Soldiers are from Mars and airmen are from Venus: Does air power do what it says on the tin?

By Air Cdre Paul Colley

In a speech to the RUSI Air Power Conference in May 2008, Lieutenant General Graham Lamb[1] made an amusing observation about the planetary origins of soldiers and airmen. It preceded a serious point; that diverse cultures, ethos and perspectives are a source of both strength and friction. No serious soldier would deny the value of mobility and lift or surveillance and reconnaissance, but the wider utility of air power in irregular warfare is less obviously clear. The current air power expression of characteristics and roles work well enough for conventional operations, but says too much about *how air power works* and has lost the clarity of *what air power actually does*. This paper outlines the philosophy behind doctrine emerging from the Development, Concepts and Doctrine Centre for air-land operations. It proposes a new definition for and expression of air power, articulates a theory of coercion and develops principles for air-land operations.

THE SHIFTING BALANCE OF CONVENTIONAL COMBAT POWER

The character of warfare is changing, due in part to the overwhelming conventional combat power developed by Western nations in general and the US in particular. Adversaries respond with irregular warfare, including insurgency, disorder, criminal activity and terrorism. They also use irregular and conventional tactics to create hybrid warfare, like that used by Hezbollah in 2006. Tactical engagements are often among populations and increasingly in the urban environment, where situational *awareness* is no longer enough to support complex operations. Commander of the Field Army believes that we need situational *understanding*. The motivations and fears of all actors are as important in irregular warfare as awareness of enemy force dispositions and intentions.

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The historic role of land forces has been to close with and engage the enemy and to take and hold ground. For maximum effectiveness of land forces in major combat operations, land commanders have traditionally demanded expansive areas of operation. In post-Cold War combat operations, there has been a shift in the relative roles of ground and air combat power. In conventional operations, all-weather precision air attack can now decisively shape the operational level of warfare. Land power exploits air power's operational effects and dominates at the tactical level because, despite huge improvements in intelligence, surveillance and reconnaissance, uncertainty reigns in close combat. Even with advances in sensor technology and improvements in command and control for time sensitive targeting, the majority of air systems are not optimised to find, track and engage fleeting targets amongst wider populations. In 2006, Hezbollah inflicted

an unprecedented strategic failure on Israel. The Israeli Air Force successfully completed its tasks in the 2006 war and with considerable tactical skill, but failed to deliver the anticipated operational or strategic success through an air campaign. When combined with political indecision, it led to strategic failure.

As the levels of warfare blur, so too have the air power roles. Many targets formerly associated only with the tactical level of warfare now have direct links to the strategic level. For example, precision air attack in Iraq and Afghanistan in 2008 is confined to well-controlled tactical battle space and against very limited target sets. Yet its significant tactical effects strongly resonate – for better or worse – within local populations, which are invariably strategic centres of gravity that are highly sensitive to the asymmetric application of force. Air power promises direct attack of strategic targets and low risk of friendly casualties, but stand-off through technology can be perceived as a blunt instrument for a hearts and minds campaign. Although there is a place for discrete air attack of strategic targets, air capabilities will be over-sold and underemployed if the difference in air power utility for conventional combat operations and irregular warfare is misunderstood.

Land power will normally determine the enduring outcome of conflict, even where air or sea power is the decisive instrument. Armies' traditional strengths have been the ability, by threat, force or occupation, to gain, sustain and exploit control over land, resources and people. Fixed wing air power is more flexible than long-range precision artillery or attack helicopters, because airmen can switch between targets at relatively short notice across an entire theatre of operations. However, with relatively small numbers of aircraft now serving multiple theatres of operation, some land commanders have concerns about the assured delivery of air effects. Much contemporary land warfare is relatively static, especially in urban areas. With organic accurate direct and indirect fire support, some soldiers question the relevance of using heavy air weapons in towns and cities. Even where ground commanders need air power, it can be resource-intensive to coordinate. Yet organic indirect fire support is relatively inflexible where the theatre of operations is expansive and the density of friendly forces low. Attack helicopters are also vulnerable to small arms. However, there is capability still to be unlocked at the seam between air and land power, not through technical and tactical interoperability, where we are investing well in equipment and training, but by better understanding how air power might achieve or support decisive conditions, particularly in irregular and hybrid warfare. The real advantage of surface capability enhanced by air power (and vice versa) is more profound than a simplistic supported or supporting relationship.

A LITTLE BIT OF HOW AIR POWER WORKS

It is worth reflecting briefly on some aspects of how air power works, starting with air strategy. A combined air operations centre is optimised for high volume tasking and large scale mechanical integration of plans. In conventional operations, a strategic air planning process drives it, but current warfare is dominated by constant requests for tactical air support from multiple theatres of operation. This makes strategy difficult, because

adversaries are adapting their tactics so quickly in theatre that only a local headquarters has the ability to sense and respond in context. There may be unifying themes across multiple theatres of operation, for example international terrorism. However, there can be no meaningful unified air strategy to address operations as disparate as those in Iraq, Afghanistan and the Horn of Africa. Air strategies are in reality being driven from within the specific theatres of operations.

History has consistently demonstrated the value of collocated headquarters. The Montgomery-Tedder combination in the North African campaign is widely referenced as a strong catalyst for enduring doctrine. Collocation resolves tension, exploits the strengths of different perspectives and better overcomes the naturally dissimilar tempos of air and land planning cycles. Commanders should position land and air component headquarters together or within easy reach *wherever possible*. The doctrine needs judgement in its application. Where headquarters cannot be collocated, the planning effort must be, using mobile planning teams for *deliberate planning*. Embedding expert and well-trained detachments of land and air staffs in counterpart headquarters is vital when headquarters are geographically separated. The air staffs in land headquarters enable *rapid planning*. The commanders who donate liaison officers to other headquarters must make clear to what extent their charges are empowered to commit resources and take decisions. The structures and processes to achieve this are within current air doctrine.

