masters of air power

Edited by Wing Commander Keith Brent

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Preface and Acknowledgments to 1st Edition

Papers have been printed as provided by the authors, with only minor changes to achieve some consistency in layout, spelling and terminology. The transcripts of the panel discussions that followed the presentation of the papers have been edited for relevance, clarity and brevity. Copies of the edited papers and transcripts were sent to the authors for comment before publication.

My thanks are due to my colleagues at the Air Power Development Centre, in particular Miss Michelle Lovi, for their highly professional editorial assistance.

Keith Brent
Air Power Development Centre
Canberra

November 2005

Preface to 2nd Edition

This book contains the papers presented at a conference held by the Royal Australian Air Force in Canberra in August 2005. Since its publication as the proceedings of the conference later that year, the book has been widely referred to and read by a cross-section of students and air power enthusiasts. The relevance of the book, and the essays within it, is built on two facts. First, it is one of the few anthologies available wherein successful commanders of air forces have been individually studied to discern the attributes necessary to attain mastery of air power. Second, the commanders analysed in the book date from World War I when aircraft were first used as weapons of war and cover the full 100 years of military aviation to recent times. This coverage makes the book a very broad study of air power professionalism and command across a majority of the major air forces of the world.

The embellishments that are necessary in published proceedings of a conference—in terms of opening and concluding remarks and transcripts of follow-on discussions—have been deliberately removed to improve the appeal of the book as a reference text. For the record, it is necessary to state here that the conference was opened by Air Marshal Geoff Shepherd, AM, the then Chief of Air Force and that Air Vice-Marshal Roxley McLennan, AM, the then Deputy Chief of Air Force, provided the closing remarks.

The common thread that is clearly discernible across all the papers is the high degree of professional mastery displayed by the commanders whose lives and performance as strategic leaders of their air forces have been studied. This book will provide significant insight into the demands of successful strategic military leadership to all students of military matters.

Sanu Kainikara
Air Power Development Centre
Canberra

November 2010

Abbreviations

AAA	Anti-Aircraft Artillery
AAP	Australian Air Publication
ACTS	Air Corps Tactical School
AEF	American Expeditionary Force
AFB	Air Force Base
AM	Member of the Order of Australia
AO	Officer of the Order of Australia
AOB	Air Order of Battle
AOC	Air Officer Commanding
ATO	Air Tasking Order
CAS	Chief of the Air Staff
CBU	Cluster Bomb Unit
CENTAF	Central Command Air Forces
DCAS	Deputy Chief of the Air Staff
GHQ	General Headquarters
HE	High Explosive
IAF	Indian Air Force
JORN	Jindalee Over-The-Horizon Radar Network
MIT	Massachusetts Institute of Technology
NBC	Nuclear, Biological and Chemical
OTU	Operational Training Unit
PhD	Doctor [or Doctorate] of Philosophy
POL	Petrol, Oils and Lubricants
POW	Prisoner of War
RAAF	Royal Australian Air Force
RAF	Royal Air Force
RFC	Royal Flying Corps
RSA	Returned and Services Association [NZ]
R/T	Radiotelephony
SAC	Strategic Air Command
SAM	Surface-to-Air Missile
SEAD	Suppression of Enemy Air Defences
SWPA	South-West Pacific Area
TLAM	Tomahawk Land Attack Missile
US	United States
USAAF	United States Army Air Forces
USAF	United States Air Force
USS	United States Ship

Introduction

Dr Sanu Kainikara

Historically, military forces have been dependent on effective command and control for their success. In fact, the majority of military failures can be attributed to the failure of command. This brings into focus the demands placed on commanders to ensure that their forces are successful when operationally employed. These demands are felt by all commanders—from the platoon commander and flight leader, through to the supreme commander at the highest strategic level. While the demands on commanders were always multifaceted, the dimensions of command have grown exponentially in modern times primarily because of two factors.

First, the increased complexity in the character and conduct of war demands dispersed and mobile operations from conventional military forces, escalating the challenges to effective command. The continuous evolution of the character of war has necessitated the formation of a large number of specialised subsections within the broader and basic organisation of a military force, which vastly enlarges the breadth of a commander's basic knowledge and skills. Second, the sophisticated capability requirements of a modern military force are usually satisfied through technological innovations. This reliance on technology as a solution places inordinate demands on the commander to be able to understand complex systems and simultaneously excel in the more traditional command responsibilities. The outcome is that it has become critical for contemporary commanders to possess professional competence of a very high order to be successful.

There is a fallacious belief that the rigours of leadership are only marginally applicable to air force commanders, since they do not demonstrably 'win' wars or fight and win battles or skirmishes, unlike for example, army commanders. Nothing could be farther from the truth. Each of the three environments in which military forces operate demands unique capabilities from its commanders—none being more, or less, complex than the other. It is crucial for air force commanders to have a very highly developed understanding of the application of air power to achieve the tactical, operational or strategic objectives of an encounter, battle or campaign—much like the requirements for commanders operating in the other two environments. The common baseline is that contemporary military commanders have to be professionals in their own environment, as well as in the joint application of military power, to ensure operational and strategic success.

Military forces have long been referred to as the 'profession of arms', a tacit acknowledgement that a soldier (sailor or airman) is not merely someone who can use a firearm or physically outfight an opponent, but someone who is part of a profession that requires training, study, experience and a commitment to service, much like the practice of medicine or law. In other words, a military force needs to have a collective

professionalism—brought about by the individual competence of its members—for it to succeed. Although this requirement manifested itself in the military forces of the 19th century, the concept of professional competence was greatly refined during the inter-war years and more so in the second half of the 20th century. Today, professional mastery is accepted as an underpinning quality of competent military forces.

Professional mastery in military activities is more nuanced than it is in the case of other professions. This is mainly because the profession of arms carries with it an inherent risk and danger to life and involves the taking of life in the normal conduct of its business. For a commander, this goes to the core of his/her competence by being made responsible for the wellbeing of the cohort he/she is leading. This being the case even in times of comparative peace, professional mastery in the military assumes a different hue. Further, the dense and complicated global strategic environment places a premium on the professional mastery of a nation's armed forces and their commanders, if and when the nation goes to war.

The contemporary security environment within which military forces operate to secure the national interest is fluid and complex. This necessitates the development of adaptable and versatile forces that can operate seamlessly to create the desired effects. In order to meet this challenge, a military force must develop an appropriate strategy and constantly strive to improve it while also maintaining the necessary level of preparedness and posture. These are demanding and vital outcomes to be achieved that require a very high level of adaptability from the force, especially since it might require the military to operate across the entire spectrum of conflict—from high-end warfare to the provision of humanitarian aid in support of civil authorities. Air forces make a unique and important contribution to this endeavour.

In this environment, only military forces commanded by professional masters—at all levels—will be able to achieve the necessary level of competency.

To create and maintain the capacity of an air force to meet and overcome emerging challenges and to guide it ably into the future demands superiority in decision-making by professional masters of air power. At the foundational level professional mastery is personal, being the sum of individual knowledge and understanding of air power nurtured by the experience and confidence gained over a period of time. This professional mastery is translated into organisational excellence through its leaders, who themselves have to be professional masters at the highest level.[1] A force that can enhance this process will be second to none.

In the context of air forces, there is a common belief that they are the products of technology and are beholden to technological developments to optimise and improve their performance. This is only partially true. Ever since the development of the first aircraft there is no doubt that air power, and by implication air forces, are intrinsically connected to technology—in fact, born and nurtured through technological innovation—and their effectiveness, or otherwise, has been largely derived from the

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1 AAP 1000–D—*The Air Power Manual*, Air Power Development Centre, Canberra, 2007, p. 18.

people that form the force. One cannot excel without the other. A judicious combination of technology and people is fundamental to the efficacy of an air force.

Technology increases the awesome range of effects that air power can deliver which are controlled by the air commander. The devastation potential of a single air-delivered weapon goes far beyond the impact of a single bullet or artillery shell, placing immense pressures on air commanders to make the 'right' decisions. This is particularly the case where the political demand on air power to provide the first response to a crisis is evolving as another dimension of modern warfare. This being the case, professional mastery of air power is a critical attribute for air force commanders to possess if they are to be successful. This adage has been repeatedly proven throughout history.

At the strategic level of command, mere professional mastery may not always be sufficient to ensure success. Analysis of command at the highest levels, especially in times of war, reveals that in the majority of cases, successful commanders also possessed some other attributes that made them forge ahead beyond the limits of professional mastery. These commanders were people of clear vision and imbibed with the fortitude to work steadily towards its attainment. Further, they had the ability to manage the intricacies of the politico-military interface, which is one of the cornerstones in ensuring that national security is never imperilled. It was a combination of these intangible qualities that allowed them to cross an invisible line and converted them from individuals with professional mastery into true 'Masters of Air Power'.

Masters of air power are persons who have transcended the level of professional mastery and function at the highest level of grand strategy with intuition, assurance and clarity of thought. They are leaders at the apex of national security, who have the knowledge and confidence to be both statesmen and effective commanders—if necessary, simultaneously. An air force fortunate enough to be commanded by people endowed with such highly developed capabilities is unlikely to fail to achieve its objectives.

This book, *Masters of Air Power*, is a collection of essays on air force commanders that were presented as papers at the 2005 RAAF History Conference that addressed the theme of professional mastery of air power. The analysis ranges from commanders at the beginning of military aviation to individuals who were instrumental in conducting successful air campaigns in recent times. The common thread that is clearly visible through all the essays is the perception of the authors that the individuals discussed were 'Masters of Air Power' in their own right. The reader can draw his/her own conclusions from the analysis, but it is certain that the conclusions drawn by the authors will stand up to such scrutiny.

Section 1

Master Bombers



First Masters of Air Power: Douhet, Trenchard and Mitchell

Doctor Chris Clark

Giulio Douhet, Hugh Trenchard and 'Billy' Mitchell are well-known names to anyone interested in the history and theory of air power. Their status as 'gurus', whose ideas helped shape the development of air power during its first few decades, would seemingly more than merely *qualify* them for consideration in a conference of this nature—their inclusion appears virtually *de rigueur*, or a matter of course. Yet the question can fairly be asked: are they really 'masters of air power'? On what actual experience of the application of air power are their reputations based? Can they properly be regarded as practitioners in the field, or merely armchair strategists?

It seems entirely appropriate to enter into such a debate here, because it might well be argued that the details of their careers, or at least some of them, are not as well known these days as might be expected. Perhaps we have come to know the particulars of their message better than we understand the basis on which they advanced the theories or ideas for which they have become famous. Let us do a little delving, therefore, into who these men were, and follow their career path to the point where they acquired semi-mystical status as prophets of that emerging black art called air power.

Douhet

Of our three experts, Douhet is the one that we know least about in terms of his military career. Indeed, during his lifetime, it seems he was little known outside of his native Italy. We do know that he was born in 1869 into a family with aristocratic and military connections to the House of Savoy over many generations. He attended the Genoa Military Academy, graduating first in his class, before being commissioned into

the artillery in 1892. Later, he attended the Polytechnic Institute in Turin where he studied science and engineering, and was then selected to attend the Italian Command and Staff College.

This early background of technical education undoubtedly explains Douhet's readiness to embrace new technologies that were, even then, beginning to transform military science. Following development of the petrol-engined motor vehicle in the mid-1880s, Douhet emerged as an early advocate of mechanising the army. He lectured on the subject, and published two significant books as well as various articles. In 1905 he was placed in command of the Bersaglieri, a special experimental motorcycle unit.

It was while assigned to the General Staff in the early 1900s that Douhet observed the arrival of, first, dirigibles and then fixed-wing aircraft in Italy. He was apparently present when French aviators Gabriel Voisin and Leon Delagrange went to Rome in May 1908 to demonstrate their motorised box kite to a large crowd, including Italy's Minister of War. He was probably also present in 1909, when the newly-formed Italian aviation body, Club Aviatori, brought Wilbur Wright to Rome to demonstrate his Military Flyer machine at the Centocelle military base, and to train Italy's first military pilot.

Douhet had never flown himself at this stage, but it is claimed that on the basis of the few aircraft he had seen that he was intuitively impressed by the potential of air power. It was at this time—as a 40-year-old Major—that he began advocating creation of a separate air arm commanded by airmen, making the famous observation that 'The army and navy must recognize in the air force the birth of a third brother—younger, but none the less important, in the great military family.'

On 29 September 1911, Italy went to war with Turkey over the latter's refusal to allow Italian occupation of the provinces of Tripolitania and Cyrenaica in Libya. Supporting the expeditionary force that Italy sent to North Africa was an improvised aviation contingent operating nine aircraft, which had been purchased only the previous year. In the ensuing campaign, this unit notched up an impressive record of world-firsts: first combat air reconnaissance, first bombing mission, first air photo reconnaissance, and first aircraft shot down (by Turkish rifle fire).

Despite claims made in some accounts that Douhet was in charge of organising this air campaign, it appears that the Italian air unit was commanded by a Captain Carlo Piazza. Douhet's association with these events actually came at the conclusion of the conflict, when he was tasked with writing a report on the lessons for aviation that had been learnt from the experience. It was allegedly in this document that he concluded that the primary role for aircraft should be high altitude bombing. One of the results of the Libyan campaign was that in 1912 the Italian Army formed a standing aviation unit, the Aeronautical Battalion, based in Turin, and Douhet was placed in command of it.

While at Turin, Douhet wrote *Rules for the Use of Airplanes in War* (1913)—perhaps the first manual of its kind. It was then that he began to acquire a reputation as a radical. Eventually, this tendency got him into trouble in 1915, when he placed an order with Gianni Caproni, a friend who was a young aircraft engineer, to build a revolutionary

three-engine bomber—unfortunately, without obtaining government authorisation. As a result, he was reposted to an infantry division, as a staff officer.

From the time that World War I started, Douhet began advocating that Italy begin building up its military forces—even though the country stayed neutral until May 1915. He particularly focused on building up aircraft numbers, suggesting an aerial fleet of 500 bombers, but became frustrated when he found that his calls fell on deaf ears. Once Italy entered the war, he was affronted by what he saw as a criminal lack of preparedness on the part of army leaders. His response was to engage in a vigorous writing campaign, bluntly criticising official incompetence in prosecuting the war effort and the failure to adopt his preferred air power solution.

After one particularly outspoken memorandum by Douhet became public knowledge, he was arrested for sedition, court-martialled, and sentenced to a year in a military gaol. From his cell he still wrote about air power, including a fictional work based around the subject called 'How the Great War Ended—the Winged Victory'. He also continued to pester ministers with letters that restated and argued the case for massive investment in air power. Vindication came shortly after his release from prison, in the form of the military disaster suffered by Italy at the hands of the Austrians and Germans at Caporetto in October 1917.

Restored to active duty, he became director of the Central Aeronautical Bureau, where he laboured to bring about a strengthening of Italy's air arm. Still disillusioned and disgusted at the mind-set of his superiors, he lasted just eight months before leaving active duty in June 1918. After the Armistice, he worked to have his court-martial overturned and conviction quashed. He was successful in this, and received promotion to Brigadier General in 1921—the year that an early version of his famous treatise on strategic bombing, *The Command of the Air*, was published by the Ministry of War.

It is not clear whether Douhet was himself a Fascist, but he supported Benito Mussolini when the Fascists came to power in 1922 and received an appointment as Commissioner of Aviation. He soon quit his bureaucratic post, however, preferring to resign from both that position and the army in order to continue his writing. This was an activity which he kept up until he died from a heart attack in 1930. It was in his 1927 edition of *The Command of the Air* that his faith in strategic bombing received its ultimate expression.

A number of points emerge from this quick outline of Douhet's career. First, although it seems that he never actually learnt to fly, he had occupied positions from which he was able to keep as informed on air warfare as practically anybody else at the time. Secondly, although his faith in air power had been evident even before World War I, the theories which he later developed and espoused were a direct response to the experience of that conflict. In particular, it was his realisation of the incomparable offensive potential of aircraft that led him to advocate air power as the means to avoid future wars of attrition such as Europe had just passed through.

A comment also seems necessary on his marked qualities as a maverick in advancing the cause of air power during his lifetime. It was certainly not essential that he was, as

one commentator described him, a 'tireless, blunt, impatient and very self-confident individual', since this undoubtedly carried penalties in having his message heard where it mattered. We cannot help but wonder, however, whether he could have made his voice heard otherwise, considering the intellectual climate of the times.

Trenchard

Hugh Montague Trenchard was another who came late to military flying. Born in 1873, he twice failed the British Army entrance exams before gaining a commission in the Royal Scots Fusiliers in 1893. Posted to India, he initially showed an indifferent attitude toward his chosen career, gaining a reputation both for flouting authority and having little time for the social aspects of Army life.

He served in South Africa during the Boer War, first seeing action in September 1900. His time at the front ended, however, after he was seriously wounded and sent home to England as an invalid. As a brief aside, mention should be made of claims that he was operating with Australian horsemen under his command when he pursued some Boers into a valley and was hit by the bullet that pierced a lung and grazed his spine.

Initially unable to walk without aid of a cane, Trenchard's health problem was reportedly self-corrected by a rough toboggan landing experienced at St. Moritz, Switzerland, in 1901; he even stayed on long enough to win the Cresta Run bobsled trophy. He was thus able to undertake ten years of postings in West Africa (Nigeria) and Ireland. The fact remains, however, that as he approached the age of 40, he had an undistinguished record and few prospects. The most remarkable thing about him was his nickname 'Boom', a reference to his distinctly loud speaking voice.

The turnaround in Trenchard's career reportedly came during the Army manoeuvres of September 1912, when he flew as observer with an Australian-born aviator from the Royal Navy named Arthur Longmore. The experience of that exercise, when the scouting machine was quickly able to locate the opposing forces and direct friendly cavalry onto them, was supposedly an epiphany for Trenchard that caused him to become alert to the impact that aviation would have on land warfare.

It was at this stage that Trenchard decided to learn to fly. He was advised by his commanding officer that he was too tall and too old, but he was undeterred. Taking two weeks' leave, he paid his own tuition at Thomas Sopwith's flying school at Brooklands. After an hour and four minutes in the air he gained his pilot's certificate. We have it from his flying instructor that 'he would never have made a good pilot', although he was 'a model pupil'.

In December 1912 Trenchard attended the first course at the Central Flying School at Upavon, in Wiltshire. He completed the course, though he had not yet qualified for his Army brevet, and was appointed in 1913 as the senior staff officer at Upavon. Depending on which account one reads, this meant that he was either Assistant Commandant or Second-in-Command, or Adjutant. A story goes that one of Trenchard's duties at Upavon was to set examination papers, arrange and supervise the exams, and correct

and assess the results. This was somewhat awkward, in view of the indeterminate state of his own qualifications, so he regularised the situation by setting himself a flying and ground exam, correcting his own paper and awarding himself his 'wings'.

Following the start of World War I, in November 1914 Trenchard was sent to France in command of a wing of two squadrons (one of only three operational wings which the Royal Flying Corps (RFC) could mount at that time). With his No 1 Wing flying in support of the British Fourth Corps and the Indian Corps, he became convinced that it was vital for the RFC to fight for air ascendancy. In January 1915 he took the opportunity to tell the Commander-in-Chief, Sir Douglas Haig, what air units could do during an offensive being planned at Neuve Chappelle. Haig was convinced, and even when the offensive failed he did not fault the air support he had received but instead reprimanded his artillery commanders for ignoring aerial signals.

During the Spring offensives that followed, Haig still looked to Trenchard to provide support. Nine months later, in August 1915, Trenchard became the RFC's General Officer Commanding in the field—which meant that he was head of all British air forces in France. The next month his squadrons were heavily involved when the Battle of Loos began on 25 September 1915. Following this, Trenchard was promoted to Major General.

Faced with an opponent operating better types of aircraft during 1916, Trenchard adopted formation tactics as a means of concentrating his own forces to fight for air superiority. In doing so, he validated his belief that an air arm had to protect its own ability to operate by establishing air superiority, before it could assist ground forces.

Trenchard's acknowledged expertise in air operations prompted Lieutenant Colonel 'Billy' Mitchell to visit his headquarters in 1917, seeking advice on the proper application of air power. After three days, Mitchell departed with a 'fatherly invitation from Trenchard to seek him out any time' and a conviction that he had never spent a more instructive time.

In August 1917 Trenchard returned to England to reorganise training at a new school at Gosport. When an Air Council was formed in January 1918, he became the first Chief of the Air Staff (CAS) and was knighted. In this post he helped to establish the Royal Air Force (RAF), but quit two weeks before its inauguration on 1 April 1918, following a quarrel with the Air Secretary, Lord Rothermere (although the announcement of his departure was delayed until 12 April). He returned to active duty, and in June that year established the inter-allied Independent Air Force that had been organised to conduct a strategic bombing campaign against railways, airfields and industrial centres in Germany.

In February 1919, following the Armistice, Trenchard accepted the invitation from Winston Churchill, the Minister for War and Air, to return as CAS and was made a baronet. During his time at the head of the RAF, he dealt with the impact of shrinking budgets and Army–Navy schemes to dismember the new Service. He remained CAS until 1927, when he was appointed the first Marshal of the RAF, and retired two years later. Created a baron in 1930, the next year he was appointed Commissioner of the

London Metropolitan Police and served until 1935. Created viscount in 1936, he entered private business.

By the time World War II began, Trenchard was in his mid-60s and too old to play an active role, though he did make morale-building visits to front-line squadrons at various times. Many of the pilots he had helped to train were now leading the RAF, including figures like C.F.A. ('Peter') Portal—soon to become CAS—and A.W. Tedder, one of his young squadron commanders in 1918. Trenchard died in 1956, at the ripe old age of 83.

These days Trenchard is remembered as a 'patron saint of airpower', as one writer called him—an early advocate of an independent air force and strategic bombing. From what I have described of his career, it is clear upon what first-hand experience that reputation was based. He had helped train and organise the RAF for World War I, then led it into battle, in the process pioneering many of the concepts that we accept as central to air warfare today. He was a first true practitioner of air power, and, I suggest, fully deserving of the title of 'master'.

Unlike Douhet, Trenchard's legacy was not especially theoretical. His advocacy of strategic bombing as the primary role of an independent air force seems not to have stemmed from a deeply held and reasoned conviction, or even intuitive faith. For instance, it comes as something of a surprise to discover that he disparagingly summed up the experience of the Independent Air Force in 1918 with the observation that there had never been a 'more gigantic waste of effort and personnel … in any war'. What appears to have changed his mind about the efficacy of bombing as a war-winning means was the struggle throughout the 1920s to maintain the RAF's existence as a separate Service, and the opportunistic need to find a rationale that countered the case for dismemberment.

Trenchard's value to the Service that he headed had less to do with intellectualism, for the simple reason that he was not notably intellectual by inclination. On the contrary, the evidence is more compelling that he was largely inarticulate, both verbally and on paper. His contribution lay chiefly in his skills as a gruff and forceful political operator. Like the 'Father' of our own RAAF, Air Marshal Sir Richard Williams, Trenchard was a difficult and formidable figure, both quarrelsome and tenacious in argument. He was not above resigning to uphold his point of view, as Lord Rothermere discovered as Trenchard's political superior in 1918.

