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**ALIVE AND WELL: THE AIR SCHOOL OF STRATEGIC  
THOUGHT**

**By**

**Doctor Alan Stephens**

## **About the Author**

Dr Alan Stephens is the RAAF Historian, based with the Air Power Studies Centre. Before joining the APSC he was a principal research officer in the Federal parliament, specialising in foreign affairs and defence; while prior to that he was an RAAF pilot, where his postings included the command of No. 2 Squadron from 1980-81.

Dr Stephens is the author of numerous books and articles on defence, air power and military history. His most recent book is *High Fliers: Leaders of the RAAF*. He is a graduate of the RAAF Staff College, and the University of New England, the Australian National University, and University of New South Wales.

## INTRODUCTION

In the years since 1911 when the Italians became the first nation to use air power offensively, various advocates have promoted various kinds of air 'strategies'. For example, some have argued that 'control of the air' constitutes the basis of air power, while others have claimed that distinction for strategic bombing. Still others would argue that there has been no such thing as a distinctive 'air' strategy and that air forces can only support the surface battle. It seems certain that some future strategists will promote 'information warfare' as air power's most useful role.

In fact, the essence of the air school of strategic thought has been and remains the search for a combination of ideas and technology which facilitates the *immediate* and *rapid* pursuit of *strategic outcomes* from the very onset of hostilities. That search continues today with considerable vigour. For countries with advanced air forces, that objective is, *in the right circumstances*, currently more feasible than ever before.

## DISPELLING THE MYTH

Before this subject is examined in detail, an air power myth needs to be dispelled. Popular perceptions of the air school of strategic thought focus almost exclusively on bombing campaigns, and in particular on the Combined Bomber Offensive conducted by the allies against Germany during World War II. That is a narrow and uninformed viewpoint, but because it has been so influential it needs to be addressed from the outset.

Central to that perception of air power has been the extraordinary conclusion drawn by the American economist, academic, diplomat, social reformer and public figure, John Kenneth Galbraith, that the allied bombing somehow accelerated German war production. A director of the United States Strategic Bombing Survey at the end of World War II, Galbraith claimed, for example, that the horrific, sustained raids against Hamburg from 24 July to 3 August 1943 'increased Germany's output of war material and thus her military effectiveness'. Galbraith also asserted that, in general, the campaign had stiffened rather than undermined German morale.<sup>1</sup> Notwithstanding compelling evidence to the contrary, it has been Galbraith's findings which many historians and commentators have chosen to believe, presumably preferring the comfort of personal prejudice to the trials of academic rigour.

Given the emotion often attached to aerial bombardment, it is essential to appraise the bombing of Germany objectively, to assess only its military effect (as opposed to its moral dimension) on the German war economy and people. Three highly authoritative but distinctly different sources lead to a common conclusion. First, the Germans themselves. According to the Nazis' minister of war production, Albert Speer, if

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<sup>1</sup> Galbraith, John Kenneth, *The Affluent Society*, Hamish Hamilton, London, 1958, pp 16-18; and *A Life in Our Times: Memoirs*, London, 1981, pp 219, 239-240. Galbraith's post-war analysis of the raids against Hamburg showed that while the centre of the city had been devastated, war industries on the perimeter of the city were not greatly damaged. Before the attacks there had been a shortage of skilled labour in Hamburg. Now, with the loss of thousands of jobs in banks, garages, stores and so on, labour sought employment in the war industries. According to Galbraith the raids thus 'forced a wholesale conversion of Germany's scarcest resource, that of manpower, to war production'.

attacks on the scale of those made against Hamburg had been repeated against six more major cities, Germany's armaments production would have been brought to a 'total halt'.<sup>2</sup> Second, the United States Strategic Bombing Survey - the organisation of which Galbraith was a senior member - concluded in September 1945 that allied bombing had been 'decisive in the war in Western Europe ... It brought the [German] economy ... to virtual collapse'.<sup>3</sup>

Finally, the most authoritative scholar of the Anglo-American offensive, Richard Overy, has presented a powerful and grim picture of the physical and mental devastation the bombing caused. It is important to appreciate that that devastation did not really start until 1944, with over eighty per cent of the bombs dropped on Europe falling in the last eighteen months of the war.<sup>4</sup> There is no doubt that prior to then the campaign experienced problems which on occasions reached major proportions. But after 1944 its effect was profound.

That effect was both direct and indirect. For example, as a direct result of the allied bombing, during 1944 the Nazis' production schedules for tanks, aircraft and trucks were reduced by thirty-five per cent, thirty-one per cent and forty-two per cent respectively.<sup>5</sup> Additionally, an enormous amount of resources which might have been used to equip front-line troops had to be diverted to air defence. By 1944 the anti-aircraft system was absorbing twenty per cent of all ammunition produced and between half to two-thirds of all radar and signals equipment. Those figures are merely representative of the far broader impact the bomber offensive had on the German war economy.

Physical destruction and the massive diversion of resources were accompanied by psychological demoralisation. Contrary to conventional wisdom that the bombing boosted morale, the sustained campaign had a crushing effect on people's mental state. Post-war surveys found that workers became tired, highly-strung and listless, and were disinclined to take risks. Absenteeism because of bombing reached twenty-five per cent in some factories in the Ruhr for the whole of 1944, a rate which drastically reduced output and undermined production schedules. When asked to identify the single most difficult thing they had to cope with during the war, ninety-one per cent of German civilians nominated bombing.<sup>6</sup> As Richard Overy has concluded, in the context of the outcome of the war, it 'is difficult not to regard [those kinds of consequences] as decisive'.<sup>7</sup>

In short, any perception that the Combined Bomber offensive 'failed' is based either on ignorance or prejudice. Let us now return to the question at hand.

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<sup>2</sup> Speer, Albert, *Inside the Third Reich*, London, Weidenfeld and Nicolson, 1970, p 284.

<sup>3</sup> MacIsaac, David, *The United States Strategic Bombing Survey*, Vol I, New York, Garland Publishing, 1976, pp 15-16.

<sup>4</sup> Overy, Richard, *The Air War 1939-1945*, Papermac, London, 1987, p 120.

<sup>5</sup> Overy, Richard, *Why the Allies Won*, Jonathan Cape, London, 1995, pp 131-133. See also Overy, Richard, 'World War II: The Bombing of Germany', in Alan Stephens (ed), *The War in the Air 1914-1994*, Air Power Studies Centre, Canberra, 1994, pp 113-140.

<sup>6</sup> *ibid.*, p 132.

<sup>7</sup> Overy, *Why the Allies Won*, p 131.

## WORLD WAR I

Aircraft were first used militarily as reconnaissance platforms. However, while reconnaissance remained the prime formal responsibility of air forces during World War I, in the minds of airmen at least other roles had assumed *de facto* priority well before 1918. Once aircrews started shooting at each other to try to prevent reconnaissance activities, control of the air had, *ipso facto*, become a prerequisite for all air activities. Consequently, specialist fighter aircraft rapidly appeared. When those fighters then started to use their enhanced performance and offensive capabilities to increasing effect against ground targets, another compelling reason to gain control of the air existed. While that operational imperative may not always have been recognised in official doctrine, it was implicitly recognised in force structures as fighter and attack aircraft began to enter air forces in increasing numbers.

The need to 'control the air' was the first of two significant air power concepts to emerge from World War I. The second was an unwavering belief in offensive action. According to General Sir Hugh Trenchard, the commander of the (British) Royal Flying Corps on the Western Front, it was the opinion 'of those most competent to judge that the aeroplane, as a weapon of attack, [could not] be too highly estimated'.<sup>8</sup> Consequently, under Trenchard's leadership, the RFC became committed to the principle of an unrelenting offensive. His brief instruction to the RFC of September 1916 entitled 'Future Policy in the Air' - impressive in its uncompromising attitude - remains the classic expression of the inherently offensive nature of air operations.<sup>9</sup>

It has been suggested that Trenchard's attitude to air fighting was little more than an imitation of Sir Douglas Haig's approach to the land war.<sup>10</sup> As commander-in-chief of the British forces in France, Haig subscribed to a 'relentless and incessant' ground offensive, a strategy which led to appalling casualties. The criticism has been made that Trenchard's emphasis on the air offensive was equally misplaced, with dreadful losses such as those at Arras in April 1917 bearing testimony to his 'stubborn stupidity'.<sup>11</sup> That accusation may or may not be true. As far as air strategy is concerned, the origins of Trenchard's directive and the reverses experienced at Arras are less significant than the focus the policy placed on the *general* importance of offensive action and air superiority. Like all military concepts, those ideas require judgment in application.

There was indisputable, physical evidence of the changes in air strategy during World War I, even if some generals and admirals continued to insist that reconnaissance was the only legitimate role for an air force. The appearance of huge formations of aircraft massing to seek combat over the Western Front - the best known example being von

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<sup>8</sup> When the Royal Air Force was formed as an independent service in 1918, Trenchard was appointed CAS. He dominated British military aviation from World War I until his retirement in 1929.

