritime lead to gain best utility of air power in the maritime environment.

It would be far too easy to use the article as a vehicle for a RN versus

RAF think-piece, but this approach would be naively simplistic. Much more valuable, and ultimately more enlightening, is to remain at the conceptual level, allied to occasional strategic thinking and backing argument with operational example. Having looked at what air power actually is, where it operates and how it developed in the maritime environment, the essay will give a naval perspective of air power, which at times will be necessarily and rightly 'dark blue' in focus, and may challenge some 'light blue' thinking. This is done not to be purposely antagonistic, but rather to reveal the maritime approach to air power and to promote discussion and counter-argument.

*"Strange as it may seem, the Air Force, except in the air, is the least mobile of all the services. A squadron can reach its destination in a few hours, but its establishments, depots, fuel, spare parts, and workshops take many weeks, and even months, to develop."*²

Churchill's quote from the 1940s may be controversial but it is one which illustrates, directly and indirectly, some of the central themes upon which this article is founded. It is clear that mobility, for example, is at the centre of Churchill's thinking, and indeed is still at the fore of contemporary discussion on the expeditionary nature of the UK's armed forces³ and the deployment options that decision makers, be they military or political, have at their disposal. But mobility is more than just physically 'moving about' and includes preparations, supporting infrastructures and indeed the distinction Churchill recognised well, namely mobility of an air platform in

the air ranged against mobility of the air assets as an entity. The support aspect will feature prominently, the discussion centring on the premise that maritime forces *maintain* support availability at all times rather than *initiate* support infrastructure at a moment of need. Of course, maritime logistics has constraints, too, and these will be exposed. Other themes that will be developed include the characteristic of impermanence, one of the limitations of air power acknowledged in AP 3000.⁴ This characteristic leads to a maritime perspective in which air power is part of, and integral to, an overall solution, but not the solution in its own right. A justification for air power without recourse to other forms of power is hard to reconcile in naval doctrine. Technology is a key aspect of air power, particularly in the Unmanned Air Systems (UAS) and Space domains, and its effect on operations in the maritime environment will be examined.

Implicit within this is that 'Air Power' exists, but that its eventual effect is not necessarily shaped by its origin. A related theme, and one which has received significant debate elsewhere, is the 'seam' between the maritime and the air environments. This article will espouse the view that the maritime / air seam is not the natural boundary, as it implies two separate bodies being managed where they are forced to meet, with the attendant issues of environmental tension. The article will argue that a better solution to managing a seam is to integrate the air and maritime from the outset such that any seam dissolves to nothing more than a delineation between capabilities provided from the same

environment. This has long been the view of many maritime commanders – that air power delivered at and from the sea should not be the preserve of an independent body of aviators under separate control, but has greater utility when conducted by those who are inculcated into maritime thinking and are able to bridge the maritime / air seam inherently rather than through compromise. Maritime experience is the critical path.

In discussing air power as a concept, the current definition given in AP 3000 is appropriate: *'The ability to project power from the air and space to influence the behaviour of people or the course of events.'*⁵ The definition does not detail from where the air power originates or how it comes to be in the air environment. Air power cannot inhabit the air environment permanently. Whilst developments in UAS are increasing presence times dramatically, they still require a land or maritime base from which to operate and although satellites create a permanence, they are not able to be used to project power as yet. Air power must therefore originate in either the land or the maritime, and this helps explain the maritime perspective of power projected from the air. In essence, the maritime view is that air power cannot be segregated from maritime operations or the projection of maritime power any more than, say, missiles may be; air power is one component of maritime power and is considered integral to it. The converse, the view that air power is intricately linked with the maritime, is not in the minds of many air power proponents; AP 3000 makes scant reference to the operation of aircraft or air platforms from ships.

Through a study of history the present may be better contextualised and this is true of the maritime perspective of air power, which has its origins in the very earliest years of both lighter-than-air and heavier-than-air flight. Navies were quick to realise the benefits of using the air dimension to extend visual range.⁶ The events are well documented in many books with far greater insight and academic analysis than can be presented here,⁷ but an insight into the genesis of the maritime view of air power is useful as it helps explain the deep sense of integration with air power that pervades and shapes maritime thinking to the present day. As the United States Air Force School of Advanced Airpower Studies declares in its motto, *'From the past, the future.'*⁸

During the First World War, as pioneers of aviation were pushing boundaries in every respect, so the ability to use the air environment was brought into naval doctrine. Initially offering a simple spotter service, the use of air power expanded the naval horizon and gave valuable information on enemy position and disposition. This developed into the ability to deliver ordnance from the air, following the lead of the use of air in support of land campaigns towards the end of WWI. History illustrates the crucial point; air power was not conceived as a concept in its own right. Air power was an extension of maritime or land power by another means, enabled by the technology which allowed man to take to the air. The initial conceptual work did not foresee the air environment as being necessarily distinct from maritime or land, rather air power was a means through which land or maritime forces could project their power in a

different way, assisted by advancing technology. This has had a profound effect on the maritime perspective of air power ever since, in that it has shaped a fundamental principle that air power is one part of the maritime environment, and should never be separated from it. *'Air power is integral to maritime power.'*⁹

Then as now, the use of the air environment was the cause of debate. The second Smuts report, in Aug 1917, concluded that an *'...air fleet can conduct extensive operations far from, and independent of, both armies and navies.'*¹⁰ Passionate dissent followed, notably from the senior officers of both the Army and the Navy, probably because this concept of air independence had never been practiced. Air power had developed as means of projecting power in support of land and maritime aims. One of the reasons for suggesting air force independence, that air power had strategic effect, was not in doubt, but removing this effect from the two environments which were the users and beneficiaries of the effect was strongly opposed. By 1918, the maritime perspective called for embracing the air environment as a dimensional expansion of the seaborne environment. It did not countenance a separated force for delivering the air effect. Perhaps surprisingly, considering what it was ceding,¹¹ the Navy agreed to the formation of the Royal Air Force, amalgamating the Royal Flying Corps and the Royal Naval Air Service, on 1 April 1918.¹² Control of all matters aviation passed away from the navy and the army. The arguments between air and maritime began in earnest¹³ and have continued, on and off, to the present.

As Dr. Jeremy Stocker notes in a previous article in *The Air Power Review*, *'The addition of a third dimension or environment to warfare, at the same time separate from, yet integral to, both the land and the sea has always engendered fierce controversies over military strategies, resource allocations, cultural differences and institutional interests.'*¹⁴ Quite so, but some further thought on 'dimension' and 'environment' is appropriate. The terms are not precisely interchangeable in the way Dr. Stocker infers. To explain, the term 'environment' is accepted as referring to maritime, land or air – the traditional military domains of operation which have demarcated the Services; dimension indicates the space of movement within each environment. The maritime perspective is that the air environment is not regarded as separate from the sea, in much the same way that the other less-obvious dimension of the maritime environment, the sub-surface, is considered as part of the overall maritime environment. Equally, the land environment, in the littoral especially, is a domain in which maritime operations occur and has been ever since soldiers were transported by ships for the purpose of waging war in foreign lands. Naval forces conduct their business in all three of the accepted military environments of maritime, land and air; naval forces have properties of cross-environmental operation *within* each environment rather than projecting effect into one from another. It is this that forms a baseline of maritime conceptual thinking. Air only operates in the air environment. It may have *effect* in the

maritime and land environments, but they are not part of its own in the way air is part of the maritime. Land forces operate in land and air (through the Army Air Corps), and can also have effect in the maritime (shore-based artillery). Only the maritime is able to utilise all three environments inherently, through ships and submarines, aircraft and amphibious forces. Maritime power operates across the environments and this impacts the perspective a navy has on air power.

By combining the above arguments and extending the notion of 'dimension', an interesting observation is revealed. Traditionally, the air environment has been viewed as three dimensional, but this does not accord with the maritime view of dimensions. Air power exists within the air environment – it does not do its business when it is on the ground or on the surface of the sea as the definition given in AP 3000 acknowledges – air power is the projection of power *from* the air.¹⁵ The platforms which deliver that power may move in three dimensions, but as a whole air power occupies a single environmental space, and whilst it has movement within that space it cannot cross into other environments. Maritime power does encompass the other environments, by using them to achieve effect, which reinforces the maritime perspective that air power is part of, and integral to, maritime power.