Mitchell

Speaking of troublesome subordinates brings us to Mitchell. Like Douhet, William Lendrum Mitchell came from distinguished background. Part of his ancestry was Scottish, which may or may not have been relevant to his later career. Grandson of millionaire railroad maker Alexander Mitchell of Milwaukee, he was the son of wealthy Wisconsin senator Colonel John Mitchell. He was born in December 1879 in Nice, France, while his parents were on an extended tour of Europe.

When aged three, his family returned to Milwaukee and he was educated there at Racine College. Later, 'Billy' began studying at what is now George Washington University in Washington DC, but he left without graduating in May 1898 in order to enlist as a private in the 1st Wisconsin Infantry during the Spanish–American War. Thanks to his father's influence, he received a field commission as a junior Lieutenant in the Army Signal Corps a few weeks later.

Subsequent Army service took Mitchell to Cuba and the Philippines, and in 1901–02 to Alaska where he was sent to establish communications by stringing a telegraph line across the territory under the most difficult conditions imaginable. He attended the Army's Staff College at Fort Leavenworth, Kansas, in 1907–09, after which came duty on the Mexican border. In 1912 he became the then-youngest member attached to the General Staff.

In 1915 he was assigned to the Aviation Section of the Signal Corps, although regarded as too old (as a 38-year-old Major) to attend the flying training school in San Diego. After he was appointed to head the Aviation Section the following year, he nonetheless decided to learn to fly at his own expense. After four hours of dual instruction, he took his first solo flight at the Atlantic Coast Aeronautical Station at Newport News, Virginia. It was reportedly at this time that he became a close friend of Orville Wright, and it is said that from then on he became a firm advocate of the military use of air power.

Mitchell went to Spain in 1917 as military attaché. He was only there a short time when the United States (US) entered World War I in April, and he was posted to the Western Front as an observer. Shortly after his arrival in May, he met extensively with British and French air leaders to study their operations. Mitchell's call on Trenchard has already been mentioned. There is an interesting account of their meeting, which began with Trenchard brusquely attempting to brush off the brash American by declaring, 'Do you suppose I've got nothing better to do than chaperone you and answer questions?' To this Mitchell replied, 'I don't suppose anything, General. I just know you've got a good organization here. It won't miss you if you take a day or two off ….' Trenchard later called Mitchell 'a man after my own heart'.

When General John Pershing arrived in France in June 1917, Mitchell put his ideas for a US air presence. He proposed dividing the Air Service into two forces—one under control of the ground commander to support the combat troops, the other for 'strategical operations against enemy aircraft and enemy materiel at a distance from the actual lines' which the Air Service commander would control. Although Pershing attached Mitchell to the American Expeditionary Force (AEF) and tasked him with making preparations for training and organising the first American pilots, this meant something less than full acceptance of his scheme. The reality was that there were too few forces on hand for the arrangement he had proposed. Due to a mix-up in orders, the 1st Aero Squadron had been left behind in Arizona when the AEF sailed and did not even reach France until August.

More to Mitchell's liking was an appointment as Air Officer of 1 Corps, which was a combat post in the rank of Lieutenant Colonel. This allowed him to establish a reputation as a daring, flamboyant and tireless leader—he was the first American to fly over enemy lines in combat. It is important to note, though, that Mitchell was not the top-ranking US airman in France for much of 1918, as some accounts often try to represent. Both Brigadier General Mason M. Patrick, the chief of AEF's Air Service, and Colonel Thomas DeWitt Milling, the Air Service commander for First Army, were senior to him.

Elevated to Milling's post at First Army in September 1918, Mitchell got to devise air tactics for an Allied attack on the Saint-Mihiel salient in the middle of that month. This entailed amassing British, French and Italian squadrons to bolster his own handful of units into a force of 1481 aircraft. It has been claimed that Mitchell sought out Trenchard's advice in planning this operation, so that it is no surprise that he 'played it in the style pioneered by Trenchard'.

Ten days later, Mitchell commanded another concentration of 800 aircraft during the more extended Meuse–Argonne offensive that lasted until 11 November 1918, leading a strong bombing force in strikes behind the enemy lines. He was allegedly working on plans for the strategic bombing of the German homeland, and for massive parachute invasions, when the Armistice concluded operations.

During the 18 months that Mitchell had in France, he had been breveted to the rank of Brigadier General at age 38, and also gained recognition as the top American combat airman; he was awarded both the Distinguished Service Cross and the Distinguished Service Medal. But he also managed to alienate most of his superiors—both flying and non-flying—with his arrogant and intolerant nature. It must be admitted up front that he has been variously described as vain, petulant, racist, tactless, overbearing, self-righteous and egotistical.

Returning to the US in March 1919, Mitchell was appointed in 1920 as assistant chief of the Air Service, still as a Brigadier General, under Major General Charles Menoher and later Mason Patrick. Over the next few years he emerged as an outspoken advocate of the power of aircraft on the battlefield and at sea, and for the need for an independent air service. His work on this score led to the famous test bombings carried out against obsolete battleships in Chesapeake Bay during 1921 and 1923. It is not widely known now, but the first of these experiments involving the *Ostfriesland* took place against a backdrop of a public and fairly scandalous divorce. Although he was remarried within a couple of years, it has been argued that this episode was a significant set-back to his career ambitions, to which further events contributed.

In April 1925 he was transferred to a lesser post as Air Officer of the VIII Corps Area in San Antonio, Texas, and reverted to the rank of Colonel. Although such demotions were not that unusual at the time, in his case it was still widely seen as punishment and censure. Even so, he continued to be critical of the preparedness of the Air Service and to promote the air power cause, including through publication of his book *Winged Defence* that year. And in maintaining this crusade he played the media game very well,

courting publicity by being seen in company with the rich and famous (such as the Prince of Wales, Henry Ford and Orville Wright).

In September 1925 the Navy dirigible *Shenandoah* crashed during a thunderstorm, with the deaths of 14 crewmen. Judging that his career was politically at a standstill and he had nothing to lose, Mitchell used the occasion to issue a 6000-word press statement in which he denounced both the Army and Navy departments for incompetence, criminal negligence, and 'almost treasonable administration of the national defence'. This was a course which led, as he must have known it would have, to disciplinary action being taken against him.

In October he faced a court-martial for insubordination. Typically, he used the occasion as a platform to air his views. Found guilty on 17 December 1925, he was suspended from active duty for five years without pay; this was later amended to half-pay by President Calvin Coolidge. Interestingly, a member of the panel of officers who tried him was General Douglas MacArthur, who reputedly cast the only dissenting vote in the verdict.

Mitchell did not sit around to take his punishment; he left the army instead, on 1 February 1926, and retired to a farm near Middleburg, Virginia. His aviation career had actually lasted just ten years, from flying lessons to resignation. Even so, he kept preaching the gospel of air power to all who would listen, and followed Douhet's example by continuing to publish. His book *Skyways* appeared in 1930, followed in 1935 by a biography of General Adolphus Greely, one of the Army Signal Corps' most innovative chiefs. A year later, on 19 February 1936, Mitchell died in New York City of a variety of ailments including a heart condition and influenza.

Attempts were made to rehabilitate Mitchell's name and reputation after his death, especially after many of his predictions and ideas were seemingly validated by events of World War II. In August 1946 Congress posthumously promoted him to Major General and authorised the award of a special Medal of Honor. This was presented to his son John in 1948 by General Carl Spaatz, who was by then Chief of Staff of the newly-established United States Air Force (USAF).

Conclusion

What conclusions can be drawn about these three individuals? Especially, we might ask, what elements in common do we see between their careers?

It might be tempting, in the cases of Douhet and Mitchell, to see a useful parallel in the bitter battles they had within their own establishments over their unpopular views, which led to both of them facing stern disciplinary action. On the other hand, perhaps it would be facile to place too much emphasis on this aspect, since it can be questioned just how much such antics on their part helped to strengthen support for the case for air power which ostensibly they sought to build. It certainly was not a prerequisite for successful air command to prove oneself fractious and opinionated.

Some writers have set out to argue that the manner in which Douhet and Mitchell acted as publicists for a cause could well have worked against their effectiveness, since in the case of both men it very likely acted to solidify opposition to their reforming efforts and hardened resistance to acceptance of the very message they wished so passionately to espouse. Some contemporary writers go so far as to suggest that Douhet and Mitchell exercised little real influence in their day, and their status as air power 'gurus' is largely a belated fabrication, or at least a retrospective projection.

It may yet well prove that the greatest influence these three figures had was upon each other. The direct form of contact that Mitchell and Trenchard had on the Western Front has already been noted. There seems little doubt that Mitchell imbibed to the full Trenchard's view that an aeroplane was, above all, a weapon that worked best when concentrated in a vigorous offensive to control the air; that winning the battle for air superiority came before everything else one might wish to do on the battlefield—including artillery cooperation, reconnaissance, ground attack and even long-range bombing; and that air power had to be under unified command.

Mitchell also seems to have come at least partly under Douhet's influence, based on evidence that there may have been an actual form of link between the two. Discovery of a partial translation of *The Command of the Air* in the archives of the US Air Service which is dated 1922, at least a decade before the translation done for the Air Corps by Dorothy Benedict and George Kenney, has been taken to show that there may even have been some direct borrowing of ideas and language.

For Trenchard's part, it seems that he at least knew the substance of Douhet's tenets, even if there is no evidence that RAF officers had access to translations of *The Command of the Air* until the mid-1930s, when Trenchard had already stepped aside from the top post in his Service. Plainly, people did not need a detailed knowledge of the fine print when it came to discussing—as they most certainly did during the rearmament period—the prospect of a terror air campaign being unleashed against the great cities of Europe at the start of any new major conflict.

None of which should obscure the plain fact that emerges from considering the actual experience of air war that all three men had, to greater or lesser extent, to bring to any discussion of air power theory and practice. Trenchard and Mitchell, in particular, had demonstrated skills and success as air component commanders in support of joint air-ground operations, and in exercising professional, innovative and effective command of air power. The principles they pursued in the conduct of those operations are ones that we can readily recognise today.

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Master Bombers? General Carl A. Spaatz, USAAF and Air Chief Marshal Sir Arthur Harris, RAF

Professor John McCarthy

'In war', noted Karl Von Clausewitz, 'everything is very simple, yet the simplest thing is very difficult'. It all does seem easy. As the American, General Nathan Bedford Forrest observed, success comes down to getting there first with the most. But as Clausewitz continues: only once war has been seen will the difficulties of it become clear. To achieve General Forrest's stated objective in actuality would be full of complexities. So it was with strategic bombing. For Douhet, Trenchard, and to a lesser extent, Mitchell, everything was very simple. Generally they held true to the theory that the correct use of the strategic bomber was sufficient for victory. From 22 February 1942 until May 1945 Air Chief Marshal Sir Arthur Harris, with considerable enthusiasm, tried to translate the idea of urban area attack into Royal Air Force Bomber Command effective strategic practice.

From 1942 when he was appointed Commander of the American Eighth Air Force in the United Kingdom, and then from 1944, Commander-in-Chief Strategic Air Forces Europe, the task of implementing the American conception of strategic air attack rested with General Carl A. Spaatz. At first glance Harris and Spaatz have little in common. Harris was born into a military and naval background with a father who worked in the Indian Civil Service. Aged 16 he went to what was then Rhodesia, working at a variety of jobs including farming, mining and coach driving. In August 1914 he joined the 1st Rhodesia Regiment as a bugler. The war and this action changed his life. After taking part in the campaign in German South West Africa he returned to England and joined

the Royal Flying Corps, completing pilot training in January 1916. By 1918 he was a fighter pilot ace, commanding No 44 Squadron on the Western Front.[1] A permanent commission in the newly formed Royal Air Force (RAF) was offered to him and accepted.

Spaatz, on the other hand, was a West Point career officer with a Prussian family background. Oddly enough for someone of Prussian descent, Spaatz was infused with self-professed laziness. This trait was evident early at his secondary school. His entry into West Point seems to have been engineered by political influence, not by academic or personal qualifications. At West Point his performance was less than distinguished. Spaatz never attained cadet rank and was still undergoing punishment drills on graduation day. Not surprisingly he finished well down in the bottom half of his class.

The obvious reluctance held by Spaatz for academic application continued. He finished Command and General Staff School in 1936 with the recommendation that he should not be considered for senior command. Spaatz, an obscure Lieutenant Colonel in 1936 was a four-star General ten years later. Spaatz was not a reflective, scholarly, introspective officer with a theoretical cast of mind. Throughout his career there is little evidence that he was interested in geopolitics, international relations, or the dynamics of the nation state system. Red-headed, lean-jawed and laconic, he is reported to have remarked of St Peter's cathedral in Rome that it would make a fine airship hanger. Thus a certain kind of culture was unknown to Spaatz. Interests outside his profession were hunting wild animals, playing poker, smoking cigarettes with a glass of scotch, and strumming the guitar. Through a chance 1910 sighting of Glenn Curtis flying over the Hudson River, Spaatz became convinced his future lay in aviation. In 1916, after 50 minutes flying training, he became one of the American Army's first pilots. Thirty-nine years later an awesome concentration of strategic air power comprising 7177 B-17 and B-24 bombers was under his command.[2]

Spaatz saw service with Pershing in Mexico and then in World War I. Again his experience was different to that of Harris. Although credited with destroying two enemy aircraft, most of his war was spent organising and commanding a French-based flying training centre. Their postwar careers also differed. Britain's Imperial interests provided opportunities for operational experience. Harris served as a squadron commander in India and then as Senior Staff Officer in the Middle East. There he oversaw the air strikes on intransigent tribesmen, catching while doing so the attention of influential senior officers, Trenchard among them. Between 1925 and January 1928 Harris commanded a home-based bomber squadron and after attending Staff College at Camberly commanded Pembroke Dock and No 210 Flying Boat Squadron. It is a speculation but suppose he had been appointed Commander-

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1 See Air Commodore Henry Probert, *Bomber Harris, His Life and Times: The Biography of Marshal of the Royal Air Force Sir Arthur Harris, the Wartime Chief of Bomber Command*, Greenhill, London, 2001,
pp. 19–45, for these early years. This is by far the best biography of Harris.

2 Stewart Halsey Ross, *Strategic Bombing by the United States in World War II: The Myths and the Facts*, McFarland & Company, Jefferson, NC, 2003, p. 52.

in-Chief Coastal Command. Perhaps he would have supported as avidly as he resisted the transfer of Bomber Command assets to allow him to fight the Battle of the Atlantic.

Harris went on to serve two terms in the Air Ministry, principally as Director of Plans between April 1934 and April 1937, where he learnt the art of composing the pungent minute and the scathing marginal comment. Finally, before being posted to Washington he was appointed Air Officer Commanding 4 Group within Bomber Command. By 1939 then, Harris had acquired wide experience as a squadron member, as a squadron commander and then, promoted to Air Commodore, as a Bomber Command Group Commander. Moreover he was a practiced staff officer.

If in an operational sense Harris had been closely involved from 1919 in the evolution of bombing concepts, Spaatz particularly in the 1920s as Chief of the Tactical Units Branch was more fighter orientated and more tactically than strategically driven. It was not until the late 1920s that his professional direction changed and at Langley Field he began organising bomber formations. Spaatz, in fact, was aboard the very first B-17 aircraft to land there early in 1937. There was no 'independent' air force in the American order of battle. It was an Army Air Force and control of air power assets was a three-way struggle between those Army officers in the Air Corps, who wanted a separate air force, and the mainstream Army officers who wanted to see American air power concentrate on the support of ground operations. The Navy, with its own aviation simply resented the Air Corps' budget.

Spaatz, in the inter-war years and up to the time the United States Air Force (USAF) was formed in 1947, was very much part of a public relations effort to influence the formation of this separate Service. For example, he appeared in 1925 for the defence at Mitchell's court martial and he advocated the employment of bombers for coastal defence, pitting Army aviation against the Navy in a series of air races. In 1929 he commanded what was known as the *Question Mark* exercise, which set an endurance record with in-flight refuelling of over 150 hours in the air. The intended point was taken. As it was observed at the time: if Spaatz and his crew could man an aircraft for that long, so could bomber crews.

The ultimate objective of forming a separate United States Air Force dominated the thinking of Hap Arnold, Spaatz's superior and the Chief of the Army Air Corps, and Carl Spaatz was his protégé. One crew member of *Question Mark* was Ira C. Eaker. In turn, Spaatz saw him promoted. After being deputy to Spaatz, Eaker came to command the American Eighth Air Force in Britain at a time when it began to penetrate German air space and to experience horrendous casualties. Who said 'like appoints like' was not far wrong?

It was Harris and Spaatz who were required to share from 21 January 1943 a common set of objectives decided upon by the combined Chiefs of Staff. As ordered:

> Your primary objective will be the progressive destruction and dislocation of the German military, industrial and economic system, and the undermining of the morale of the German people to a point where their capacity for armed resistance is fatally weakened.[3]

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3 Sir Charles Webster and Noble Frankland, *The Strategic Air Offensive Against Germany, 1939–1945,*

It might be seen how this directive encompassed the American doctrine of employing strategic air power and the British more Douhetist idea of attacking directly urban civilian morale.

The American conception of strategic air attack as it developed particularly in the 1930s was more 'stiletto', you might say, than the British 'blunt instrument' of attacking built-up areas. Central to the theory, as argued by the American Air Corps Tactical School, was that a modern industrialised nation possesses essential economic nodes. If such nodes were directly and precisely attacked, their destruction would lead to the fatal weakening of an industrialised enemy nation so placing its armed forces in a position where they could no longer fight. Victory, thus, would come through the precise application of strategic air power.

How Harris and Spaatz attempted to carry out their collective task and with what results and how successfully they implemented their differing theories of strategic bombing must determine if Harris and Spaatz were 'Master Bombers'. This question must touch one of the most controversial subjects of World War II: the effectiveness of the strategic air offensive against Germany.

What then makes a 'Master Bomber'? One qualification must surely be air power professional mastery. As outlined in AAP1000 – *Fundamentals of Australian Aerospace Power*, professional mastery consists of a comprehensive understanding of a body of knowledge, the ability to apply this knowledge in pursuit of a mission and a willingness to apply this knowledge to the development of new and innovative ways of employing air power. At senior command level, professional mastery also requires a clear understanding of the strengths and limitations of air power and an ability to communicate this understanding to others.[4]

Targeting is the very essence of air strike. It follows then that a Master Bomber must also be a master of targeting. Determination of the correct target requires the production of detailed data and a thorough analysis of that data. Judgement has to be applied to that analysis. A commander has to be certain his force available is capable of finding the target and effectively carrying out an attack. The target ideally should help reduce, if not suspend, the enemy's ability to conduct combat operations. Thus, not only has the correct target to be identified but its vulnerability to attack considered and then the degree to which it might recover from attack taken into account. For example, a factory building itself might be extensively damaged but the machine tools inside it could more often than not be left untouched and, therefore, production only slightly hampered. Industry could also be dispersed.

Vol. IV: Annexes and Appendices, Her Majesty's Stationery Office, London, 1961, p. 153. This was the so-called 'Pointblank Directive' which, although modified later to stress that the German aircraft capacity was the main target, did remain the broad directive for the rest of the war.

4 AAP1000, *Fundamentals of Australian Aerospace Power*, RAAF Aerospace Centre, Canberra, 2002, p. 20.

Ball bearing production, a chosen target for the American daylight bombers, provides a prime example for such dispersion. As an economic node target it made sense—most mechanical moving parts depend on ball bearings. Destroy the source of supply and the mechanised parts of a fighting force can no longer function. Schweinfurt, and the four factories there which produced some 52 per cent of German ball bearing supplies, was thus the target for the American B-17s in their two initial German deep penetration attacks. They paid an enormous price. On 17 August 1943, 229 B-17s, without fighter escort, attacked Schweinfurt: 60 of them were lost. A further attack on 14 October 1943 resulted in 65 B-17s destroyed. But production was dispersed, and the warfighting ability of the Wehrmacht was not impaired. Urged by the Air Staff to destroy the city of Schweinfurt, Harris was highly sceptical.[5] Harris was certainly right in not regarding Schweinfurt as a suitable target. When, under pressure, Harris sent 734 bombers against Schweinfurt on the night of 24/25 February 1944, 4.5 per cent of the force was lost and German records noted only 'nominal damage'.[6]

What then did Harris regard as a suitable target? Firstly, he simply disdained the American concept of attacking supposedly key economic nodes. To him, they were simply what he termed 'panacea targets'. Even, in his mind, the Bomber Command operation against the Mohne, Eder and Sorpe dams on 16/17 May 1943 fell into this category. For Harris, although his command was subject to diversion to other targets by higher authorities, the only proper objective for his mainline bomber force was the destruction of urban residential areas. If industrial infrastructure was destroyed in the process, that was a bonus.

With this said, Harris quite unfairly has been seen as introducing the concept of deliberately attacking German civilian morale. The British mind, however, had always carried that possibility. In 1939 the Royal Air Force avoided the question—the British *Manual of Air Force Law* stated: 'It has not as yet been possible to include in this volume a chapter relating to air warfare'. Yet the then only recently publicly acknowledged Luftwaffe issued a service directive that read '… attacks on cities for the purpose of terrorising the civilian population are absolutely forbidden'. The Italian Air Force, the Reggio Aeronautica—the spiritual home of Douhet—stated in its law of war manual '… bombardment for the sole purpose of punishing civilian populations or of destroying or damaging properties of non-military importance is in every case prohibited'.[7]

The official British idea that civilians might be regarded as suitable targets goes back at least to Trenchards' May 1928 paper, 'The War Object of an Air Force'. We find

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5 Webster and Frankland, *The Strategic Air Offensive Against Germany 1939–1945*, Vol. IV, Appendix 19. See also Sebastian Cox, 'Sir Arthur Harris and the Air Ministry' in Peter W. Gray and Sebastian Cox (eds.), Air Power Leadership: Theory and Practice, Defence Studies (Royal Air Force), Joint Doctrine and Concepts Centre, Wiltshire, 2002, p. 221.

6 Martin Middlebrook and Chris Everitt, *The Bomber Command War Diaries – An Operational Reference Book 1939–1945*, Viking, New York, 1985, pp. 475–76.

7 Wing Commander E.E. Casagrande, Air Bombardment and the Law of Armed Conflict, Air Power Studies Centre Paper No. 10, Air Power Studies Centre, Canberra, 1993, pp. 6–7.

Trenchard arguing: 'What is illegitimate, as being contrary to the dictates of humanity, is the indiscriminate bombing of a city for the sole purpose of terrorising the civilian population.' But, argues Trenchard, it is acceptable to terrorise men and women munitions workers.[8] It was, you might argue, a fine line of distinction which was capable of having wide interpretation.

As early as July 1941, Bomber Command was directed to concentrate its main effort on dislocating the German transportation system and on '… destroying the morale of the civilian population as a whole and the industrial workers in particular'. On 14 February 1942, Bomber Command was advised of the decision that the primary objective of bombing operations was to attack the morale of the German civilian population. Sir Charles Portal, the Chief of the Air Staff, wrote directly to Harris, the incoming Commander-in-Chief, the following day:

> I suppose it is clear that the aiming points are to be the built-up areas, not for instance the dockyards or aircraft factories … this must be made quite clear if it is not already understood.[9]

Harris had this directive on his desk when seven days later he assumed command. He should not then be criticised as a cold-hearted butcher for carrying out this policy as instructed until at least after the Battle of Berlin in March 1944. Surely, he would have been neglecting his duty to have done otherwise.