<sup>9</sup> 'Future Policy in the Air', in Stephens, Alan and O'Loughlin, Brendan (eds), *The Decisive Factor: Air Power Doctrine by Air Vice-Marshal H.N. Wrigley*, Canberra, AGPS, 1990, pp 131-134.

<sup>10</sup> Cooper, Malcolm, *The Birth of Independent Air Power*, London, Allen and Unwin, 1986, pp 71-73.

<sup>11</sup> RFC losses at Arras were so high that April 1917 became known as 'Bloody April'. Raleigh, Walter and Jones, H.A., *The War in the Air*, Volume III, Oxford, Clarendon Press, 1922-35, pp 334-79. See also Sykes, Marshal of the RAF Sir Frederick, *From Many Angles*, London, Harrup and Co., 1942, pp 219-221.

Richthofen's Flying Circus - were a practical expression of the need to concentrate force and take the initiative; that is, to prosecute offensive action in the struggle for control of the air and of the battlefield. Those formations were also an indication that air combat might become an end in itself.

The emphasis on the offensive was not restricted to air-to-air combat. Few events during World War I caused more panic and alarm than the attacks on London by German Gotha bombers in June and July 1917.<sup>12</sup> As a direct consequence of those attacks, within three months the British Government had established what amounted to a strategic bombing unit in France, known as the Independent Force, to conduct reprisal raids against the German homeland;<sup>13</sup> and within a year the RAF had come into being as a separate service.

The establishment of the Independent Force did more than formalise the notion of air strike operations. First, it contained more than a hint of the notion of 'deterrence' which in subsequent years was to become a central feature of air strategy. And second, it implicitly acknowledged the radical theory that future wars might be won quickly and decisively - and, therefore, with minimum human and material loss - by air power alone. That theory rested on a powerful psychological base. In part, it was a reaction to the ghastly, moribund mess on the ground, which had made British Prime Minister Lloyd George desperate for an alternative strategy to liberate his army from 'the dead hand of Haig'. Additionally, the reports of the Gotha raids against London and the subsequent retaliation by the Independent Force against cities like Cologne starkly revealed the appeal of strategic bombing.<sup>14</sup> In view of the manifest public panic and fear and the seeming invulnerability of marauding fleets of bombers, the collapse of civilian morale and, therefore, the idea of a quick, decisive victory, seemed entirely plausible.

The concepts of control of the air and strategic strike were radical additions to theories of war fighting. The greatest strategic theorist, Carl von Clausewitz, had believed defence to be the stronger form of warfare.<sup>15</sup> Clausewitz had, of course, been describing war between armies, for whom historically defence has been easier to organise and conduct than offence. Clausewitz had also concluded that victory was achieved by defeating an enemy's military forces in the field.<sup>16</sup> Air power, however, had *extended* the battlefield. Total warfare could now be waged - that is, against an entire nation - with the objective being the destruction of national will rather than armies and navies, which would simply be overflowed by aircraft on their way to attack true strategic targets. The air weapon thus threatened to turn traditional military thinking on its head. It was also plain that air strategy intrinsically contained a powerful political dimension.

If air bombardment was a controversial addition to strategic thought, there were few disputes over the value of the large number of roles and missions air forces

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<sup>12</sup> Raleigh and Jones, *The War in the Air*, Volume V, pp 26-32.

<sup>13</sup> *ibid.*, Volume VI, pp 118-174.

<sup>14</sup> See 'Reports on the Attack on Cologne, 18 May 1918', in Stephens and O'Loughlin, *The Decisive Factor*, pp 22-25.

<sup>15</sup> von Clausewitz, Carl, *On War* (ed. A. Rapoport), Harmondsworth, Penguin, 1968, pp 113-114.

<sup>16</sup> *ibid.*, pp 130-134.

contributed to surface operations. By the end of World War I almost every role performed by air power in the 1991 Gulf War had emerged, albeit in a sometimes rather primitive form.<sup>17</sup> For armies, roles such as close air support, transport, reconnaissance, communications, interdiction, artillery spotting, resupply and rescue had made the aeroplane an indispensable contributor to continental strategy. Many of those roles were repeated in support of maritime strategy, in addition to anti-submarine warfare, convoy escort, search and rescue, maritime strike and minefield survey.<sup>18</sup>

## BETWEEN THE WARS

Control of the air may have emerged by 1918 as the prime air role, and air support for other combat forces may have been the role embraced by admirals and generals, but it was air bombardment which primarily occupied the minds of air strategists and statesmen during the interwar years.

If Trenchard had provided the practical model for offensive air operations, the great Italian theorist, Giulio Douhet, provided the most compelling theoretical model in his classic work *The Command of the Air*, first published in 1921 but containing ideas which Douhet had been promoting for years.<sup>19</sup>

Douhet's central thesis was presented in his book under the portentous heading 'The Extreme Consequences'. His position was unequivocal: 'To conquer command of the air means victory; to be beaten in the air means defeat and acceptance of whatever terms the enemy may be pleased to impose'. He accordingly concluded that the air force was destined to become the dominant form of combat power, to the extent that it should be strengthened at the expense of the other services. Air power had introduced a 'new character to war' which emphasised the 'advantages of the offensive' and would make for 'swift, crushing decisions on the battlefield'.

General Douhet took his argument even further in his definition of the 'battlefield'. Because of the aircraft's range, speed, relative invulnerability and unparalleled striking power, and its predicted ability to create fear and panic among the enemy's population, it was logical, he stated, for aerial bombardment to be directed primarily at population centres and the national infrastructure. The destruction of 'vital centres' such as 'governing bodies, banks and other public services in a day' would plunge an enemy into 'terror and confusion'. Superiority over an enemy's air force was likely to be a prerequisite for victory and would be gained, not by combat in the skies, but by destruction on the ground; that is, by again employing the inherent and decisive offensive capabilities of air power.

A 'battleplane' which combined the characteristics of bomber and fighter aircraft was proposed as the means to those ends.<sup>20</sup> Douhet's concept of a battleplane was one of

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<sup>17</sup> By 1918 every modern air power role with the exception of electronic warfare and air-to-air refuelling had been conducted.

<sup>18</sup> Raleigh and Jones, *The War in the Air*, Volume VI, pp 329-396.

<sup>19</sup> Douhet, Giulio, *The Command of the Air* (trans. D. Ferrari), Washington, Office of Air Force History, 1983.

<sup>20</sup> *ibid.*, pp 117-120.

the first proposals for a 'general purpose' or 'multi-role' aircraft, an idea which has been something of an article of faith for airmen ever since and which, like the belief in strategic strike, for many years never quite met the expectations of its advocates.

Douhet accompanied his thesis on aerial bombardment with considerable comment on other aspects of air warfare, including organisation, the moral aspects and material preparation. That he overstated his case and by doing so possibly harmed the credibility of the air weapon should not be allowed to diminish his status as a pre-eminent military thinker.

The historian Edward Warner has suggested that if Douhet wrote for the professional military audience, General William 'Billy' Mitchell addressed his convictions on air power primarily to the public.<sup>21</sup> Unlike the more scholarly Italian, Mitchell was passionate and outspoken in his beliefs, particularly regarding the independence of air forces. Notwithstanding the difference in temperament, he shared with Douhet an over-riding faith in the inevitable dominance of air power through offensive action. Key factors in that belief were Mitchell's perception of the continually increasing technical superiority of the aircraft over other machines of war, and the fragility of civilian morale. In a moment of the first magnitude in the history of combat, Mitchell provided a dramatic demonstration of his theories by sinking the captured German dreadnought *Ostfriesland* with 2,000 pound bombs during trials off Norfolk in 1921.<sup>22</sup> From then on, surface ships operating without air cover had to be considered at risk.

Mitchell had been a combat pilot in World War I but his projections for the future uses of air power were, like those of Douhet, excessively speculative. He thus overestimated the extent to which the aircraft would achieve technical dominance and underestimated the capacity of the civilian population and industry to withstand the effects of strategic bombing. It is noteworthy that Mitchell, like Douhet, was court-martialled for criticising prevailing land- and sea-oriented national defence strategies.

Given the opprobrium area bombing subsequently attracted during World War II, it is noteworthy that the 'classical' air strategists saw their weapon almost as a 'civilising' instrument. As Mitchell noted in 1930, '[bombardment] is a distinct move for the betterment of civilisation because wars will be decided quickly and not drag on for years ... It is a quick way of deciding a war and really more humane'.<sup>23</sup>

Notwithstanding the fact that the theories of the early air power strategists were based on limited evidence and an exaggerated belief in the technical capabilities of the air weapon, the perceived threat of offensive air power strongly influenced military planning and international relations during the inter-war years. In the United Kingdom and the United States airmen promoted the idea of quick victory through decisive air attacks, with fast, heavily armed, unescorted bombers making war-winning 'knock-out blows' deep in enemy territory.<sup>24</sup> Throughout Europe statesmen were haunted by

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<sup>21</sup> Warner, Edward M., 'Douhet, Mitchell, Seversky: Theories of Air Warfare', in Edward Meade Earle (ed), *Makers of Modern Strategy*, Princeton, Princeton University Press, 1943.