The four roles of air power are neatly and eloquently summarised in AP 3000 (Fourth Edition); Control of the Air and Space; Air Mobility; Intelligence and Situational Awareness; Attack.¹⁶ Within these,

the aspects of air power are expanded and the full range of air power tasks is described. All are important, and can be critical, to the success of a campaign. But on their own, they serve little purpose. Controlling the air and space in itself does not offer advantage unless that control is used to enable the employment of other forces, be they military or civilian, or to provide security under which other elements of a joint force can operate. Similarly, there is scant reward in prosecuting a target unless the effect of so doing is melded into a wider strategy. Air Mobility has undoubted benefit in being able to reposition forces rapidly for influence or combat effect, to evacuate casualties, to support forces with tactical lift or to increase operational tempo, but all these attributes are only relevant if other forces are part of the equation. On its own, the ability to move rapidly is not decisive. It is only through the marriage of the characteristics of the air¹⁷ and the requirements prevailing in other environments that the utility of air power is fully harnessed. From a maritime perspective, air power is seen as a function which allows an overall solution to be implemented in the most efficient way. Air power is in itself not the solution. In planning maritime campaigns, either as part of joint reaction or in isolation, several options may exist, from the pure naval response, through the use of air power at and from the sea, to the deployment of landing forces into a littoral, and eventually land, environment. The maritime effort will be a combination. An air solution is just that – an air solution. It cannot draw upon the other environment's characteristics, yet it needs either land or maritime bases to exist. Air

power needs *permission*; it is unable to perform unless either the land or maritime component is aware of its existence and has factored its use into an integrated campaign plan. It is thus reasonable to expect that air power is viewed, from the maritime perspective, as contributing to the solution space rather than of being the solution space.

Extending this argument further, there is a rightful acceptance within naval doctrine that the maritime environment should not provide the sole means of deploying air power. By employing air power at and from the sea, however, the attributes that are applied to maritime forces, such as flexibility, reach, persistence,¹⁸ are also lent to the air elements. This makes them particularly suited to certain operations, such as Theatre Entry and establishing initial control, especially where host nation support or access, basing and overflight are restricted. Maritime air power is, in maritime thinking, not a substitute for land-based air power, but it is a valid and useful complementary option to enable the clear benefit of air power to be brought to bear where land-basing is not possible or desirable. Moreover, maritime basing also offers utility even where land-basing is available, as the continuing presence of aircraft carriers in the Gulf and Arabian Sea have demonstrated. Political sensitivities and the wish to avoid long-term obligations may lead to a sea-based solution as well as a land-based option.

Technology plays a crucial role in determining the effectiveness of air power. An exceptionally detailed and informative account of technological advances and their integration into

all aspects of air power is given by Air Vice Marshall Mason in his article *'The Technology Interaction'*,¹⁹ but this does not address the one area of interaction which is vital to gaining full advantage from such advanced air forces, namely the interaction with the other environments. Even in the section headed 'Maritime Operations',²⁰ AVM Mason does not articulate the integration of air power forces and technology across the air and maritime environments. Yet all principal naval platforms, and especially those whose purpose is to integrate air power into maritime operations, have technology specifically developed to support and employ air power. Technology provides an edge in combat, but that edge is soon blunted if the technology does not afford the ability to operate in an integrated fashion. The naval perspective is founded on the premise that maritime and air technology must develop in unison, nowhere more so than in the ISTAR arena, to enable air power to fulfil its potential. In air power thinking, technology serves to create an air edge; the difference in naval thinking is that technology creates an advantage that transcends the boundaries between maritime and air power and forms closer integration between the two. In an increasingly joint structure, this, aligned to technology, and not technology alone, will create the combat edge.

Returning to the theme of support, there is a fundamental difference in the process by which logistic networks are established in the maritime environment when compared to the mechanisms to employ and sustain expeditionary land-based air power. An air force, generically,

will have the necessary functions to be able to collect, transport, deposit, establish and protect the combat elements of the air force to another airfield, assuming one is available and suitable. This has to occur on each occasion it is called for, and for each new base it is required in. Here is where maritime process differs, through necessity rather than anything else. A maritime force has to be able to routinely sustain itself wherever it goes. It takes its logistics with it such that, initially at least, no further support infrastructure needs to be established. Of course, this does not give an indefinite solution as eventually a naval task group, even one with several replenishment ships, will be depleted of food, fuel, ammunition or spares. But it can exist without external support for an extended duration. It is this mindset which colours the maritime concepts of air power, too, as it will necessarily be accounted for in the same way as any other aspect of naval power and therefore will be viewed as part of the combat power that needs support. Navies are set up to do this inherently and permanently.

The term flexibility is constantly applied to military forces, and this implies that several options for the use of their power exist. Their utility is in their employment as instruments of power, from 'soft' diplomacy to 'hard' warfighting. To be credible, even diplomacy needs the backing of being able to bring other means or power to bear should the political process fail. The ability to use force gives a position of strength from which a nation may conduct its affairs, but this use must be guaranteed to have any impact. There are numerous examples of the use of air power from

overseas bases; so too are there many examples of access being denied or constraints²¹ being placed on the missions that may be flown from non-sovereign bases.²² This challenges the characteristic of ubiquity²³ that is often applied to air power since it may be the case that the delivery of air power from a land base is simply not available, not allowed or not viable. Maritime platforms do not suffer the same limitations; they remain sovereign bases wherever they are and can, in the main, operate in international waters. Ships have an inherent mobility. The maritime view of air power is thus not binary and the way in which air power is integrated into maritime solutions re-instates its flexibility. To deny that air power from the sea has limitations would patently be injudicious, but the maritime environment does bring a measure of choice and flexibility that may not be present, or assured, in land basing options. Should conditions change at a land base such that support from a host nation is withdrawn, there is no alternative but to cease operations or move to another base. From a maritime base, air power is not affected thus, and the base can and does move to maximise advantage as a situation develops. The maritime perspective is that air power can become flexible, can be endowed with a high degree of ubiquity and can be integrated into an overall plan with some certainty that it will remain available. One of the most obvious manifestations of this is the ability for maritime elements to manoeuvre around weather and thus maximise flying opportunities. A land base, on the other hand, is immobile.

Revisiting history, following an

enquiry into the control of Fleet Air Work in 1923, the Balfour Committee recommended all naval airborne observers were to be naval officers, with 70 per cent of carrier pilots being naval officers.²⁴ The figures may be debated, but the view that air power in the maritime environment is more efficiently conducted by those with a maritime understanding remains. The extent to which this understanding is provided is the subject of separate deliberations, but the maritime view is that it cannot be adequately given with minimal exposure to the maritime environment, any more than a true appreciation of Air Land Integration can be gleaned from a limited time spent studying army manoeuvre and air support requirements. What counts is experience, and this can only be gained through immersion in the maritime environment at regular intervals and for extensive periods. In 1664, King Charles II recognised the significance of sea-mindedness amongst soldiers when he gave Royal Consent to the formation of a maritime foot regiment.²⁵ Francis Grose records that soldiers not familiar with the maritime environment were ‘..for some time, until they had been accustomed to the sea, in a great measure unserviceable...’²⁶ and it was this that prompted the permanent assignment of soldiers to the maritime environment. The Royal Marines had been born. Move forward some 250 years, and the first aviators to fly from sea were naval and marine officers by background, and it soon became apparent that to fully bring the powerful effect of aircraft into warfighting required some degree of understanding of the maritime environment, air power

being an extension of maritime power as argued previously. The Royal Naval Air Service was formed. It was the same with land based squadrons, manned by army officers in the Royal Flying Corps. With the advent of the Royal Air Force, the maritime experience and expertise was lost after the First World War as air power concentrated its efforts into operations in support of land forces. Having suffered a general lack of resources and investment, the importance of sea-minded aviators was formally acknowledged in 1937 with the formation, under Admiralty control, of the Fleet Air Arm. The principle of sea-minded air power still applies today, and the maritime perspective, quite naturally, is that air power in the maritime environment requires a maritime understanding deeper than that gained by limited acquaintance.