Harris though, it is argued, lacked at least one of the qualities a Master Bomber needs to have in terms of professional mastery: strategic innovation. Tactics, most certainly. It was Harris who insisted on concentration of force; the 1000 bomber raids mounted between May and August 1942 are evidence enough. He innovated the idea of the bomber stream, which concentrated bombing ideally over a 30-minute period and discarded the tactic of relatively few bombers flying hopefully to the target virtually in isolation.[10] Harris, it will be recalled, was given a command close to dispersal. In August 1941, the Butt Report showed of the crews who claimed to have hit the target, only a third got within the 75 square miles surrounding the target. Over the Ruhr, only one aircraft in ten got within five miles of the suggested target and on moonless nights only one in fifteen got within that distance. Churchill suspended bomber operations for the winter. Harris turned this around. The power of the newly arriving four-engined bombers was not dispersed, he saw early the shortcomings of the Stirling and the Halifax 1, and he shrewdly employed the twin-engined Mosquito and its use in diversionary attacks and in controlling the bombing by the main force. While he did oppose the formation of the Pathfinders under the command of the Australian,

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8 Webster and Frankland, *The Strategic Air Offensive Against Germany 1939–1945*, Vol. IV, Appendix 2, pp. 71 ff.

9 ibid., p. 144.

10 Guy Gibson, Enemy Coast Ahead, Michael Joseph, London, 1946, is the best first-hand account of such operations.

Don Bennett, he was quick to grasp the target finding qualities of airborne radar and electronic force multipliers.

All this and more is evidence enough of his organisational, administrative ability and his outstanding fearless belligerent attitude to command. Such people are extremely rare. But strategic innovation? Take the Battle of Berlin. In November 1943, Harris wrote to the Chief of the Air Staff and the Prime Minister Winston Churchill:

> We can wreck Berlin from end to end if the USAAF will come in on it. It will cost us 400 to 500 aircraft. It will cost Germany the war.[11]

In December 1943, he told Portal:

> It appears that the Lancaster force alone should be sufficient, but only just sufficient, to produce in Germany by April 1st 1944, a state of devastation in which surrender is inevitable.[12]

Pure Douhet, pure Harris, but no Douhet/Harris result. The Battle of Berlin ended officially with a disastrous attack on Nuremberg. On this operation, Harris lost 95 bombers or 11.9 per cent of the force dispatched. From then until 5 June 1944, Bomber Command was directed to attack pre-invasion targets. Harris did with reluctance. As soon as he could resume bombing cities, he did so.

Overall the Battle of Berlin was, according to the British official historians, not only a failure but a 'defeat'. Of the 19 major raids launched at the city and associated targets 1117 aircraft were lost at an average rate of 5.8 per cent.[13] It is estimated that Harris's 2½-year urban offensive killed more than half a million German civilians, injured another million and destroyed three million homes. Bomber Command suffered heavy losses. Overall some 55,000 aircrew were killed in Bomber Command throughout the war, with some 40,000 aircrew deaths during the period of Harris' command.

With the end of the European war only six weeks away it might seem remarkable that in March 1945, with Spaatz joining the area offensive, the total tonnage of bombs dropped by the Anglo-American bomber forces was just short of the total amount dropped in the whole of 1943. A recent PhD thesis done in the University of Sydney has argued the Bomber Command offensive cost £2.78 billion (in 1942 values). Every sortie flown cost £2911.00 and the cost of killing each German civilian was £5914.00.[14] One must

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11 See Martin Middlebrook, *The Berlin Raids – RAF Bomber Command Winter 1943–44*, Penguin Books, London, 1990, pp. 2–3, for this statement.

12 ibid.

13 Middlebrook and Everitt, *The Bomber Command War Diaries – An Operational Reference Book 1939–1945*, p. 488.

14 John Fahey, 'Britain 1939–1945: The Cost of Strategic Bombing', unpublished PhD thesis, University of Sydney, 2004. These figures are in 1942 values. Harris himself would have been on a salary perhaps of some £2500.00 per year.

wonder if killing German civilians contributed to ending the war. Morale never broke and the streets of Berlin were defended until the very end against the Red Army. Harris a Master Bomber? At the very best an open verdict.

If Harris was tunnel visioned, then so was Spaatz. He learnt nothing from the early disastrous British experience of daylight bomber attacks. He was in London during the Battle of Britain and saw what happened to the Luftwaffe formations in their daylight raids. Although Bomber Command had realised very early the very high if not prohibitive cost of daylight attacks, Spaatz against evidence continued to argue that his heavily armed bombers could fly unescorted and employing the Nordern bombsight could drop a bomb in a 'pickle barrel' from 20,000 feet. Cloud cover rendered the Nordern ineffective but even in clear visibility its much-vaunted accuracy was overrated. How overrated the Nordern bombsight actually was is indicated by the fact that of every 100 bombs dropped on oil plants, for example, 87 completely missed the target and only three did any damage.[15]

After the first Eighth Air Force B-17 raid on Rouen on 17 August 1942, Spaatz was convinced that such operations could be extended '… into the heart of Germany without fighter protection over the whole range of operation'.[16] When commanding the North-West African Air Force in June 1943, air power under his control had reduced the island of Pantelleria, half-way between Tunis and Sicily, to the point of surrender without the use of ground forces. For Spaatz, that result simply confirmed the extreme theories of Douhet, Mitchell and Trenchard. As he wrote:

> The application of air power available to us can reduce to the point of surrender any first class nation now in existence within six months from the time that pressure is applied.[17]

That could have been Harris and his forecasted victory through bombing by 1 April 1944.

If it is accepted that professional mastery does require a clear understanding of the strengths and limitations of air power, then Spaatz it could be argued fails this test, and he does it alongside Harris. It was the P-51 Mustang with its British Merlin engine, which allowed the American daylight offensive to continue. At the beginning of 1944, Arnold dictated the strategic objective would be the destruction of the Luftwaffe as a prelude to the invasion of Normandy. Spaatz found himself involved in a war of attrition in the sky over Germany; a war of attrition which recalls 1917/18 on the Western Front. Aircraft factories were also attacked. Spaatz was able to put well over a 1000 heavy bombers over a target. The result: deliveries of fighter aircraft were the highest of any year in the war—some 10,000 fighter aircraft had been built in 1943 and 25,285 in 1944. It was not the

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15 Richard G. Davis, *Carl A. Spaatz and the Air War in Europe*, Smithsonian Institution Press, Washington DC, 1994, p. 505.

16 David R. Mets, *Master of Air Power: General Carl A. Spaatz*, Presidio Press, Novato, CA, 1997, p. 134.

17 Davis, Carl A. *Spaatz and the Air War in Europe*, p. 236.

shortage of fighter aircraft that determined the result of D-Day 6 June 1944, rather the shortage of experienced pilots and the crippling shortage of aviation fuel.

On one crucial point on targeting, Spaatz was right; he stressed that attacks on synthetic oil installations were crucial. It is not enough, however, to make him a Master Bomber. Spaatz insisted on attacking oil, one suspects, because the Army wanted his bombers to attack transportation. Such attacks would have been of immediate benefit to the forward edge of battle. That for Spaatz was not a strategic target. As Arnold wrote to him in November 1944, it was important that the strategic air offensive was seen to be acting in an independent mode:

> … my concern [is that] the American people be given the facts necessary to a correct evaluation of the part air power has played in the war … the United States should not make the mistake of allowing through lack of knowledge the tearing down in the post war years of what has cost us so much blood and sweat to build up.[18]

Finally under the pretext of attacking the German transportation system, Spaatz committed his awesome bomber force to a series of massive area attacks. On 3 February 1945, Berlin was struck with more than a 1000 B-17s. The aiming point was the city centre. Dresden was to follow, with Spaatz committing 521 heavy bomber sorties against the city that had been attacked by 796 Lancasters the previous night. A series of operations were carried out against a number of small targets, such as Heidelberg, Gottingen and Baden-Baden. Such targets had little or no economic or military value and Spaatz knew it. The real intent though had to be closely guarded. As he stressed: 'Special care should be taken against giving any impression that this operation is aimed, repeat aimed, at civilian populations or intended to terrorize them.'[19] By the end of 1944, Spaatz had in fact embraced a policy of indiscriminate bombing of German cities. Allied bombs probably killed 600,000 German civilians; Harris and Spaatz had more in common that one might at first suppose.

Spaatz, as with Harris, was a premier airman and like Harris he extracted from his aircrew an enormous cost, which is perhaps not as well known as that suffered by the equally brave aircrew of Bomber Command. The American strategic bomber force combining the Eighth and Fifteenth Air Forces under his command lost 8337 bombers and 3924 fighters. Some 73,000 aircrew were lost, with nearly 30,000 dead. In perspective, the United Army lost 16,000 dead in Normandy and 57,000 dead in the entire Pacific War.

To return to Clausewitz: in war everything is very simple. In practice, however, it is very difficult. Spaatz and Harris found this and both were learning while fighting and this is always costly. Neither mastered the art or science of strategic bombing; has

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18 ibid., p. 525.

19 Ross, *Strategic Bombing by the United States in World War II: The Myths and the Facts*, p. 74.

anybody yet? Judgement is simple but perhaps we should recall the words of Gerald Manley Hopkins:

> O the mind, mind has mountains; cliffs of fall
> Frightful, sheer, no-man-fathomed. Hold them cheap
> May who ne'er hung there.[20]

What must seem sure is that the theories of Douhet, Mitchell and Trenchard should remain buried in the last century. For everyone involved, the price of their application is too high.

Professor John McCarthy

Professor John McCarthy graduated with First Class Honours in History and a University Medal from the University of Queensland. In 1968 he completed a Master of Arts research degree in history at the University of New South Wales.

His PhD in Political Science was awarded by the Research School of Social Sciences, Australian National University, in 1972. Between 1976 and 1979 he was foundation editor of the Australian Journal of Defence Studies and is currently Vice-President of the Australian Commission of Military History.

After teaching at the University of New South Wales, Kensington and the University of Wollongong, he joined the Faculty of Military Studies as a Lecturer in the Department of History in 1970.

Retiring from the History School at the Australian Defence Force as Associate Professor in 1998, he continued to run distance courses and remains a Visiting Fellow at the Academy. In 2001 he joined the Air Power Development Centre as Deputy Director CAF Fellows and since 2004 has conducted distance courses at the Centre on 'War in the Third Dimension'.

He has published widely in the fields of Australian defence and foreign policy, and Australian politics generally. His work includes such books as *Australian and Imperial Defence 1918–1939: A Study in Air and Sea Power*, (1976), *Australian War Strategy 1939–1945* (1985), and a study of the Empire Air Training Scheme in World War II titled *A Last Call of Empire* (1988), as well as numerous articles on defence and foreign policy.

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20 James Reeves (ed.), *Selected Poems of Gerald Manley Hopkins*, Heinemann, London, 1953, p. 65.

Section 2

World War II Masters in Europe and North Africa

Air Chief Marshal Sir Hugh Dowding Fighter Command and the Battle of Britain

Mr Sal Sidoti

A difficult man, a self-opinionated man, a most determined man, and a man who knew, more than anybody, about all aspects of aerial warfare.[1]

General Sir Frederick Pile
GOC, Anti-Aircraft Command, 1939–1945

Introduction

The Battle of Britain was undoubtedly one of the key turning points of World War II. The great aerial battle fought between Great Britain and Nazi Germany in August and September 1940 effectively halted the Nazi advance westward and enabled the 'unsinkable aircraft carrier'—Great Britain—to remain as a base from which the Allied invasion of Europe could be launched four years later. During the battle, the Royal Air Force (RAF) Fighter Command earned responsibility for the aerial defence of England. Headquartered at Bentley Priory in Stanmore, on the outskirts of London, Fighter Command was headed by Air Chief Marshal Hugh Dowding from 1936 until he relinquished the post shortly after the battle.

This essay considers, in particular, what Dowding's greatest personal contributions to the victory were and how he developed the personal qualities that allowed him to achieve these. It is not intended to recount the Battle of Britain, nor to detail Dowding's contribution to it, but to consider those factors that enabled Dowding to lead Fighter Command to ultimate success.

Early Days

Hugh Caswell Tremenheere Dowding was born in 1882 in Moffat, Scotland. His father Arthur, a Wiltshire schoolmaster, ran St Ninian's preparatory school for boys, were Hugh was ultimately enrolled as a student. His family and home life installed in him a quiet self-confidence and reserved nature, which was to be a personal hallmark throughout his career. He was not an aggressive boy, rarely succeeding in the many sports on offer at St Ninian's, but 'he held strong views on many subjects and was not backwards in expressing them'. During the term he was treated just like any of the other boarders and learnt the self-discipline required to survive the upcoming years in a public school.

These began for him at the age of 13 when he began his four-year term at Winchester. Here he progressed solidly, if somewhat unremarkably. Shunning the more traditional team sports, such as cricket and football, he developed a passion for individual competitive pursuits, such as squash and marksmanship. Also, like many boys at the school, when faced with having to enrol in Greek, he chose the only alternative, that being the Army Class. This he did and his future career was determined.

His Early Military Experience and World War I

Having rejected the Classics, Dowding saw little alternative to joining the Army upon his graduation from Winchester. He had little interest in his family's traditional pursuits of schooling or the clergy and soldiering offered him the opportunity of a respectable career that seemed as palatable as any other. So, in late 1899, having achieved results in the entrance examinations sufficient to secure him a place in the Royal Engineers should he maintain them, he entered the Royal Military Academy at Woolwich. However, by taking advantage of the opportunities Woolwich offered a young man not previously available to him, Dowding relaxed and upon graduation failed to maintain the academic placement with which he had entered the Academy. Accordingly, the Engineers were now no longer open to him and Dowding graduated in 1900 as Second Lieutenant in the Garrison artillery.

As a young gunner, Dowding served in Gibraltar and India before being admitted to Staff College in 1912. During his studies there he developed an interest in the application of air power but at that time the Central Flying School at Upavon only accepted students with existing civilian flying licences. This he undertook, and graduated with his civilian licence, having spent a grand total of one hour and forty minutes airborne. In earning his Wings his intention was never actually to become a full-time airmen, but to acquire skills and knowledge that would be useful to him on his return to regimental duty. In the spring of 1914 he duly returned to service as a gunner.

With the outbreak of war, Dowding was posted to No 7 Squadron, and by continually hounding Trenchard, he finally arranged a transfer to an active squadron in France in October. With casualties among aircrew growing he was soon transferred as a flight commander to No 9 Squadron, known then as the 'Wireless Squadron' for its primary

role of spotting fall-of-shot for friendly artillery by wireless. However, it quickly became apparent to Dowding that his new squadron commander was quite unbalanced, believing firmly that the Flying Corps had it way too easy and that unpredictable and unnecessary hardship was the only way to reduce the balance. However, of greater concern was his refusal to authorise the fitting of new wings to the squadron's aircraft, which had perished to the extent that the aircraft could barely take-off. Taking advantage of the commander's absence on leave, Dowding used his temporary powers to arrange the much needed maintenance. Predictably though, on his return the squadron commander furiously ordered the refitting of the old wings, at which point Royal Flying Corps (RFC) Headquarters, hearing of these goings on, relieved the commander of his position and appointed Dowding in his place.

However, soon after his return from leave in January 1915, news arrived from England that the squadron was to be disbanded as an operational unit and reformed as a wireless school and experimental establishment near Brooklands. Here he immediately set to improving the radios, which to that point had proved too unwieldy for operational use in fighter aircraft. With almost no resources, he shepherded the work of his two gifted civilian staff and they were soon able to devise and manufacture the prototypes of a variety of air-to-ground wireless sets. Utilising components obtained quite illicitly from a civilian radio manufacturer, Dowding's unit was able to develop a wireless set approximately a quarter the weight of its officially endorsed counterpart. He issued a challenge to the War Office that his set was not only lighter and smaller, but also had superior performance. A trial was organised, resulting in a resounding win for the Brooklands team, but not one sufficient to convince the War Office to consider their design further. This was a defining moment in his career. He had long suspected that the prevailing attitude among his fellow soldiers was one of conservatism to the point of blindly rejecting anything that challenged the official world view. 'Soldiers with a capital "S"' he felt, 'were on one side of an intangible barrier; I was on the other.' Further, he viewed them as having the 'mental laziness which made it always easier to say No than to say Yes, because if you say Yes you will have to think, and you may make a mistake'.

His next posting was to command No 16 Squadron in the summer of 1915. Dowding was told by Trenchard that he had inherited a unit suffering from low morale, having been driven beyond breaking point by their previous commanding officer. Here Dowding's reserved, seemingly aloof, but ultimately human character demonstrated him to be an able and thoroughly capable, if not legendary, commander. He immediately set about improving living conditions and doing what he could to improve training, implementing a sweepstake to reinvigorate interest in bomb-aiming practice. He also demonstrated his personal dedication and courage; when following the victory at Loos, his squadron was ordered to conduct reconnaissance over the reportedly retreating Germans. The conditions were terrible, with unbroken low crowd cover and accurate anti-aircraft fire. Dowding selected one of his best pilots and he himself went along as observer. They darted in and out of the clouds to avoid the ground fire, but they

become lost, and icing forced them to land just behind British lines. They despatched their report, cleared the aircraft of ice and returned to their unit.

Dowding's technical flair was demonstrated early in this posting. In those formative days, the various fittings which enabled aircraft to carry additional equipment, such as cameras and bombsights were not standardised, but were jury-rigged and installed by each squadron individually. Soon after he assumed command, a competition was held between the squadrons to determine which had the best design. No 16 Squadron won and their designs were adopted throughout the Wing. However, his technical flair led to a run-in with the 'overlord' of early British airpower, Trenchard. Supplied with new propellers that did not fit his aircraft and getting no satisfaction from Wing Headquarters, Dowding sought Trenchard's assistance. However, Trenchard felt an ad hoc modification to the propeller hub would solve the problem. Dowding considered this modification to be highly dangerous, but nonetheless carried out the order, and conducted the test flight himself. Fortunately, the propeller held together and upon reporting the results to Trenchard, Dowding was informed that he had in fact been correct, and Trenchard would ensure his squadron received the correct propellers immediately.

Dowding ended the war with the rank of Brigadier General, having added command of a fighting wing and a training school to his experience with No 16 Squadron. However, despite demonstrating such competence he was told during the spring of 1918 that he had not been selected to join the newly formed RAF, but was to return to service with the Royal Artillery. Only the persistent intervention of his Commander, Vice-Admiral Sir Vyell Vyvyan obtained for his a commission into the new Service.

Between the Wars

During this inter-war period one of his most notable postings was as the Chief of Staff to Air Vice-Marshal John Higgins, who was posted to command RAF forces in Iraq. Here the RAF had recently taken over from the Army the task of deterring nomadic tribes from sporadic raiding. This was done by bombing those villages suspected of producing or harbouring the offenders, frequently at the cost of civilian casualties. Dowding objected to this bombing without warning and, taking advantage of a period during which his commander was on leave, Dowding ordered that all bombings should be preceded by a warning to enable the inhabitants to get clear. On his return, Higgins accepted the policy as a sensible one and continued the practice. Dowding had showed this sense of consideration, befitting a man of his devout beliefs, before. While commanding No 16 Squadron, his aircraft had brought down only one enemy aircraft, which crash-landed behind British lines and where the crew had been shot emerging from the wreck. Dowding arranged for the return of their personal possessions along with a message describing where the men had been buried. Although such gallantry was not uncommon in the earlier parts of World War I, it earned him a reputation as a man who respected the humanity of others, irrespective of their nationality.

During the early 1930s, Dowding was appointed the position of the Air Member for Supply and Research, whereupon he was to make, arguably, his greatest contribution to the future success of the RAF in the Battle of Britain. This was both in terms of the significant technical developments he led during this period, and the deep understanding of technologies that it provided to him. Although many technical developments occurred during these six years, it is generally accepted that the two most decisive were the introduction of the high-performance monoplane fighter and the development of radar as an early warning system.

In 1931, thanks in part to a generous private donation, Britain won for the third time in a row the Schneider Trophy, a race for high-performance seaplanes over a closed circuit. This third win provided Britain with permanent ownership of the Trophy, and a proposal was raised to provide a new prize in its place to continue the competition. Dowding opposed this plan, believing that the search for outright performance should be made secondary to the exploitation of the technologies already developed. He believed that further gains in maximum speed were negated by the consideration for alighting from the aircraft in the event of an emergency. This practical concern for the wellbeing of his pilots was to be another personal hallmark. Early in 1940 he had asked the Hawker Company to seal the Hurricane's fuselage fuel tanks with 'Linatex' to help seal them if they were punctured by gunfire. However, it was not until the actual battle had begun that the procedure was undertaken in earnest.

When advised by his experts that biplanes provided superior flying properties, Dowding was quick to inquire why the winning designs in the Schneider Trophy were all monoplanes. The biplane was indeed a superior platform, but only at low speeds, and now that engine performance had advanced sufficiently he felt that monoplanes should be developed exclusively. Based upon these successful Schneider designs, the Spitfire and Hurricane were developed. Further, it was during the Air Ministry conference in July 1934 that one of Dowding's deputies demonstrated that for the brief few seconds a fighter pilot could expect to keep his target under fire, he would need the combined hitting power of six or preferably eight rapid-fire machine-guns in order to inflict fatal damage. This led to the Air Ministry requirement that led to the fitting of eight machine-guns in the wings of the developing Hurricane prototype.

But, short-range fighters were of limited use if they could not be directed onto enemy raids quickly and effectively. In January 1935, scientists in Dowding's research department, acting within the newly created Committee for the Scientific Survey of Air Defence, presented to him a proposal that radio waves could be used to detect aircraft at long distances. Prior to this, considerable investment had been made in a variety of technologies for this purpose, including sound mirrors, which provided a disappointingly short range and were very susceptible to interference. Based upon a moderately successful demonstration conducted the next month, Dowding endorsed the project and obtained sufficient funding to establish an experimental station in Suffolk. This ultimately led to the erection of five radar stations straddling the Thames estuary, the beginning of what was later to be known as the Chain Home radar network.

Preparing for the Battle

In July 1936, as this prototype network neared completion, Dowding was chosen to be the first commander of the newly created Fighter Command. At 54 years of age, he was already the senior member of the Air Council and had no reason not to be considered for the position of Chief of the Air Staff. However 'Stuffy', as he had been known since Staff College, was 'a quiet, reserved man, obstinate in pressing his views and not a good mixer'. At that time, Fighter Command was considered to be a second-rate post for an Air Marshal. However, he quickly impressed his staff with those characteristics of personality he had consistently demonstrated throughout his career—solid determination, pragmatism and humanity. His overriding goal was to prepare Fighter Command for what he viewed as the ultimate battle, the aerial battle in defence of Britain itself—a battle for which he did not view Fighter Command as being prepared.