<sup>22</sup> Mitchell, William, *Winged Defense*, New York, Dover Publications, 1988, pp 66-73.

<sup>23</sup> Quoted in Meilinger, Phillip S., 'Global Air Power and Power Projection', in RUSI's and Brassey's *Defence Yearbook 1992*, London, Brassey's, 1992, p 195.

<sup>24</sup> Futrell, Robert Frank, *Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force 1907-1960*, Volume I, Maxwell, Air University Press, 1989, pp 64-65, 68-70; and Frankland, Noble,



the spectre of fleets of marauding bombers, against which it was thought defence would be powerless.<sup>25</sup> The notorious claim that the bomber would always get through came not from an airman but a politician, former British Prime Minister Stanley Baldwin during a speech to the House of Commons in 1931. It was because of the disturbing offensive potential of air power that successive conferences on international law and disarmament throughout the 1920s and 1930s considered proposals as extreme as completely banning aerial bombardment.<sup>26</sup> The ‘horror’ bombing of Guernica by Hitler’s Condor Legion in April 1937 fuelled those apprehensions. During the Munich crisis of 1938, fear of the Luftwaffe saw trenches dug in London parks, while nearly one-third of the population of Paris evacuated the city.<sup>27</sup>

Those were intensely emotional reactions to the terrifying prospect of strikes from the sky. A more dispassionate response would have painted a far different picture. The two critical questions air strategists needed to answer were: first, what constitutes a ‘strategic’ target which, if successfully attacked, will quickly lead to an enemy’s capitulation; and second, how can aircrews find and hit those targets with precision? The issue was, and remains, central to offensive air operations and to air strategy. As the contemporary air power scholar Colonel Phillip Meilinger has pointed out, in essence, ‘air power is targeting’.<sup>28</sup>

More than any other single factor, it was the inability of air forces satisfactorily to address that apparently simple challenge which, for almost sixty years, undermined the predictions of Douhet and his fellow air power theorists.

It was not as though no effort was made. On the contrary, centre of gravity analysis was the subject of serious attention between the wars in both the RAF and the United States Army Air Corps. Under Trenchard’s influence the RAF focused on the morale of the German population as a key target, while at the same time recognising the potential vulnerability of critical elements of the economy such as transport and fuel. War planners in the United States rejected morale as a strategic vulnerability, concentrating instead on the enemy’s ‘national economic structure’, which was defined as food distribution, steel production, transportation and, above all, electric power.<sup>29</sup> USAAC strategists believed that attacks on those specific target sets would generate guaranteed, cumulative and lasting results.

Assuming that those were in fact strategic targets, the task then became one of finding and hitting them. Here, efforts on both sides of the Atlantic were characterised more

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*The Bombing Offensive Against Germany*, London, Faber and Faber, 1965, pp 38-46. Prominent air bombardment advocates included Trenchard, Portal, Harris and Slessor in the RAF; and Mitchell, Olds, Walker, Arnold and Kenney in the USAAC.

<sup>25</sup> Taylor, A.J.P., *The Origins of the Second World War*, Harmondsworth, Penguin, 1981, p 151.

<sup>26</sup> Quester, George H., *Deterrence Before Hiroshima*, New York, John Wiley, 1966, pp 77-89, 123.

<sup>27</sup> *ibid.*, p 98.

<sup>28</sup> Meilinger, Colonel Phillip S., ‘Ten Propositions Regarding Air Power’, *APSC Paper No 36*, Air Power Studies Centre, Canberra, 1995, pp 13-16.

<sup>29</sup> McFarland, Stephen L., *America’s Pursuit of Precision Bombing, 1910-1945*, Smithsonian Institution Press, Washington, 1995, pp 78-88; Overy, *The Air War*, pp 106-108; Futrell, Robert Frank, *Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force, 1907-1960*, Air University, Maxwell, 1971, pp 108-110; Frankland, Noble, *The Bombing Offensive Against Germany*, Faber and Faber, London, 1965, pp 40, 56; Sherry, Michael S., *The Rise of American Air Power*, Yale University Press, New Haven, 1987, pp 98-125.

by self-delusion than anything else. The fact was, the available technology lagged too far behind the theory. Insufficient thought was given to the challenge of how to find targets by day and night in unfavourable weather over unfamiliar territory and under intense enemy attack.<sup>30</sup> And if by chance the target were found, the aiming systems simply were not good enough. As the Second World War was to demonstrate, 'precision' is a relative word: in Max Hastings' words: 'for all the technology embodied in the [wartime] bomber aircraft, its load once released was an astonishingly crude and imprecise weapon'.<sup>31</sup>

Not all airmen were seduced by the mystique of the bomber. There were those like Claire Chennault, an instructor at the USAAC's Air Corps Tactical School in the mid-1930s, who believed bombers were vulnerable and that command of the air would only be achieved by the use of fighters, either defending vital points or escorting bombers. Chennault described the Tactical School as a 'crucible' of doctrinal debate, in which the dispute over the relative effectiveness of fighters and bombers reached 'white-hot intensity'.<sup>32</sup> The theories which underpinned that debate were put to the test in 1939.

## WORLD WAR II

'The master weapon of World War II', the Royal Australian Navy stated in its Post-War Plan in 1945, 'has been the aeroplane'.<sup>33</sup> Notwithstanding the vicissitudes of the various strategic bombing offensives, there was no doubt that air power had been a decisive force.

The war confirmed control of the air as the prime air role, with the best-known example being the RAF's victory in the Battle of Britain, which averted the planned invasion of the United Kingdom. That battle, incidentally, is one of the few examples of a successful *defensive* control of the air (or counter air) campaign: in general, airmen would prefer to wage an *offensive* campaign, that is, to destroy an enemy's air power on the ground rather than fight a war of attrition in the skies. It is noteworthy that the Germans had been on the verge of achieving an offensive counter air victory during the Battle of Britain when Goering made his fateful decision to shift the focus of the Luftwaffe's bombing attacks from the RAF's Fighter Command to British cities and ports. Goering thus inadvertently allowed the beleaguered Fighter Command to recover, regroup and eventually carry the day.

Two other incidents illustrate the importance of control of the air particularly well. The first was the introduction into service in December 1943 of the long range P-51 Mustang fighter, which was able to accompany USAAF strategic bombers deep into Germany. Prior to the arrival of the Mustang the unprotected USAAF daylight bomber force had been experiencing loss rates which threatened to become

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<sup>30</sup> For more detail on this subject see Stephens, Alan, 'The True Believers', in Stephens, *The War in the Air*, pp 64-66.

<sup>31</sup> Hastings, Max, *Bomber Command*, Michael Joseph, London, 1987, p 351.

<sup>32</sup> Chennault, Claire Lee, *Way of a Fighter*, Putnam's, New York, 1949, p 27.

<sup>33</sup> Australian Archives, CRS A5954 (Shedden Papers), Box 1841.

unsustainable.<sup>34</sup> The P-51, however, was able to establish *local* air superiority *around* bomber formations, thus greatly reducing their losses. As Noble Frankland concluded, the introduction of the Mustang ‘changed the course of the war in the air’.<sup>35</sup> The second incident concerns the preparations for the Normandy invasion of 6 June 1944. General Eisenhower’s deputy supreme commander, Air Chief Marshal Sir Arthur Tedder, believed the most important contribution air power could make to the invasion would be the disruption of the transport system in France. Because Fighter Command had established air superiority over France, allied bombers were able to achieve Tedder’s aim relatively free from attack. Basil Liddell Hart later concluded that Tedder’s paralysis of the Nazis’ communications system was the single most significant factor in the success of the Normandy invasion.<sup>36</sup> It was the control of the air, though, that underwrote Tedder’s achievement.