Air power in the United States developed in a very similar fashion to the UK, and when faced with discussions pertaining to an independent air service, the US Navy fiercely resisted. Their resolve was stronger than the Royal Navy's, however, and in order to prevent the control of maritime aviation slipping from their grasp, the US Navy integrated air power into its doctrine and operations so tightly that it became ingrained.²⁷ US air power truly was part of US sea power. To this day, the US Navy has retained an air arm independent of US Air Force control, a position that is unlikely to be overturned any time soon. The contested issue of 'ownership' has appeared many times in the history of air power in the UK, and it is not for this article to ruminate further on the matter. It is sufficient to say

that the maritime view is that those elements of air power which operate at and from the sea should ideally be under maritime command and control as an integrated element of the maritime force. The UK is unique in working under a system which sees some of the air assets which have a role in maritime aviation being wholly controlled by another service. Either the UK is exceptionally forward thinking and will eventually demonstrate the success of this approach to other navies, or it is alone in its appraisal of the maritime / air power seam.

Air-mindedness²⁸ is essential for maximising the effectiveness of air power. Similarly, so is sea-mindedness for maritime power. But where maritime and air power meet, which prevails? One argument is that maritime understanding should have primacy because as an environment it encompasses the air dimension. For maritime aviation, an air-minded mariner is required. This does not mean that air power from other forces cannot be integrated into the maritime when required, but this integration occurs with improved efficiency where it augments existing maritime air power rather than being an independent addition. The maritime perspective of air power is that, as an integral part of the maritime environment, understanding the maritime environment is key. This can only be achieved through experience and education, which means closer integration between maritime aviators and other airmen. In delivering air power at and from the sea, a balance is required. There will be occasions when air platforms from both the Army and the RAF, and indeed other

nations' forces, will operate from RN ships in order to achieve the required effect. But to offer the full utility of air power, there needs to be an indigenous maritime cadre to lead the way.

It is fair to conclude that the view of air power from the maritime perspective is one of integration. The air dimension is an inseparable part of the maritime environment and one which simultaneously expands the utility of maritime power, or at least of air power delivered at and from the sea, and forms a flexible and integral aspect of naval solutions and operations. From a maritime perspective, air power is part of maritime power. Air power in the maritime cannot provide the entire air solution, however, and therefore it is complementary to air power delivered from land bases, which is justifiably the main effort of an air force be it independent or otherwise. The key is integration, with a maritime lead when air power is operating in the maritime environment. Air power is not something which is attached to the maritime, it is an inherent part of maritime forces and needs to be managed accordingly. Accepting and understanding this would perhaps bring much-needed clarity to the future direction of air power within the UK's Armed Forces. As the motto of the UK's Centre for Air Power Studies, '*Concordia res parvae*', suggests, air power practitioners of all backgrounds should '*Work together to accomplish more*'.

Notes

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⁵ AP 3000, Preface, p.5.

⁶ David Wragg, *Wings Over the Sea: A History of Naval Aviation*, (Newton Abbot, David and Charles, 1979), 10.

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⁸ Lt Col Mark Jelonek USAF, *Toward an Air and Space Force: Naval Aviation and the Implications for Space Power*, The CADRE Papers, (Maxwell Air Force Base, Alabama, Air University Press, 1999), 5.

⁹ P. S. Das, 'A View From the Sea' in J. Singh (Ed.), *Air Power and Joint Operations*, (New Delhi, Knowledge World, 2003), 243.

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¹¹ Christina J. M. Goulter, 'The Royal Air Force and the Future of Maritime Aviation', in Andrew Dorman, Mike Lawrence Smith and Matthew R. H. Uttley (Eds.), *The Changing Face of Maritime Power*, (Basingstoke, Macmillan press Ltd., 1999), 160.

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¹⁴ Stocker, 'There is no such thing as

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¹⁵ AP 3000, Preface, p.5.

¹⁶ AP 3000, Chapter 3, 37-60.

¹⁷ AP 3000, Chapter 1, 16-19.

¹⁸ BR1806, *British Maritime Doctrine*, Third Edition, (London, The Stationery Office, 2004), 28-34.

¹⁹ AVM Tony Mason, 'The Technology Interaction', in S. Peach (Ed.), *Perspectives on Air Power: Air Power in its Wider Context*, (London, The Stationery Office, 1998), 131-166.

²⁰ Mason, 'The Technology Interaction', 162-165.

²¹ Turkey offers a good example. Until the opening stages of the Gulf war, US forces based in Incirlik were only allowed to be employed on humanitarian missions or for limited logistical support. See Lawrence Freedman and Efraim Karsh, *The Gulf Conflict 1991: Diplomacy and War in the New World Order*, (London, Faber and Faber, 1993), 352-353.

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²³ AP 3000, Chapter 1, 16-17.

²⁴ Brian Johnson, *Fly Navy: The History of Maritime Aviation*, (New York, William Morrow and Company, Inc, 1981), 110.

²⁵ L. Eyde, *History of the Royal Marines Forces, 1664-1701*, (London, Harrison and Sons, 1893), 1.

²⁶ Francis Grose, *Military Antiquities Respecting a History of the English Army from the Conquest to the Present Time*, Vol. I, (London, T. Egerton and G. Kearsley, 1801), 167. (For readability, the citation has been altered to replace the old English 'f' in the original text with the modern 's'.)

²⁷ Jelonek, *Toward an Air and Space Force*, 13.

²⁸ AP 3000, Chapter 1, 25-26.

Viewpoint

The Life of an Air Attaché: Alcohol, Cholesterol and Protocol?

By Air Commodore Ian Elliott

Having been in post as the UK Air Attaché in Washington DC for a few months, my wife and I were visited by my eldest daughter who had remained in the UK to complete her university studies. Around the dinner table one evening, she asked me “so Daddy, are you a real life spy now?” In most of my previous tours it must have been fairly self evident what I did for a living – the flying suit alone being a fair clue! In trying to answer her question, I was struck by the thought that it is hardly surprising that she didn’t have any understanding as to what an attaché is or what one does. After all, if I’m honest, I myself had little real clue as to the breadth and depth of my responsibilities before I arrived in post. And so it was that, with one year of diplomatic experience now under my belt, I thought I would commit a few thoughts to paper to dispel a few myths and, perhaps, whet the appetite of a few other ‘trained warriors’ who may consider a diversion into this fascinating but little understood career area.

In making the following observations, I would highlight two key points: no two attaché posts are the same and no two attachés approach their tasks in the same way. The challenges I face in the USA are dramatically different to those faced by colleagues

in Russia or Australia or Brazil. The UK (and the RAF) has radically different relationships with each country; history has shaped our current geopolitical and military landscape. The role of the diplomatic community is to forge relationships, build trust and influence others such that strategies, policies and plans are shaped in accord with the UK’s preferred direction of travel. Diplomats are also the UK government’s in country ‘eyes and ears’ who provide feedback on everything from politics and public opinion to threats and opportunities, be they economic, climatic or security related. As a member of the military attaché fraternity my overall role is therefore best summed up as ‘insight and influence’.

My challenge in the USA is far different from colleagues in many other nations, not least because the USA is, and is likely to continue to be, our military ally of choice. They are the world’s only current superpower and possess military might beyond compare. Their active duty armed forces total nearly 1.5 million; their annual military budget is \$680Bn; their Air Force totals almost 540000 personnel across active duty, Guard and Reserve areas; they currently field over 5500 manned ac and have a further 180 unmanned; their USAF training machine graduates 800 new

airmen recruits each week to sustain the 327000 current USAF strength.

So is there a special relationship between this monolith and our humble nation? Indeed, does it matter? Are the quantitative differences between the military capabilities of our two nations now so stark that we are wasting our time and effort in even trying to keep up with them? I would argue very strongly that the 'Special Relationship' is very much alive and well. Of the numerous areas of common ground between our two nations which stem from our common language and shared values, it is the field of security which provides the real underpinning substance to making the relationship 'Special'. Indeed, the manner in which the relationship has evolved with regard to the sharing of intelligence and nuclear cooperation would undoubtedly have forced a knowing 'I told you so' smile from Churchill – the man who originally coined the phrase back in 1944.

In these times when we face the significant stresses of concurrent widespread operational commitments and major budgetary constraints, it behoves us to do all that we can to ensure that every penny of the defence budget is spent wisely to maximize the effects of our fielded and contingent military capabilities. Given the United States of America's lead role in current coalition operations in both Iraq and Afghanistan, it is critical that we should stay militarily 'close' to their armed forces if we are to integrate and interoperate effectively in the joint and coalition environment on the deployed stage. In seeking to be 'close', I mean close in every

regard. We need to understand their people, their kit, their doctrine, their leadership thinking, their industry, their political drivers and their constraints. For the US military machinery, this is no small challenge! However, we have a host of tools available to assist. Enter Air Attaché stage left!