One of the many handicaps faced by Fighter Command was the lack of all-weather runways, particularly in the vital front-line fighter bases. During the winter of 1936/37 soil conditions completely prevented the take off and landing of aircraft from the key aerodrome at Kenley for three weeks. The Air Ministry had long opposed the building of permanent all-weather airfields on the grounds that they would be difficult to camouflage and, therefore, susceptible to attack. In response, Dowding demonstrated his skills in dealing with bureaucracy in his typically respectful but incisive style. He did not suffer fools gladly and, when certain of his position, was extremely forthright. 'Dowding showed himself a master of the sharp rejoinder which does little to conceal the writer's contempt for the mental equipment of his adversary.' Arguing from a position of superior technical understanding and with an almost pious zeal to prepare for what he viewed as the upcoming supreme battle, Whitehall acquiesced and construction of a number of critical all-weather airfields began.

Another of his goals was to improve his two key front-line fighters—the Spitfire and the Hurricane. It had become quickly apparent that the existing armament of both the Spitfire and Hurricane—eight 0.303 inch calibre machine-guns—was inadequate in the face of armour being installed in German aircraft. A decision needed to be made between the two main upgrade paths—the Browning 0.5 inch calibre machine-gun and the heavier 20mm Hispano-Suiza cannon. The Browning, should it prove to have sufficient penetrating power for the task, was the preferred option as it was lighter and more ammunition could be carried. Trials had already shown that the 0.5 inch could penetrate the armour plate believed to be used by the Luftwaffe, but Dowding was not yet convinced. Still, the Air Ministry did not believe that further trials were required, and Dowding was required to petition Lord Beaverbrook directly to obtain a captured Messerschmitt BF 109 for a trial. The first shots were fired from a range of about 30 yards at bare armour plates and, as predicted, the armour was pierced. Dowding, perhaps leveraging from his strong practitioner's understanding of ballistics, directed the trial be repeated, this time at the actual fuselage of the Messerschmitt itself. In this case, the rounds did not penetrate the armour and Dowding left convinced that the heavier cannon armament would be required.

However, the installation of the cannons into the fighters was not immediately successful and, once again, Dowding stepped in to make a personal assessment of the situation and decide the outcome. Fitted initially into modified wings of early model Spitfires operated by No 19 Squadron, the cannons would only fire a few rounds and then jam. This was clearly unacceptable and Dowding, accompanied by his armaments experts, went to discuss the matter with Squadron Leader Sandy Lane, the squadron's Commanding Officer. Lane explained the persistent stoppages, at which point the Fighter Command armament staff interjected to claim that there was simply nothing wrong with the cannons and fault must lie with the squadron's maintenance crews. Dowding asked Squadron Leader Lane what he wanted, to which he replied that he would like the cannons replaced with the old machine-guns. Dowding immediately supported his views and ordered that this be done. The next year, when the Mark Vb Spitfire was introduced with wings purpose designed for cannons, they were found to operate without trouble.

Dowding was also seriously concerned with the inadequate number of fighter squadrons with which he had been equipped, particularly when the fighting in Europe was placing an ever-increasing demand to send additional fighter squadrons to France to bolster the effort there. Dowding was consistently and single-mindedly against the bleeding of his scarce resources to support what he viewed as a losing battle on the continent. Admittedly not alone among senior airmen in this view, Dowding's feelings were that 'the likely course which the war would take might well demand the use of all possible resources at home'. 'I was responsible for the Air Defence of Great Britain, and I saw my resources slipping away like sand in an hour-glass. The pressure for more and more assistance to France was relentless and inexorable.' He also sorely felt the loss of British pilots in France, and on 2 June 1940 he wrote a general letter of thanks to all of the squadrons, expressing his gratitude to them for their efforts there.

Despite this, it is a testimony to his character that notwithstanding his efforts to boost Fighter Command resources and to ensure they were not frittered away on the continent he also appreciated that an offensive air capability was essential. During a visit by Churchill to the Command on 4 August 1940 he was noted as having said to the Prime Minister that it was 'quite obvious that we could not win the war if we pushed everything into defence; we must have regard to building up the bomber force in order to hit Germany hard and, therefore, no more fighter squadrons should be formed than those which were absolutely essential for our security'. Similarly, when asked by Lord Beaverbrook in mid-1939 to supply Spitfires for photographic work. Dowding replied that he begrudged releasing any of his scarce front-line fighters, but acquiesced, saying 'but I must take a broad view of the question'.

The Battle of Britain

Once the Battle of Britain itself began, Dowding's headquarters provided overall coordination and warning filtering, but the lion's share of the tactical decision-making during the battle itself was occurring at the Group level, in particular

by Air Vice-Marshal Park's No 11 Group. Here, Park and his fighter controllers made the decisions that tactically decided the great battle. Park's Headquarters ultimately decided when and where fighters should intercept German formations, at what height, what the priorities for engagement were and (in theory) when reinforcements should be requested from the other Groups. He despatched aircraft to meet incoming raids and requested spare resources from neighbouring Groups to defend his airfields. The Group level Headquarters also determined and promulgated the tactical instructions, such as how and when to attack different formations. However, it was Dowding's responsibility to move squadrons between the various Groups that made up his command. This he did throughout the worst of the August and September battles, rotating badly mauled squadrons, such as No 111 Squadron, from the front line to quieter areas, and to attempt to build newer squadrons up to battle readiness. 'The timing of the movement of squadrons into or out of the main battle zone was one of Dowding's greatest problems.'

Dowding's intense personal interest in technology continued throughout the battle. With the Luftwaffe undertaking more night attacks, it was becoming critical to improve the abilities of Britain's air defences during these periods. Dowding continued to supervise personally much of the research work being conducted. At the end of most working days he would drive to Kenley or Redhill to view or supervise experiments with airborne radar or other means designed to defeat the night bomber. Returning in the early hours of the morning through often blocked and blacked out streets he was constantly deprived of sleep. Asked whether he felt that he could have left such work to subordinates, he replied that he felt his presence was essential.

Despite this new priority, he resisted attempts by the Air Ministry to reallocate some Hurricane squadrons solely to night duties, but under pressure from the Prime Minister to do something about the night offensive, they ultimately decided to allocate fully three squadrons to this task. Dowding obeyed the instruction, but his letters to the Ministry clearly indicated his dislike for the decision. He remained convinced that technical advancements in airborne and gun-laying radars were the secret to winning the night battle without unacceptably weakening day-time defences. His view was that two-seat fighters, such as the Beaufighter, fitted with prototype airborne intercept (AI) radars were the most efficient method of defeating the night attacks. But, despite Dowding's personal involvement, development of the AI sets was proving problematic and it was only the involvement of some of the large radio manufacturing companies which looked likely to turn the tide.

Despite these issues, Dowding's primary role during the main battles revolved around ensuring his Groups had sufficient and appropriately balanced resources with which to fight the battle. 'It was absolutely essential that the enemy should be made to believe that our strength is in no way diminished. No 11 Group must have the best of everything ...' Supporting this, he pointed out to his commanders that the aircraft factories, which enabled him to supply them with aircraft, were key targets that must be protected before all others.

Notwithstanding his strong technical focus, Dowding had a firm grasp of reality and was able to make plans for the worst when others preferred to think optimistically. Convening a conference of his senior commanders on 7 September at the height of the attack on the aerodromes, Dowding was keen to seek advice on the best and most economical method by which to 'go down hill', given the severe losses in pilots and aircraft that were presently being suffered. Deputy Chief of the Air Staff, Sholto-Douglas, questioned whether the term 'go down hill' was unnecessarily pessimistic, but both Dowding and Park were united in viewing the current situation as grave and certainly unsustainable.

He also was clearly not interested in discipline for the sake of giving the appearance of discipline. He maintained exceptionally high personal standards but understood the humanity of those under his command, provided they produced the goods when needed. Aircraftwoman Class 2 Joan Clark recalls how during their long shifts in the Filter Room, people around the plotting table would be knitting or doing crosswords. 'Occasionally someone would happen to cast an eye up at the balcony and notice dear old 'Stuffy' Dowding was peering down at us. We would immediately give each other the nudge and immediately the knitting, writing and books would disappear. I'm sure he must have inwardly chuckled seeing our reaction; no one knew how long he had been standing there.' In another's view, 'the Commander-in-Chief usually came down two or three times a day and watched from the balcony. He was a grand character really, a shy and retiring man. Once or twice I went up from the Operations Room to take a message to him in his office in the main building and he was always courteous and quiet, more like a schoolmaster.'

In the aftermath of the decisive battles of 15 September, controversy erupted over the contribution made by Air Vice-Marshal Leigh-Mallory's No 12 Group. During some key attacks, No 12 Group assembled and deployed a five-squadron wing to attack the Germans and to help defend Park's airfields. This 'Big Wing' achieved considerable success and some took the opportunity to suggest that, had Park used similar tactics, the outcome could have been even more favourable for the British. Dowding responded in defence of Park, emphasising that with the notice that was available to front-line fighter units, there was no time available to them to form large wing formations, and indeed the simultaneous launch of such large numbers would make them and their stations vulnerable during launch and recovery. He did, however, believe in the effectiveness of large formations of fighters acting cooperatively, but rejected the slights on Park's command (and therefore his own leadership) by those who suggested things could have been managed better.

The animosity between Leigh-Mallory and Park continued, with Park writing formally to Fighter Command on 29 September complaining of the behaviour of the No 12 Group squadrons during this period. Park was concerned that No 12 Group's aircraft were not limiting themselves to the areas where they had been requested to assist, and that the amount of time taken for them to form into the 'Big Wings' was allowing German bombers to strike targets prior to being attacked. He acknowledged (as did Dowding) that concentration of force and, therefore, big formations were theoretically

sound and did usually result in superior kill ratios, but this should not come at the expense of striking the German formations prior to their attacks; never more so than when his own stations were the targets. It was also pointed out that the simultaneous launch of such large formations would leave them unavailable and vulnerable when they simultaneously returned for rest, refuelling and rearming.

In this matter politics continued to play a part, and often at the expense of perceptions of Dowding's leadership. No 12 Group staff were concerned that Park's resistance to their 'Big Wing' tactics was merely that No 11 Group 'objected to their poaching on their territory and were jealous of the wing formation being likely to shoot down No 11 Group Germans.' Claims and counterclaims were being made on both sides. The issue became increasingly divisive and involved members of parliament and the legendary Douglas Bader, one of the most vocal supporters of the 'Big Wing'. In the end, Sholto Douglas, the current Chief of the Air Staff, asked Dowding to settle the matter by providing an authoritative and final statement of his own views as Air Officer Commanding-in-Chief. Dowding's response was as pragmatic as ever: the 'Big Wing' was a theoretically superior concept but was not the one to be employed by No 11 Group in the current circumstances. Bader was transferred to another station and Dowding issued an edict firmly limiting the flexibility of No 12 Group squadrons when they were called in to reinforce No 11 Group. Specifically, they were to:

- reinforce No 11 Group only in specifically defined circumstances, where disproportionate gain could be gained from outside assistance;
- be employed in an area adjacent to No 12 Group's boundary;
- be employed against a limited objective and on stated tasks;
- be provided in the strength and at the time and place requested of them; and
- decide the tactical methods they were to employ, subject to the task allotted to them by No 11 Group.

In issuing these orders, Dowding reinforced the basic premise under which the south-east of England had been divided into sectors in the first place. 'Big Wings' were an effective tactic, but were not immediately suited to the circumstances facing No 11 Group. 'Some of the area commanders resented Dowding's cautious policy and clamoured for the tactics of the "big wing". All along Dowding suffered from a disloyalty as well as from a lack of understanding.'

Conclusions

Dowding provided solid and considered leadership during the Battle of Britain. But perhaps his greatest contributions were those leading up to the battle, particularly in his stewardship of the technical development of Britain's air defences. It would be difficult to contest that without the implementation of the Chain Home radar networks and

the introduction into service of the high-performance monoplane fighter that Britain would have not survived the Battle of Britain.

His upbringing and nature imbued in him the solid human characteristics of self-confidence, self-control, discipline, determination and a solid respect for his fellow human being. His early postings to wireless developmental units and then his years of service as the Senior Air Member for research and development provided him with an excellent technical grounding and an understanding of what recent developments could achieve. 'The commander who had shown clarity and ability in strategic preparation had a less sure touch in its tactical application.'

Nonetheless, commanding the forces responsible for the defence of England, Dowding retained the confidence of the Prime Minister, despite their occasional differences in opinion. 'Personally, I think [Dowding] is one of the very best men you have got, and I say this having been in contact with him for about two years. I have greatly admired the whole of his work in the Fighter Command.'

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Mr Sal Sidoti

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Prior to this, he served for 17 years in the Royal Australian Air Force as an Armaments Engineering Officer, undertaking a diverse range of postings. He was for four years the Officer-in-Charge of the RAAF Explosive Ordnance Disposal Flight and also served in both the Defence Intelligence Organisation and the Defence Materiel Organisation. In 1999 he was selected for a Chief of Air Force Fellowship at the then RAAF Air Power Studies Centre, during which time he researched and wrote a major study on air base survivability and post-attack recovery. This has now been published in two editions and has received international recognition.

Mr Sidoti is a Chartered Professional Engineer and a member of the Australian Institute of Project Management. He has a Master of Business Administration from Deakin University, and is nearing completion of a Master of Science at the University of New South Wales, Australian Defence Force Academy campus.

Generalfeldmarschall Dr Ing Freiherr Wolfram von Richthofen

Air Vice-Marshal Hans Roser (Ret'd)

Among the practitioners and commanders of air power in World War II the name of Wolfram von Richthofen is little known, certainly less so than his famous cousin Manfred the Red Baron and top scoring ace of World War I. There are several reasons for this; firstly the story of commanders on the losing side of a war is not so often told or even researched. Secondly, Richthofen did not survive the war and therefore, unlike others, he was not interrogated by the Allies nor had the chance to write his memoirs. Nonetheless, he was regarded by Royal Air Force (RAF) intelligence as the outstanding tactical air commander of the Luftwaffe.

To comprehend such an assessment requires not only an understanding of the man and the campaigns that he directed but also the nature of the times in which he lived. Because of the nature of the conference I have taken an operational military rather than an academic or historical perspective of the subject.

The Richthofen family name is traceable back to 1562. The von Richthofens were scholars, scientists, ambassadors, advisers to kings and princes and held high public office. Not until the end of the 19th century did the family produce military officers of note. The best known were obviously Manfred and his brother Lothar, himself a famous ace of World War I. The younger cousin Wolfram served as a pilot in the Red Baron's fighter wing for six months before the end of the war and was credited with eight victories.

Wolfram was a man very conscious of his ancestry. He was arrogant and demanding of his staff. He generally kept his distance from others, whether superiors, peers or subordinates. He was tough and ruthless and possessed extraordinary courage, energy and determination. He was regarded as brilliant and was not afraid to speak his mind.

He was also a strong supporter of National Socialism, but a soldier of principle and conviction in the Prussian tradition and a good subordinate, even if he disagreed with his superiors. During the siege of Stalingrad he argued strenuously against the resupply of 6th Army by air, a decision he thought was lunacy. Nevertheless he exerted every ounce of energy to achieve the impossible when given the task. He lived up to his Christian name 'Wolfram', the German word for tungsten.

Von Richthofen joined the Imperial Army in a hussar regiment. By 1917 he managed to enter pilot training but at the war's end, a First Lieutenant, he was retired from the Army. He decided to study engineering as he 'liked mathematics'. Enrolling at the Technische Hochschule in Hannover, he gained a Diploma. He was then drawn back to the Reichswehr by General von Seeckt the Commander, who had among other far-sighted measures waived the examination for admission to the General Staff for officers who held a degree in engineering or technology studies. Richthofen completed a doctorate in 1928.

By 1925 he was married and an officer in a transport unit. In 1929 he was sent to Italy under the guise of an air attaché to study the Italian Air Force. Typically he learned Italian and managed to establish some important future connections. This was the time when General Douhet was the patron saint of strategic air bombardment and the supremacy of the strategic bomber was hotly debated in all major air forces. The senior officers of the Reichswehr also believed in the need for strategic bombing and Richthofen was among its advocates. However, in Germany between the wars air power theory had developed in a somewhat different way from the fighter versus bomber debates seen, for example, in the US Army Air Corps.

Air Power Doctrine

The Versailles Treaty limited Germany to a military force of 100,000 men, a small Navy and no Air Force. Further, all aircraft manufacturing capability was dismantled, a factor which was to limit Germany severely when the Luftwaffe was constituted in 1935.

The early Reichswehr was fortunate to have a chief with a strong strategic vision. General von Seeckt strongly believed that the next war would be very different and one of firepower and movement. He believed that tanks and air power would be decisive weapons in such a war. He also saw the need for an independent air force and earmarked some of his best officers to lead that Service when the time came. In 1920 he had constituted numerous teams composed of General Staff officers to analyse the lessons of World War I.

The analysis team on air power was led by Captain (later General) Helmuth Wilberg, a lateral thinker who had been the Air Commander at the German 4th Army and had controlled the operations of over 700 aircraft. Wilberg worked on this task with a staff for a number of years and the Germans followed the air power debates in other countries with great care. Wilberg himself travelled extensively. In 1936 at the behest of General Walter Wever, the first Chief of the Luftwaffe, Wilberg produced an Air Power

Manual, *Dienstschrift 16 – Luftkriegfuehrung*. The manual of some 39 pages laid out the analysis of the General Staff. The manual was not prescriptive but laid down guidelines for the conduct of the air war. It stipulated that:

- Strategy for the air war would be decided by the Government and that air operations would be conducted according to the principles of war, in particular flexibility, concentration of force, surprise and attention to logistics.
- The manual warned against a two-front war. (As a land power Germany's greatest concern was a war on two fronts.)
- Air superiority was the prime task of the Luftwaffe and was needed for the conduct of air, naval and land operations.
- Strategic operations should, where practicable and necessary be conducted against *'enemy centers of power'*; these included ports and harbours, aircraft factories, power complexes, POL and military production centres.
- The Air Force must also be used to support armoured offensive operations by attacking a defined *'schwerpunkt'* or centre of gravity to either achieve a breakthrough or to blunt an enemy attack. It would also seal the battlefield to prevent the forward movement of enemy reserves.
- The Air Force must support naval operations. This was the one major neglected area by the Luftwaffe in World War II, including by Richthofen.
- It stressed the importance of all forms of aerial reconnaissance.
- Finally, it discussed civil defence, anti-aircraft defence and the use of airborne troops.

The manual gives the lie to the conventional wisdom that the Luftwaffe was designed purely as an organisation to support the Army. While the Luftwaffe did not need a 'strategic' bomber in campaigns against Poland, France or perhaps even the UK, such an aircraft was necessary for any attacks against Soviet industrial targets. In the 1930s there was a strong program to produce a strategic bomber—the Ural bomber—to provide the ability to attack the known industrial and weapons factories in the Soviet Union. We will look at the demise of this program in the next section.

At the same time, General Heinz Guderian had been analysing tank warfare for some 15 years. A World War I officer, employed principally in signals, he had been exposed to tank warfare. He was fluent in English and French, and had studied the writings of J.F.C. Fuller and De Gaulle. Generally regarded by Reichswehr officers as eccentric, in 1937 he published a book called *Achtung Panzer*. In this he advocated a combined arms team of powerful concentrated tank columns supported by combat engineers, artillery and motorised infantry. The whole was covered by an air umbrella and linked by modern communications—in other words, networked.

Guderian laid down the need for a radio in every tank with at least the command tanks having two-way communications. Additionally, he advocated that tank commanders lead from the front, a dictate he followed religiously even as a four-star General. The Luftwaffe took this doctrine to heart and before the outbreak of war seconded selected officers and flying units to Guderian's tank exercises. This was the beginning of German army/air cooperation on the battlefield.

Technology

After his return from Italy, Major von Richthofen found himself posted to the Luftwaffe Technisches Amt (Technical and Procurement Office) in charge of the Capability Department, an ideal appointment for an officer with his engineering qualifications. At the time the Amt was headed by General Wilhelm Wimmer, held in great esteem by Richthofen as the best technical mind in the Luftwaffe—a high compliment indeed. Under his leadership the Luftwaffe developed the modern generation of fighter, bomber and reconnaissance aircraft. There was a strong consciousness both within the Technisches Amt and the Air Staff of the difficulty of accurately finding targets by night and in bad weather and of the accuracy of high altitude bombing. Consequently, emphasis was also placed on the development of electronic and landing aids, and a high altitude gyro-stabilised bombsight.

The office did not neglect the development of the strategic bomber aircraft and both Junkers and Dornier produced designs and built prototypes. Richthofen was strongly supportive; he had returned from Italy more convinced of the need for such an aircraft. He had actually put a stop to the further development of a dive-bomber (the Hs 123) as he was convinced that these aircraft would be too vulnerable below 2000 metres. However, the performance of the two bomber models was so deficient that Wimmer proposed and General Wever reluctantly accepted the cancellation of the program. The main problem was the lack of adequate aircraft engines. A later attempt in 1942/3 by Messerschmitt to produce an 'Amerika' bomber—the Me 264—was promising but failed through lack of resources for design and production. Richthofen, at the beginning of the war, bemoaned the fact that Germany did not possess a long-range bombing aircraft.

In 1936 Goering relieved the independent-minded Wimmer of his appointment and replaced him with Ernst Udet, a man of incredible flying skills and organisational incompetence, and a friend of the Reichsmarschall from the first war. Udet was the protagonist of the dive-bomber and convinced Hitler and Goering of the advantages. Indeed, he advocated that every bomber type had to able to deliver weapons in a dive. This proved a disastrous decision for the development of future bombing aircraft like the Ju 88 and the Hs 177. He let a competition and from among five types tested, the Junkers Ju 87 design won. The Stuka was born.

Ju 87 Stuka

The aircraft that was to become the backbone of army air support was a strongly built machine with some remarkable technical innovations. It carried an extensive set of communications, had dive brakes and a robust undercarriage for rough forward airfields. The undercarriage was designed to shear off during crashlandings. The aircraft also featured an automatic pilot to recover from the steep dive angles employed and the resultant high 'G' forces. Ingeniously, it also had a window in the cockpit floor to help the pilot keep his target in sight before the dive.

Almost 5000 were built but production ceased late in the war as the aircraft became more vulnerable. The fact that the first prototypes were powered by Rolls Royce Kestrel engines shows the weakness of the aircraft engine industry in Germany. Later versions of the aircraft could carry 2000 kilograms of various bombs, including bomblet containers (early CBUs) and special weapons, such as hollow charge anti-tank bombs. The centreline bomb station incorporated a cradle that swung the bomb clear of the propeller on release. In 1943 an anti-tank version equipped with two 37mm cannon was produced. This was an outstanding success but provided the pilots with some hair-raising missions. Altogether the Stuka was an aircraft for the times.

Flak/Pak - 88

The other weapon of the time was the 88mm anti-aircraft/anti-tank gun. The original design dates back to World War I but was considerably enhanced in the subsequent years. Again, because of the Versailles armament limitations, Krupp collaborated with Bofors of Sweden, which was granted the export rights to the weapon in return for design development and production. The gun had an effective range of 8000 metres and could fire 12–15 rounds per minute, an impressive performance. It was manned by a crew of eight and mounted on a great variety of carriages, including tanks.

Although initially designed as an anti-aircraft weapon, deployment in the Spanish war by Richthofen demonstrated its effectiveness against fortified targets and even moving tanks. It had a highly capable Selsyn sighting system that allowed rapid target acquisition and firing. During Operation *Battleaxe* in Cyrenaica, Rommel dug in his 13 guns at Halfaya Pass, where they literally halted the British armour destroying 50 per cent of the 238 deployed British tanks. The combination of this gun and the Stuka became the basic weapon to support the Panzer Korps.