The UK philosophy of command promotes decentralisation for speed of action and initiative. Commanders ensure that subordinates understand intent and then exercise a minimum of control over them, commensurate with experience and ability. Upholding the philosophy is difficult for an air commander in widely dispersed coalition operations, yet the imperative for decentralisation was rarely greater than now. The cardinal air control principle of *centralised control and decentralised execution* is valid. However, in irregular warfare or even conventional operations unfolding at pace, commanders who fail to emphasise the primacy of *decentralised execution* – and to adapt structure and process accordingly – risk inviting adversaries to operate inside coalition decision cycles. Decentralisation is the only way to achieve responsiveness compatible with the character of dispersed operations and irregular warfare. Some scarce high value air assets, such as intelligence platforms and air refuelling aircraft must be centrally controlled, because demand will always outstrip supply. But if airmen do not sensibly interpret the air command and control mantra, ground forces will lack the assurance that they seek and naturally argue for organic air support. The paper now articulates the essentials of air power in a contemporary context, so that airmen can more safely 'under-promise and over-deliver' and so that soldiers can better appreciate how to integrate air operations into planning at all levels.

THE UTILITY OF AIR POWER

All military strategies except total destruction seek to influence the behaviour of people. Influence is invariably an ultimate goal at the strategic level of warfare, but it also has utility at the tactical level

of all contemporary warfare. An understanding of coercion is therefore vital, because without mastery of coercion, there is no mastery of warfare; coercion is central to the threat or use of all military force and crucial for developing contemporary air power strategies. To coerce is to '*persuade an unwilling person to do something by using force or threats*'[2] and it is closely linked to deterrence. Air power's current definition may be outdated. The new one proposed below embraces the primacy of influence in air strategy and the paper subsequently describes a theory of coercion.

Air power is the ability to project power from the air in order to influence the behaviour of people or the course of events.

Airmen are well versed in air power characteristics and the Future Air and Space Operational Concept describes Core Air and Space Power Roles. These remain useful, but tend to say as much about *how air power works as what it can do*. This paper will express what air power can do, cast as four fundamental roles within the Joint Action doctrinal framework. The framework helps visualise the proper relationship between manoeuvre, fires and influence, which is central to coercive strategy. Joint Action is *the deliberate use and orchestration of the full range of available military capabilities and activities to realise effects.*[3]

Air power achieves influence in many ways, from promoting international relations to managing crises. When engaged in combat, shattering an opponent's cohesion and breaking his will have their roots in doctrine for conventional combat operations, where they remain valid. However, the emphasis in irregular warfare is more often on discrete application of force to support a broader influence campaign. The evolution of planning at the strategic and operational levels of warfare (and recent experience at the tactical level) supports a shift away from pure destruction of an enemy's fighting power. Where information operations once supported combat operations, influence can dominate the contemporary approach and it requires a more subtle and nuanced application of fires, influence and manoeuvre. Air power delivers most fires through precision attack. However, it also has non-lethal capabilities. When properly integrated and synchronised into an overall scheme of manoeuvre, fires achieve influence and the bridge between the two is most often achieved by understanding the theory and practise of coercion.

Fast jets are well suited to rapid manoeuvre and surprise. Helicopters and larger fixed wing aircraft also move at pace and significantly enhance ground manoeuvre. However, air power's greatest contribution to freedom of air and ground manoeuvre is through control of the air. Two air power capabilities are crucial for Joint operations, but not proposed as air power roles, because they are enablers and not outputs. Those capabilities are position, navigation and timing, and air command and control. Both enable battle space management. The US Global Positioning System invariably provides position, navigation and timing and, although vital for many battle space functions, including the synchronisation of communication networks, it is transparent to most users. Air command and control has a major bearing on the effectiveness of air power

and is complex, particularly in coalition operations. It is therefore described later in the paper. However, what air power actually does can be boiled down to four fundamental roles: Control of the Air; Rapid Mobility and Lift; Intelligence and Situational Awareness; and Coercion.

ROLE 1: CONTROL OF THE AIR

If we lose the war in the air, we lose the war, and we lose it very quickly.[4]

Without control of the air, operational success is fatally compromised. Control of the Air enables freedom of air and surface manoeuvre and therefore the ability of commanders to retain the initiative. Control of the skies above Northern and Southern Iraq for a period of 11 years denied Iraq much freedom of surface manoeuvre by containing air threats and an integrated air defence system. It also paved the way for lower risk major combat operations in 2003. As a result, coalition soldiers did not look up at the sky in dread in the way that those who they fought did. Even where air threats are largely absent as a result of successful air control operations, control still allows the successful integration of military and civil air into Joint, multinational and inter-agency plans. The active control of military airspace above Fallujah in 2004, to enable high tempo air support to ground urban combat operations, and of the airspace above Baghdad and Basra in 2008, to integrate military and civil air operations, was underpinned by air control capabilities. It is rarely possible to achieve complete control of the air; although fixed wing aircraft may often enjoy considerable freedom from most threats after successful counter-air operations, adversaries invariably contest the lower airspace with man-portable missiles and small arms. Rotary and large fixed wing aircraft are particularly vulnerable to such threats. Air control operations are highly specialised and tactical doctrine best describes how it is done. Operational level Joint doctrine simply makes the point that air control is an absolute pre-requisite for Joint operations.