Prior to taking up my current appointment, a learned former 4-Star RAF Officer gave me some excellent advice. He observed that: "countries do not have relationships; air forces do not have relationships; people have relationships". Wise words! Ultimately, the waging of war (or deterring of aggression) is fundamentally about human behavior and attempts to persuade others to behave differently. Equally, at the heart of politics, lies the fundamental issue of relationships. As I go about my 'insight and influence' duties, I have become acutely aware that I am not going to achieve anything unless there is a fundamental bond of trust between me and my interlocutors. This is not something which can be signed out from Stores; it needs investment of time and effort and needs constant nurturing. However, once established, doors magically open, favours are granted, long standing bureaucratic hurdles can be overcome and real progress can be made. That is not to say that we should always agree with our US brethren. Often we do not. However, where an atmosphere of mutual trust and respect (and in this regard our military heritage brings us enormous kudos) exists, then a full and frank expose of potentially contrary positions can be debated without anyone falling out! A serving USAF 4-Star General remarked to me

recently that the relationship between our air forces was like a long standing marriage: we cohabit very happily but do not necessarily always agree about everything!

We are very fortunate that another vehicle we have at our disposal, which helps foster trust and build mutual understanding and respect and which thus contributes significantly to the enhancement of our military, is the UK/US military exchange programme. In the air domain, we currently have 57 exchange officers embedded within the USAF and within the air arms of the US Navy and US Marine Corps. These officers range in rank from Flight Lieutenant to Group Captain and are employed in a wide range of capability areas. Many are aircrew: we have exchange Officers on most front line USAF aircraft types, including the F22 and the B2. Others are employed in staff duties in the Pentagon in areas ranging from long term strategy development to air force legal activity. We have Officers involved in USAF research into the use of directed energy weapons, space operations, medical research, cyber development, force protection training, air C2 training and sophisticated information architecture work. In all these areas, RAF Officers are exposed to the latest US thinking and the latest US hardware. More importantly, they work – and in some cases fight – alongside their US colleagues. Their US counterparts are employed in a similarly wide-ranging number of posts within the UK. The friendships and professional relationships developed during these tours endure and in many cases current RAF air Officers enjoy unwarranted access and influence with USAF General Officers because

the 2 parties have a personal history dating back to an earlier exchange tour. The experiences of our 2 air forces in working constantly side by side on deployed operations since 1990 has also provided a perfect opportunity for senior staff to generate that all important mutual understanding and trust.

In terms of RAF development and the UK's strategy for air power, I would contend that the RAF/USAF relationship is every bit as important as the RAF/British Army relationship or the RAF/Royal Navy. That said, in undertaking my job I am not exclusively 'USAF facing' as I go about my business. Within DC, there are 110 air attachés (which was a shock to me – I had no idea there were that many air forces in the world!) and there is considerable horizontal networking between us. Not a day passes when I do not meet with at least one of my DC air attaché colleagues to have a full and frank discussion about matters of mutual interest. With 57 exchange Officers to look after, a steady throughput of senior RAF visitors to the US and numerous attaché colleagues to keep abreast of, no two days are the same and each week throws up fresh but interesting new challenges.

I hope this short piece has provided a brief flavour for the range of activities in which I am engaged. Is it interesting/varied/valued work? Absolutely! Do I feel that I and my small team 'make a difference'? Absolutely! Is this an area of Defence business which I would recommend to colleagues who fancy a change from 'mainstream' RAF/MOD HQ work? Absolutely!

The answer to my elder daughter's

original query is 'no, I am not a spy!', rather, I devil in numerous areas in pursuit of the British Defence Staff's overall role of securing insight and influence. I am not a 'snitch' - I work for policy makers not the intelligence community!

I recollect that on arrival at nursery school at Brize Norton aged 4, my younger daughter when questioned about her father's profession announced confidently that "my Daddy is an alligator" – an understandably close approximation to the correct answer of 'navigator'. Fast forward the clock 16 yrs and during a recent family reunion she posed the same 'so what do you actually do now Daddy?' query. I explained that I was effectively the oil in the gearbox between the cogs of the USAF and the cogs of the RAF. 'Ah' she exclaimed, 'so you're a lubricant now!' I think I preferred the alligator description....!

Ian Elliott
Air Commodore
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Book Reviews

High Stakes: Britain's Air Arms in Action 1945-1990

By Vic Flintham

Reviewed by Wing Commander Clive Blount

This is a well-researched and comprehensive look at Britain's use of Air Power throughout the Cold War, and covers all of the incidents and major campaigns of the period. It is not an RAF history - it attempts to cover events that have involved all of Britain's military air arms and even includes a section on *Op Eldorado Canyon*, on the somewhat tenuous basis that the US aircraft took off from British bases. Largely chronological in layout, each section contains a short background history to each conflict before describing, in some detail, the contributions of air power to the campaigns. Flintham also attempts interweave a thematic approach looking at such areas as Defending and Maintaining Empire, Humanitarian and Peacekeeping and Homeland Security; this he achieves with varying degrees of success, but the combined approach means that every use of British airpower during the period is covered.

I particularly enjoyed the book's coverage of the lesser well-known crisis of the period, such as the infiltration of insurgents into Communist Albania in 1946 (largely compromised by the spy Kim Philby) and the operations to 'stabilise' South East Asia after the defeat of the Japanese, although coverage of more recent operations such as those in Northern Ireland, Beirut

and the Falklands is equally adept. It is the breadth of coverage which is most impressive, although I feel that sometimes depth suffers, with some events being glossed over with, effectively, just a list of aircraft and units taking part. However, as an introduction to crises in which British air arms have participated and a gateway to further research, the detail is about right.

The volume is well illustrated and brimming with facts, with each section including lists of units participating, aircraft types, locations and dates and, periodically, more detailed panels about the key aircraft types. However, it is this wealth of detail that leads to my main criticism of the book - it is difficult to see what niche the book is intended to fill. The history sections are well-researched and cover even the most obscure incidents in appropriate detail but, just when one's interest is piqued, one is assailed by a block of facts, squadron numbers etc, or by some fairly lightweight details about an aircraft type. It is neither a history textbook or a 'spotter's guide' but seems to be trying to do both, without doing either particularly well. The book also lacks a serious index which has certainly hampered my use of it as a reference in research.

This is a shame. Flintham's research must have taken years and, as a

historical text without the pointless aircraft panels this would be a very useful addition to Cold War literature. Indeed, I am sure he has sufficient facts to produce an excellent, but separate, guide to Cold War aircraft which, in company with the history text, would form a very useful reference. All this said, *High Stakes*, is a sumptuous volume which is a pleasure to dip into. It is largely an enjoyable read, but its main strength lies in that it is an easy and accessible book to browse through and enjoy. Notwithstanding its faults, it is a fine addition to an aviation enthusiast's library.

Book Reviews

The Price of Peace: Just War in the Twenty-First Century

By Charles Reed and David Ryall

Reviewed by Group Captain Ian Shields

In the Spring 2009 issue of *Airpower Review* I considered *The Past as Prologue* (now on the Chief of the Air Staff's reading List for 2009); as with that book this volume is a collection of essays based on a conference. While *The Past as Prologue* has immediate and obvious appeal for Airpower practitioners, a book asking how the Just War theory, most commonly associated with the thirteenth century writings of Thomas Aquinas, might be applicable to contemporary conflict is less obviously required reading. And yet moral accountability must remain at the heart of why and how we resort to conflict to resolve problems, for without such a moral approach the sacrifice of which we, the Services, may be called to give is meaningless. Therefore I suggest that moral and ethical dimensions continue to play their part, and the Just War theory remains an excellent starting point for such considerations.

Let me say here what this book is not: it is not an explanation of the Just war theory itself. Indeed, any reader of the book will benefit from an understanding of the Just War theory and even of their application; for such an introduction (and well worth a read in its own right) is the very short tome *Just War: The Just War Tradition – Ethics in Modern Warfare* by Charles Guthrie and Michael Quinlan

(London: Bloomsbury, 2007). But what *The Price of Peace* does represent is a collection of pieces by some of the leading clerical and academic thinkers from both sides of the Atlantic that examine the ethical and moral dimensions of contemporary conflict using the Just War theory as a basis – and produce some challenging and thought-provoking conclusions.