Spain

The appointment of Udet to head the Technical Office proved a disaster for the Luftwaffe and was too much for Richthofen. After three months he was looking for a new appointment. He went to see Wilberg and fate took a hand. He was about to take on a task that would set his future as a master of air power.

In July 1936 General Franco asked the Fuehrer for assistance in the Spanish Civil War. Hitler agreed and Goering set up a special staff under General Wilberg to manage the operation (Sonderstab W). Within days, 20 Junkers Ju 52 aircraft flown by Lufthansa crews and six Heinkel He 51 fighters, together with anti-aircraft guns, communications equipment and support were dispatched with a small group of Luftwaffe personnel. The intention was to establish a Military Advisory Group (MAG) to train Spanish personnel in the use of the equipment. The reality of the situation soon showed that the Germans had underestimated the serious predicament of the Nationalist forces and were forced to commit their own personnel and equipment to combat operations.

Coalition War

Suddenly Germany was faced with a markedly escalating military commitment and a coalition war with both Spain (Franco) and Italy as partners. The Italians had, without consultation, dispatched 50,000 men and 150 aircraft, and planned to conduct independent operations. The Germans established a joint German Command (Legion Kondor) under Major General (later Field Marshal) Hugo Sperrle, who was to be responsible only to General Franco. All German forces were integrated into the Legion. Over the subsequent three years, coalition operations with the Nationalists developed well but there was not the same relationship with the 'Blackshirts' as Richthofen called the Italians. There was a distinct distrust of Italian competence and bravado. Coalition warfare was to be a major deficiency in German command arrangements during the Spanish war and continued into the next war.

There was considerable concern in Germany that this commitment not escalate to include ground forces. Operations were to be conducted in consultation with and support of the Nationalist field commanders. Lieutenant Colonel von Richthofen was appointed the Chief of Staff of the Legion from January to September 1937, and was to return in November 1938 as the last Commander. He quickly learned Spanish. The German contingent soon grew to one bomber and one fighter group, a reconnaissance squadron supported by communications and flak units—both heavy (88mm) and light (20mm)—armour and artillery. Altogether some 19,000 German soldiers were to serve in the Legion between 1936 and 1939. Germany deployed some 790 aircraft, including 131 Heinkel He 51 fighter/ground attack aircraft, 100 He 111 bombers, 116 Junkers Ju 52 bomber/transports, 133 Me 109 fighters and seven Ju 87, the latter in 1938. Most were handed over to the Spanish Nationalist Air Force including most training machines.

Sperrle, the large bluff Bavarian, and Richthofen made a good team. Sperrle did not seek to dictate to Franco but rather acted as a strategic adviser on campaigns and on assistance the Legion could provide. He was not short of expressing his opinion on strategic plans but both he and Richthofen, who was also not famous for his diplomatic skills, did so diplomatically and established a strong relationship with General Franco. Even when they did not agree with Franco's strategic decisions, they executed them with diligence. Richthofen executed the Legion's operations, provided the support and dealt with the front commanders. He reviewed their operational plans and established

the tactical command and control arrangements. He spent much of his considerable energy touring the units, giving briefings, discussing attack plans with the Spanish commanders and issuing orders to his flying units.

Initially the Italians caused the Legion's commanders considerable grief with their insistence on autonomous operations. However, soon after their arrival they conducted a disastrous operation in the Jamara valley to seize the city of Guadalajara where they were soundly repulsed by the Republican forces. From then on Richthofen exercised de facto operational control over their air contingent. During the battle in the Basque/Asturia regions, Franco also placed Spanish squadrons under Legion operational control. Richthofen had a force of several hundred combat aircraft at his disposal, including some capable Italian bomber aircraft.

It soon became apparent that the He 51 (Hawker Demon equivalent) was not able to match the latest Russian fighters. This led to the progressive introduction of the Me 109, which soon established air superiority. By mid 1937, German aircraft were seldom challenged and the bombers could fly deep into enemy territory without escort. This was to be an unsolved problem for the Luftwaffe in the Battle of Britain and for the Allies over Germany, until the introduction of the long-range Mustang and Thunderbolt.

The Ju 52 was the main bomber aircraft. It was relatively fast and could carry a two tonne bomb load but suffered from a very poor bombsight. They were replaced by the He 111, an aircraft that became the main German bomber type of early World War II. The Ju 52 reverted to its traditional transport role in which it excelled. Indeed, the first operations flown by this aircraft were the ferry of 15,000 Spanish Moroccan troops from Africa to Spain between July and September 1936. This was the first large-scale troop transport operation in aviation history and hailed by General Hap Arnold as the major aviation development between the wars. Close support of troops was provided by the He 51 and was supplemented by the first dive bombers—the Henschel Hs 123, a Gloster Gladiator type biplane. These were later supplemented by the first Ju 87 Stuka dive bombers. The Stukas immediately impressed Richthofen with their accuracy against bridges, fortifications and other small targets, and he lost his earlier reservations about the dive bomber.

The Germans learned many lessons about the performance of their aircraft. Multitudinous reports flowed back to the Technical Office in Berlin about the operational performance and limitations of combat aircraft, level bombing and bombsight deficiencies, flak effectiveness and weapons (that is bomb) effectiveness against various targets. Although the understanding of aircraft performance was important, it was in the area of tactics that the greatest lessons were learned. Under the leadership of Lieutenant Werner Moelders, fighter tactics changed considerably with the introduction of the 'finger four' formation and staggering fighter formations in altitude. Squadron and wing organisation was changed to adapt to the new concept as well as to the continuous need for mobility to forward airfields. It became important, particularly with limited resources, to shorten transit time to target to a minimum.

Fighter squadrons maintained a railway train that provided sleeping, eating and administrative facilities, and of course most paddocks could provide landing strips. Additional support was brought in by 'Auntie Ju' (Ju 52). The railway train was a practice developed by the Germans in the first war and used extensively in the second. Logistics, including a meteorological service, became an important adjunct to Legion success. This became the basis of the logistic support system for the Luftwaffe in World War II.

The tactical coordination of ground forces with air attack provided the biggest challenge. During 1937 the most important involvement of the Legion was the campaign in the north-west—the Basque/Asturia region. This was a heavily fortified defensive line known as the 'Iron Belt'. All of the Legion's aircraft, plus some Spanish and Italian squadrons deployed around Vittoria. Often airfields were primitive and crowded. The Nationalist forces were frequently poorly led, late for an attack and possessed little artillery. Richthofen employed his 88mm guns on key areas to make up for this lack, and they were extremely effective on fortifications. Air support was provided by He 51 aircraft that were now used in shuttle bombing of Republican lines to keep the defenders pinned down and to reduce their anti-aircraft response. This was a classic SEAD (Suppression of Enemy Air Defences) mission that allowed the He 111 bombers to attack battlefield targets unmolested. Frequently, the He 51s would approach from behind the defenders and release their weapons together—a technique dubbed the 'poor man's carpet bombing'. The vicinity of their airfields allowed around the clock (daylight) attack with pilots often flying three to five sorties per day.

Communications were the main problem. There was no ground-to-air radio communication at this stage so the Legion deployed liaison officers (Flievos) to Corps and Division Headquarters. These would maintain communications with the Legion (that is Richthofen's) command post that was situated with the Nationalist commander. By 1940 this problem had been resolved with air-ground R/T communications. Richthofen also expended much energy to find the most advantageous location for his command posts. Either Richthofen or Sperrle manned the post during major operations and tasked the aircraft by telegraph or radiotelephone on advice from his Flievos. Missions were carefully pre-planned and attacking troops would display white panels to alert Legion pilots to their position. Because of the limitations of the Versailles Treaty, Luftwaffe personnel who had mainly served in the Army had extensive experience and understanding of Army tactics and procedures. This was a major factor in the increasing effectiveness of the Flievos. However, these procedures did not completely prevent friendly casualties, neither in Spain nor later.

These tactics soon brought good results and, one after the other, the Republican strongholds fell. Bilbao, one of Spain's major industrial centres, fell on 19 June 1937. In subsequent operations in the south-west, particularly during 1938, the emphasis changed to manoeuvre warfare with battlefield interdiction often the primary task. Battlefield reconnaissance became a major factor in these operations. Some strategic bombing missions were flown against power stations, ammunition factories and rail yards. During this latter period, Richthofen's Chief of Staff was the very able

and experienced Lieutenant Colonel Hans Seidemann. He was to stay with his chief through the Polish and French campaigns and eventually to take over command of the VIII Flieger Korps during the Kursk battle.

War in the West

The Legion Kondor returned to Germany in May 1939, covered with glory and rewarded by both the Spanish and German Governments. Richthofen was named the 'man of the match' and led a large victory parade through Berlin—he had won the war for General Franco. The lessons learned in Spain were to govern Luftwaffe Army support operations for the forthcoming war. An analysis of the Legion's operations had already led the Air Staff to the establishment of a special Air Division structured specifically for Army battlefield support. It was to be the only specialised organisation of its kind and was placed under the command of Major General von Richthofen – *Air Commander for Special Purposes*. Germany entered World War II with the only air force that included a specialist Army support component.

Poland

The division was tasked with supporting the 10th Army containing the larger part of the German tank forces in the attack on Poland. It comprised some 200 aircraft, including the majority of Stukas in the Air Order of Battle. It also included all the remaining Hs 123s and a squadron of Dornier Do 17 reconnaissance aircraft. This was later reinforced with a wing of Do 17 light bombers suitable for low-level attacks. The division also included four detachments of signals troops equipped with armoured vehicles to act as the liaison officers with the 10th Army. Richthofen was to introduce air support operations to the German Army. His classic task was briefly:

- to assist the 10th Army with the break in through the Polish border and crossing the Warthe river;
- to assist in the fighting around Cschechostowa;
- to interdict the rail and road lines of communication around Piotrokowsk, Kielce, Lublin and Skiernewice;
- to provide support for the battle around Radom; and
- to fly missions against Warsaw and Modlin, the latter being a major fort constructed during the Napoleonic wars.

Richthofen immediately collocated his Headquarters with that of the Army Commander, General von Reichenau.

Although the operations were successful and von Reichenau was fulsome in his praise, there were some strong lessons in the three weeks' campaign. Not all the procedures worked as planned but the coordination of air and armoured forces had been established. In particular, the large Luftwaffe logistic support force allowed the

constant sustained movement of units to keep close to the advancing Panzers. On the first day Richthofen was concerned that insufficient requests from Army Headquarters were received. He took off in his Storch aircraft and soon found a large number of targets to which he personally tasked sorties from the air. His small slow machine was badly shot up by ground fire and he just managed to force land on the German side of the line. He continued the practice of personal airborne reconnaissance through all his campaigns. His division lost 56 aircraft—an attrition rate of 18 per cent—an unacceptable rate that included seventeen Ju 87 and six Hs 123 aircraft. On the other hand, the Hs 123 performed well at very low altitude against non-mechanised troops. The doctrine had been established and Richthofen's division was expanded to a full air corps of 450 aircraft—Flieger Korps VIII—that became the one specialised army support organisation in the Luftwaffe.

The Western Front

The French campaign was a repetition of Poland with some refinements. During the crossing of the Meuse River by two Panzer divisions in the face of French counter-fire, the Stukas kept up continuous air attack on the defenders for eight hours. It was the first time that tanks achieved a contested river crossing. Richthofen also instituted alert rosters for his aircraft and achieved a 20-minute response time for aircraft over target for immediate requests. An attempt was made to establish daily 'bomb lines' to minimise friendly casualties, but the rapid advances of the Panzer divisions negated the effect. A major achievement was the protection of the flank of an armoured corps entirely by air. The campaign also saw the first use of airborne troops. At the end of this campaign he was awarded the Knight's Cross and promoted two ranks to General.

The Balkans

The Balkans and Greek campaigns were mere repetitions against forces poorly equipped and without air support. The notable battle occurred in Crete in May 1941. By this time the VIII Korps numbered almost 800 aircraft, including 80 of the new Ju 88 medium bombers. The ferocity of this battle is legendary and eventually turned on the contest between Richthofen's air corps and Admiral Cunningham's Mediterranean fleet. The Royal Navy (RN) suffered heavy losses with nine ships sunk (including three cruisers) and thirteen others badly damaged (including a carrier and two battleships). Nevertheless, the Navy evacuated 16,000 of the 22,000 men from Crete. Cunningham's order was, 'we must not let the Army down'. When the Army expressed concern about the heavy losses of ships, Cunningham remarked that 'it takes three years to build a ship; it takes 300 years to build a tradition'. The German XI Flieger Korps lost 35 per cent of its 500 Ju 52 transports and 6,000–10,000 killed. On express orders of Hitler, the paratroopers never again conducted large-scale operations of this kind; a lesson not clearly learned by the Allies. Richthofen was exultant about his own success against the British Fleet.

War in the East – Operation *Barbarossa*

The VIII Flieger Korps was now deployed on the Russian Central Front with the task of providing air support to army operations spread over a front of nearly 1000 kilometres. In July Richthofen became the 31st soldier of the Wehrmacht to receive the Oakleaves to the Knight's Cross. In February 1942 he was promoted to Generaloberst (four-star), a unique honour for an air corps commander.

The advance eastward stopped with the onset of the winter of 1941. It was to be the end of the Blitzkrieg. Hitler now set new objectives (War Directive No 41) for the 1942 campaign. The drastic shortage of oil led to the second attempt to capture the oilfields of the Caucasus. Two major Army formations were to thrust east-south-east to the Don River and Stalingrad and turn south. The major effort was to be General von Manstein's re-conquest of the Crimea and a thrust across the Kerch peninsula to the oilfields at Maikop and beyond. Hitler approved Manstein's plans, which had been developed since December 1941, but ordered him not to start the operation until he had 'adequate air support'. The latter was to be provided by a strengthened VIII Flieger Korps, with the proviso that air units might be withdrawn from it if the situation elsewhere so required—a prophetic statement. The Luftwaffe entered the 1942 campaign on the East with some 1650 aircraft, of which Richthofen had almost half. The preparation for the offensive required the move of the VIII Korps some 500 kilometres south to the Crimea. Richthofen travelled there to meet Manstein. The meeting sparked a relationship between two officers of the nobility and of equal rank, both imbued with the Prussian tradition of duty and determination that was probably unequalled in the war. Both were brilliant strategic planners and both were determined to succeed in the face of incredible odds. Manstein was almost ten years the older but treated Richthofen entirely as an equal.

Manstein was outnumbered three to one by the Soviets and had to breach two formidable defensive lines to reach Kerch. Fortunately, and probably for the last time, the Luftwaffe enjoyed total air superiority. Richthofen had three weeks to move his forces into place and many of the units were still in Germany refitting. His command was reinforced and he had at his disposal some 750 bombers, dive-bombers and fighters. In the interim the 4th Air Fleet had been busy establishing the ground organisation, preparing bases, and locating weapons, fuel depots and signals units in the Crimea. As usual, Richthofen located his Headquarters near the Army commander and went through Manstein's plans in detail. The result was total agreement. The campaign was in two phases—the first, an attack against the heavily defended Prapach line near Feodosiya, blasting through the southern part of the line and advancing on the town of Kerch. This began on 8 May 1942 with a heavy air assault starting at first light along the line with particular concentration on the southern flank. This preceded the infantry assault. German Pioneers landed in boats right on the fortification under constant fire support from the Luftwaffe. Richthofen's aircraft flew 2000 sorties on the first day, shot down 80 Soviet aircraft and lost only 10 of their own. The next day the 20th Panzer Division roared through a gap in the line and after heavy fighting Kerch fell on 15 May after only seven days. Manstein captured 170,000 prisoners, 1000 guns and much other

materiel. VIII Flieger Korps also accounted for some 300 Soviet aircraft destroyed in the air and on the ground. However, because of a sudden Russian offensive around Karkhov, Richthofen was forced to send almost half of his aircraft to the north—a directive that caused him considerable consternation.

Having secured the eastern peninsula and opened the door to the Caucasus, the second phase was the subjugation of the Sevastopol fortress, the strongest in Europe and the scene of one of the British Army's most illustrious cavalry charges. Richthofen returned to Germany to brief Hitler and the High Command on the proposed air operations and the need to assign him more aircraft. The offensive started in early June and took three weeks. Richthofen had some 600 aircraft and supplemented Manstein's artillery with his own flak guns, which he refused to place under Army operational control. His aircraft flew an average of 800–1000 sorties per day until fuel and bomb shortages reduced the sortie rate. He then instituted a 'cab rank' system for control of aircraft against particular targets. His Stukas flew up to eight sorties per day, while his Ju 88s flew up to four sorties without refuelling, with crews in the aircraft in 35°C temperatures. The stress on air and ground crews was enormous. Richthofen himself was called away to a new task before the battle was even decided but Sevastopol fell on 29 June 1942. The Crimean campaign was to prove the zenith of Luftwaffe support for the Army. Richthofen had proven himself as a very hands-on commander, who demanded much of his units and himself and achieved extraordinary results. Hitler called him his 'specialist'. Manstein was complimentary about his air commander's intervention in the battle.

Epilogue – the last campaign

In June Richthofen took command of the 4th Air Fleet responsible for the support of the whole Southern Front. His first action was to restructure his other organisation IV Flieger Korps commanded by General Kurt Pflugbeil, another very capable commander, into a close support corps. He saw that as an essential element for the future support of the Army. The major effort of the Air Fleet for the remainder of 1942 was the support of the 6th Army at Stalingrad. This eventually led to the unsuccessful attempt to supply the beleaguered Army by air when the Fuehrer, against strong advice from numerous sources, forbade a breakout and General von Paulus refused to take the initiative for such an operation. Not even the intervention and organisational genius of Field Marshal Milch could generate the supply support in the Russian winter and Paulus surrendered in February 1943. Germany lost some 250,000 soldiers as a consequence. The VIII Flieger Korps, which executed the bulk of this support, was now commanded by General Martin Fiebig, a good friend and previously the commander of the close combat forces in the Korps. In 1943, just before the battle of Kursk, he was to hand over command to General Hans Seidemann, Richthofen's Chief of Staff in Spain.

In the same month Richthofen was promoted to Field Marshal and at age 47 was the youngest officer to hold this rank in Prusso–German history. He continued his close collaboration with Manstein but in June 1943 he was transferred to Italy to head the 2nd Air Fleet with the appointment of Kesselring as Commander-in-Chief South. The

Air Fleet had few resources and the main activity was the recovery of Luftwaffe units from Africa to the defence of Italy. The one major strategic operation was the bombing of Bari Harbour by 100 Ju 88 aircraft in December 1943.

Bari, on the heel of Italy, was the supply port for Montgomery's army and the then headquarters for the USAF Fifteenth Air Force commanded by General Doolittle. Air Marshal Coningham regarded an attack on Bari as out of the question. Kesselring on Richthofen's advice ordered a night attack with some 105 Ju 88 aircraft; all that were available. The aircraft approached Bari from the east out of the Adriatic Sea at low level and dispensed chaff to blind Allied radars. They attacked under flares but found the city unprepared and well lit up; the attack started at 1930 hours and lasted for 20 minutes. Some 17 out of 30 ships were sunk and it was estimated that this attack delayed the build-up of Fifteenth Air Force well into 1944. It was the last major operation executed by the 2nd Air Fleet commander, and has been described by some historians as the 'second Pearl Harbor'.

In late 1944 Richthofen was diagnosed with a tumour and hospitalised. He became inactive and eventually was to die in American captivity in July 1945.

Wolfram von Richthofen was generally regarded as Germany's greatest tactical air commander. There is no doubt that Hitler admired him and the various Army commanders with whom he operated regarded him as an outstanding airman. The final cachet must come from the British—RAF intelligence labelled him the Luftwaffe's greatest tactical air commander of the war.

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Air Vice-Marshal Hans Roser, AM (Ret'd)

Air Vice-Marshal Roser has 45 years' experience in the defence and aviation industry in Australia and overseas. His expertise lies in strategic planning, project management of high technology projects and executive representation with government.

He has extensive overseas defence experience in Malaysia, Singapore, Thailand, Vietnam, the United Kingdom and North America, where he served in his military career.

Between 1990 and 1998 he worked as a senior executive with Kinhill Pty Ltd and Brown & Root Asia Pacific, where he held corporate responsibility for business development with the Federal Government and, in particular, Defence.

During his Air Force career he was involved in a number of major Air Force acquisition projects, in particular the F/A-18 Hornet fighter aircraft, which had a project cost of some $4.5 billion. Later as Chief of Materiel in Air Force he was responsible for all Air Force acquisition programs.

He has been chairman of several industry associations and has been a member of several Australian and overseas boards. Between 1998 and 2002 he was a member of the board of Eurocopter International Pacific and from 2000 to 2003 he was Chief Executive Officer of Thales International Pacific Holdings. He is now a Director of both ADI Limited and Thales Australia Holdings.

Coningham and Tedder: Masters in the Arts of Listening, Cooperating, Trusting

Doctor Vincent Orange

I have given a subtitle to this paper comparing the careers of two famous Royal Air Force (RAF) officers of the last century, Arthur Coningham and Arthur Tedder.[1] It is 'Masters in the Arts of Listening, Cooperating, Trusting'. They also became, of course, Masters of Air Power. At first, they were masters only in the sense that this city is full of Masters of Arts—men and women who have acquired, by long years of moderately diligent study, a certain understanding of such demanding subjects as History or English, French or German. It was only after Coningham and Tedder had been apparently fully-fledged airmen for years that they began to realise—as graduates in academic subjects eventually do—how very little they knew about their profession.

In that sense, this room is full of Masters of Air Power: men and women who have made a good beginning in a demanding career. Some of you have already done much more than that. Others will go on in your chosen service. You will *grow*—as Coningham and Tedder did—from being keen, brave, confident and ignorant young men to being (in later years) no less keen and brave, but sufficiently experienced to know and live with the harsh fact that in time of war even the right decisions will result in casualties. The knowledge that every master of any branch of every armed service in recorded history has borne that same burden, on behalf of the civilian population, made it easier for them to bear, as it will you.

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1 Vincent Orange, Coningham: *A Biography of Air Marshal Sir Arthur Coningham, KCB, KBE, DSO, DFC, AFC*, Methuen, London, 1990 (and Office of Air Force History, Washington DC, 1992); Vincent Orange, Tedder: Quietly in Command, Frank Cass, London and Portland, Oregon, 2004.

Given their basic competence as airmen, plus a readiness to work hard even in dull jobs and do their best to keep everyone under their command usefully employed, 'listening, cooperating, trusting' were three important secrets of the success enjoyed by Coningham and Tedder. But surely, you may be thinking, there is nothing special about those qualities. Do we not all listen, cooperate and trust others? Only up to a point, in my opinion; Coningham and Tedder went beyond that point.

As for listening: they were able to do more than merely keep their mouths shut and wait politely for the other person to stop before starting to speak again. They listened and *learned*, especially in their growing years, even when what they heard was not what they wanted to hear. They took in, they did not give out, unless or until it suited them. They absorbed into their own thought whatever was useful in the other person's talk. One senior airman said of the young Coningham: 'his outstanding characteristic lay in his ability to keep his own counsel. I never felt I really knew what was going on behind his dark brown eyes, though we met daily at my headquarters and often at each other's houses.' Men said the same about Tedder. He was notorious, even at meetings attended by Prime Ministers in Whitehall and Presidents in Washington, for staying silent unless he had something to say.