ROLE 2: RAPID MOBILITY AND LIFT

Air mobility and lift enable the global, regional and local deployment of people and materiel. With acknowledged limitations in payload compared with surface lift, it is nevertheless a fast way to deploy and sustain forces. Like air control, mobility and lift is a fundamental enabler of surface manoeuvre. It has particular utility for light and special forces and is vital for casualty evacuation from austere locations. Where risks to life in combat are high, intra- and inter-theatre air mobility strongly underpins the moral component of fighting power; it is often the only way to get wounded soldiers to specialist medical support quickly. In 2007, there were over 40,000 tactical airlift sorties flown in Iraq. In Afghanistan, there were over 10,000 tactical airlift sorties and more than 500 air drops. Air lift can be used for discrete disaster relief operations, but has also successfully been used to achieve other positive influence within local populations, for example by supporting development projects and evacuating local casualties to medical facilities.

Large fixed wing aircraft like the C-17A Globemaster and C-130J Hercules are capable of both inter- and intra-theatre lift. A C17A can deploy from the UK to areas of operation in days or even hours. A C130J can reach from its forward

operating bases to typical areas of operation in hours or even minutes. Whilst operations in and out of main

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operating bases allow maximum effectiveness for handling large numbers of people and high volumes of materiel, even the largest fixed wing transport aircraft can operate independently of main operating bases where the need is urgent and the ground threat manageable. All air transport aircraft are vulnerable to ground fire, including small arms, particularly when at lower speeds and operating close to or on the ground. Where threats to surface movement are high, for example through improvised explosive devices, tactical fixed wing aircraft can re-supply ground forces at lower risk than ground convoys by using precision air drop.

Precision air drop
In 2007, RAF C-130Js in Afghanistan conducted low altitude night missions to re-supply forward operating bases using an air dropped container delivery system. Between May and December 2007, crews delivered nearly 1000 containers containing 800 tons of food, water, ammunition, fuel, generators and even power plants for CVRT fighting vehicles. The C-130J will soon be capable of precision air drop from even greater height, further improving its survivability and utility by allowing precision daylight delivery of materiel over hostile areas.

Helicopters like the Chinook HC2 and Merlin HC3 are the tactical mobility workhorses. Typically operating at lower heights and speeds than fixed wing aircraft, they nevertheless enable rapid tactical movement of people and materiel. They are fundamental enablers of ground manoeuvre and surprise, allowing troops to circumvent difficult terrain and to bypass ground threats to troop movement and re-supply. Helicopters are invariably in great demand and often in short supply.

Rotary wing aircraft – tactical workhorses
In June 2007, the crew of a Merlin HC3 extracted a seriously wounded soldier from Basra at night under sustained small arms fire. It was assessed that, without the rapid insertion of the Immediate Response Team, the soldier would have died within 15 minutes.

In one month early in 2008, Joint Helicopter Force (Afghanistan) helicopters flew 293,000kg of cargo and over 6000 troops within its Area of Operations. Helicopters supported Immediate Response Teams and High Readiness Forces 24hrs a day and were on standby for casualty evacuation and the Quick Reaction Force to support Troops in Contact.

ROLE 3: INTELLIGENCE AND SITUATIONAL AWARENESS
Contemporary operations place an ever-increasing emphasis on the weight of effort dedicated to the find

function. Even with a good capability to direct, collect, process and disseminate information, there are limitations to what air and space systems can *find*. However, air power contributes enormously and, with current systems, including long endurance unmanned air vehicles, provides an almost *unblinking eye*, albeit sometimes with high resolution and narrow fields of view. Video and other forms of air-derived information have proved to be crucial enablers for irregular warfare. However, staff at all levels must integrate air *and* surface inputs to promote situational *understanding*. Because much information is time sensitive, a cardinal principle is to integrate information at the lowest practical level of command. The finest granularity and texture of information often comes from the ground; this is what tends to unlock the pathways from awareness of something happening to understanding what it means.

The airman's vantage allows sensors to provide an almost unhindered view across the electromagnetic spectrum. Air and space sensors can detect and identify innumerable objects, including individual people. They can map terrain, infrastructure and even patterns of behaviour, routinely penetrating poor weather and overcoming concealment techniques. Sensors also intercept other signals, which help build the intelligence picture. However, it is difficult to plumb the depths of strategic nuance and tactical complexity from the air. Finding some things is quite simply a job for boots on the ground rather than eyes in the sky, because the best sensor is often the person familiar with the physical and social terrain. Otherwise, imagery and signals create an illusion that you understand what is going on. Air intelligence, surveillance and reconnaissance provide situational awareness, whether for operational level commanders taking a theatre-wide perspective or individual soldiers exploiting live intelligence feeds. Because land warfare remains fundamentally uncertain due to the human, psychological, political and cultural dimensions of conflict, air technology will not lift the fog of warfare. Nevertheless, several thousands of intelligence, surveillance and reconnaissance sorties flown in Iraq and Afghanistan indicate the priority that commanders are now placing on the *find* function of contemporary warfare; and on the part that air power plays. The essence of good surveillance is to provide both broad context and detailed information. Airmen can provide a measure of both, but land and air sources must be closely integrated to build understanding from awareness.

The limitations of surveillance – Operation ANACONDA

In 2002, commanders in Afghanistan planned an attack against a concentration of Taliban in the Shah-i-Kot valley. Intelligence preparation was extensive and focused considerable surveillance effort (most of it from air and space) on a relatively small target area. Yet US infantry made the initial assault by air almost directly on top of undetected enemy positions. Soldiers came under immediate fire from small arms, mortars, rocket-propelled grenades and machine guns as their helicopters landed. Attack helicopters providing direct fire support were hit and rendered inoperable. Units were pinned down by enemy fire and many of the wounded could not be extracted until the following night. As the fight developed, it became clear that a large number of the enemy positions and hundreds of al-Qaeda fighters had gone undetected.

ROLE 4: COERCION

Air power's reach is measured in hundreds or even thousands of miles and responsive precision attack at range is one of air power's greatest strengths. It provides an ability to coerce an adversary by holding him at continuous risk. The capability to attack at will supports the credibility of diplomatic warning and military signalling, including operational and tactical non-kinetic shows of force. If force is used, it too can be graduated and the ability to escalate is an important part of coercive strategies. Commanders can use precision attack to deter opponents and if necessary destroy capabilities, punish adversaries or deny courses of action. However, the ultimate goal at the strategic level of warfare is invariably to influence somebody, therefore precision attack is a means to an end.