In order to judge the strengths and weaknesses of this book – and it has both – it is important to place it in context. Its origins lie in a symposium held in March 2005 on 'Just War in the Twenty-First Century' and it is the timing that is critical to an appreciation of this book's limitations: the symposium was strongly influenced by the 2003 Gulf War and the arguments raging at the time about its justness. And sadly, for me, the first section – "A Framework for Ethical Decision Making: State and Civil Society-Based Approaches" – nearly led me to abandoning the book in total, due to its overtly religious, and sometimes pacifist (not the same thing), themes. However, the remaining two-thirds of the book more than makes up for this slightly disappointing beginning. The second of the five sections, comprising four essays, considers how to respond to contemporary threats in a just manner. These extremely timely, profound and

thought-provoking essays, which in Just War terms corresponds to *jus ad bellum*, explore how we should deal with humanitarian interventions, respond to terrorism, tackle rogue regimes, and balance moral with legal stands. They are followed by a section on Fighting Wars Justly (or *jus in bello* in Just War parlance), with two more apposite pieces on the ethics of effects-based warfare, and on the just conduct of war against radical Islamic terror and insurgencies. Given advances in technology that increasingly blur traditional moral boundaries - one wonders how Aquinas would have addressed the ethical questions of fighting a war when one side is not experiencing combat or being placed in any danger - this is highly relevant, particularly to Airpower practitioners.

The fourth part examines what Michael Walzer identified as a new strand: just actions after war, or *jus post bellum*, actions in places such as East Timor once the fighting had finished. While there is not yet universal acceptance that this is really an element of the Just War theory, the three chapters in Securing Peace Justly, more than hold their own. For those who have now reached p. 275 the good news is that the four short pieces, almost *op eds*, that form the fifth and concluding section are all *tour de forces* and deserve close attention. As with the opening section, they alternate between American and British viewpoints, but there is a balance with all the views that I found lacking in the first part.

This book is not just for those interested in ethics or the nuances of the Just War theory, but offers a fascinating insight into some

of the complexities that we face with contemporary warfare. As Airpower practitioners we face ethical challenges unlike those of our naval and military colleagues, and are at the forefront of the employment of new technology, technology that is changing the conduct of war faster than ever. As such, we should keep ourselves abreast of issues such as ethics, for without this understanding we lose the moral high ground so vital to our contemporary challenges. This book will prepare all of us better for the challenges we face today and in the future, and I unhesitatingly recommend it.

Historic Book Review

The Air Campaign

By John Warden

Reviewed by Air Commodore Neville Parton

And so we come to the second United States Air Force (USAF) officer to have a profound impact on air power theory since the World War II, Colonel John A. Warden III, and one of the most spoken-about, but perhaps least-read, books of recent times on this subject, *The Air Campaign*. As with all in this series, we shall begin by considering the man himself before moving on to the book, and considering the part that it has played in our recent understanding of air power.

John A Warden III was born just before Christmas 1943, into a family that had significant military connections. It was an uncle, Colonel 'Pete' Warden, who provided the link into the USAF, with his tales of combat experience in the Philippines, and post-war involvement in the bomber programme that would give rise to the B-52. Warden's decision to enrol as a cadet at the USAF Academy in 1961 probably did not therefore come as a surprise to his family. However, from the start it became apparent that Warden was perhaps slightly out of tune with both his classmates, and the general orientation of USAFA. Academically he was far more inclined to military history than the engineering and science subjects which formed the core of the USAFA syllabus, and on the social front his more formal dress-

style and reserved manner singled him out from his classmates.¹ After completion at the Academy, Warden was posted onto an F-4 Phantom squadron, and as was standard at the time, began his career in the rear-seat of the aircraft. Although the squadron deployed operationally to South Korea within a few months of his joining, Warden found the posting unchallenging, and, seeing how long the upgrade programme to the front seat was, volunteered to become a Forward Air Controller flying the OV-10 Bronco. It was in this capacity that he would gain his direct combat experience, operating from 1969-1970 in both close air support (CAS) and interdiction roles. Offered a training post afterwards, Warden elected to return to the F-4, and, having rapidly completed his front-seat upgrade whilst based at Incirlik Air Base in Turkey, began to think more deeply about the role in which the USAF was engaged in Europe. In particular, he was interested in what he saw as an over-focus on the CAS role combined with a lack of interest in the gaining of air superiority, which led to him submitting his thoughts in writing for the first time.²

Warden's interest in strategic matters coalesced in 1974, when he spent a year undertaking a master's degree at Texas Technical University, with a dissertation based on an

examination of decision-making at the grand strategic level. This was to be followed by Warden's first tour in the Pentagon, where he began work in the Directorate of Plans, in the Middle East and Africa Division. Here he began to understand how the 'system' worked, and also impressed his superiors with his originality of thought and ability to express himself with clarity – and confidence in front of his superiors. Promoted to lieutenant colonel in 1978, he was hand-picked to work in the office of the Chief of Staff of the USAF. A just reward for his five years of staff work was conversion to the F15 and a posting to the 33rd Tactical Fighter Wing at Eglin Air Force Base (AFB), where he was responsible for preparing the wing for inspections. During this tour *Planning to Win*, his first published piece of work, appeared in the *Air University Review*. Two more command detachments were to follow in short order – to Moody AFB as Deputy Commander for Operations and to Decimomannu in Sicily as the permanent Detachment Commander, before the by-now Colonel Warden was selected to attend the National War College in Washington in the autumn of 1985.

The NWC provided Warden with an unparalleled opportunity to further his thinking, and it was during this period of academic reflection that the thesis which would soon become *The Air Campaign* was based. The worth of the work was recognised immediately, with the NWC commandant having the thesis initially published by the National Defense University (NDU) press. This success was followed by Warden's posting to Bitberg AFB in Germany,

as the Wing Commander for the Thirty-Sixth Tactical Fighter Wing. This posting has been the subject of much speculation, almost from the moment it ended, and it is hard to separate fact from fiction. What is clear is that whilst introducing many worthwhile initiatives, and succeeding in ensuring the Wing passed all necessary inspections, Warden's reputation as a commander took a battering – and when, unlike his ten predecessors, Warden did not leave on promotion, others were quick to draw the lesson that this tour had been a failure. Yet the following few years would see Warden's approach vindicated on the world stage, as he moved back into the Pentagon, albeit initially into what was perceived at the time to be a dead-end job.

Shortly after Warden's return to the Pentagon though, his unquestioned intellectual ability again brought him to the attention of some influential generals in the USAF, and he was soon appointed as the Director for Warfighting Concepts, which included the now-famous Checkmate Division. During this time the concepts inherent in *The Air Campaign* were refined to produce the *Five Rings Model*, which in turn would form the basis for the campaign plan that Warden would present to General Schwarzkopf in August of 1990 as *Instant Thunder*. Unfortunately space precludes going into detail regarding the way in which senior command relationships played out, and the consequent distancing of the Checkmate team from the operational theatre – but no-one can deny the unmistakable influence of Warden's ideas on the final campaign plan.

The last few years of Warden's career could have been an anti-climax after the Gulf War, but, following a period as Special Assistant to the Vice President, appointment as the Commandant at the Air Command and Staff College gave Warden an unequalled opportunity to cement his thinking into the USAF's future development. Warden recast the entire venture into one aimed at producing Air Force campaign planners, and along the way developed an institution that gained new respect from within the defense community. Promotion perhaps would have been expected for such a run of success, but previous events had stayed in the minds of those at the top, and John Warden retired from the USAF in 1995.

Like John Boyd before him, Warden had become regarded as something of a maverick by the USAF establishment – and it is notable that both of these men, despite having contributed enormously to the field of air power thinking, never achieved general rank. Of course Warden was a very different personality from Boyd, being in many ways the antithesis of a fighter pilot, but both shared a common sense of righteousness in their cause, backed by total self-belief. John Warden's activities post-retirement have focused on applying his ideas about strategy to a broader field, and he established a company, Venturist Inc., which delivers his ideas about both the development of strategy, and its importance, for companies and government departments. A 2001 publication, *Winning in Fast Time*, captured his ideas for a more-business orientated audience, and

this has been recently replaced by *Strategic Thinking and Planning*, which was published in 2008.³ He does still engage on the air power front, however, and some *Air Power Review* readers may have been privileged to hear him when he addressed the 2008 RAF Centre for Air Power Studies (RAFCAPS) conference on 'Air Power and Strategy : Challenges for the 21st Century' as the keynote speaker. Having come right up to date, our attention now needs to be turned to the publication itself.