As for cooperating: the dictionary tells us the word means 'working together to the same end.' Mark well, please, the last three words: 'the same end.' Cooperating therefore does not necessarily mean nodding and smiling at whatever the other person says. It does not exclude arguing, even quarrelling and banging one's fist on the table (as both our heroes did from time to time, and as some persons here present may have done). It does, however, include trust. That is the vital, unspoken, concept underlying cooperation.

General Eisenhower led one of history's most successful coalitions, but even for him it was difficult to get 'a degree of co-operation that ensured seamless and successful combined operations. ... Ultimately, the cohesion of any coalition hinges on a single, intangible characteristic—trust. It is trust—not doctrine or technology or equipment—that binds a successful coalition and enables effective multinational operations.' The author of those words is Richard Cousens of the Centre for Defence and International Security Studies in Henley, England. He had in mind the move in November 2004 of the Black Watch to closer support of American troops around Baghdad, but his argument applies to all coalitions, ancient and modern.[2]

Coningham and Tedder often argued with other airmen, soldiers, sailors, allies and politicians. Why should they not? The issues facing them during World War II were matters of life and death, and hard-headed men with years of hard-earned experience in all shades of blue or brown uniforms or civilian suits *should* express their opinions forcefully. They listened to each other (as well as they were able); they often gave way, graciously or otherwise, to reasoned argument; but above all they accepted that everyone at the top table was 'working to the same end.' Thank God the same is nowhere near true for Germany, Italy and Japan during that terrible war.

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2 Richard Cousens, *Weekly Telegraph*, London, 2–8 November 2004, p. 19.

It is here that Coningham and Tedder (at a higher level) show themselves as better than Masters, better even than PhDs in Air Power, for by the time they came to that top table their long field experience—including defeat, best of all teachers—had burned into their souls two principles. One was the need for close relations with the United States at whatever cost to British influence over grand strategy. British industry simply could not provide sufficient weapons (on land, at sea or in the air) to avoid defeat, let alone to achieve victory. American supplies were already essential for the Desert War in 1941, and American manpower became so for the *Overlord* campaign in 1944.

The second was the need for centralised control of air power. Tedder insisted on this, overcoming strong opposition from naval and army commanders. Air superiority, he argued, must be sought before close support at sea or on land could be offered. And he, the Air Commander, must be the judge—advised by his own field commanders—of where and when that support could best be offered.

Here I must add that both Coningham and Tedder were acutely aware that from start to finish of World War II they never faced anything like the full weight of German forces, which were destroyed mainly by the forces of the Soviet Union. That is a consideration telling against all British or American army or air commanders in World War II. The British and American navies, however, can claim to have faced and defeated—with the essential help of aircraft—the undivided strength of their enemies.

Now I have some good news for all officers here present who wonder if they really might have a 'top brass' baton in their knapsacks. Arthur Coningham (born in January 1895) was decorated five times for gallantry in combat or for conduct of exceptional merit. He was knighted twice. He was promoted to three-star rank. He was granted the Freedom of Brussels, his favourite city. And he is regarded as one of the greatest tactical air commanders of World War II. But he achieved all this and more despite seven heavy handicaps, few of which (I believe) you share.

- One, he was born in Brisbane.
- Two, his penniless parents tried to screw money out of the Roman Catholic Church in Sydney by alleging that a priest had fathered Arthur's younger brother. The allegation made banner headlines in 1900 and 1901 during two High Court trials and earned them a million column inches in the deeply-shocked Australian press.
- Three, the family was obliged to flee from civilised Sydney to the Empire's equivalent of Siberia, New Zealand.
- Four, Arthur's father then did six months in Hokitika gaol for collecting money from simple souls as down payment on medical books they never got.
- Five, his parents later divorced (then a dirty word) on account of Dad's adultery (then an even dirtier word) in a court case that earned them another million words in the deeply-shocked New Zealand press. 'In Sydney', he said,

'my wife said she did and a jury said she didn't. In Wellington, I said I didn't and a jury said I did.'[3]

- Six, our future hero himself—in those days a thick farm boy—thought it a neat idea to see what happens if you hit a piece of gelignite with a hammer. He desisted while he was still in one piece. It was his first intelligent command decision.
- And seven, when he reached England, to join the Royal Flying Corps (RFC), he allowed himself to be known as 'Mary', a nickname worn down from the original 'Maori' (then thought suitable for any New Zealander, even one born in Australia to parents of English origin). He made sure his friends called him 'Mary'. Except officially—he could hardly be 'Sir Mary Coningham', could he?—but he never otherwise answered to 'Arthur'.

As for Arthur Tedder (born in July 1890 and thus four and a half years older than Coningham), here is some more good news for those of you who wish to get to the top. Tedder was never decorated at all, despite over 36 years of uniformed service. He served diligently on the Western Front and in Egypt with only a single dramatic episode to his credit. En route to Egypt in 1918, his ship was torpedoed in the Mediterranean and he was rescued by the crew of a *Japanese* destroyer. No other senior British, or British Empire, or American officer, in any of the Services—Tedder proudly declared—could equal that distinction. But like Coningham, he suffered from seven heavy handicaps, few of which you share.

- One, he was born in a distillery, a whisky-making factory in Scotland, where his father was the resident customs and excise officer. He was then carted off by his parents to another distillery in the Shetland Islands, which are closer to Norway than to England and less civilised even than Scotland.
- Two, his mother dressed him as a girl when he was a child, and in a kilt after she reluctantly admitted his deficiency.
- Three, he began his serious education at a quality London school where he spoke at first with an accent that would have baffled Geordies, let alone the effete southern English. His voice, his kilt, and a pair of ears that flapped in any half-decent breeze were all miseries for a shy little boy, unused to the rough-and-tumble of a big and busy school. Having survived the cruel mockery of adolescents and proved his fitness for command by rising to the

3 Here I must record, to the credit of Arthur Coningham senior, that he appeared in one Test match for his country, against England, in Melbourne (December 1894–January 1895) as a fast-medium left-arm bowler and left-hand batsman. Australia lost; Arthur was dropped and never selected again, but he set three records in that single appearance: he was the first Queenslander to represent Australia; he took a wicket with his first ball in Test cricket; which was also the first ball of the match. As at 13 August 2005, no Australian has matched either feat.

rank of Cyclist-Sergeant in the School Cadets, he later found Churchill and Montgomery at their worst easy to deal with.

- Four, at Magdalene College, Cambridge University, he managed only a 2/2 degree in History (always an easy option) even with the help of a personal crammer and plenty of one-to-one tuition. It was such an ordinary degree that he was rejected when he applied for a lecturer position at the University of Queensland. Instead of minding his books, he wasted most of his varsity years on rowing, rugby, cycling, courting, admiring beautiful buildings, climbing about on college roofs and discussing the Meaning of Life. He even went out in the wet to canvas for a politician.
- Five, he wrote a book. But it is not about air power. It is not even about jointness. It is about the Royal Navy in the 17th century—a time when the Empire lacked air power, suffered many setbacks as a consequence and left several parts of the world unconquered. To impress readers, he even stooped so low as to throw in a few German, Dutch and French citations merely to make his text look more scholarly.
- Six, he intended to make his career in Britain's Colonial Service and was actually a cadet in Fiji when World War I began. So much for his feeble grasp, as a history graduate in a decent university, of the world scene in 1914.
- And seven, our hero fell hopelessly in love and frittered away countless hours of precious study time, either in writing numerous letters or, whenever they met, gazing into her beautiful eyes while they told each other that *their* love soared far above physical lust into the ethereal empyrean where immortal purity reigns supreme. His beloved was a young Sydney woman whom he had met in Germany and had relatives in a wilderness, part of which is now Canberra.

Both Coningham and Tedder, then, had to overcome many handicaps en route to glory. The officers here present can do likewise. All you need is what they had. Natural talent, boundless energy, a pleasant manner (genuine, if possible), low cunning and fierce ambition (both carefully concealed, at least until you reach one-star rank). You must endure years of hard service under shot and shell in a variety of enormous headquarters, all overrun either by brown jobs or Americans, and you must find a senior officer to guard your back and a corporal clerk who understands the paperwork. If you survive that, field service against an enemy will seem a doddle.

You must also ensure that, if war comes, you are a 'second wave' commander. Get appointed only *after* those in command at the outset of hostilities have been killed, captured or dismissed, and the government and industry have together got around to providing the men and materials you were demanding before hostilities began.

Also, of course, you need to be amazingly lucky. Lucky in avoiding the bullet that has cut off so many young men in all nations who had it in them to get to the top. Lucky in

picking up the experience and friends that happen to matter when crunch time comes. And lucky enough to avoid mortally offending a powerful politician, an influential officer, a crabby ally—at least until you have reached such an eminence, as did Coningham and Tedder, that you are fireproof. Not even Montgomery and Churchill were able to pull them down, hard though they tried.

Once upon a time, it was a huge advantage to have a wife who regarded your career as hers. A wife who was happy to pack the children off to boarding school, who was able to smile her way through endless formal dinners and coffee mornings in the hope of creating a good impression. Both Coningham and Tedder were blessed with such wives, but they may be rare birds these days. Finally, it will help if your side wins any conflict that is going on, although that has not harmed the respect generally accorded to Richthofen, Ataturk, Rommel and Yamamoto, among many other enemies—especially after they were dead.

A quality which Coningham and Tedder had in abundance was guts—a bloody-minded determination not to be put down despite massive odds against them. Coningham, for instance, began his career as a soldier in Samoa in August 1914 and then served at Anzac Cove. A combination of sunstroke, dysentery and typhoid caused him to spend months in hospital before he was sent home to New Zealand and discharged, unfit for further military service, in March 1916. 'To Hell with that!' was his response, so off he sailed to England, at his own expense, in April. He was commissioned in the Royal Flying Corps, learned to fly, and the rest, as they say, is history.

Tedder also had to fight hard for the chance of a career in aviation. Being in Fiji on the outbreak of war, he was ordered to stay put and carry on bearing his share of the white man's burden. His response was as blunt as Coningham's. Off he sailed to England (via Sydney, home of his beloved) where he became an infantry officer. But he twisted a knee so badly that he was likely to be invalided out or—at best—condemned to dogsbody duties, such as conducting pay parades, organising sports days, sniffing doubtful bacon and keeping Mess accounts, far behind the lines for as long as the war lasted. He decided to seek a transfer to the Royal Flying Corps. After a long struggle, he agitated his way to a commission, learned to fly, and the rest is also history.

In family circumstances, however, in quality of education, in physical appearance and in social tastes the two men were by no means brothers under the skin. They certainly shared a love of flying, but whereas Coningham rapidly became first-class and remained an active pilot and accurate navigator for the whole of his career, Tedder was never better than an average pilot, although he matched Coningham as a navigator.

Coningham was a big, handsome man. He became a brilliant pilot in aerial combat. By the time of the Armistice in November 1918, he had flown no fewer than 176 patrols during eleven months at the front (an average of four per week) and not only lived to tell the tale but during all those anxious hours in the air he had personally destroyed nine enemy aircraft, shared in the destruction of four, damaged at least four, and driven away scores. These figures are lower than those that used to be bandied about for all

airmen, in both world wars. They have been verified by recent research and he retains a high place among combat aces.

Yet most of Coningham's patrols were flown in machines of inadequate performance. The de Havilland 2 (DH-2) was a single-seat 'pusher' biplane, with the engine mounted behind the pilot, so that he had an unrestricted forward view, but the DH-2 was underpowered and the pilot could see very little above and behind him. His next machine was the DH-5, a single-seater 'tractor' biplane, rather more powerful but the pronounced backward stagger of the upper plane was such that the pilot could see even less of the sky above and behind him. Only in the last four months of the war was he able to fly a superb single-seat fighter—the SE5a—though used mainly as a ground attacker.

By the end of 1918, he later recalled, fighter squadrons in close cooperation with tanks were leading the Allied advance on the Western Front, and fighter-bombers were making the German retreat 'expensive and chaotic'. The principles thrashed out then, Coningham wrote in 1946, had remained constant. The concentration of air effort in support of land forces by the end of World War I was excellent. Contact between soldiers and airmen was very close and mutual appreciation cemented both forces into a team. Much of Coningham's best work during the next war would be devoted to restoring that 'mutual appreciation', which had been sadly neglected after victory was achieved.

After the war, Coningham made a very poor impression on his first peacetime superior: 'his work and general behaviour were most unsatisfactory. He returned late from weekend leave on more than one occasion and just before his final examination absented himself without leave, returning too late to sit the first paper. Displayed an entire lack of discipline and from this point of view appears to be unfit for any senior rank.' So please do not despair if you too have suffered from similar criticism: you can overcome it.

Coningham's flying skills were soon on display at many air shows. Then, in 1925, he showed himself capable of doing the hard yards as well as making the spectacular burst. He led a flight of three DH-9a two-seater single-engined biplanes from Helwan (near Cairo) to Kaduna in Nigeria and back. A round trip of about 10,400 kilometres—80 hours in the air, on 16 of the 24 days spent on the journey, at an average speed of about 128 kph. It was the first east–west crossing of Africa by air, in obsolete machines with reconditioned engines, no radio aids on the ground or in the air, landing strips that were narrow and short even for the DH-9a, maps showing few landmarks accurately and slender chances of survival or rescue should a forced landing become necessary. The value of the route he pioneered would be fully exploited for sending aircraft to Cairo from Britain and the United States during World War II.

Unlike some exceptional airmen, Coningham was also a patient teacher even of young men who were never going to be first-class pilots. No sneering, no mocking. All he asked of them was maximum effort and attention to instruction. He was also an outstanding sportsman, especially at shooting, polo and the handling of small boats. He was a popular party guest, even though he drank little and never smoked, for he never hesitated to circulate, talking easily to people he did not know, and rarely went home till late.

Coningham cleverly avoided Staff College and was rarely trapped behind a desk in some headquarters for long. He infuriated several contemporaries by moving easily from one interesting flying job to another, year after year. Among his most interesting appointments was a two-year stint in Iraq, 1922–24, where he commanded No 55 Squadron. It had the excellent motto *Nil Nos Tremefacit* (Nothing Shakes Us—more freely translated as 'You can't put the wind up 55'). There were many tense moments, but nothing like the current miseries. Off duty, he played polo, enjoyed river-bathing, weekend shooting expeditions (sand grouse and duck) and hunting pig; he also endured a couple of spells in hospital with sandfly fever. 'We lived for flying,' recalled one of Coningham's dearest friends—later an Air Chief Marshal—'and, taking no thought for the morrow, asked little more of life in our mid-twenties than to be spared for as long as possible from Marriage and Death.'

In short, Coningham was just the sort of chap whom one would expect to reach the rank of Wing Commander, certainly nothing higher. He would then fade away into the grey civilian world because he had no interest in deskwork, and no one keeps his edge in flying skills, any more than in top-class sport, past the age of 40. One would expect him to end up on a small farm or in a garage or a boatbuilder's yard, prospering moderately. He would become a pillar of the local branch of the RSA (Returned and Services Association), a monumental bore about his famous deeds, get divorced, alienate his children, and drink himself to death at 60.

That did not happen; partly because of Hitler, Mussolini and the equally aggressive Japanese, but mostly because he gradually revealed (especially after his marriage) an unexpected capacity to keep on growing—from gelignite moron through combat champion, long-distance pilot, gifted teacher, enthusiastic sportsman, commanding officer, and on to a mastery of air power.

As for Tedder, he was a small, wiry chap, never more than a competent pilot who probably failed to down a single enemy aircraft despite 378 hours of flying on the Western Front, even though he had been an excellent shot at school and university. He piloted the FE2b, a two-seater biplane with its engine placed behind the crew, and later the Sopwith One-and-a-Half Strutter, the RFC's first aircraft with a machine-gun firing through the propeller arc and the observer seated behind the pilot. Neither machine was at its best in aerial combat.

Tedder soon proved to be an effective manager of men on the ground as well as in the air. Older than most pilots (he turned 26 in July 1916), and more thoroughly educated, his diligence and literary skill enabled him to shift official paper swiftly and pacify higher command on all those routine matters that have always been the despair of those for whom the cockpit is the only real world. Tedder also had the calm temperament and good humour needed to see men through times of severe casualties—of which there were many.

Tedder showed himself very adroit at finding that difficult line between being too hard or too soft on his men; between knowing when to blast or when to praise them; between knowing which matters should be reserved for his personal decision and

which he should not poke his nose into; between knowing when, how and over which issues to push senior officers and when it was wise to back off, shut up and get on with it. His rule was always, whether as a junior or senior commander, *to say little but mean it*.

After the war, Tedder became a hardworking student, an excellent teacher, a thoughtful commander and an able administrator. He was no horseman, but just as good in a small boat as Coningham. He would play the piano—even jazz—in the Mess, but disappeared whenever a bright-eyed officer said: 'This place needs livening up' and began to suggest ways in which this might be done. He was a most reluctant party guest, for Tedder's idea of a jolly evening was to be at home with his family—sketching, reading, listening to classical music and puffing away at a pipe rarely out of his mouth (except, presumably, in bed).

In short, Tedder was just the sort of chap whom one would expect to reach the rank of Group Captain, certainly nothing higher. He would then fade away into the grey civilian world because he lacked that dynamic personality, that much-admired (but rarely-defined) quality of *leadership* that the topmost brass look for. One would expect him to end up as manager of a small but thriving business, perhaps a bookstore or record shop, prospering nicely. He would become a prudent, incorruptible pillar of the local council, steer clear of the RSA (except on Anzac Day) and be quite well liked by a very small circle of friends. He would rarely speak of his career; he would not get divorced; his children would respect him; and he would die quietly at 70.

That did not happen; partly because of those villainous rulers of Germany, Italy and Japan, but mostly because he too, just like Coningham, revealed a surprising capacity to keep on growing—from casual student and dreamy lover through conscientious pilot, thoughtful manager, gifted teacher, wise administrator, commanding officer and on to a mastery of air power. He was well ahead of Coningham in his knowledge of aircraft design and performance, and in knowing what actually went on in aircraft factories and RAF hangars when senior officers were not present.

Coningham broke through the informal barrier that existed between *flying* officers and *commanding* officers during the 1930s. Between those men who could handle a single squadron on a good day in peacetime and those who could be entrusted—so it was hoped—with the handling of a group of squadrons on a bad day in wartime. In July 1939, he took command in York of 4 Group, Bomber Command. He began the task of converting a nominal weapon—five squadrons of men untrained in night operations, flying inadequate Armstrong Whitworth Whitley twin-engined bombers—into one that might become a dangerous weapon. His future as a 'bomber baron' seemed assured by July 1941, as his group was enlarged and its training and equipment were improved.

At that very moment, Coningham was whisked off to Cairo to command 204 Group, at the request of Tedder, recently confirmed as head of Middle East Air Command. Why did he choose Coningham? They had never served together and commanding night bombers in north-eastern England seems no sort of preparation for commanding fighters and fighter-bombers in daylight over the Western Desert. The Chief of the Air

Staff (CAS), Sir Charles Portal, had offered Tedder a choice of three officers—of whom Coningham was the third.

But he got the job because Tedder thought he might be 'the better co-operator with the other services'. Tedder told him to 'get together' with the Army commander as his first task on arriving in the Desert. This order, Coningham wrote later, was of 'fundamental importance and had a direct bearing on the combined fighting of the two Services until the end of the War'. In September he set up his first joint headquarters, when the Eighth Army was formed, and in October 204 Group became the Western Desert Air Force—to match that Army's status.

Coningham came to be regarded by Tedder (in the words of an eminent military historian, Sir Basil Liddell Hart) as 'the real hero' of the Desert War. His powers of inspiration; his tactical awareness (emphasising the need to win air superiority *before* attempting close cooperation with ground forces); and his ability to act sensibly in numerous crises also attracted the admiration of senior American airmen, especially during the campaign in Tunisia (November 1942 to May 1943). But Coningham had no interest in *logistics*—the science of planning and carrying out the movement and maintenance of forces—so Tedder provided him in February 1942 with an able assistant, Air Commodore Thomas Elmhirst, who loved this work.

Sadly, Coningham and General Montgomery (appointed to command the Eighth Army in August 1942) became estranged during November over what seemed to airmen the army's unduly slow pursuit of Rommel after the battle of El Alamein. Personal relations between Coningham (supported by Tedder) and Montgomery worsened, but all three usually agreed on a basic issue—*air power must be independent of army (or navy) control*—an issue that divided commanders in all Services and on all sides throughout the war.

During 1943, Coningham became a key member of the Anglo-American team which achieved victory in Tunisia, conquered Sicily, and successfully invaded Italy. He returned to England in January 1944 as head of the 2nd Tactical Air Force, part of the Expedition preparing to help liberate Occupied Europe and destroy Nazi Germany. The stakes were high; the options various; the enemy cunning; the commanders forceful men, used to obedience; and—I must emphasise—they were all tired, anxious, over-stretched, and required to make decisions every day costing men and women their lives. They did not have the advantages of myself and other armchair historians who know the results of their efforts and can spend years picking over their decisions, awarding a plus here and a black mark there as if we were some kind of gods.

Coningham retired in August 1947 and was killed early on the morning of 30 January 1948—just 11 days past his 53rd birthday—when an Avro Tudor IV airliner named *Star Tiger* in which he was travelling as a passenger to Havana, Cuba, crashed into the sea north-east of Bermuda. Coningham's daughter well remembered a succession of cables, telephone calls and visitors to her mother on the day *Star Tiger* went missing. Then came another knock at the door. A small man, wearing a shabby raincoat, stood there.

'My name is Tedder,' he said. 'May I come in?' He had come to tell mother and daughter that there was no longer any hope of finding Coningham alive.

His death shared the front page of the *New York Times* on 31 January with news of the assassination of Ghandi in India and the death of Orville Wright in the United States. Tedder's appreciation appeared in *The Times* on 14 February. Coningham, he wrote, had 'the alert, active, inquiring mind, the imaginative, highly-strung temperament, the perennial youth' of 'a brilliant commander of air forces. ... It was to him personally more than to anyone else that we owe the initiation and development of the joint land-air technique which became the doctrine and practice of the Eighth Army and the Desert Air Force and subsequently of the Allied Armies and Tactical Air Forces in North Africa and Europe.'

Meanwhile, back in 1922, Tedder had taken a squadron to Constantinople on the brink of what Churchill thought would be another war with Turkey, but Mustafa Kemal Ataturk—hero of Gallipoli—refused to fight.[4] The 'dramatic and bizarre' Chanak Crisis had erupted early in September when Ataturk advanced to the Dardanelles and threatened a small British garrison in Chanak (Canakkale), a town of strategic significance on the Asian coast. During the nine months he spent there, as part of Britain's first inter-Service peacekeeping force of the 20th century, Tedder enhanced the reputation he had already earned with Sir Hugh Trenchard, 'Father of the Royal Air Force', and was thereafter, in the positive sense, a marked man by the father of all patronage.