The war also confirmed the growing, perhaps even vital, importance of the air force contribution to surface operations. On land, perhaps the best known example was the now-classic combination of armour, highly mobile infantry and aircraft in the blitzkrieg attack. While blitzkrieg is generally associated with the German Army, the technique was used to equal effect by others, such as Air Vice-Marshal Coningham’s Desert Air Force and General Montgomery’s Eighth Army in North Africa; and, on the Russian Front, the Soviet Army in combination with the remarkable Ilyushin Il-2 *Shturmovik* ground attack aircraft, which was described by Stalin as being ‘as essential to the Red Army as air and bread’.<sup>37</sup>

At sea, Billy Mitchell’s demonstration from 1921 was quickly given operational expression by a number of actions, perhaps the most dramatic being the sinking of HMS *Prince of Wales* and *Repulse* by Japanese aircraft only three days after Pearl Harbor. Six months later, at the Battle of the Coral Sea, a major air/sea battle was fought for the first time in history without surface ships ever coming within sight of each other.<sup>38</sup> Nor did they exchange fire, as all offensive action was carried out by aircraft at distances in excess of one hundred miles from their carriers. The belief that aircraft had become integral to maritime operations was further strengthened by the role air forces played in the fight against the U-boats, with almost half of all German submarines lost during the war falling to direct air attack.<sup>39</sup> Air/sea cooperation continued to expand as naval and air force units worked together in a wide range of tasks, including convoy escort, maritime strike, mine-laying, reconnaissance, air defence, fleet protection and communications.

Before concluding this section brief mention should be made of the strategic bombing campaign in the Pacific Theatre. It is sometimes forgotten that Japan - one of the

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<sup>34</sup> For example, during a raid against the ball-bearing factories at Schweinfurt on 14 October 1943, the USAAF’s Eighth Air Force had lost 60 of 291 B-17 Flying Fortresses, a rate no combat force could sustain. Frankland, *The Bombing Offensive Against Germany*, pp 77-78.

<sup>35</sup> *ibid.*, pp 78-83.

<sup>36</sup> Liddell Hart, B.H., *History of the Second World War*, London, Pan Books, 1973, p 636.

<sup>37</sup> Quoted in Taylor, John W.R., *Combat Aircraft of the World*, Ebury Press, London, 1969, p 572.

About 35,000 Il-2s were built, and the aircraft fought ‘with considerable success’ on every front where Soviet military forces were engaged.

<sup>38</sup> Morison, Samuel Eliot, *History of United States Naval Operations in World War II, Volume IV, Coral Sea, Midway and Submarine Actions, May 1942-August 1942*, Boston, Little Brown, 1950, p 63.

<sup>39</sup> Hallion, Richard P., ‘Air Warfare and Maritime Operations’, *Air Power Studies Centre Paper Number 45*, APSC, Canberra, 1996, p 18. Of the 785 U-Boats were lost, aircraft accounted for 368.

war's major belligerents - surrendered unconditionally with its armies intact before a single allied soldier set foot on the Home Islands. Japan's capitulation is sometimes linked solely to the atomic attacks against Hiroshima and Nagasaki. In fact, the use of the atomic weapons was the conclusion of a devastating bombing campaign during which many more people were killed and far more damage was caused by 'fire bombing' raids conducted with conventional weapons.<sup>40</sup> Like the Combined Bomber Offensive in Europe, fifty years after the event, the campaign in the Pacific remains surrounded by controversy. The harsh truth is, like the bombing of Germany, the campaign against Japan was in the end brutally effective.

The final observation to be made in this section concerns the contrasting approaches of the allied and axis powers to strategic bombardment. For most of the war the allies were able to prosecute an air strategy which incorporated all of the major air power roles and missions. By contrast, both Germany and Japan were constrained by their doctrine and equipment to a limited air strategy. The problem was that the Luftwaffe was structured primarily to support the German Army, and Japanese air power the Army and the Navy. Neither country ever established a powerful, independent strategic bombing force comparable to that of the RAF or the USAAF. The Germans in particular failed to develop a genuine strategic bomber, a deficiency which became a major factor in their inability to prosecute the war to maximum effect.<sup>41</sup>

## **COLD WAR STRATEGIES AND THE GREAT DETERRENT**

The two atomic attacks on Japan were the ultimate expression of Douhet's theory of victory through air power.<sup>42</sup> They also provided the foundation for the strategy of nuclear deterrence which has since dominated global security planning. While that development may have indicated a pre-eminent place in military thinking for air strategy, it also raised a major intellectual challenge. It was a challenge air strategists initially did not address fully.<sup>43</sup>

The advent of nuclear weapons seemed fundamentally to have changed the nature of war. In a now-famous passage, Bernard Brodie redefined global conflict in 1946 when he wrote: 'Thus far the chief purpose of our military establishment has been to win wars. From now on its chief purpose must be to avert them. It can have almost no other useful purpose'.<sup>44</sup> Against that background, by early 1950 the United States Joint Chiefs of Staff had agreed that deterrence through strategic bombing was the primary mission of the USAF, and the first priority of joint defence was the 'ability to

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<sup>40</sup> Sherry, Michael S., *The Rise of American Air Power*, Newhaven, Yale University Press, 1987, pp 257-292.

<sup>41</sup> Murray, Williamson, *Strategy for Defeat: The Luftwaffe 1933-1945*, New Jersey, Chartwell Books, 1986, pp 16-29, for background on the development of the Luftwaffe and its doctrine. See also Overy, *The Air War*, p 103.

<sup>42</sup> In Bernard Brodie's opinion, time 'rescued' Douhet 'from his first and gravest error - his gross overestimation of physical effects per ton of bombs dropped - by introducing the nuclear bomb'. Bernard Brodie, *Strategy in the Missile Age*, Princeton University Press, Princeton, 1991, p 73.

<sup>43</sup> For provocative comment on this issue see MacIsaac, David, 'Voices From the Central Blue: The Air Power Theorists', in Paret, Peter (ed), *Makers of Modern Strategy*, Princeton, Princeton University Press, 1986, pp 639-642.

<sup>44</sup> Brodie, Bernard, 'The Weapon', in Bernard Brodie (ed), *The Absolute Weapon*, Harcourt Brace, New York, p 76.

deliver the atomic bomb'.<sup>45</sup> That was pure Douhet. Because of the joint chiefs' decision the USAF's Strategic Air Command enjoyed pre-eminent status and budget priority at the expense of the other services and USAF commands.<sup>46</sup>

The endorsement of nuclear deterrence as the essence of air strategy brought with it a number of intellectual complications which perhaps were not widely appreciated at the time. First, the suggestion that the primary role of Western air power at the global level was to *prevent* wars, not win them, clearly carried radical implications for force structures, training and attitudes. Second, control of the air apparently was no longer the prime role. That too was a change with major implications. Finally, there was a danger that the other air power roles, and the continuing review of ideas associated with those roles, might be neglected in the face of the apparently overwhelming force of the nuclear bomber.

One influential strategist who recognised those potential difficulties was Marshal of the RAF Sir John Slessor, chief of the air staff in the UK from 1950 to 1952. Slessor appreciated that in its fullest sense air power had become an *unlimited* instrument of war.<sup>47</sup> The paradox for air strategists therefore was that, having achieved the dominance predicted by Douhet, the appalling consequences of exploiting that dominance made it untenable for other than irrational nations. As Slessor noted, because of strategic (nuclear) air power, 'total war [had] abolished itself'.<sup>48</sup> Thus, large air forces like those of the US, the UK and the USSR were pouring resources into a capability which had *unlimited* war fighting power, yet which could be used only within the most *limited* air strategy. Nevertheless, Slessor concluded, it was essential to retain the 'Great Deterrent' in the interests of world peace.<sup>49</sup> Should the unthinkable happen and global nuclear war occur, then air power alone would decide the outcome. In that specific, very narrow context, air strategy had been reduced to the most straightforward formula.

At about the same time an important addition was made to perceptions of strategic air operations. In June 1948 the Soviet Union exploited the arrangements under which the wartime allies had occupied Germany by closing off all surface access to the city of Berlin. If left unchallenged the communists' provocative action might not only have won them an important psychological victory, but also might have given them permanent control of all of Berlin. Worried that an attempt to force the blockade on the ground might precipitate World War III, the allies instead 'built' a *Luftbrücke* - an air bridge - into Berlin. For the next fifteen months the 2.2 million inhabitants of the Western sectors of Berlin were sustained by air power alone as the *Luftbrücke* flew in 2.33 million tonnes of supplies in 277,569 flights.<sup>50</sup>

Airlift had previously come of age during World War II but it is questionable whether its potential had been fully appreciated by commanders who predominantly defined

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<sup>45</sup> Futrell, *Ideas, Concepts, Doctrine*, pp 246-249.

<sup>46</sup> Kohn, Richard H. and Harahan, Joseph P. (eds), *Strategic Air Warfare*, Office of Air Force History, Washington, 1988.

<sup>47</sup> Slessor, Marshal of the RAF Sir John, *Strategy for the West*, Cassell and Co., London, 1954, p 63.

<sup>48</sup> *ibid.*, p 97.

<sup>49</sup> Slessor, Marshal of the RAF Sir John, *The Great Deterrent*, Cassell and Co., London, 1957, *passim*.

<sup>50</sup> Stephens, Alan, *Going Solo: The RAAF 1946-1971*, AGPS, Canberra, 1995, p 201.