The Air Campaign is actually a rather diminutive book, running out at 160 pages, and addresses one specific subject – namely the use of air power at the operational level of war. It may come as a surprise to some readers that no trace is to be found of Warden's 'Rings' within the publication – they were to come later – but the clear genesis of his ideas as related to the air campaign against Iraq can be readily identified. In outline, the book consisted of ten short chapters which aimed, after providing a short introduction, to consider all of the major areas that an air commander should be aware of when drawing up a campaign plan.⁴ The first chapter introduced the concept of air superiority, and argued that this was '... crucial to success ...' by way of a number of historical examples.⁵ It also brought in an analytical framework for air superiority which underpinned the remainder of the work, based upon five different cases. As these are fundamental to the rest of the book, a summary of the cases are outlined in the table opposite.⁶

Two additional variables were also considered, namely the availability

Case	Description	Example
1.	Both sides have the capability and will to strike at each other's bases	Pacific theatre early in World War II, when both Allied and Japanese forces could strike bases/targets behind each other's lines
2.	One side can strike anywhere, whilst the enemy is limited to reaching the battlefield only	Mainland Europe after 1943, when Allied air forces could attack Germany without fear of any militarily significant riposte
3.	Reverse of case 2 – enemy can strike anywhere whilst other side is limited to the battlefield	Battle of Britain, when the RAF was unable to strike effectively at Luftwaffe bases in either France or Germany
4.	Neither side can operate against rear areas or air bases, and air action is confined to the battlefield	Korean War – US forces constrained by political limitations, Communist forces by inability to attack US bases effectively
5.	Neither side uses air power – either due to political constraints or because neither side possesses any	Great power proxy combat where air power is not provided, or conflict between two poor countries

of skilled personnel and material, which were assigned values of either 'limited' or 'unlimited' – and this combination of factors combined to form the basis of reference for all analysis of the various aspects of the many campaigns considered.

The second chapter considered the ways in which air superiority could be obtained, concentrating on the differences between offensive and defensive campaigns, and looking at the Case 1 scenario of both sides being in a roughly equivalent position. Perhaps not surprisingly, Warden comes out strongly in favour of a strong offensive, although he does recognise that in some cases this may not be practicable, at least, given various constraints, and a defensive approach may be required initially before an offensive campaign can be effectively mounted. The risk identified is that going on the defensive initially presupposes factors that will allow the offensive to take place in the future, or as Warden more elegantly describes it: 'In other words, the commander who adopts the defense ... is betting heavily on a future that might not happen as he thinks it will.'⁷ The

value of concentration of force is highlighted, with particular reference to the Pacific campaign of World War II, as is the importance of accurate intelligence and the need to consider alternate ways of attacking air defence systems. In this latter area, the 1973 Arab-Israeli conflict was used to demonstrate that a combination of indirect attack and the use of ground and naval forces to outflank and penetrate enabled the most to be made of the inherent flexibility of air power when contrasted with the general rigidity of land-based air defence systems.

The third chapter, the longest in the book, is based around the Case 2 exemplar, which Warden identified as being the '... commander's dream ...', where friendly bases are effectively immune from enemy action whilst all elements of the enemy's system are open to attack.⁸ This was seen as providing the opportunity for decisive air action – so decisive that theoretically the war could be won from the air. The issue was therefore the selection of the correct centre of gravity, and then determining how to attack this most effectively. Areas such as equipment, logistics,

personnel and command and control were considered, in relation to both geography and doctrine, and with an emphasis on understanding the nature of the enemy's forces – and the way that he thinks about using them. However, a cogent warning was also sounded regarding the need to consider carefully what should *actually* be done with the forces at a commander's disposal, in order to prevent dissipation of effort. This was summarised in the closing paragraphs as follows:

*Careful consideration of enemy centres of gravity, assisted by analysis of enemy doctrine, is the first step to success. The second step is concentration of effort. Especially in the situation where one seems to have numerical superiority, there is a tendency to try to do everything. In all likelihood, the net result will be that nothing is done as efficiently as it should be.*⁹

The next chapter examines the opposite position, where the enemy is almost invulnerable, and a defensive approach is not a matter of choice. Warden identifies that in this position the possibility of 'winning', at least in a conventional military sense, is not feasible, and the strategic aim has to be limited to 'not losing'. Having also pointed out that being on the defensive in the air does not confer the same advantages in the air that it generally does on the ground, a potential difference is identified in that an attacker is likely to be more sensitive to loss rates than the defence – and hence imposing high enemy losses is likely to be the most successful strategy. Again the importance of concentrating force is emphasised, with an understanding that links back to Lanchester's analysis

during the First World War, in terms of the need to employ defending forces intelligently so as to outnumber the attackers in any given engagement.¹⁰ The use of reserves in defence is also highlighted, with the RAF's approach during the Battle of Britain cited, and this area is specifically returned to later on. The case of limited options is then considered in a particularly short (five page) chapter, with the emphasis on how to win an air battle in the case where an enemy air force can only be met in the air. The use of fighter screens, in the defensive case, and fighter sweeps or close escort for the offensive, are outlined, with a constant reminder of the need to use air power's mobility to ensure concentration of force – in Warden's own words: 'No simpler nor more often ignored – principle exists than this one. The commander who concentrates his forces either wins or staves off defeat. The commander, who doesn't, loses or wins by accident.'¹¹

That summary effectively concluded the examination of air superiority, and led onto two chapters that considered the air to ground environment, looking at interdiction and close air support (CAS) respectively. On the former front, particular mention is given to the benefits that can be obtained from combining an effective interdiction campaign with a ground offensive, in a synthesis which had its roots in Slessor's thoughts on the subject in the 1930s.¹² Consideration was also given to the role that air power could play in either destroying or defending a retreating force, before moving on to the links between the temporal nature of different types of interdiction – or in other

words, the time lags inherent in particular target sets before they produce results, balanced against the scale of the results that can be obtained. Lastly, the question of balancing competing demands is considered, particularly between air superiority and interdiction missions. Unusually for Warden, he suggests a compromise by looking for those targets which support both, with fuel supply being given as a cogent example. The thorny area of close air support begins with a definitional issue – what exactly is meant by CAS? In this understanding, CAS is defined as any air operation which could be done by ground forces if there were enough of them. The problem, as outlined, is that by its very nature CAS is almost always of use to the soldier on the ground, and therefore that it should be considered as analogous to an operational reserve on the ground – only to be committed when the advantage gained is likely to be significant. It is suggested that the most advantageous use will only come in dynamic warfare, and that enabling or preventing breakthroughs, or covering a flank, are tasks which CAS can accomplish – again, backed up with a number of examples. Perhaps the most important element is the constant stress on the need to consider the ‘opportunity costs’ of CAS, in terms of what else could be achieved with the air power committed in this manner.

The eighth chapter dealt with a subject not often specifically mentioned in air power texts, regarding the use of reserves at the operational level, which the author considered to be of particular importance. The utility of reserves is examined by introducing their

Clausewitzian origins, where they were seen as a way of enabling a commander to deal with some of the effects of ‘friction’ at the battle front. Perhaps, unsurprisingly, the main effort underpinning the message is that if reserves are to be maintained, they should not be used in a piecemeal fashion, and that they are at their most effective in a situation of near-equal strength.

The last two chapters covered topics that were extremely closely linked, namely the orchestration of war, and how to plan an air campaign effectively. A great deal of stress is laid on the Vietnamese and Japanese conflicts, and particularly the need to link military objectives to the desired political end state, as well as considering the need to introduce an element of surprise into the planning process – or challenging orthodoxy. For this to work, the absolute need to identify the enemy’s centre of gravity, and then strike it, in any of the cases outlined, is reaffirmed. Orchestration (in musical terms) is used as an analogy, with the conductor (theatre commander) bring responsible for using all the instruments within the orchestra, at the right time, and in the right order, to produce the desired effect. In terms of the air campaign itself, the need for a clear ‘plan’ which outlines the air centres of gravity, phasing of operations and resources required is stressed, with guidance on the division of effort amongst the roles, and an explanation of how the air campaign fits into the larger picture. The primary importance of air superiority is reinforced, followed by an enumeration of the factors to be considered when deciding whether to commit forces to CAS or interdiction, and then the need to

ensure concentration of effort. Oddly, the subject of deception is introduced right at the end of the final chapter, almost as an afterthought, before pointing out again the need to use reserves decisively. Finally, the need for a commander to have perspective, and to be certain in the command and control system that he is going to use to fight the campaign are covered, together with the need to have trained to fight as you intend to fight. Warden finishes with a note that (referring to the commander): ‘The rest is up to him.’¹³

The Air Campaign is an extremely worthy book on at least two levels: firstly it provides an excellent (and very readable) overview for anyone wishing to understand the issues involved in the employment of air power above the tactical level, and secondly it allows an insight into the individual who, arguably more than any other, shaped the use of air power in the first Gulf War. It is not a deeply academic book,

although it is clearly based upon a great deal of research and thought, and in some ways it is surprising that it is so highly regarded as there is nothing particularly new or remarkable in the ideas contained within it. However, it does represent a very different understanding of air power by the USAF than that which had immediately preceded it, and it presents that understanding in a very straightforward and logical manner – to argue the case for the author’s beliefs about the way in which that power should be used. Given the subsequent influence that Warden would have on the USAF’s approach to the Gulf War of 1990-91, based upon this understanding, this book clearly deserves its place on the shelf of air power history.