Coercion underpinned by precision attack can be used at the strategic, operational or tactical levels of warfare, but it no longer helps to define air roles associated only with one level of warfare. Air platforms are extremely flexible and the levels of warfare are so blurred in contemporary operations that artificial boundaries undermine the essential clarity of air power's coercive capability; the notion that particular aircraft have only strategic or tactical roles inhibits creative thinking. For example, large fixed wing bombers designed for strategic attack are equally capable of tactical close air support if integrated with surface forces. Conversely, short range tactical aircraft are capable of achieving strategic effect; it is the context in which they are used and how that matters. It is therefore better to accept that coercion is almost unlimited in its flexibility, because aircraft can attack an enormous range of mobile and static targets across multiple theatres of operation.

Precision air attack is so effective against conventional forces that it can be used in preference to land force-on-force engagements. In 2003, of nearly 20,000 targets hit during combat operations in Iraq, over 15,000 in the close battle were by air power. The percentage of air sorties flown in support of land increased from 55% in the first Gulf War to 78% in the second. Direct attack of land forces by air reduces friendly casualties. Because attack helicopters in general and land-based tactical missile systems in particular have not proven as effective as fixed-wing aircraft in conducting deep operations, air component commanders should be *supported* where there are opportunities to attack lucrative conventional target sets. In these circumstances, Joint commanders can use land forces to manoeuvre against and fix enemy ground forces (and provide targeting support) so that air power can attack before land forces close to contact. This idea tends to draw a familiar response from advocates of traditional land warfare, but if we do not grip this idea, we will miss future opportunities to shatter an opponent's cohesion in conventional warfare. It needs a change of mind set and a more serious progression of the old debate about which commanders control fire support coordination lines and where they are placed. It may also need some decent investment in friendly force tracking capabilities.

Planners should exploit air power's speed and reach to create an emphasis on deep attack and interdiction wherever possible, attacking and disrupting enemy forces before they

can engage in close combat. These are typically *denial* strategies, seeking to physically reduce the enemy's ability to continue successfully or making his ultimate objectives unachievable. However, adversaries sometimes deliberately seek to engage in direct combat in order to create casualties and undermine political or public will. In the event that a land battle unfolds, land forces can of course exploit air power in the close battle by using traditional counter-land procedures, such as air interdiction and close air support.

In irregular warfare, particularly when an adversary chooses to fight in the urban environment, collateral damage and unintended effects are more likely. The more precise our weapons become, the higher the expectation of no collateral damage. Air power can execute so-called 'surgical strikes', but even a surgeon's knife lets blood and creates scars. Proportionate air attacks are too often perceived as delivering brute force. Absent the means to defend against or respond to air attack, adversaries will use information strategies to project an image that asymmetry is a cruel overmatch. Although our adversaries create unhelpful media profiles when air weapons cause casualties, airmen are creating a small proportion of civilian casualties in contemporary warfare. This is arguably due to two factors: firstly, the standards of precision now possible; and secondly, the depth of education and training required to operate a combat aircraft. Like soldiers, aircrews are subject to considerable pressure in combat, but airmen often have a *useful detachment* from the intensity of ground combat and can more easily exercise discretion of weapon release. This is not to suggest that soldiers exercise less discretion, but the pressures and perspectives are very different; height and speed buy fast jet crews thinking time and they can be relied upon in contemporary operations for deliberate *no drop* decisions as much as their ability to hit the right targets. Therefore, air weapons have undoubted utility for irregular warfare, but planners and operators should not underestimate the potential for unintended psychological effects on the population, whose trust we seek to maintain when targets are in and among the local population. Technology may deliver ever-greater precision and control of direct effects, but the expectation of no collateral damage will increase in direct proportion to any new standards set. Nevertheless, coercion through precision air attack will continue to be one of the greatest asymmetric capabilities for surface commanders to exploit.

Urban and human terrain are vital ground in irregular warfare and the majority view is that there are fundamental differences between flying urban missions and those flown in other environments. The use of air power in urban operations is a big challenge, even where there are limited enemy air defences and no enemy aircraft. High density of friendly aircraft over an area of interest, such as operations over Fallujah in November 2004, requires intensive planning and coordination.

It can be hard for an inbound attack pilot to build situational awareness and there can be a drastic difference in perspective between those on the ground and those in the air.

The speed, operating height and turning circles of fast jets make it harder for aircrews to provide

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actionable information to ground units in urban operations; even with the most capable targeting pods, crews can struggle to assist in the pursuit of some mobile targets. One pilot in Iraq described tracking non-distinct vehicles in urban areas as the hardest thing he had ever done. However, a soldier sometimes needs to know only what is on the other side of a wall or round the next block and aerial surveillance can be invaluable. Helicopters have excellent observation and tracking capabilities, but are vulnerable to small arms, particularly in daylight, as operations over Mogadishu, Iraq and Afghanistan have all demonstrated. However, attack helicopters have sensors and weapons that allow increased standoff and can increase survivability by operating from higher altitudes. The US AC-130 gunship can provide excellent close air support capabilities and often operates at night to increase its survivability.

The Spectre AC-130 Gunship

In the history of the 1st Battalion, Princess of Wales's Royal Regiment (PWRR) in Maysan province in Iraq, Richard Holmes noted that: '[The AC-130] effect on morale was palpable…some of the 1 PWRR's soldiers undoubtedly owe their lives to the ability of Spectre crews to understand the ground battle and weigh in with super-accurate fire at midnight in a burning town'.[5]

Fast jet close air support in urban operations is feasible, but demanding, therefore crews must be well trained and familiar with the local urban terrain. The principles are thorough training and planning, common reference systems and execution at the lowest practical level of command. Weapons can be used with discretion to support troops in contact and aircraft can generate useful psychological effects.