I must make four points here:

- Firstly, Tedder exercised sensible, consistent discipline over officers and men based just outside a very large Eurasian city offering temptations only rarely found near Britain's RAF stations during the 1920s.
- Secondly, he showed a practical concern to improve appalling living conditions, *not* by writing stiff letters to some remote headquarters and *not* by moaning to some supposedly sympathetic journalist, but by galvanising every backside into action, including his own, to get drains laid, rubbish cleared, wooden huts built to replace tents, paths set out, flowering shrubs planted, reliable supplies of food, water and mail organised, with realistic training on the ground and in the air carried out regularly. Such activity may seem to be at the lower end of the spectrum when assessing masters of air power, but even the greatest cathedrals need solid foundations if they are to survive.
- Thirdly, having been personally selected by the CAS for this mission, Tedder made sure that he kept the great man informed of his actions by writing direct to his secretary. Modesty is all very well, but an ambitious officer

4 Vincent Orange, 'Tedder and the Air Ministry', in Peter W. Gray and Sebastian Cox (eds.), *Air Power Leadership: Theory and Practice*, Her Majesty's Stationery Office, London, 2002, pp. 228–29.

ought to find a means—subtle if possible, but blatant will do—of drawing the attention of top brass to his exceptional merits.

- And fourthly, throughout a sensitive period he avoided *embarrassing incidents*—a feat that always pleases the government (and senior officers) back home. Not only with Turks, Greeks or Russians, but also with senior British naval or army officers or with French allies. No easier to do then than it is today, except that Tedder was spared wall-to-wall journalists, long-range cameras and men texting home messages he would have preferred not to be sent.

Having spent several years as a Staff College teacher, thereby acquiring a mastery of pen and ink, Tedder became 'a man of nuts and bolts' during the 1930s, as Churchill described him in 1940. He did have nearly two years in command of Singapore—where he helped to devise and conduct realistic tri-Service exercises to counter a possible Japanese attack—before he was whisked back to the Air Ministry. Apart from that interlude, he was responsible for flying, armament and navigation training, and kept in touch with designers, manufacturers and government departments. Later, he was in charge of research and development.

Although experience in at least some of these areas is an essential part of air power mastery, it has often happened, in all Services in all centuries, that a senior commander is overwhelmed by *detail*—the performance of weapons, problems of supply and reinforcement, correspondence with those above and those below, agitation with fellow officers or awkward allies. Such an officer may be invaluable in a subordinate role, but unsuitable for operational command and unlikely to provide inspirational leadership in a war currently being lost—as was Britain's case at the end of 1940. At that time, Churchill had good reason to reject Tedder as deputy to Arthur Longmore, head of Middle East Air Command, with its headquarters in Cairo.

The job went to an officer of whom no one has ever heard, Owen Tudor Boyd. He was both unlucky and unwise. Unlucky because the aircraft carrying him to Cairo made a refuelling stop in the Italian island of Sicily instead of the British island of Malta. Unwise because Boyd allowed this silly error to be made. Tedder's friends pressed his case a second time and Churchill relented: he was, after all, only to be Longmore's *deputy* and could make himself useful in the office.

Who could know—including Tedder himself—that he would prove an immediate success, not only in command of airmen (that was to be expected) but also in his relations with soldiers, sailors, politicians of all sorts in Cairo and Whitehall, and American airmen? And that within six months Longmore would be gone and Tedder in charge? One can be wise after the event—as I was in my biography—but the bottom line is that men who served with Tedder from 1916 onwards were not surprised by his rise to the top.

He gradually assembled an outstanding team of men with uncommon ability themselves who were prepared to remain in his service for years. Above all was Peter

Drummond (his deputy, an Australian, and one of the RAF's unsung heroes). There was Grahame Dawson (in charge of repair and maintenance, 'a disloyal crook with a would-be dictator complex,' Tedder thought, but a man he could and did use). There was Coningham (his field commander), assisted by Thomas Elmhirst (responsible for administration and supply). There was Keith Park, who earned great fame in Malta as well as throughout the Battle of Britain. And there was Solly Zuckerman, Chief Scientific Officer: a biologist who transformed himself after 1939 into an expert on the effects of bombing, who helped Tedder to devise and implement the Transportation Plan that played such a vital role before and after D-Day. He became a very big wheel in Whitehall for the rest of his life.

In other words, a Master of Air Power usually knows how to get himself so well served in vital day-to-day matters that he has *time* and *space* in which to have a quiet think, plan ahead and by no means least talk to the troops. Neither Tedder nor Coningham—nor the wiser generals and admirals among the Western Allies—ever lost sight of the fact that very few of those under command were career airmen, soldiers or sailors. Many of them became superbly professional in attitude, but they remained at heart what they were when the call to arms came. In the words of Max Hastings: 'bank clerks, lorry drivers, stockbrokers, lawyers. They were merely performing a masquerade as soldiers or submariners or aircrew.'[5]

Tedder, therefore, frequently left his office to talk to all ranks and became (as an obituary noted) 'the most unstuffy of great commanders, who could be found sitting cross-legged, jacketless, pipe smouldering, answering questions on a desert airstrip'. Everyone agrees that he was unpompous. I believe he developed this natural characteristic into an effective symbol. Neither you nor I can visualise Tedder decking himself out like General George S. Patton Jr as Prince of Ruritania in shiny boots, pearl-handled pistols, tailored uniform, a blaze of medals, ribbons and other decorations, the lot topped by a battle-scarred helmet and with a cracking whip in his white-gloved hand.

Nor can we imagine Patton wandering casually and alone as Tedder often did into aircraft servicing areas, wearing an old raincoat without rank badges, nattering away with fitters and riggers (who did not recognise him) and then politely asking the way to headquarters. But there is no difference between Tedder impressing his men as a helluva fellow by appearing among them looking like a low-grade clerk who has just lost his job and Patton going to the opposite extreme. Both men knew what they were doing, believed it helped them in their commanding roles, and enjoyed showing off in their very different ways.

Success in the Desert War, achieved by November 1942, commended Tedder to General Dwight D. Eisenhower, newly-arrived in north-west Africa as Supreme Allied Commander, and to General Carl A. Spaatz, head of American air forces there. They soon formed a triumvirate which did much to balance increasingly tense relations with Montgomery, an exceptional but single-minded British field commander, who became

5 Max Hastings, *Weekly Telegraph*, London, 13–19 July 2005, p. 20.

increasingly reluctant to discuss hopes and fears with fellow commanders, preferring instead to declare his own intentions.

The D-Day campaign ended in Berlin, where Tedder enjoyed the magnificent privilege of signing, on behalf of all the Western Allies, the document ending the European War. He was then promoted to five-star rank, granted the Freedom of London, and headed the Royal Air Force for four years, when its responsibilities stretched from Germany to Hong Kong via the Middle East, and a Cold War began against the Soviet Union which would last for more than 40 years. He was elevated to the peerage, elected Chancellor of Cambridge University, President of Surrey County Cricket Club, and appointed Managing Director of a big British motor-car company, in the days when there was a big British motor-car industry.

With the help of friends, he composed an account of his deeds in World War II—entitled *With Prejudice* (published in 1966)—and lived just long enough to know that his book had attracted scholarly as well as popular attention throughout the English-speaking world. As a great American historian, Alfred Goldberg wrote, 'There is none of the self-justification, vainglory, and posturing that mar the works of many of his contemporaries.' Readers regret that he found neither time nor strength to cover his whole life.

Last word on Tedder, set down here with current events in mind. Sebastian Cox, head of the Air Historical Branch, Ministry of Defence, London, wrote in his preface to my biography: 'Tedder was in many ways the perfect coalition commander. He was not only acutely aware of the need for sensitivity in all matters when conducting coalition warfare, whether relations with the press or relations with other Allied commanders, but he was also adept at achieving his military objectives within such a framework. He did so in such a way as to ensure he got most of what he wanted without causing dissension, and frequently against the previously expressed preferences of those with whom he had to deal.'

Dr Vincent Orange

Dr Vincent Orange recently retired as Reader in History at the University of Canterbury, Christchurch, New Zealand, where he has taught medieval and 20th century European history since 1962. He is the author of numerous reviews, papers and articles on aviation issues and personalities, and has spoken at several conferences in Britain and the United States, as well as Australia. Six biographies of New Zealand and British airmen are among his major publications, including (of particular relevance to this conference) Sir Arthur Coningham (1990) and Lord Tedder (2004).

Dr Orange is also the author of a history of No 14 Squadron, RAF, called Winged Promises (1996). The Oxford Dictionary of National Biography, published last year, included 19 entries on airmen which he wrote, as well as 50 others which he vetted as Associate Editor for Aviation. His biography of Marshal of the RAF Sir John Slessor will be published by Grub Street of London in August 2006.

Section 3

Pacific Masters

Shigeo Nango: The Fellow who Sustained Japan's War in New Guinea

Mr Hiroyuki Shindo

Introduction

Among the Japanese air commanders who fought against Australian air forces during World War II, Captain Shigeo Nango of the Army Air Force stands out as one of the most notable. Nango earned his fame as the Executive Officer of the 59th Sentai[1] while it was based in Wewak, New Guinea during the second half of 1943 and into early 1944. During most of this time, Nango served as acting commander of the 59th, personally leading it, and often other fighter sentais as well, into battle, before he was killed in action on 23 January 1944. In the process, he became one of the dominating personalities in the Japanese Army in New Guinea, and came to be called 'The Fellow who Sustained Japan's War in New Guinea' by his comrades.

Nango was not an air power theoretician, strategist, or innovator of aerial tactics or formations, unlike many other outstanding practitioners of air operations. Rather, during his brief military career, which lasted not quite five years, Nango left his mark in Japanese military aviation history as a combat commander, personally leading the Japanese Army fighter units in central New Guinea as they fought a difficult defensive campaign under an increasingly worsening strategic outlook. Leadership by example, character and force of personality are always essential qualities for any military

1 Sentai is often translated as 'Air Regiment' or, in the case of a fighter unit, 'Fighter Regiment'. The paper strength of a sentai was three chutai (see Footnote 2 for an explanation of 'chutai').

commander at any level, and especially in a difficult defensive campaign. Nango proved to be such a combat leader, as shall be explained in the following essay.

Early Background

Shigeo Nango was born in Tokyo on 26 February 1917, as the scion of a socially and militarily distinguished family. His grandfather, Shigemitsu Nango, was a high official within the Navy Ministry in the 1870s and 1880s before briefly becoming an Upper House member of Japan's Parliament. Shigemitsu's eldest son, Jiro, was a navy officer, rising to rear admiral and commanding the cruisers *Kasuga* and *Katori* along the way.

Shigeo Nango's oldest brother, Mochifumi, was born in July 1906, and became a navy fighter pilot. Sent to fight in the skies over China in October 1937, Mochifumi fought with distinction until his untimely death on 18 July 1938 over Nanchang, when he collided with an enemy aircraft and crashed.

Like his brothers, Shigeo attended the Gakushuin Middle School, an elite, prestigious private education institution in prewar Japan, which included members of Japan's imperial family and other nobility among its alumni. In April 1935, Shigeo enrolled in the preparatory course of the Military Academy, progressed into its pilot's course (in what was called the Air Academy), and graduated in April 1939, at which time he was commissioned as a Second Lieutenant.

Nango's aptitude and fondness of flying, as well as his energetic and positive attitude, were traits which would serve him well later and were already in evidence during his Air Academy days. Yasuhiko Kuroe, who went on to become a renowned fighter pilot and combat leader himself with the famous 64th Sentai, and was one year Nango's senior at the Air Academy, recalled that Nango would often persuade him into participating in voluntary and impromptu but intense dogfighting practices in the morning, before classes began.

Upon graduating from the Air Academy, Second Lieutenant Nango entered the Army's Akeno Flight School. He completed this course in August 1939, and received his first assignment with a combat unit, the 33rd Sentai, which was then deployed along the border between Manchuria and the Soviet Union as one of the units taking part in the so-called Nomonhan Incident.

Nango did not get a chance to fly his Type 95 biplane fighter in combat at Nomonhan. The regiment commander, Lieutenant Colonel Takezo Aoki, was reluctant to throw his new, inexperienced pilot into battle prematurely, possibly because the ageing Type 95 fighter had been proven to be at a decided disadvantage in air-to-air combat against the Polikarpov I-16s flown by the Soviets.

In April 1940, Nango was promoted to First Lieutenant, and in November that year was sent to the Akeno Flight School again, this time into the half-year course designed to train prospective future chutai[2] commanders.

Upon completing his second stint as a student at Akeno, Nango found himself assigned as a cadet platoon leader at the Air Academy, instead of receiving a posting with a combat unit, as he had intensely desired. Nango was extremely disappointed and dissatisfied with this assignment. After all, he already had combat experience, and he had just polished his flying skills at Akeno, and naturally expected and indeed wished to be reassigned to a combat unit.

Nango did not make it back to the front lines until March 1942, when he was assigned to the 59th Sentai, which was taking part in operations against the Allies over Malaya and the Dutch East Indies. When Nango caught up with his unit, a colleague noted Nango's obvious relief and pleasure at having made it back to a combat unit and the front lines, where he felt more in his element.

In the Pacific War

With the 59th Fighter Regiment in the Dutch East Indies: January 1942 through June 1943

The 59th Sentai was one of the more prestigious and well-known fighter sentai in the Japanese Army Air Force. Established on 1 July 1938, the 59th had been in combat in China from September 1938 onwards, and had also been sent to Nomonhan in August 1939. The 59th was the first fighter sentai to receive the new Nakajima Type One 'Hayabusa' fighter, the Oscar, and was deployed to Indochina in early December 1941, in preparation for the imminent war with the Western Allies.

Nango was assigned to the 59th as commander of its 2nd Chutai in January 1942 and, for good measure, promoted to Captain in March, but was not able to catch up with his unit until March, when it was based at Bandon on Java Island. Unfortunately for Nango, the Dutch East Indies had just fallen to the Japanese, and major combat operations in that region had come to an end. Until July 1943, the new Captain therefore occupied his time primarily with flying air patrols over Japanese supply ships and training.

The most noteworthy event during this part of Nango's career was his participation in the Army's air raids on Darwin in June 1943. Early in 1943, reconnaissance and other intelligence indicated a build-up of Allied forces around the Darwin area in north-west Australia. The Army air forces in the area therefore decided to join the Navy's ongoing effort and to pre-emptively bomb Allied bases in the Darwin area, before they could seriously threaten the Japanese positions in the Dutch East Indies.

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2 Chutai is often translated as 'Air Company' or, in fighter units, 'Fighter Company'. The paper strength of a fighter chutai was twelve aircraft, whereas bomber, reconnaissance and attack chutai had a paper strength of nine aircraft.

On 12 June 1943, the 59th Sentai and other air units of the 7th Hiko-Shidan[3] received their orders to bomb Darwin. Nango flew in the first mission, which took place on 20 June, and returned with a headache, which he attributed to the lack of oxygen at high altitude. In addition, he came down the next day with a fever of 38.3°C, but was revived by a shot from the doctor, and led the Army's second air raid, a fighter sweep, on Darwin on 22 June. Unfortunately, the mission returned empty-handed, as Nango noted in his diary:

> June 22 (Tuesday)
>
> 0530, reveille. The fever has gone down considerably. At 0720, took off at the head of the flight … Arrived over Port Darwin but there were no enemy planes, no anti-aircraft fire. We hoped for something on the way home but there was nothing …

The 22 June raid turned out to be the Japanese Army's last on Darwin. On 19 June, even before the Army's first raid had taken place, higher headquarters had ordered the 7th Hiko-Shidan, including the 59th, to proceed to New Guinea, to bolster Japanese air forces in that region.

With the 59th to New Guinea: Overview of Japanese Army Air Force Operations in the South Pacific

Generally speaking, the Japanese Imperial General Headquarters and the Japanese Army considered Japan's war effort in the South Pacific to be the responsibility of the Navy. The Army had therefore not deployed any combat air forces to the South Pacific until December 1942, and then only in response to the Navy's appeal for assistance in countering the strategic situation, which had been steadily worsening after the American landings on Guadalcanal and the reverses along the Kokoda Trail in August 1942.

During the spring and early summer of 1943, with the loss of Guadalcanal and further setbacks in New Guinea, the Army decided its air forces in New Guinea needed to be strengthened, in part because studies showed that Allied air forces would otherwise attain a three-to-one numerical advantage over the Japanese by December 1943.

The discovery that the Allies were building new airfields in New Guinea in the vicinity of Mount Hagen and Bena Bena, much further up the Markham River Valley than had been imagined, gave the Japanese a greater sense of urgency. (The 'airfield' at Bena Bena was actually a deception by the Allies, to conceal the real airfield being built at Marilinan—also called Tsili Tsili—further to the east.) The Japanese determined that these new airfields would seriously threaten the Japanese positions at Wewak and

3 Hiko-Shidan is often translated as 'Air Division,' and consists of two or more Hikodan ('Air Brigade') and other attached units. Most Hikodan were made up of two to four sentai, plus various administrative and other attached units.

elsewhere along the north central coast of New Guinea, which were still not fully completed.

In order to counter this immediate threat, the Army activated a new command, the Fourth Air Army, effective 10 August 1943, not only to increase the effectiveness of its air operations over New Guinea, but also to place the combat air forces under a command which could also command bases and resources further to the rear, in the eastern East Indies and the Philippines. The Army hoped that this arrangement would give the Japanese air defences in New Guinea more depth and flexibility, and enable better and more efficient logistical efforts to be made, particularly with respect to unit rotation and aircraft maintenance and replacement. As part of this new arrangement, the 7th Hiko-Shidan, which included Nango's 59th Sentai, was transferred to 4th Air Army command.

The staffs of the 4th Air Army and its subordinate air units in the Rabaul and New Guinea area were well aware of the various difficulties faced by their efforts to strengthen their air force capabilities in the area, such as the lack of information about the geography of New Guinea and the relative lack of mechanisation that hampered their efforts to build and expand airstrips, and an early warning system that depended largely on visual observation, which posed problems in a mountainous, rainy area of limited visibility like New Guinea. Furthermore, what observation and intelligence units were sent to New Guinea were inadequate considering the vastness of the airspace that needed to be monitored.

The 4th Air Army and its subordinate headquarters realised that these problems left their air forces too concentrated on the few airfields available, and exposed to the dangers of a surprise attack. The Japanese could not, however, rectify this situation by building more airfields, reducing the number of air units deployed or shortening their front lines, and so had no choice but to proceed with their plans and hope that the worst would not occur.

Nango's Experience in New Guinea

The 59th Sentai began its move from Timor to New Guinea on 7 July 1943, and by 11 July had assembled on But East airfield, its assigned base in the Wewak area.

The 4th Air Army, and therefore the 59th Sentai's missions in New Guinea were the destruction of enemy air forces (offensive counter air, in modern parlance), patrol over merchant shipping arriving at Japanese bases in New Guinea, ground support of Japanese 18th Army units fighting in New Guinea, and the defence of Japanese air bases.

On 28 July, Nango was designated Executive Officer of the 59th. This was actually a promotion of sorts, although Nango initially thought he was being relieved as commander of the 2nd Chutai because he had damaged his aircraft the day before when landing. As events turned out, Nango found himself increasingly assuming the role of

acting commander of the 59th from around this time onwards, as the commander of the 59th, Major Takeo Fukuda, was often grounded due to various tropical illnesses.

Nango did not have to wait long for his first action in New Guinea. The discovery of the 'real' airfield at Marilinan on 11 August prompted the 4th Air Army to order an aerial attack, and on 15 August 1943, the 59th and other 7th Hiko-Shidan units began an effort to destroy the Allied air forces at Marilinan. Nango led the 59th Sentai's Oscars on this mission, during which he pressed home his attacks so closely that the oil from a damaged enemy aircraft splashed onto his own canopy, leading Nango to think that his own aircraft had been hit, as he recorded later in his diary:

> August 15 (Sunday)
>
> Took off at 0540. Altitude 3000 [metres] when we arrived at [Marilinan]. Below us were P-39s and P-40s, a total of 20-plus aircraft. 15 or 16 DC-3s on the ground. 15 or 16 [enemy] planes airborne. We were in perfect position for the attack, and had the advantage in altitude as we entered [the combat airspace]. The results were unexpectedly less than anticipated … [I] ruptured the lubricating oil system of a DC-3, thought that my own plane had malfunctioned, and almost decided to crash my plane. The light bombers suffered heavy losses.

One of Nango's fellow pilots on this mission, Shigeki Nanba, recalled that Nango was still pursuing enemy aircraft over Marilinan, and coming dangerously close to the strongest anti-aircraft defences of the area, even as the other Japanese aircraft were assembling for the flight home, and disengaged only when he approached and signalled frantically that Nango should not press home his attacks and his luck for too long.

Just as the Japanese 4th Air Army began its counter air operation against the 'threat' at Bena Bena, however, the American Fifth Air Force carried out a massive air raid on the Wewak area on 17 August 1943. This and further air raids, which were carried out on the following days, were part of a deliberate effort by the Fifth Air Force to destroy the Japanese air forces in the Wewak area, the build-up of which had been fairly accurately detected and followed by American intelligence. Some 200 Japanese aircraft were destroyed, and the 59th itself was left with only nine fighters. Even as he bemoaned the Japanese losses, Nango praised the enemy's daring and skill:

> August 17 (Tuesday)
>
> Yesterday, due to nighttime bombing, one plane went up in flames, 5 were severely or moderately damaged, and 6 were lightly damaged. The sentai has only 8 planes left which can fly missions. At 0800, was attacked by 3 North [sic] B-25s. 7 planes rose to intercept but we could not shoot down any. Not only that, but Umetani had to ditch at sea. Losses were 2 Type 100 Heavies and one Type 100 Reconnaissance which went up in flames. The enemy is proud; he has made a speculative and heroic attack … The other Wewak airfields were also attacked simultaneously, and our losses amount to approximately 40 aircraft. The enemy

> has gradually gotten smarter, and it is admirable. The sentai has no dead or wounded personnel …

Notwithstanding these heavy losses, which were gradually replaced, the 59th and other units of the 6th and 7th Hiko-Shidans continued their efforts to destroy the Allied air forces at Marilinan and elsewhere along the Markham River Valley through mid-September.

Even as the Japanese continued to wrestle with the Marilinan airfield, however, the Allies created an additional problem for them by successfully landing forces at Finschafen on 22 September 1943. The 6th and 7th Hiko-Shidans carried out air attacks on the beachhead and offshore supply ships over the next several days, but failed to push the Americans back.

The 4th Air Army concluded that the Japanese air forces had failed to thwart the Finschafen landings because they were simply too weak and depleted, and decided to rotate its sentais back to the rear to rest and refit. The 59th Sentai was among those sent back to the Philippines in early October for this purpose.

In Manila, Nango spent his time catching up on his reading, watching a few movies, and visiting his wounded comrades who were convalescing in local hospitals. The human side of Nango shows in an episode related by First Lieutenant Hiroshi Kawamura, who was the crew chief of Nango's aircraft. Nango sensed that the staff and other officers of the 59th would not be able to relax fully if they were billeted in the same lodgings, the Dai-toa Hotel, as their commanding officer, Major Fukuda. He thus suggested to Fukuda that the more luxurious Manila Hotel was a more appropriate hotel for a sentai commander, got him to move there, and then asked Lieutenant Kawamura to stay there as well, in order to keep the commander company!