Anyone seeking to understand the John Warden story in more detail should read John Olsen’s meticulously-researched and eminently-readable book, “John Warden and the Renaissance of American Air Power” – details given below. This

Air Superiority Cases¹⁴

Case	Blue Air Fields and Rear Areas*	Battle Lines**	Red Air Fields and Rear Areas
I	Vulnerable	Reachable	Vulnerable
II	Safe***	Reachable****	Vulnerable
III	Vulnerable	Reachable	Safe
IV	Safe	Reachable	Safe
V	Safe	Unreachable	Safe

* Blue and Red fields encompass supporting infrastructure such as power, fuel, and command and control facilities.

** Normally the ground front, but could be a border.

*** Safe means that the fields are not likely to be hit either because the enemy is unable to hit them, or chooses not to do so, or they are protected by political constraints.

**** When *Case II* progresses to its logical conclusion, Red will probably be unable to reach even the battle lines.

appeared on the 2008 CAS Reading List, and copies should therefore be available on most units' libraries. "The Air Campaign" is also fairly accessible, as it has been reprinted on a number of occasions – again, details given below. Finally, Warden's 'Five Rings Model' can best be understood by seeking out a copy of 'Global Strategy Outline', copies of which can be found online.

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Notes

¹ John Andreas Olsen, *John Warden and the Renaissance of American Air Power* (Washington D.C.: Potomac Books, Inc., 2007), pp. 13-17.

² 'Employment of Tactical Air in Europe', *Ibid.*, p. 23.

³ John A. Warden III and Leland A. Russell, *Winning in Fast Time* (Montgomery, Alabama: Venturist Publishing, 2001). and John A. Warden

III, *Strategic Thinking and Planning* (Montgomery, Alabama: Venturist Publishing, 2008).

⁴ When we say short in this context we mean it – Chapter 1 is only ten pages long, and Chapter 2 only twelve.

⁵ John A Warden, *The Air Campaign* (Washington: Pergamon-Brassey's, 1989), p. 13.

⁶ A copy of the original table is shown at the end of the article.

⁷ Warden, *The Air Campaign*, p. 24.

⁸ *Ibid.*, p. 33.

⁹ *Ibid.*, p. 54.

¹⁰ Lanchester was an aeronautical engineer who provided the first mathematically-based analysis of air combat. See F.W. Lanchester, *Aircraft in Warfare : The Dawn of the Fourth Arm* (London: Constable and Company Limited, 1916), pp. 39-66.

¹¹ Warden, *The Air Campaign*, p. 70.

¹² J C Slessor, *Air Power and Armies* (London: Oxford University Press, 1936).

¹³ Warden, *The Air Campaign*, p. 140.

¹⁴ *Ibid.*, p. 17. For the benefit of younger readers the use of a blue force/red force scenario was commonplace during the Cold War to identify 'us and them' without specifically saying so!

Letters

Response to "Building a Good Instrument"

Reviewed by Group Captain Ian Shields

Letter to the Editor

Sir,

I read with interest Wg Cdr Miller's well-crafted piece "Building a Good Instrument: Assessing the Likely Characteristics of Future Conflicts and Their Implications for the Air Component" in the Winter 2009 edition of *Air Power Review*. Hers is a welcome addition to the debate on where conflict might be headed, and how we might shape Airpower's present direction in order to meet future requirements. I fully support Wg Cdr Miller's assertion at the start of her article that trying to predict the future where warfare is concerned is fraught with difficulty (albeit that I would contend that its nature is unchanging, it is the conduct that evolves) but I do wonder whether there is an assumption in her piece that the next war will be largely more of the same and that we will undertake conflict that is recognisably in the same mould as present?

That present conflicts set the pattern for the future is a seductive argument. Asymmetric effect, the 3- (or 4-) Block War, Fourth Generation Warfare, Hybrid Warfare: they all seem to argue that the future is more of the same. There is considerable evidence that can be marshalled to support such a line, but predicting the future is a risky business, and

in terms of Defence we face three particular challenges. First, we are effectively talking of the Nation's insurance policy, and we cannot afford to get this wrong. Second, there are no prizes for coming second in war! Third, and a point that Wg Cdr Miller rightly makes, with major pieces of military hardware lasting, from inception to retirement, in the region of half a century, we need to be careful with our wishes.

In particular, I believe that there are three reasons why we should be cautious about rushing too quickly into aligning our efforts too exclusively with the Counter-Insurgency (COIN) school of warfare as the only model for the future. My largest and most immediate concern is the threat that WME, and in particular nuclear weapons, represents. To counter such a threat we need credible and capable forces, including (one could argue especially as we offer a uniquely rapid response capability) Airpower. We must be capable of deterring, intervening and denying the threat that the proliferation of WME represents, and an air force that is configured too much towards undertaking predominantly COIN tasks may be poorly placed to undertake more demanding and high-end missions. Second, while the threat of state-on-state warfare as we recognise

it from the Twentieth Century may have receded, certainly in western Europe, all the growing threats that Wg Cdr Miller highlights from the Development Concepts and Doctrine Centre's (DCDC's) Strategic Trends work (such as globalisation, population growth and energy challenges) suggest increasing competition for resources. While we may not be called upon to fight for access to resources in a manner conventionally understood, and may not be challenged by what we currently recognise as a state (albeit we could be challenged by an actor with state-like properties, including the means and will to use violence for political ends), nevertheless if we need to defend our interests at range from the UK home base – be that for safe passage of goods or access to raw materials – we must have an air force that can undertake a wider range of roles, at distance and probably in heavily contested airspace; an air force more capable than one overly configured to COIN (demanding a role though that is). Finally, Wg Cdr Miller highlights how we are increasingly facing an asymmetric threat where technology is levered against us. I would contend, however, that there is nothing new in this (using trumpets to level the walls of Jericho was a devastatingly asymmetric effect) so let us be careful about drawing too many lessons from this facet of our opponent's adaptability.

So, while I support much of Wg Cdr Miller's analysis, I am uneasy with her suggestion that 'more low-end platforms' is the preferred direction of travel. While we must be aware of resource constraint and not "cry wolf", we should equally be ready to

argue forcibly that if history teaches us nothing else about the character of conflict, it is that the last and the present wars are more unlikely than likely to be the same as the next. The Royal Air Force only just got it right in the 1930s when there was what we can now recognise as clear indicators and warnings, but with ever-longer lead-in times to procure the latest equipment, can we afford the risk that an over-concentration on *the* war rather than *a* war might represent?

Gp Capt Ian Shields
Assistant Head, Air and Space,
DCDC

Letters

Finding time for Fun

Reviewed by Air Commodore Alistair Monkman

Some years ago, I as a TGRF Sqn Cdr - along with all my contemporaries - attended a Strike Command Conference to discuss and debate the issues of the day as seen from our collective perspective. Whilst the agenda quickly homed in on the usual suspects: operations, risk, resources, structures etc, after a few hours, most in the room were broadly aware that the debate had become somewhat overly clinical, conceptual and business orientated and was ignoring the moral component which is so intrinsic to our military way of life. In a courageous attempt to redress the balance and place morale back on the agenda, one brave soul stuck up his hand and ventured the proposition that what was increasingly missing was, quite simply, the fun element. Succinctly put, our people were becoming tired, parochial and overly task orientated and, as a consequence, needed some form of recurring 'decompression' to reset the work/life balance and add back that 'sparkle' into their lives.