Air/Land coordination in urban operations

Even with perfect procedures, the vast number of potential targets in urban areas makes air-land coordination of urban air attacks difficult. There were 800 building reference points for Fallujah in 2004, including separate designations for the four corners of some structures. This exceeded aircraft automated capacities for some aircraft, whose pilots had to use manual directories of designation codes.

There are non-lethal means for coercion, but techniques are classified and beyond the scope of this paper. However, air power's established reputation for reliable precision attack can be used to generate psychological effects. It can be

used for *shows of presence* and *shows of force*.

'Air power was of great value. One night we were [grabbing a suspect] and the streets cleared as we were driving out, which meant something was about to happen. I had two F-16s fly low right down the street [which created] a tremendous noise, and we had no problems'.[6]

Although there are limitations sustaining psychological effect, there is little doubt about the immediate impact. Similar effects have been noted from attack helicopters in all current theatres of operation. In one example, Apaches flew deliberately across a compound, imposing an instant ceasefire. They circled for forty minutes and when they broke away to refuel, firing began again almost immediately. There was a concurrent reassurance to the friendly soldier on the ground:

'So accustomed was I now to the sound of that aircraft and the implied power of its presence that I noticed instantly when it flew away. As so often during this confrontation, we were engaged almost immediately afterwards by machine-guns.[7]

The reader may at this stage be slightly clearer about what air power can do. Nesting the capabilities in a Joint Action framework helps forge the essential link between fires and influence. An essential tool for air strategists to achieve that link is the theory and practise of coercion.

THE THEORY AND PRACTICE OF COERCION[8]

Coercion is defined earlier in this paper and closely linked to deterrence. Deterrence seeks to *'discourage someone from doing something by instilling the fear of the consequences'.*[9] Thus, to coerce involves deterring people from or compelling them to do something. It depends not just on making an adversary's intended behaviour appear unappealing. It should also make what you *want* an adversary to do look more attractive. Rewards can work as well as threats. The two forms of coercion (deter and compel) resemble each other more than they differ, but a good strategist should pay attention to both and this requires an understanding of personal motivations. Coercion works at many levels and can include, for example, integrated sanctions and other political pressures. It involves graduated pressure and multiple approaches, therefore a comprehensive approach and the ability to escalate is important.

Air power can provide an impressive asymmetry of force and it is attractive in a low stakes contest, because it allows an attacker to escalate at small political cost, with lower risk of mass casualties and the possibility of avoiding ground invasion. Global reach and precise weapons endow air power with the potential to hold an adversary at continuous risk, and it is an unusually seductive form of military strength. Unfortunately, air power is not an omnipotent coercive instrument and the history of air power theory includes strategies built on flawed coercive mechanisms. In the past 20 years, nations have tried to decapitate or coerce rogue leaders with air power, but it was ineffective or backfired in many cases.[10] Decapitation of rogue leaders is one approach and can be a successful part of wider coercive strategies.[11] However, leaders can be replaced and martyrdom or revenge has consequences. Therefore, air power is best confined to 3 broad coercive strategies: destruction; punishment; and denial.

Destruction is a simple concept, but can be difficult if the goal is too ambitious, like completely eliminating an adversary's ability to fight. Coercion seeks to change the behaviour of an adversary and differs from force that is employed solely to destroy a target. At the tactical level of conventional warfare, force can predominate and the objective of attack is usually to destroy or incapacitate an enemy force. The link to changed behaviour is the contrast with typical strategic level objectives, where destruction is rarely the ultimate goal of armed force. There are exceptions to this, such as the 1981 Israeli Air Force attack against the Osirak nuclear reactor, but they are rare. When a state or coalition seeks to make an enemy surrender, it is engaged in coercion, because the goal is to compel the enemy to make a choice. Wars in which no surrender will be accepted do occur, but the military, political and social costs can be very high. Therefore, coercion usually seeks concessions well short of national surrender. However, where destruction is part of an overall coercive strategy, the role of precision air attack is clear. Destruction also has its place in irregular and hybrid warfare. However, what might be justified as acceptable collateral damage for military objectives in conventional warfare might have higher risk of alienating populations in irregular warfare, which could undermine strategic objectives.

Israeli destruction of nuclear capabilities

In 1981, 8 Israeli F-16 fighter-bombers and 2 F-15 fighters took off from a base in Egypt's Sinai Desert, which was occupied at the time by Israel. Their target was the Osirak nuclear reactor in Iraq. The mission flew unchallenged at low level through Jordanian, Saudi and Iraqi airspace. At 20Km from the target, the F-16 pilots climbed to height for the attack and released pairs of 1,000kg bombs at the target. The reactor was destroyed before it received its first load of nuclear fuel and never entered operational service. By dusk, all 10 aircraft returned unscathed.

In 2007, Israel launched a similar attack against what was believed to be a nuclear reactor under construction in Syria.

At the opposite end of the coercive spectrum lies punishment, the use of force to change an adversary's policy choice, but without affecting absolute capabilities. Examples include the US punitive air raids in 1986 against Libya and Israel's frequent retaliatory attacks against targets in Lebanon. Such attacks have no significant effect on the adversary's absolute capability to persist in their chosen courses of action, but if the punishment demonstrates political will and the coercer has the ability to escalate, punitive attacks can affect the enemy's will to persist. Where punishment strategies are used in irregular and hybrid warfare, they must be well integrated with information operations if the target audience is to understand both the message being sent and the required change of behaviour.