‘strategic’ in terms of bombs on targets.<sup>51</sup> The Berlin Airlift showed that air strategists needed to broaden their horizons. Arguably air power’s single most decisive contribution to the Cold War, the operation unquestionably achieved a profound strategic outcome. The Soviets’ eventual capitulation and dismantling of the surface blockade changed the face of Europe and the course of the Cold War - without a bomb having been dropped.

With the benefit of hindsight it is possible to view the Berlin Airlift as the precursor to other strategic applications of air power which also did not employ force.<sup>52</sup> But at the same time it is important to realise that the transport aircraft which saved Berlin were protected by allied fighters and backed by the deployment of nuclear-capable bombers to Europe. A more subtle element might have been introduced to the air school of strategic thought, but it was still underpinned by the deterrent threat of massive force.

## CONVENTIONAL UNCERTAINTY

The Great Deterrent and its associated strategy, the aptly named Mutual Assured Destruction (MAD), must be considered to have succeeded (or, as some commentators would have it, at least did not fail), as the United States and the Soviet Union avoided direct conflict for almost fifty years until the Soviet Empire finally collapsed under the weight of its own political, economic and social ineptitude in 1989. In the meantime, however, about one hundred conflicts had been fought around the world with conventional weapons, sometimes between proxies of the superpowers, other times between ‘traditional’ enemies. Whatever the underlying causes of a particular conflict may have been, for much of the period air strategists struggled to reconcile the apparently conflicting demands of the theory and practice of offensive air warfare. For the wars in which members of the Western alliance were engaged, there was generally a strong demand for air power to conduct those roles which might be described as ‘support’; for example, airlift, reconnaissance, medevac, battlefield interdiction, close air support, and so on. But those roles did not translate into a distinctive ‘air’ strategy; rather, they made a contribution to land or maritime strategy.

The intellectual difficulties airmen experienced were most apparent in the West’s first two major conflicts after World War II, Korea and Vietnam. Largely because of the priority given to the USAF’s nuclear force, Strategic Air Command, other USAF commands had suffered from a relative lack of technical innovation and research and development since 1945. The status and support given to Tactical Air Command in particular had been substantially reduced.<sup>53</sup> Not surprisingly, serious doctrinal and operational shortcomings soon became apparent in Korea. In the space of five years some of the fundamental lessons of World War II had been forgotten. American pilots

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<sup>51</sup> The best known ‘strategic’ use of air power during World War II were the USAAF’s resupply missions over the ‘Hump’ from northeast India into southwest China. See Tunner, William H., *Over the Hump*, Office of Air Force History, Washington, 1985.

<sup>52</sup> For example, the use of reconnaissance aircraft during the Cuban missile crisis of October 1962. See Allison, Graham T., *Essence of Decision*, Little Brown, Boston, 1971.

<sup>53</sup> Armitage, M.J. and Mason, R.A., *Air Power in the Nuclear Age, 1945-84: Theory and Practice*, 2nd ed, The Macmillan Press, London, 1985, pp 43-44; Futrell, *Ideas, Concepts, Doctrine*, pp 224, 307-308; and Meilinger, ‘Ten Propositions Regarding Air Power’, footnote 7.

and planners had to relearn the art of providing close support for ground forces. Further, major difficulties were experienced with the massive air interdiction campaign, which failed to take into account the *nature* of the enemy. Allied air planners never really came to grips with the fact that it was enormously more difficult to interdict a supply system based on peasant labour than mechanised transport.<sup>54</sup>

The real issue for air strategy from Korea, though, was the imposition of political controls on United Nations' bomber aircraft. Grand notions of victory through air power alone meant little if airmen were prevented from using the full force at their disposal. That was the case in Korea, where political considerations and the problem of target discrimination combined to debar the use of nuclear weapons and inhibit the choice of targets for conventional bombing. The simplistic formula of the Great Deterrent was inadequate for the complexities of limited war. The complaints of leading airmen like General Curtis LeMay that air power was unreasonably constrained in Korea showed a disappointing lack of understanding of the political dimension of strategy.<sup>55</sup> A vicious war on the Korean Peninsula was bad enough: no-one wanted it to escalate into World War III through the preemptory use of excessive force.

Political imperatives also influenced the use of offensive air power in Indochina some fifteen years later. During the bombing of North Vietnam from 1965 to 1968, codenamed Operation Rolling Thunder, an extraordinary degree of control was exercised over the tempo of bombing and the selection of targets by US President Lyndon Johnson and Secretary of Defense Robert McNamara. According to USAF General J.W. Vogt, Johnson and McNamara selected targets using the doctrinally distorted objectives of 'sending signals' to the North Vietnamese and minimising public outcry in the West, when their decisions should have been based on 'whether [a particular] mission would help us win the war'.<sup>56</sup> Vogt's observation was given more definition by strategist Colonel Harry G. Summers, who argued that a major factor in the West's defeat in Indochina was the usurpation of military strategy by civilian analysts. According to the Summers' thesis, the analysts who had most influence with Johnson and McNamara reduced military doctrine to a 'subset of economic utility theory', in which the application of cost/benefit analysis almost inevitably made the determined pursuit of military objectives seem like a failure of policy, contrary to the traditional view of war as the continuation of policy by other means.<sup>57</sup>

There was undoubtedly some truth in Vogt's criticism and Summers' analysis. However, military air strategists were scarcely blameless themselves. Looking back on the perceived failure of the bombing of the North a decade after the war, four of the USAF's leaders from that period - Generals Curtis LeMay, Leon Johnson, David Burchinal and Jack Catton - got closer to recognising the real problem, albeit perhaps

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<sup>54</sup> Rees, David, *Korea: The Limited War*, Macmillan, London, 1964, pp 49-50; James T. Stewart (ed), *Airpower: The Decisive Force in Korea*, Van Nostrand Co., Princeton, 1957, pp 28, 283.

<sup>55</sup> At the start of the Korean War, LeMay, as Commander of SAC, unofficially recommended that 'we ought to turn SAC loose with incendiaries on some North Korean towns'. Quoted in Kohn and Harahan, *Air Interdiction in World War II, Korea and Vietnam*, p 88.

<sup>56</sup> Vogt, General J.W., quoted in Kohn, Richard H. and Harahan, Joseph P., (eds), *Air Interdiction in World War II, Korea and Vietnam*, Washington, Office of Air Force History, 1986, pp 66-68.

<sup>57</sup> Summers, Colonel Harry G., *On Strategy: A Critical Analysis of the Vietnam War*, Presido Press, Novato, 1982, pp 63-90.

unintentionally.<sup>58</sup> The four generals correctly identified the fundamental contradiction in air strategy in Vietnam. As they pointed out, the civilian ‘whiz kids’ working for McNamara ‘did not understand air power’, which they thought could be used ‘like a scalpel’ to provide a flexible response to communist aggression; that is, they believed they could apply ‘just enough [bombing of North Vietnam], *not too much*’.<sup>59</sup> Yet as General Burchinal noted, ‘military force is a pretty damn blunt instrument’ which should be used for ‘maximum shock effect - hard, fast and continuous - [to] get the job done’. The problem was, if air power could not be used in accordance with General Burchinal’s approach, the strategy was likely to unravel. Like any form of combat power, air bombardment can only be applied in accordance with the prevailing political ethos. Vietnam was not Japan, and the war in Indochina was not World War II. General LeMay’s admission that at one stage he recommended that the USAF should ‘go up and burn down North Vietnam’ was not only morally reprehensible but also an indictment of his understanding of strategy in its fullest sense.<sup>60</sup>

The final question which must be asked is why McNamara’s analysts believed they could successfully apply air power in the way they attempted. In large part, the dominance claimed for strategic bombing and the pre-eminent place in USAF thinking of Strategic Air Command must carry some blame.

In fairness to air strategists it is of course simplistic to assert that Western air power ‘failed’ in Korea and Vietnam, any more than land or sea forces ‘failed’. In both wars the air contribution to surface operations was vital through such missions as close air support, airlift, rescue, reconnaissance and so on. It is also easy to overlook the fact that, once again, because Western air forces had established air superiority, their armies and navies were able to fight on the surface free from enemy air attack, in contrast to their opponents who suffered severely from aerial bombardment. Mention should also be made of Operation Linebacker II in December 1972, when offensive air power was applied ‘hard, fast and continuous’ and proved to be a decisive factor in bringing North Vietnam to meaningful negotiations.

### **Alive and Well**

Linebacker II represents a good point from which to start the next section of this paper, which argues that the air school of strategic thought has flourished in both theory and practice over the last twenty years; that is, in the period since the traumas (for the West) of Vietnam.

Two aspects of Linebacker II warrant special comment. First, as has been noted, when planning the operation, US strategists rejected the ‘on again off again’ approach which too often had characterised the bombing campaign against the North. There was ample evidence from World War II that offensive air power must be sustained if it is to have maximum effect. Linebacker II observed that lesson. Second, the timing

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<sup>58</sup> See Kohn and Harahan, *Strategic Air Warfare*. LeMay’s posts included chief of staff, USAF, from 1962-65; Johnson’s Air Deputy, supreme allied command Europe in the late 1950s; Burchinal’s deputy commander-in-chief, US European Command from 1966-72; and Catton’s commander, Military Airlift Command from 1969-72.