The top down response was swift and chillingly negative, postulating that we were far too busy to consider having fun, that fun and an operational focus in a climate of scarce resources were mutually exclusive and that such frivolities were not the business of serious commanders. Indeed, 'having

fun' was an irrelevant distraction that we could - and should - be above, and our people similarly do without. Moreover, any attempt to engage in 'fun' was a quasi-fraudulent abuse of our resources and above all a diversion from our core responsibilities as frontline commanders.

Now, I may be being slightly unfair in my recollection of events but I do clearly recall the electric shock of disagreement - followed by the smoulderingly visceral undercurrent of opinion that we were 'on the wrong track' - which followed this very visible 'shooting down' of an attempt to put fun into its proper perspective. Fortunately, things have changed dramatically over the last few years and Commanders at all levels are now charged with achieving an appropriate balance; we have overseen a veritable explosion in Force Development initiatives and a powerful resurgence of sport, AT and people-broadening learning activities.

This is as it should be - but I sense that we have still not yet fully justified precisely why this is so important and why we must factor fun into decision-making at all levels. The need to have fun is an emotionally charged and seemingly obvious and intuitively human response to the stresses and strains of busy lives but it needs a degree of objective

analysis if it is to secure its strategic foothold in our vision of who we are and what we stand for. Otherwise, there is a very real danger that as technology allows us to work ever harder (witness the 24/7 'on call' Blackberry wielding executive as the modern commercial role model), and as we become ever more connected to external organisations with enormous capacities - and demands - for ever more comprehensive and multi-disciplinary engagement (UN, USAF, EU etc) then - in a 'time is money' world, fun will yet again be relegated to an unfunded aspiration against which we can take increasing risk. Where 'fun' sits amongst our many priorities is a debate we have yet to fully bottom out (and now may not be the time) but from my perspective as a recent stn cdr, 'fun' certainly sits on a par with 'quality' and it spoke to all the issues in my in-tray: change, building capacity, recruitment, retention and engagement. Therefore, I hope that this brief foray into fun fuels a wider and more informed debate.

I believe that the propensity to have fun - to 'work hard and play hard' - is a defining element of our military credo. This has always been so but is of particular significance today as we struggle to recruit from a limited labour market beset with competitors offering more money for less risk or disturbance. It is certainly one of the core - almost a defining - attributes governing how we are perceived by society at large. And this really shouldn't come as a big surprise: we are all positively selected from the gene pool of potential recruits for, amongst other factors, a willingness to engage broadly (mentally and physically), to

respond to and enjoy opportunities for travel and 'adventure' and to seek out excitement, risk and personal challenge. Thus we are identified, conditioned and then stimulated in such a way as to need and respond positively to fun (or so my doctor wife informs me...)! Even a cursory check of our military mantras reveals how much fun is a fundamental part of what we believe in. How many times have we heard quoted, at all levels, such truisms as 'nobody likes to work for a miserable so and so' or 'I'll keep on going in the Service until it stops being fun'.

But what is fun and how can we measure it? Fun is an intrinsic part of what we do and was acknowledged as one of my Stn's 3 priorities along with support to operations and training/personal development. It should be as much about how we do our business as what we do. It is not only retention positive, it is vital to our people's welfare and well being, particularly during a period of high operational tempo. Without turning this into a pseudo-scientific treatise, I volunteer that fun might be viewed as having 3 different but related elements. Firstly there are those activities we individually enjoy and which put a smile on our faces. Clearly these are personality and contextually dependent but whether playing golf, in pantomime, paint-balling or pig-sticking, all act to re-charge and re-energise mind and body alike, and most are social activities which are best enjoyed in the company of like-minded individuals. Secondly, work itself can be fun if the vision is well articulated, the task is achievable, the infrastructure and tools fit for purpose, people perceive themselves

to be well led and suitably rewarded and a culture of learning, devolved responsibility and innovation is carefully fostered. If the second element is nurtured and supported, then people will pass the acid test and look forward to going to work on Monday - even after a weekend of having fun with the family! Thirdly, there is that element of fun which is derived from exposure to novel and often demanding circumstances. It derives from the euphoria experienced after expanding our own personal envelope, successfully tackling difficult issues or achieving results in the face of complexity, ambiguity, uncertainty or danger. Here lies the sense of having 'grown'; we all tend to enjoy what we are good at but we often find even more satisfaction in discovering a new talent or overcoming an old weakness. All 3 elements of fun appear to me to have certain characteristics in common. Fun will always be bespoke to the situation and personalities involved - but it does have enduring themes. There is a real human need for fun: it is an essential trace element of life and not simply a desirable HR input. Its successful injection is immediately apparent, offering instant improvement, benefits and feedback. It is also incredibly infectious and, as a vital force multiplier, it speaks to the core of what really motivates people, both as individuals and within teams. It overcomes prejudices, enlarges perspectives, enables people to go the extra mile and is an extremely powerful bonding/ team building agent. Short term gains aside, it must have longer term beneficial effects in terms of stress relief, building resilience, aiding

recuperation and, from my personal experience of watching our war-damaged people, it can definitely assist in any healing process. Akin to morale, just because it isn't there doesn't mean it is not needed, and people will search elsewhere for fun if the Service fails to provide the required format and dosage. Most people find fun in sports and hobbies and it is interesting to note how, whilst our Stn's Clubs are for the most part still thriving, they are often populated by our more mature personnel. How many of us have bemoaned the younger generations apparent fixation on 36" LCD TVs and unwillingness to participate in Station clubs - only to be equally astounded as to how well they perform under stress on exercises and operations. Their need for fun is as strong as ever but we may not be offering the appropriate outlets. I have a gut but unquantifiable hunch that our younger Servicemen and women are increasingly turning away from seeing the Service as a source of relevant fun and are looking elsewhere to fuel their needs.

So where does that leave us as leaders keen to avoid being labelled as the 'fun police' by those we seek to engage! Well, the first point is to recognise that there is a huge demand for fun within our Service. It has been perceived by those we lead, until recently, to be a seriously neglected area - especially amongst those who have been around long enough to witness the erosion of previously acceptable levels of fun as our numbers have declined, working practices leaned and increased operational demands taking its toll. Secondly we cannot take a gamble on ignoring the need for fun; we

can take calculated risks (cognisant of the relevant opportunity costs and consequences) - much as we do for stocks or flying hours - but, like training, standards and practices, if we ignore the need for fun, we do so at our peril. Thirdly there is a perception that the RAF, in embracing technology and business practices to the degree we have, is becoming relatively more 'fun un-friendly' than our sister Services. Fourthly, the solution lies, not in defining processes and procedures - nor via pamphlets, scorecards or in designing Station 'fun-o-meters' - but in discretely setting the conditions for success and giving fun the priority it needs. Fun needs to be subtly re-authorised as an appropriate military activity and viewed as an acceptable norm rather than a frivolous activity undertaken by those with spare time on their hands. This will entail allocating a percentage of our overall effort and energy into fun-related activities - we will need to apportion time for fun if we are to counter the common perception that fun and work are part of a zero sum calculation in which work is afforded the status of an ever-increasing constant.

Finding time for fun will make our people more agile, fitter and better motivated. Fun is a critical strength and weakness of our tactical centre of gravity at the Force Commander level: the morale of our personnel. Beyond that, it has the power to strategically influence and/or shock the system through manning levels and recruitment and retention rates if not taken seriously. As a basic human need, fun is directly proportional to activity levels: the harder you work, the more critical becomes the requirement for fun.

Although it appears that it can be deferred in times of high op tempo, we must ensure that we appropriately 'down-gear' on return from ops to enable its resumption.

Ultimately, having fun is as much a fundamental part of the moral component of war fighting as effective leadership, morale, training and education. Fun bonds, energises and enables our people - and our current ability (or inability?) to recognise its worth and shape its engagement will be, ultimately, one of the determining factors in securing the future success and existence of our Service. We do not own the monopoly on fun and many other organisations are actively plagiarising those very elements of fun which once made the military such an attractive employment opportunity. It would be unutterably tragic if our once greatest asset assisted our nemesis.

This image shows a full page of blank, lined paper. It features approximately 20 horizontal blue lines spaced evenly across the page, typical of standard notebook paper. The lines are thin and light blue, set against a plain white background. There are no margins, text, or other markings on the page.

This image shows a single page of white paper with horizontal blue lines. The lines are evenly spaced and run across the width of the page, typical of notebook or ledger paper. There are no margins, text, or other markings on the page.

This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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