Punishment of Libya – Operation EL DORADO CANYON

In 1986, US Naval and Air Forces launched an operation to punish Libya for terrorist attacks. The raid was also designed to deter future behaviour. Targets included: barracks and terrorist headquarters in Tripoli and Benghazi; a naval commando school in Tripoli, where terrorists had trained; terrorist support facilities at Tripoli's main airport; and an airfield near Benghazi, which was a direct military threat to the operation.

Targets were attacked with a large air package, including USAF aircraft flown from the UK. The attack lasted less than 12 minutes, during which time aircraft dropped 60 tons of weapons and narrowly missed the Libyan leader. It may have precipitated the subsequent terrorist bombing of Pan Am Flight 103. However, the credible threat of follow-on attacks could have helped the subsequent international strategy that eventually changed Libya's behaviour.

Between the coercive extremes of destruction and punishment lies denial. Denial involves changing an adversary's behaviour by making the undesired course of action appear pointless, either through physically reducing the enemy's ability to continue successfully, or by persuading the enemy that it cannot succeed. It seeks to reduce options to a choice between submitting now or surrendering later. Denial has much in common with destruction; both seek to make the enemy's objectives unachievable. However, denial is coercive, for it targets the adversary's beliefs about the future and calls upon him to make a choice. The attacks mounted in a denial strategy may resemble those contained in destruction, since the best way to convince someone that defeat is inevitable is usually to make it so. However, a strategy to make an adversary surrender is likely to have significant differences from one to destroy an enemy outright. In conventional *and* irregular warfare against highly motivated and determined adversaries, air power has an asymmetric advantage. Where control of the air is assured, there can be few effective replies to air delivered weapons; insurgents cannot directly fight precision bombs. It is not be the fear of death that removes the will to fight in such cases, but the feeling of helplessness about the inevitability of it.

A good coercive strategy is one in which the target has no reasonable choice but to succumb, because it would be contrary to practical reason. Successful strategies are generally built on 3 principles or *the three Cs*: credibility; capability; and communication.

A threat will only carry weight to the extent that the adversary believes the coercer will carry it out. Whether the adversary's perception is correct is irrelevant; what matters is whether the threat is believed. Even small chances that a coercer will follow through a threat may be sufficient in some cases to carry considerable coercive weight. Severe threats are often more expensive to carry out, and thus can be less credible than milder ones. Because credibility is so central to coercion, but can often be quite difficult to establish, it demands considerable thought on the part of strategists.

Capability is an often-neglected part of coercion. If the adversary does not believe that the coercer has the ability to carry out a threat, it is worthless, even if the coercer's will to try is not in doubt. Although linked with credibility, capability can draw less attention in coercive strategies where asymmetry of force exists in favour of the attacker. However, capability can be problematic, even for powerful nations. Israel, the most powerful military nation in the Middle East, arguably had to recover both its capability (for conventional land operations) and its credibility (for coercion of irregular and hybrid threats) after the 2006 war in Lebanon.

Threats must be communicated to be effective, which is challenging if

the messages are complex. This is particularly so if the coercer wishes to send threats through actions rather than words, for example by demonstrations of force. Even words can be difficult where there are cultural barriers, including language, to overcome. We often judge actions and words from our own cultural perspective and may take it for granted that what we *mean* to convey is easily translated. This can be mitigated by education, training and cultural empathy, but never eliminated. It is equally critical to communicate what will happen if the adversary *does* accede to the coercer's demands. Threats of harm must be communicated as conditional on the target's behaviour, if they are to encourage compliance. There is evidence that non-lethal posturing of attack aircraft can communicate intent and influence behaviour (see the psychological effects of air power above). However, there is no substitute for the effectiveness of face-to-face communication with all of its non-verbal subtleties.

Coercion theory assumes some rationality in behaviour. Behaviour can fall short of rational for many reasons, for example tribal or ethnic interest groups pursuing parochial instead of national interests, inefficient government bureaucracies and imperfect communication, which can make coercion more difficult. However, truly irrational behaviour, which should not be confused with people rationally pursuing objectives that seem senseless to others, is rare. A factor that profoundly shapes the success and failure of coercion is the interests at stake. Almost nothing will persuade most states to sacrifice their sovereignty or national survival, yet even very limited pressure may be enough to coerce an adversary to give up something trivial. Some insurgents in Iraq had lost power and privileges to the extent that the stakes for them had become incredibly high.

Air strategists should not be seduced by a quest for critical or panacea target sets, the destruction of which they believe will unhinge the adversary's will or ability to resist. Opportunities do exist to achieve physical and coercive effects that are out of proportion to the modest effort required for attacks, but identifying these requires a depth of analysis that may not be possible in the time available. Moreover, coercive mechanisms usually include assumptions about follow-on effects, but despite efforts to achieve strategic insight, strategists will rarely fully appreciate how an adversary makes policy decisions, or how an economy, society or individual and collective psychology of enemy leaders and citizens works. Trying to understand an adversary is right, but trying to scientifically model behaviour and the effects of air power applied against key nodes is folly. An effects based approach can be applied, but it can only be taken so far. *A good strategy is agile*, where the best assessment is made in the time available, where people are willing learn and where strategies are built on anticipated first and second order effects only. The ability to sense and respond to what then unfolds becomes crucial. Only then can coercive strategists adapt, learn, gain deeper insights into their adversaries, and retain the initiative. It is a question of balance; failing to inflict the damage called for by the initial strategy, or abandoning a sound strategy before it has time to work are problems that an astute strategist considers. 'Select and maintain the aim' will always

be apposite, but allegiances shift, centres of gravity change and desired end states must sometimes morph.