<sup>59</sup> Kohn and Harahan, *Strategic Air Warfare*, p 121. Emphasis in original.

<sup>60</sup> Quoted in Kohn and Harahan, *Strategic Air Warfare*, p 125.



and the target were both right. Linebacker II was timed to coincide with a particularly sensitive stage of the peace talks in Paris, where US Secretary of State Henry Kissinger was trying to negotiate an agreement which would enable his country to withdraw from Vietnam with a semblance of dignity. Believing that the North Vietnamese delegates were dissembling, President Richard Nixon ordered the sustained and intensive bombing campaign to convince the communists to negotiate. Observing the classical strategy of Douhet and Trenchard, Nixon was targeting his opponents' will.<sup>61</sup> In this case both his analysis of the enemy and the execution of the strategy were correct. North Vietnam resumed genuine talks in Paris and it 'quickly became apparent' to Henry Kissinger that they wanted 'to settle'.<sup>62</sup>

Astute targeting and planning, albeit in a less complex environment, were also evident in the Middle East from the 1960s onwards. During the Six-Day War of 1967, the Yom Kippur War of 1973 and the air war in the Bekaa Valley in 1982, the Israeli Air Force (IAF) provided near-text book examples of air strategy. Gaining control of the air was always the first priority, after which attack aircraft were used to devastating effect either on independent strike operations or in support of surface combat forces. The relative success of Arab ground forces during the first week of the Yom Kippur War was a direct consequence of their strategy to neutralise the IAF;<sup>63</sup> equally, the Israelis' eventual victory seemed inevitable once the IAF had reasserted itself.

The IAF was not the only air force to learn from the traumas of Indochina. Following the West's defeat in Vietnam, airmen in a number of air forces, particularly the USAF, embarked on a fundamental re-examination of their strategic thinking. They were aided in their conceptual work by important technological developments in areas such as space-based and airborne information systems, guided weapons, electronic warfare, all-weather navigation and weapons systems, low observability (stealth), and command and control systems.

The relationship between air strategy and technology is obvious and critical. All things being equal, an air force with a technological edge is likely to prevail. Further, if over the years any one factor has weakened the position of air power theorists, it has been the comparatively indiscriminate nature of air bombardment and its associated unacceptable levels of collateral damage. To return to Colonel Meilinger's aphorism, this time quoting it in full, 'In essence, Air power is targeting, targeting is intelligence, and intelligence is analysing the effects of air operations'.<sup>64</sup> The difficulties experienced in World War II, Korea and Vietnam were generally attributable either to incorrect target selection (that is, attacking targets which were not the most critical to the enemy's ability to wage war), or to inaccuracy and the resultant public outcry over excessive collateral damage. The development of comprehensive information systems and precision guided munitions (PGMs) should therefore be seen as crucial. Most targets can now be identified, and if they can be seen they almost certainly can be hit. Technology has caught up with ideas.

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<sup>61</sup> Kissinger, Henry, *The White House Years*, Hodder and Stoughton, Sydney, 1979, pp 1446-61; and Clodfelter, Mark, *The Limits of Air Power*, Free Press, New York, 1989, pp 182-202.

<sup>62</sup> Kissinger, *The White House Years*, pp 1463-1464.

<sup>63</sup> Narayan, Colonel B.K., *Lessons and Consequences of the October War*, Vikas, New Delhi, pp 50-52.

<sup>64</sup> Meilinger, 'Ten Propositions Regarding Air Power', p 13.

Equally as important as that ability to hit targets ‘surgically’ is the concomitant control of collateral damage. As the Coalition’s attack on the Al Firdus bunker in Baghdad during the Gulf War showed, in the era of near-real time worldwide television news services, hitting the wrong target may have greater strategic implications than hitting the right one.<sup>65</sup>

But by themselves modern surveillance, reconnaissance and weapons systems provide only part of the answer. They must be supported by a rational model for strategic air operations. Here, the major intellectual contribution has come from USAF Colonel John A. Warden, whose book *The Air Campaign* is probably the most influential treatise on air strategy published since World War II.<sup>66</sup>

Warden was the architect of the air campaign conducted by Coalition forces against Iraq in the 1991 Gulf War, a campaign which translated his theories into devastating practice.<sup>67</sup> Three aspects of his work are especially noteworthy for the focus and logic they have brought to air strategy. While those aspects were evident to some extent in previous air campaigns, it was Warden who brought them into a coherent whole and articulated them publicly.

First, Warden applied a rigour to the classification of various targets which too often had been absent from previous air offensives. Central to that process was his definition of an enemy’s system of vital points as series of five concentric rings. While each of those rings is important, the innermost represents the highest value target and the outermost the least influential. Starting from the centre, Warden’s model lists the five critical components of the enemy’s system as follows: leadership; organic essentials (‘those facilities or processes without which the state or organisation cannot maintain itself’); infrastructure; population (with the emphasis on attacking the national will, *not* people themselves); and finally, the fielded military forces.

The logic is clear enough: victory depends on forcing the opposition leadership to capitulate, and it is with that objective clearly in mind that the model has been constructed. Successful strikes against an inner ‘ring’ are more likely to achieve the desired outcome than those against an outer ring. Ideally, though, the entire enemy system should be attacked simultaneously. But regardless of which systems are

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<sup>65</sup> The Al Firdus bunker was originally constructed as a bomb shelter but had been modified for use in Iraq’s command and control system. At the time of the USAF strike it was being used as a shelter by several hundred civilians, many of whom were killed or seriously injured. World-wide television coverage of the strike threatened at one stage to affect Coalition air attacks against Iraq. The incident forced the Coalition to curtail strikes on metropolitan Baghdad.

<sup>66</sup> Warden, John A., *The Air Campaign*, Pergamon-Brassey’s, Washington, 1989. Warden subsequently developed his concepts in several articles: see in particular Warden, ‘Employing Air Power in the Twenty-first Century’ in Schultz, Richard H. and Pfaltzgraff, Robert L., *The Future of Air Power*, Air University Press, Maxwell, 1992, pp 57-87; and ‘The Enemy as a System’ in *Airpower Journal*, Spring 1995, pp 40-55.

<sup>67</sup> For accounts of Warden’s role in the Gulf War, see Hallion, Richard P., *Storm Over Iraq*, Smithsonian Institution Press, Washington, 1992; Gordon, Michael R. and Trainor, Bernard E., *The Generals’ War*, Little Brown, Boston, 1995; and Reynolds, Richard T., *Heart of the Storm*, Air University Press, Maxwell, 1995. Reynolds’ book provides an extraordinary insight into the politics of the Gulf air campaign.

targeted in which order, it is ‘imperative to remember that all actions are aimed against the mind of the enemy command or against the enemy system as a whole’.<sup>68</sup>

Warden has noted that in most cases all of the rings will be present in an enemy’s system, but it may not always be possible to reach more than one or two of the outer rings. For example, by about the middle of World War II, the axis powers were capable of reaching only the outer rings of the allies’ strategic system, a consequence of the allies’ air superiority and the deficiencies of the German and Japanese strategic air capabilities. The ability to bypass the outer elements of an enemy’s systems or to concentrate on any one or a combination of the five ‘rings’ is of course one of the distinctive strengths of a fully developed air power capability.

Second, and following directly from the first aspect, offensive air power can now be applied against a range of targets in *parallel* rather than sequentially. In contrast to the Second World War, Korea and Vietnam, where very large numbers of aircraft had to be concentrated over a single target to achieve the desired effect, today a small number of aircraft armed with PGMs can achieve a disproportionate effect. Broadly speaking, thirty conventional (non-nuclear) 1990s era precision-guided bombs can achieve the same effect as nine thousand 1940s era unguided bombs.<sup>69</sup> Thus, instead of having to strike target systems sequentially, many targets, perhaps incorporating vital points across the enemy’s entire range of vulnerabilities (Warden’s ‘rings’) can be attacked simultaneously to achieve an exponential effect. As was the case in the Gulf, the enemy’s warfighting system from the leadership down can be subjected to intolerable pressure from the opening moments of hostilities. ‘Parallel’ warfare is a direct consequence of precise information and weapons.