Coercion is usually competitive. It is the party with the greater will to win relative to the pressure being applied against it that should prevail. The logic of coercion indicates that success is most likely when: the expected net costs of resistance are high; when the costs of compliance appear low; and when there is little or no prospect that resisting will lead to a result that would be better than complying. In each case, the effectiveness of communication and the perception of the coerced party is vital ground. Strategists should focus not on the targets to be attacked, but on the coercive mechanism that they expect will lead to the objective. A coercive target set is only as important as the chain of events that attacking it will trigger, so what to attack should be decided only after the strategist knows why to attack it. Many states (and non-state actors) have an underestimated capacity for adaptation. As a rule of thumb, coercion has a good chance of succeeding if the coercer can bring about four related conditions. First, the enemy should believe that victory is impossible, because even a slim hope of eventual success may be sufficient motivation to hold out against great coercive pressure. Second, if the stakes are high, the enemy should be further convinced that continued resistance offers no hope of leading to any result better than complying. Even when victory appears out of reach, the enemy is likely to grasp at straws such as the prospect of forcing a negotiated compromise. Third, early surrender should appear to be a better deal than later surrender, either because resistance is costly, or because the terms demanded are likely to become more severe as time passes. Otherwise, even futile resistance will be attractive. Clear communication of the 'better deal' is vital. An ability to escalate the pressure will strengthen a strategist's hand. Finally, complying must be acceptable in absolute terms, for if compliance looks too awful to contemplate, then any alternative is likely to appear preferable, no matter how unpleasant, hopeless, or desperate. Strategists should not undermine cultural aspects including the concept of honour. Coercion may succeed without achieving all of these conditions, particularly if the demands are not great. However, failure to fulfil any of them may be sufficient to make a strategy fail.

CONCLUSION

The differences in Service culture, ethos and perspective are sources of both strength and friction. It seems intuitive that Joint education might overcome some friction, but the Armed Forces have limited quantities of that most precious resource of time to squeeze too much more into their programmes without undermining single Service competencies. What helps is for each Service to articulate its strengths in a way that others comprehend. It also helps if we are more brutally honest about single Service limitations and I hope that this paper helps to expose what air power cannot do as much as what it can. If soldiers reading this air power message get it, integration and trust might more easily follow. I doubt if the paper is written in perfect Martian, but if General Lamb's green men reading it remember that air power has only four fundamental outputs, we will have some useful oil for the Joint machinery. This is the label that the author would put on his air power tin:

Air power allows *control of the air*, which provides freedom of air and surface manoeuvre. It enables *rapid mobility and lift*, which gets people and materiel quickly to and around the battle space. It also provides *intelligence and situational awareness* to help commanders develop a deeper understanding of the battle space. Air power allows airmen to fight an enemy before anybody else has to and it can use a credible threat of precision attack for *coercion*. Air weapons are now accurate enough to be exploited throughout the battle space and the presence of an aircraft can sometimes be enough to shape behaviour. The integration and synchronisation of air and land operations will only be achieved by placing sufficient emphasis on decentralisation of some air planning. This will enable air effects to be planned in sufficient detail for accurate final execution; in a way that will reassure and not alienate the people amongst whom we currently fight.

Notes

1 Commander of the (British) Field Army.

2 Concise Oxford English Dictionary.

3 DCDC Joint Doctrine Note 1/07 Joint Action.

4 Montgomery.

5 Richard Holmes, Dusty Warriors (in Countering Counterinsurgency Challenges 2006).

6 Major St. John Coughlan, interview with Russell W. Glenn (RAND), 26 March 2006.

7 Mark Etherington, interview with Russell W. Glenn (RAND), 22 March 2006.

8 The theory is an ongoing DCDC adaptation of work by Dr Karl Mueller and others, including Daniel Byman, Matthew Waxman and Jeremy Shapiro.

9 Oxford English Dictionary.

10 Qaddafi (Libya 1986), al-Musawi (Lebanon 1992), Dudayev (1996 Chechnya), Milosevic (1999 Serbia), Muhammad Omar (2001 Afghanistan) and Hussein (Iraq 1990, 1998, 2003).

11 For example, the killing of Zarqawi in 2006 Iraq (seen in the context of the wider Sunni awakening) or the longer-term impact of the 1986 US attack on Libya, when seen in the context of post-Lockerbie diplomatic and economic pressures.

Letter to the Editor

Where are the air power strategists?

I very much enjoyed reading Gp Capt Ian Shield's thought provoking article 'Where are the Air Power Strategists?' in the Spring Edition of the *Air Power Review,* and note your challenge for letters on this subject. In his article Gp Capt Shields asked what was the 'art' of air power, and where were the air power strategists to compare with Corbett and Mahan, and Jomini and Clausewitz as maritime and land warfare strategists? He neatly categorises the development of air power into three eras: a 'strategic effect' era up until the end of the Second World War, a 'lines on maps' era from 1945 to the 1991 Gulf War, and a 'third age' era, still underway, of agile air power, characterised by space and networked enabled capability. He suggests four reasons why we have yet to capture the art of air power: our age, our military origins, technology, and the uniquely joint nature of air. Gp Capt Shields argues that it is necessary to 'capture the very essence of air power' and 'as air power proponents we risk becoming mired in tactical effect, wedded to today's battle.' He goes on to say 'if the third dimension is not to be regarded as merely an adjunct to the efforts of the other Services, where is air power's unique and compelling voice?'

I suggest Gp Capt Shields very nearly answers his own questions. His 'third age' provides the opportunity to 'capture the very essence of air power' achieving effect at the strategic, operational and tactical levels, and co-ordinated with joint and component command as appropriate. Hence, the era of separate strategists for each environment has been and gone, though a 'lines on maps' mindset still limits co-ordination.

The direct equivalents of Corbett, Mahan, Clausewitz and Jomini were the air power theorists of Gp Capt Shield's 'strategic effect' era, such as Douhet and Trenchard. They viewed their own environments as separate and dominant in that environment. Clausewitz considered the nature of war and the relationship between politics and war, but as a Prussian student of Napoleon he focused on land warfare and ignored maritime and economic warfare. Mahan on the other hand believed controlling sea-borne commerce was critical to domination in war. Douhet sought victory through coercive, morale bombing enabled by Command of the Air – which would now be judged indiscriminate and therefore illegitimate unless in supreme emergency. Warden is perhaps best viewed as a descendent of this 'strategic effect' era, and not from the 'lines on maps' era as suggested. As Gp Capt Shields's points out, it is air power that has enabled environments to project power in other environments. Clausewitz and Mahan predate this and so we should not look for contemporary comparisons.

The contemporary 'art 'of air power is therefore exploiting air power within a joint context. Yet the 'lines on maps' era is not yet over. For example Johnson's Learning Large Lessons explores contemporary friction between the US Army and Air Force in joint war-fighting.[1] His analysis of post-Cold War conflicts suggests a shift in the relative war-fighting roles of land and air power, most apparent in Operation IRAQI FREEDOM. Air power

dominates the strategic and operational levels of war fighting against large, conventional enemy forces, whereas exploitation at the tactical level is the domain of land power. However land commanders demand large areas of operations, pushing out the fire support co-ordination line, in order to mount deep, shaping attacks with their own long-range missile fire and attack helicopters, when air power would be more effective, and indeed these 'lines on maps' make air power less effective. Johnson maintains that the authority to establish fire support coordination measures that affect the theatre campaign plan should be withheld by the joint force commander.

NATO's Joint Air Power Competence Centre (JAPCC) has tried to capture what Gp Capt Shields's describes as the enduring 'essence of air power' in our recent NATO Future Joint Air and Space Power concept.[2] We describe the enduring nature of air and space power in three levels or categories of activity – Deep Persistent Operations, Control of the Air (and Space), and Joint Enabling activities. All three are critical to any joint operation across the spectrum of conflict, including contemporary operations countering irregular activity.

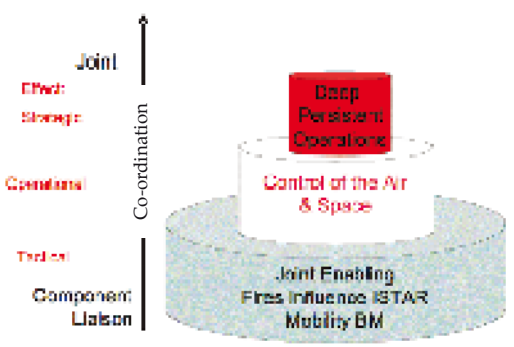

Figure 1 – The nature of air and space power

The relationship between these categories, the degree to which the manoeuvre is co-ordinated between components and the strategic, operational and tactical focus for each category is shown below.

Essentially air power conducts deep persistent operations co-ordinated by the joint force commander. Air is the supported component for delivering control of the air and space, co-ordinated at the operational-level, and supports maritime and land with tactical-level joint enabling activities. Plainly our categories of air power are not dissimilar to the explanation of the core capabilities of air power found in AP3000, but the key is to put them in context of level of warfare and degree of co-ordination required. This in turn allows a model to be constructed to provide the required command, information and intelligence, battlespace management, liaison and co-ordination, and exploit network enabling, and so on.

The term 'air power strategist' is obsolete, for the reasons I have argued, as it is wedded to the 'strategic effect' era. Instead, the focus is on air power within the joint context, such as the JAPCC thoughts outlined above and by the work I know Gp Capt Shields is doing at the DCDC, that 'captures the very essence of air power'. This is not 'wedded to today's battle', but is enduring – not merely an adjunct to the efforts of other Services – and reflects air power's unique contribution.

Gp Capt John Alexander,
NATO JAPCC, Kalkar, Germany

Notes

1 David E. Johnson, Learning Large Lessons: The Evolving Roles of Ground Power and Air Power in the Post–Cold War Era (RAND Corporation, 2007) at http://www.rand.org/pubs/monographs/MG405.1/ accessed 15 July 2008

2 See http://www.japcc.de/projects.html

Dir Def S (RAF)
Comment

Group Captain Alexander makes some very interesting points in his response to Group Captain Shields's excellent paper. It is worth reading his comments in conjunction with Air Commodore Colley's article in this edition of *Air Power Review*. Both Group Captain Alexander and Air Commodore Colley highlight the primacy of air power at the strategic and operational levels and particularly in 'Third Generation Warfare',[1] where air is being increasingly used as a substitute for more traditional methods of firepower support.

This was acknowledged at the RUSI conference in June, where the Chief of the General Staff, Sir Richard Dannatt, explained the reorganisation of the British Army into a uniform brigade structure, accepting that the heavier firepower elements – tanks, infantry fighting vehicles and self-propelled artillery – would now be spread more thinly across the brigades on the basis of 'our increased confidence of delivery of effect from the air'.[2] However, the effective application of air power at the tactical level in largely static, Phase 4-type stabilisation operations in current 'Fourth Generation Warfare' is more problematic, and therefore more contentious.

Clearly, there are strong parallels between the model that NATO's Joint Air Power Competence Centre has developed to explain the utility of air power in a joint context and Air Commodore Colley's proposal to use the 'joint action' model as a framework. *Air Power Review* would welcome alternative views or interventions into this critical debate for the future of the delivery of air power effect.

Notes

1 Thomas Hammes categorises warfare in 4 epochs: 'Third Generation Warfare' is the conventional, mechanised and mobile, all arms warfare developed since 1918, whereas 'Fourth Generation Warfare' is Rupert Smith's 'war amongst the people', the net-worked, irregular and asymmetric warfare experienced on current operations. Hammes, Thomas X., The Sling and the Stone, (Zenith Imprint: New York, 2006).

2 Quoted in 'British Army proposes to revamp brigade structure', Jane's Defence Weekly, Vol. 45, Issue 28, 9 July 2008, p. 4.