The third and final central feature of Warden’s strategic modelling is the emphasis he places on understanding the enemy’s culture, of ‘getting inside the enemy’s head’. The bombing of North Vietnam illustrates the point. Too often USAF air planners imposed first world Western values on their third world Eastern opponents. Yet there may be little point and even less leverage in subjecting an agrarian society to a bombing campaign predicated on demoralising an industrial society. Correct targeting relies on knowing what is important to the enemy.<sup>70</sup>

Colonel Warden’s approach to constructing an air strategy has been the subject of considerable analysis since the Gulf War and the question of whether or not his model has general relevance is debatable. However, there should be no doubt that his admirably clear concept has contributed a great deal to the air school of strategic thought. Perhaps the most provocative response to his work emerged from the former Soviet Union. During the 1980s the Soviet General Staff had developed a concept of global air/space warfare which, its originators believed, could make victory in conventional war possible without either a large ground offensive or the occupation of

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<sup>68</sup> Warden, ‘The Enemy as a System’, p 51.

<sup>69</sup> Hallion, *Storm Over Iraq*, pp 282-283.

<sup>70</sup> For a perhaps self-consciously sophisticated but nevertheless interesting perspective of strategic targeting, see Faber, Lieutenant Colonel Peter, ‘Competing Theories of Airpower: A Language for Analysis’, a paper presented at the USAF Air and Space Power Doctrine Symposium, Maxwell Air Force Base, 30 April 1996.

territory, thus making traditional armies redundant. Some Russian experts concluded that the success of the Coalition's air forces in the Gulf affirmed that concept.<sup>71</sup>

Western airmen have continued to refine their strategic thinking since the Gulf War. A major influence on their work has been the imperative to accommodate the political nature of contemporary conflict. That imperative has been shaped largely by the experiences of Somalia and Bosnia, and has essentially been defined by the need to minimise casualties, achieve a quick resolution of hostilities, and maximise the West's greatest comparative advantage, namely, technological superiority.

By itself technology cannot and never will guarantee success, as the communists in Indochina, the Mujihadeen in Afghanistan and more recently the Hezbollah in the Middle East have shown. Nevertheless, advanced technology represents an enormous comparative advantage for the advanced economies. Most of the undeveloped world's armed forces fight very well at close quarters: the point is to deny them that opportunity. It is technology, and in particular air power, which offers those who have it the option of choosing the field and nature of conflict. To return to the example of the Hezbollah, and their recent rocket attacks against Israel, while Israeli Air Force retaliatory strikes have been unable to prevent those rocket attacks, the IAF has reminded their enemies that there will be a price to pay, and because Israel has an absolute air power dominance, that price can be exacted where, when and as the Israelis choose, at little risk to themselves. The point is to maximise one's strengths; to exploit, in Tony Mason's words, the advantages of 'differential air power' (another way of saying 'we have it and they don't').<sup>72</sup>

The point can be extended. It does not matter whether the aggressor is a rogue state, an international terrorist, a drug baron, a member of organised crime, whatever. The things he values - infrastructure, supply dumps, poppy fields, mansions, and so on - can be seen by advanced surveillance systems and targeted by advanced air weapons. Aggressors without modern aerospace technology can do neither of those things. And as the Gulf War and the conflict in Bosnia have graphically demonstrated, the coalition of nations of which the United States is the nominal leader enjoys an incontestable advantage in air power which no rogue state and no non-state entity can hope to challenge inside the next twenty years at least.<sup>73</sup>

The kinds of targets described in the preceding paragraph suggest a significant shift of emphasis in strategic air warfare. That is indeed the case. Rather than seeking 'absolute' outcomes - specifically, unconditional victory, with its concomitant possibility of absolute failure or unacceptable levels of destruction and casualties - modern air strategies are designed more to *compel* or *coerce*, to drive protagonists to the negotiating table or to modify their behaviour.

Like most things in life compellence/coercion is not new. The RAF, for example, used 'air control' or 'air policing' to discipline recalcitrant tribesmen in the Middle East

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<sup>71</sup> Bellamy, Christopher, 'Turmoil Gives Birth to New Model Army', in the *Independent*, 24-8-91, p 4.

<sup>72</sup> Mason, Tony, *Air Power: A Centennial Appraisal*, Brassey's, London, 1994, pp 236-240.

<sup>73</sup> Colonel Charles M. Westenhoff has argued that organisations which do not have a liberal democratic tradition may, for political and psychological reasons, be incapable of developing and using air power to its fullest extent. See Westenhoff, Charles M., 'Air Power and Political Culture', *Air Power Studies Centre Paper No 42*, APSC, Fairbairn, 1996.

and on the Northwest Frontier in the 1920s and 1930s; while the French Air Force used the same technique in Chad on several occasions throughout the 1960s and 1970s.<sup>74</sup> And over the years a vast amount has been written on the supposed various forms of coercion, such as ‘punishment’, ‘risk’, ‘denial’ and ‘decapitation’.<sup>75</sup> The fact was, though, that targeting which too often was inadequate and bombing which too often was inaccurate confined the utility of those concepts to the halls of academe. In practice, the implicit degree of discrimination could not be guaranteed to the necessary degree. However, the concept of controlled coercion now seems to be far more generally feasible and relevant.

Operation Deliberate Force provides an informative case study. A brief air campaign conducted by NATO against the Bosnian Serbs between 30 August and 20 September 1995, Deliberate Force involved the relatively small number of 3,500 sorties against fifty-six target complexes. It may well come to be seen as a turning point in air strategy. The targets selected were not those of the ‘classic’ air strike campaign such as electrical grids, petroleum production, transport systems, war production and so on, but rather the Serb Army’s supply dumps. As NATO’s strategists had astutely deduced, those supplies were essential to the Serbs’ land campaign against their Croatian and Bosnian opponents. They were the Serbs’ vital point and thus a *strategic* target. Once NATO air power started to destroy those supplies the Serbs quickly realised they were in danger of losing the ascendancy they held in the land war. They had little option other than to return to the negotiating table, thus satisfying NATO’s limited political objective. The ensuing Dayton Peace Accords offered hope that there might be some resolution of what at times has seemed an intractable dispute.

Three particularly important points have emerged from Deliberate Force. First, it is noteworthy that the operation became possible only when vulnerable NATO ‘peace keeping’ ground forces were withdrawn from the region and so were no longer potential hostages.<sup>76</sup> Second, because of NATO’s air supremacy, there was little the Bosnian Serbs could do to stop the air strikes.

Finally, and most importantly, the nature of the word ‘strategic’, at least as it has been applied in the air school of strategic thought, is finally clear. For years the (often inadvertent) incorrect use of that most ubiquitous of military terms has helped confound air strategists. Any target which was a long way from an attacking aircraft’s home base almost automatically attracted the description ‘strategic’. Similarly, any bomber raid against an enemy’s homeland was ‘strategic’, regardless of the target. And an aircraft with four engines and which was capable of carrying a heavy bomb load was always a ‘strategic’ bomber. In short, the nature of the target seemed secondary to the image of the machine and the mission. Yet in Vietnam ‘tactical’ fighters were used for ‘strategic’ missions against the North, while ‘strategic’ B-52s were used for ‘tactical’ strikes in the South. Apparently the role might not always be

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<sup>74</sup> For an example of the former see C.F.A. Portal, ‘British Air Control in Underdeveloped Areas’, in Emme, Eugene M., *The Impact of Air Power*, Van Nostrand, Princeton, 1959, pp 351-362; for the latter, Lorell, Mark, ‘Air Power in Peripheral Conflict: Lessons from the French Experience’, in Vallance, A.G.B. (ed), *Air Power: Collected Essays on Doctrine*, MOD, 1990, pp 76-90.

<sup>75</sup> For a recent addition to the list see Pape, Robert A., *Bombing to Win*, Cornell University Press, Ithica, 1996.

<sup>76</sup> Only one aircraft was lost during Operation Deliberate Force and the crew was subsequently released.

defined by the platform. When helicopters were used for long-range 'strategic' strikes in the opening phases of the Gulf War the game was finally up. It was clear that *'strategic' is defined by the objective of the mission, not by the target, platform, weapon or distance flown.* Campaign planners (and academics) may still wish to finesse the matter by describing a particular strike in terms of 'punishment', 'denial', 'decapitation' and so on, but their real task will have been done once they have decided whether or not a genuine strategic air action is feasible; and, if so, which targets should be attacked. Semantics contribute little to this debate: it is the ability to do the job which matters. Colonel Warden's air campaign model and Colonel Meilinger's aphorism once again tell the story.

To reiterate, the strategic application of air power involves the direct pursuit of first-order political-military objectives. That definition of 'strategic' raises another interesting case study from Bosnia which may have long-term implications for perceptions of air power. The suggestion has already been made that the Berlin Airlift was perhaps air power's most important contribution to the Cold War. In today's complex world where so-called 'low intensity' conflicts often demand more subtle action than the application of force, strategic airlift has assumed a significant profile. For example, between July 1992 and January 1996 Operation Provide Promise became the longest-running air supply campaign in history as twenty-one nations flew more than 160,000 tonnes of food, medicine and relief supplies into the besieged city of Sarajevo.<sup>77</sup> At a time when peace support operations seem to be replacing war between states as the main occupation of military forces, airmen may have to pay more attention to the potential of strategic airlift.

However, the strongest caution must be sounded regarding all future air strategies which focus on strike, airlift or any other role which involves operations into potentially hostile territory. For over half a century air strategies for the West have been underwritten by the domination of the air which the USAF, RAF, RAAF and their allies have invariably provided. So comprehensive has that domination been that concepts of operations prepared by the armies and navies of Western countries tend to assume that they will be free from enemy air strikes, while they themselves will be able call on friendly air support as and when required.<sup>78</sup> History has shown that to be a fair assumption, but perhaps surface force commanders occasionally need to be reminded that that most favourable outcome has not been achieved by chance.

### **Applying Air Power: A Doctrinal Model**

Strategic thinking is translated into operational action through the development and application of doctrine. The combination of theory and practical experience which comprises doctrine suggests that there are five main roles for the application of air power. The first four are directly concerned with warfighting activities while the fifth provides the essential support base upon which air power rests. Those roles are:

#### a. Theatre Control

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<sup>77</sup> *Air Force Magazine*, March 1996, p 12.

<sup>78</sup> For example, Australian Army planning 'relies on [the RAAF] dominating the air ... approaches to prevent large scale conventional operations against Australian territory'. Sanderson, Lieutenant General J.M., 'Army Beyond 2000: And Army Requirements for Air Support', in Stephens, Alan (ed), *New Era Security*, Air Power Studies Centre, Canberra, 1996.

- b. Strategic Strike
- c. Force Application
- d. Force Multiplication
- e. Force Support

### **Theatre Control**

Since World War I many air forces have listed the ability to ‘control the air’ - that is, to secure the freedom to conduct air operations while denying the enemy that capability - as the ‘prime’ air activity. But as the Coalition air forces demonstrated through their stunning dominance of the entire battlespace during the Gulf War, that definition has become too restrictive. Limiting the ‘control’ function of air forces to only one element of the combat environment - the air - is inconsistent with the capabilities of modern air power and is therefore doctrinally incomplete. Any description of the ‘control’ role should encompass the full extent of what is possible, not merely part of what is possible. The fact is, in the right circumstances, for more than half a century, air forces have been (and are) just as capable of controlling the land and the sea as they are of controlling the air. That vital capability perhaps tends to be overlooked because of the emphasis doctrine has placed on air control, and because of the (misplaced) sensitivities of armies and navies. Consequently, a much broader description of that role than simply ‘control of the air’ is necessary. The term ‘theatre control’ most accurately describes air power’s ‘control’ capability over the modern battlespace.

‘Theatre control’ is broad in application and consists of three subsets:

- a. Air Control,
- b. Surface Control (incorporating sub-surface control), and
- c. Information Control.

Depending on circumstances and the joint force commander’s overall campaign plan, those three subsets of theatre control could be prosecuted separately or in parallel. Should highly favourable circumstances already prevail (for example, if the enemy cannot contest one or all of those subsets), they might even be ignored. However, experience has shown that control of the surface is unlikely to be achieved without first gaining control of the air. The timing of information control missions is less certain at this early stage of the phenomenon of ‘information warfare’, but it may well prove to be the case in future that the need to establish some degree of information control will precede the other control roles.

### ***Air Control***

In most circumstances air control will remain the prime air power task. One or a number of missions can be conducted to achieve air control: offensive counter air; defensive counter air; suppression of enemy air defences; and so on. It is probable that

surface forces will continue to contribute to the air control role through special force missions (to sabotage enemy air defences etc), radar picket ships and the like. At the least, the involvement of surface forces will be essential for such enabling roles as air base defence and logistic support.

### ***Surface Control***

The failure of most doctrine manuals explicitly to specify as a major role air power's ability in certain circumstances to control enemy surface (and sub-surface) actions is a serious omission which could adversely affect the development of concepts of operations and campaign planning.<sup>79</sup> In particular, the omission means that the possible dominance of air forces in joint operations is not acknowledged. Yet instances where air forces have dominated the movement of surface and sub-surface forces abound: Bosnia in September 1995, the 1991 Gulf War, the Falklands in 1982, and the Battle of the Atlantic after 1944 are only a few. At a time when joint operations increasingly are being recognised as the preferred method of conducting conflict, it is incumbent upon airmen to remind their army and navy colleagues of the full range of possibilities their service brings to the planning process.

### ***Information Control***

Acknowledging the importance of information to warfare is scarcely original. What is new, however, is the ability of many military forces rapidly to gather, process, analyse and exploit information, to the extent that 'information dominance' must now be regarded as a distinct and crucial military activity; as a potent weapon and a lucrative target. The driver for this phenomenon has been the extraordinary advances made in the last twenty years in the technical means of collecting, storing, transmitting and analysing information.

Some strategists believe that air forces should seek to acquire the required degree of information control before they attempt to establish air control; that is, that information control should be an air force's prime role. But like any role or mission, the priority accorded to information warfare will be dependent on the enemy's capabilities and one's own campaign plan. At this early stage there is no one correct answer to the question of 'control' priorities. It is doctrinally more correct and operationally more logical simply to group the three control roles, leaving the joint force commander the option of placing his effort and (probably limited) resources where he chooses.

### ***Strategic Strike***

The single quality which above all others has distinguished air forces since World War I has been air power's ability to strike directly against an enemy's sources of power, be they leadership, oil, electricity or whatever - that is, to conduct strategic strikes. Notwithstanding the advent of surface- and sub-surface launched cruise and

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<sup>79</sup> See for example RAAF, *The Air Power Manual* (2nd ed), Air Power Studies Centre, Fairbairn, 1994; USAF, AFM 1-1, *Basic Aerospace Doctrine of the United States Air Force*, HQUSAF, Washington, March 1992, RAF, *Air Power Doctrine* (2nd ed), 1993.



ballistic missiles, long-range aircraft equipped with precision missiles remain the pre-eminent expression of strategic strike.

It follows from the preceding discussion that 'strategic strike' should be the preferred role for air power employment. Should circumstances dictate otherwise - for example, that a surface-oriented attrition campaign will have to be conducted, then the 'theatre control' role would be implemented.

### **Force Application**

Force Application deals with the application of combat air power for purposes other than the theatre control and strategic strike roles. Missions which force application might incorporate include battlefield interdiction, close air support, anti-shipping strikes, anti-submarine warfare and reconnaissance.

### **Force Multiplication**

The RAF's first chief of staff, Sir Hugh Trenchard, may not have been familiar with the term 'force multiplication' but he understood its meaning: 'to expand the effectiveness of man and machine without increasing the numbers of either; in that way lies economy'.<sup>80</sup> Force multiplication can be achieved through the exploitation of such air power capabilities as air-to-air refuelling, superior command and control systems, multi-role aircraft, electronic support measures and better personnel practices.

### **Force Support**

Force Support is the essential base upon which all other air roles depend, and is concerned with activities like logistics, recruiting, training, research and development and air base defence. No matter how good the aircrew, the aircraft and the weapons systems, it is unlikely an air force without a high quality support organisation will succeed. As is the case with other air roles, there is no reason why land and sea forces should not be employed to conduct this action.

## **CONCLUSION**

From the time of the First World War the *essential* aim of air strategists has been to devise an approach to warfare which facilitates the immediate and rapid pursuit of strategic outcomes. If attainable, that approach could reasonably be expected to achieve quicker and less destructive outcomes than the attrition model of warfare commonly employed by surface forces. In the event, technical and intellectual shortcomings meant that for about half a century airmen also waged attrition warfare. However, through the experiences of two world wars, Korea, Vietnam, the Middle East, the Gulf, and now central Europe, there is clear evidence that, *in the right*

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<sup>80</sup> Trenchard, Sir Hugh, quoted in Mason, Air Vice-Marshal R.A., 'Current Air Power Developments', in Ball, Desmond (ed), *Air Power: Global Developments and Australian Perspectives*, Pergamon-Brassey's, Rushcutters Bay, 1988, p 62.

*circumstances*, an advanced air power has the ability to pursue potentially decisive strategic objectives from the very start of hostilities.

This is a development with major implications for senior commanders. For most of the 20th century military campaign plans have been drafted predominantly from a land, or sometimes a maritime, perspective; that is, the ultimate objective has been to seize and hold parts of the surface. It is questionable whether that approach retains any general validity. Currently, advanced technology, expressed primarily through air forces, represents the developed world's greatest military comparative advantage. That is *not* to say that air power alone can win wars or achieve desired political outcomes. It cannot, and too often in the past the card-carrying members of the air school of strategic thought have diminished their endeavours by claiming otherwise. It *is* to say, however, that at the turn of the 21st century innovative thinking combined with technological supremacy have made air power the democracies' weapon of first choice. Joint force commanders charged with preparing campaign plans would do well to understand the *full* range of options the air school of strategic thought has given them.