On 1 November, the replenished 59th once again flew out to New Guinea. Along the way, Major Fukuda had to make a forced landing, cause unknown, and was declared missing in action. Nango became the 59th's temporary commander until late December, when Fukuda's replacement finally arrived. Thus began the part of Nango's career for which he has earned the most fame.

Once back in New Guinea, the 59th joined the other sentai in a renewed, all-out effort to destroy enemy aircraft at Marilinan, Nadzab and the other airfields in the Markham and Ramu River Valleys. All of the fighter sentai in New Guinea, including the 59th, were placed under 6th Hiko-Shidan command for this operation, which began with an attack against Nadzab on 6 November 1943. This operation continued until mid-December, during which the 59th also took part in ground support missions in the Finschafen area, shipping patrols and air defence over their own airbases.

These operations were not totally ineffective, but also quickly wore down the 59th and other sentais. For example, the 59th had 24 operational fighters as of 6 November, the first day of the Markham River Valley offensive, but by the 10th was down to just nine. Thereafter, through the month of November, the 59th occasionally received

replacement aircraft, and its operational strength fluctuated between eight and sixteen aircraft, or always less than half its 'paper' strength.

Despite the desperate defensive efforts made by the Japanese, the Allies continued their leapfrogging advance, successfully landing forces on 15 December at Cape Merkus (Arawe) on New Britain, and at Cape Gloucester on 26 December. Even as the Markham River Valley operation continued, the 59th and other 4th Air Army units were thrown against these additional beachheads, which further overextended the weakening Japanese air forces.

Nango personally led the 59th in nearly all of its missions during this time, maintaining its fighting morale through his strength of personality and leadership by example even as the tactical situation for Japan increasingly soured. In the process, Nango also often acted as the overall tactical commander when other sentai flew joint missions with the 59th. Even as he was making his mark as an outstanding air commander, however, Nango was forced to note, somewhat sadly, that the Japanese were relying on a fighter that had become an aircraft of the past:

> December 15 (Wednesday)
>
> The enemy has landed on Cape Merkus on New Britain island … The chutais assembled at 1400, and proceeded with the direct escort of 5 planes from the 9th Bomber Sentai … Four P-38s came, I attacked two of them, but the two employed their capabilities sufficiently and gave me a very bad time. It is no longer the age of the Oscar …

In fact, higher commanders were aware that the Oscar, while still useful because of its great range and relative serviceability, had become technically inferior compared to the newer generation of Allied fighters, such as the P-38 and P-47, and was too lightly armed to intercept the B-24 and other Allied bombers effectively. In early October, the 4th Air Army had requested deployments of the Nakajima Type 2 'Tojo' fighter, which had a greater maximum speed, heavier armament and was therefore deemed to be superior to the Oscar. Nothing came of this request, however, in part because the Tojo, which had a shorter range and required longer runways for take-off than the Oscar, was believed to be less suitable for the airfields and environment of the South Pacific, and the Oscar soldiered on as the mainstay of Japanese Army fighter units in New Guinea.

When flown by a skilled pilot such as Nango, however, the 'outdated' Oscar could still be a dangerous opponent for the Allies, as Nango noted in his diary:

> December 18 (Saturday)
>
> 0615, took off from But. Landed at Wewak before departing at 0800. At 0955, over Cape Merkus 20 P-38s attacked from approximately 1000 meters [sic] above us. We skillfully [sic] evaded, then engaged them, and then made them flee completely, and were unable to see any more aircraft in the combat airspace. We leisurely assembled over the combat area and then headed home. A complete victory. I feel like I am now starting to understand the give and take of combat.

> The shooting down of two P-38s (of which one is unconfirmed) is not a major accomplishment, but making the enemy flee so completely after a combat in which I was in a disadvantageous position can be called a major achievement …

During these difficult times, Nango maintained an air of determination and relative optimism, and on occasion evidently even wished for action:

> January 7 (Friday)
>
> No intelligence, because of the bad weather … Training in the afternoon. Recently we have not had the thrill of combat, and training leaves us somewhat unfulfilled. Still it is better than having nothing to do.

Earlier, in late December, the new commander of the 59th, Major Takeo Sato, finally arrived at But and relieved Nango of his temporary command. Major Sato recalled later that Nango seemed to be extremely and sincerely relieved and reassured now that the real commander had arrived, and Sato quickly came to appreciate the heavy burden and responsibility Nango had been bearing for the past few months.

To his comrades, Nango thus still appeared as a brave, energetic, sincere and indestructible leader, but he was certainly aware that Japan's position in New Guinea was steadily worsening, and this may have led him to have a premonition of his own death. In January 1944, he had quietly confided to his crew chief Kawamura, 'I'm not going to be able to make it home.'

On 23 January 1944, the Wewak area came under yet another attack by approximately 70 Allied fighters and bombers. Nango led all of the available Japanese fighters in the area as they attempted to intercept the incoming force. There are two versions of what transpired thereafter. According to Major Sato, Nango and the others were guided by radio to a point approximately 50 kilometres east of Kairiru Island, to the north of Wewak, where they intercepted the Allied formation. Nango's element made a head-on pass at the Allies, and became separated from the rest of the 59th Sentai and other units as the Allied formation passed to his rear. The intercepting force found themselves in another intense aerial battle, and lost sight of Nango. Despite a search and rescue effort personally led by Major Sato, Nango was never seen again. Sato estimated that Nango had gone down in an area about 30 kilometres east of Kairiru Island, about 30 kilometres offshore to the north of Wewak.

According to an account written by a Shigehiro Nango on 30 March 1944, however, the intercepting force, a mix of Oscars and other fighters first fought over Wewak with a force of approximately 40 P-38s and 12 P-47s. As the aerial battle drifted to the south, approximately 50 B-24s thundered in over Wewak. Upon seeing these B-24s, the Oscars disengaged from the Allied fighters and raced back to the airspace over Wewak, because the Oscars' mission that day was bomber intercept. Nango, however, either did not or could not disengage, and continued chasing the P-38s approximately 60 kilometres to the *south* of Wewak, from where he did not return.

In either account, Nango's end was not witnessed by anyone. According to Japan's official war history, the Japanese intercepting force reported 18 aircraft shot down, including six unconfirmed kills, and the Japanese lost seven aircraft, one of which was Nango's.

Higher commands had recognised that Nango would be an invaluable instructor, and he was slated to be assigned to Akeno as a flight instructor in early 1944. Unfortunately, he did not live to receive that reassignment.

Nango was unofficially credited with having shot down approximately 15 enemy aircraft. On 29 April 1944, two months after his untimely death over New Guinea, Nango was posthumously promoted to Lieutenant Colonel, and received a Personal Commendation in the name of the 4th Air Army commander, in which Nango was commended for commanding 'the airborne units in every battle, leading from the front, with fierce fighting spirit, and acting positively and boldly, and [overcoming] superior forces well with forces which were always inferior', and which emphasised that 'his outstanding leadership, his incomparable fighting spirit and his excellent combat skills can truly be considered a model for the commander of an Imperial Army fighter unit; his military achievements were extremely great, and his military exploits unrivalled'.

Aftermath

The 59th Sentai did not outlast Nango in New Guinea for long. At the time of Nango's death in action, it had already been designated for rotation back to the rear. On 19 February 1944, the remaining dozen or so pilots of the 59th boarded two heavy bombers at Hollandia and departed for Menado, the first stop on their way back to Japan, where they arrived on 26 February. The 59th was thereafter based in the Kyushu area, reconstituted around its survivors, and took part in the air defence over Kyushu and the Okinawa campaign until the end of the war in August 1945.

The 59th received a unit commendation dated 29 April 1944, in which it was credited with destroying 90 Allied aircraft during the approximately six months it had fought in New Guinea.

The Japanese Army's air war in central New Guinea in turn did not outlast the departure of the 59th for long. In late March through early April, the remaining Japanese air units, which by then were concentrated in the Hollandia area, were devastated by a series of Allied air attacks, and what aircraft remained were destroyed during the attacks by American aircraft which preceded the American landings at Hollandia on 21 April. The approximately 7300 pilots and ground crew in the area were ordered to evacuate by making an overland march to Sarmi, several hundred miles west through the untracked jungle. By the time the bulk of the survivors reached Sarmi at the end of May, about half had been lost to disease and starvation, and the survivors were too exhausted and weakened to be of any further combat value. The 6th Hiko-Shidan and its remaining fighter sentai (the 63rd, 68th, 77th, 78th and 248th) were disbanded, never to be reconstituted again.

Conclusion

As mentioned earlier, Nango left his mark in Japanese military aviation history as a front-line commander, leading by example and by force of personality. These are important traits for military leaders of any rank and in any situation, and are especially vital for a combat leader in Nango's position, fighting in an increasingly deteriorating strategic situation, with outdated equipment, steadily becoming outnumbered and facing an increasingly skilled adversary. The responsibility, if any, for failing to devise a better strategy, or to provide the resources which would enable more effective operations, must lie with higher headquarters. In the absence of such a strategy or resources, Nango could only fight and lead with what he had and to the best of his ability, and this he evidently did very well in the skies over New Guinea.

Nango's surviving colleagues have nothing but praise for him as a leader and a person. Major Sato, his last commanding officer, wrote the following comments to Nango's father after Shigeo's death, which reveal Nango's character and the difficult situation in which he had to act as commander:

> I arrived in New Guinea at the end of last year. At the time, Shigeo had been fighting courageously and determinedly for several months, and had been lauded as 'Nango, The Great Man of Wisdom' and 'The Flower of New Guinea'. Some said to me with envy, 'You are really fortunate to have a man like Nango as your executive officer.' When I first arrived over But and saw the utter devastation, I could not help but weep, thinking about Nango who had been holding out for so long in such a situation, and being thankful from my heart for his asura-like[4] fighting spirit.

The following comments by Yasuhiko Kuroe, who was mentioned in the beginning of this essay and who himself was apparently no poor judge of others, describe Nango's character very well, and perhaps best show why he was such an effective and revered combat commander.

> [Nango was] a great guy that you would absolutely be captivated by, for whom the description 'a fine fellow, with a [straight, forthright and clean] personality like a split bamboo' seemingly was made for … Captain Nango was tall, did not fit any mold [sic], and was dashing, and always exuded an aura of manly toughness. Even more than his older brother, Lieutenant Commander [Mochifumi] Nango, was considered to be the Great Man of the Naval fighter corps, [Shigeo] was a symbol among Army fighter pilots. [He had a] cheerful and undesiring personality, he was extremely brave and unpretentious. Rare is a person who was so popular and loved by his superiors, subordinates and colleagues.

4 An 'asura' is a fierce and powerful being in Hindu mythology.

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General Kenney and Air Vice-Marshal Bostock

Squadron Leader Alex Post

Introduction

General Kenney and Air Vice-Marshal Bostock both served during World War II in the South-West Pacific Area (SWPA) under the leadership of General Douglas MacArthur. Kenney was appointed as MacArthur's senior air commander and exercised control of all the air units placed under MacArthur's command by the American, Australian, British, Dutch and New Zealand Governments. Bostock served under Kenney as the Air Officer Commanding (AOC) RAAF Command, which contained the bulk of the Australian operational squadrons in the theatre and, at various times, also included units of the other national air forces.

Concerning these two air commanders, MacArthur had only the highest praise for their conduct of the SWPA air campaign against the Japanese. Of Kenney, MacArthur said:

> Of all the commanders of our major Air Forces engaged in World War II, none surpassed General Kenney in those three great essentials of successful combat leadership: aggressive vision, mastery over air strategy and tactics, and the ability to exact the maximum in fighting qualities from both men and equipment.[1]

1 Douglas MacArthur, quoted by Herman S. Wolk, 'George C. Kenney: MacArthur's Premier Airman', in William M. Leary (ed.), *We Shall Return: MacArthur's Commanders and the Defeat of Japan 1942–1945*, The University Press of Kentucky, Lexington, Kentucky, 1988, p. 113.

Regarding Bostock, MacArthur wrote in a letter to him in February 1946:

> Your service under my command during the long years of the Pacific war was superior in every respect and marked you as one of the world's most successful airmen. I am sure this is universally recognized.
>
> In order to bring this matter officially to the full attention of the Australian Government I am recommending you for one of the United States' highest decorations. It occurred to me that this would be the best way to emphasize my complete professional evaluation of your service.[2]

While those who have studied military air operations generally accept the designation of Kenney as a master of air power, the premise that Bostock was of the same calibre is not as well recognised. Examining the history of these two men's years of preparation and war service gives us some indication of what is required to be classed as a master of air power.

General George Churchill Kenney

George Churchill Kenney was born on 6 August 1889. He attended Massachusetts Institute of Technology (MIT) and worked as an engineer.[3] While still studying Kenney built his own aircraft during 1911 and thus began his flying career.[4] With America's entry into World War I Kenney was attracted to Army's Air Corps and enlisted in it during 1917.

Training and Leadership

After completing some initial training in America, Kenney was sent to France with 17.5 hours flying time to his credit. In February 1918, halfway through his course of training in France, Kenney and 18 others of his group were formed into the 91st Squadron and were sent into combat operations on the Western Front. With no training in air-to-air gunnery, aerobatics or formation flying the pilots of the 91st had to learn on-the-job. The importance of effective training and leadership was impressed on Kenney by his own experience and by the losses suffered in newly raised American squadrons when they were placed under the command of officers fresh from the US and lacking in combat experience. By the end of the war Kenney had risen to command the 91st, had shot down two enemy aircraft, been shot down himself, flown 75 missions and had been decorated with the American DSC and Silver Star.[5]

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2 Australian War Memorial, PR 84/127, File 419/36/30, Folder 16, Item 10 of 11, Letter from MacArthur to Bostock, dated 15 February 1946.

3 Wolk, 'George C. Kenney: MacArthur's Premier Airman', p. 89.

4 DeWitt S. Copp, *A Few Great Captains: The Men and Events That Shaped the Development of US Air Power*, EPM Publications, MacLean, Virginia, 1980, pp. 279–80.

5 ibid.; Wolk, 'George C. Kenney: MacArthur's Premier Airman', p. 89.

Technology

Deciding to make military aviation his career, Kenney remained in the Army and was promoted to Captain, a rank he would hold for the next 17 years. He returned to America in 1919 as a staunch advocate of the move to establish an independent air force and a supporter of Billy Mitchell. After postings to the Mexican border and the artillery Kenney enhanced his MIT qualifications by attending the Air Service Engineering School where he studied aeronautical engineering, graduating in 1921. Kenney then took up the position of air service representative and test pilot at the Curtiss aircraft factory. In 1923 he was posted to the inspection and contracts section of the production-engineering department of the Air Service Engineering Division where he was involved with the production scheduling and quality control of aircraft being built for the air service. He also involved himself in aircraft design issues, such as mounting guns in the wings of fighters.[6]

Air Power Theory

Kenney also attended the general officer training courses at the Air Corps Tactical School (ACTS), the Command and General Staff School and the War College. He returned to ACTS in 1928 as an instructor and was also responsible for obtaining and translating into English a French version of Douhet's work, *The Command of the Air*. As an instructor Kenney taught doctrine and tactics and actively promoted his ideas and views about 'attack aviation'. In this Kenney was mainly concerned with the employment of aviation to gain control of the air and then attack the fielded forces and lines of communication of an enemy while also supporting friendly ground forces. Kenney wrote the textbooks for the Attack and Observation Courses taught at ACTS and based his tactics on his own experiences and on actual exercises carried out with the classes he instructed. During this period Kenney developed many of the techniques and some of the weapons that he later employed in the SWPA. After Kenney's departure from ACTS, attack aviation fell into decline and 'bombardment aviation' came to prominence with the concept of long-range, high-speed, unescorted, precision, daylight bomber operations that were believed to be most difficult, if not impossible, for an enemy to stop.[7]

Organisation

After ACTS Kenney was posted to the Plans Division of the Chief of the Air Corps from 1933 to 1935 where he was heavily involved in the drafting of a bill on air autonomy. From the Plans Division Kenney was appointed to the newly formed General

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6 Copp, *A Few Great Captains: The Men and Events That Shaped the Development of US Air Power*, p. 281; Wolk, 'George C. Kenney: MacArthur's Premier Airman', pp. 281–82.

7 Thomas H. Green, *The Development of Air Doctrine in the Army Air Arm 1917–1941*, Office of Air Force History, Washington DC, 1985, pp. 51, 53 and 66–67; Copp, *A Few Great Captains: The Men and Events That Shaped the Development of US Air Power*, pp. 282–83; Wolk, 'George C. Kenney: MacArthur's Premier Airman', pp. 90–91.

Headquarters (GHQ) Air Force as the Chief of Operations and Training. GHQ Air Force was created by the Chief of Staff of the Army, General Douglas MacArthur, as an operational headquarters that would have responsibility for the conduct of operations while the Air Corps retained responsibility for administration of the whole air arm. The commanders of both GHQ Air Force and the Air Corps were of the same rank. In the six years of the GHQ Air Force's existence, three different commanders of the Air Corps and two different commanders of GHQ Air Force could not get the arrangement to work effectively and continual disputes were had 'over personnel, equipment and funds.'[8] The American experience strongly suggests that any two commanders placed in a similar situation would be likely to come into conflict with each other over the interests of their respective formations. The whole set-up foreshadowed the RAAF Command and RAAF Headquarters debacle that affected the RAAF's operations in World War II and tends to refute the suggestion that the RAAF arrangement could have worked with different personalities.

At GHQ Air Force Kenney gained valuable experience in developing the new formation and making it work. He was heavily involved in developing the tables of organisation for the units and formations in the command and also in the training and exercise programs that were implemented within GHQ Air Force. He was a strong advocate of the operational organisation and came into conflict with the Air Corps over the equipment needs of GHQ Air Force. As a result of Kenney's strong advocacy of the cause of GHQ Air Force, the Air Corps posted him to the Infantry School of the Army, a posting that he hated.[9]

Technology again

Kenney was rescued from the Infantry School when General Arnold was appointed Chief of the Air Corps in 1938. Arnold knew Kenney well and made him the Chief of the Engineering and Production Section of the Air Corps Materiel Division. Kenney believed that from this point onward Arnold employed him as a troubleshooter to fix any problem that occurred. While in this position Arnold sent Kenney to Europe to observe what lessons could be learnt from the fighting taking place there. With the experience gained from this brief tour Kenney returned to the US full of ideas about aircraft modifications that included power gun-turrets, bulletproof glass, and demand oxygen systems.[10] Kenney continued to supervise the modification of aircraft until the Japanese attack in December 1941. He was then sent by Arnold to take command of

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8 R. Earl McClendon, *Autonomy of the Air Arm*, US Government Printing Office, Washington DC, 1996, p. 80.

9 Copp, A Few Great Captains: *The Men and Events That Shaped the Development of US Air Power*, pp. 270, 279–82, 353–54 and 478–79; Wolk, 'George C. Kenney: MacArthur's Premier Airman', p. 91; Thomas E. Griffith Jr, *MacArthur's Airman: General George C. Kenney and the War in the Southwest Pacific*, University of Kansas Press, Lawrence, 1998, pp. 35–40 and 43.

10 Wolk, 'George C. Kenney: MacArthur's Premier Airman', pp. 91–92; Green, *The Development of Air Doctrine in the Army Air Arm 1917–1941*, pp. 108–09.

the Fourth Air Force in San Francisco that had responsibility for the air defence of the West Coast and for training units for overseas deployment. It was from this position that Kenney was appointed on 12 July 1942 to be General Brett's replacement as MacArthur's air commander in the SWPA.

Politics, Command, Leadership and Organisation

On arrival in the SWPA Kenney found a number of matters that required his immediate attention. He first had to establish a working relationship with MacArthur who had lost all confidence in the air forces under Brett's command. After a frank exchange of views and an assurance of his loyalty to MacArthur, Kenney secured a better working relationship with MacArthur than Brett had been able to achieve. Next Kenney had to deal with MacArthur's Chief of Staff, General Sutherland, who had been dictating to Brett what air missions were to be carried out, how they were to be executed and what bombloads were required. Kenney placed a piece of paper in front of Sutherland and placed a pinpoint pencil mark in the centre. He explained to Sutherland that the dot was what Sutherland knew about air operations while the rest of the sheet of paper was what Kenney knew about them. When Sutherland began to object Kenney insisted that they immediately see MacArthur to settle the matter. Sutherland backed down and Kenney's control of the air forces was never again questioned.[11]

Kenney then sent home a number of senior officers who he variously described as 'deadwood' or 'not operators', and for whom he had no use.[12] These officers included Generals Perrin, Royce, Scanlon, Sneed and Lincoln, and about 40 Colonels and Lieutenant Colonels.[13] Good operators that he discovered in the SWPA were promoted to senior positions even when their rank was junior to their new responsibilities. Among these good operators were the Americans Whitehead and Wurtsmith, and the Australian Bostock who Kenney strongly believed 'wasn't a staff officer; he was a commander and he belonged in the field with the fighting forces'.[14]

The change in personnel also heralded a change in the organisation of the Allied air forces. Kenney separated the American and Australian units into two separate commands; the Australian RAAF Command and the American Fifth Air Force. Bostock commanded RAAF Command and Whitehead commanded the advanced headquarters of the Fifth Air Force in Port Moresby. The administration, supply and maintenance of the Fifth Air Force also changed to comply with Kenney's total focus on operations against the Japanese.

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11 Herman S. Wolk, 'The Genius of George Kenney', *Air Force Magazine: Journal of the Air Force Association*, Air Force Association, April 2002, Vol. 85, No. 04, Arlington VA, p. 69; George C. Kenney, *General Kenney Reports*, USAF Warrior Studies, Office of Air Force History, Washington DC, 1987, pp. 52–53.

12 Kenney, *General Kenney Reports*, pp. 44 and 90.

13 Wolk, 'George C. Kenney: MacArthur's Premier Airman', p. 93.

14 RAAF Historical Records, 'Oral Reminiscences of General George C. Kenney', Interview with General Kenney, New York, 16 July 1971, Microfilm Roll 1234, Document 1028948, pp. 14–15.

Another personnel problem confronting Kenney was the insufficient level of training received by the aircrew before they were sent to the SWPA, which left them unready for their operational roles when they arrived in theatre, which was reminiscent of his own experience in World War I.[15] Kenney organised operational training units (OTUs) within the SWPA to provide the required instruction and experience, including live operations against Japanese targets in areas that were not strongly defended.[16]

Operations

In the SWPA Kenney had to make do with limited resources because of the 'Europe First' policy that had been adopted by the Allied nations. In his employment of his scarce air power assets Kenney had to be flexible, innovative and adaptable. At times he had his heavy bombers bomb from low level for increased accuracy, operate at night for increased survivability, and attack ships with skip-bombing tactics that proved more effective against shipping than high-level bombing. But perhaps his greatest contribution was his development of a winning strategy that was employed against the Japanese.

Within months of arriving in the SWPA Kenney developed an appreciation of the nature of the theatre and formulated a strategy for fighting the Japanese that he outlined in a letter to Arnold in 1942.[17] Kenney's relationship with MacArthur grew to the point where his influence was more than just that of air commander and as a consequence he was able to 'sell' his strategy for fighting the Japanese to MacArthur. The scheme of manoeuvre that underpinned the whole SWPA campaign was outlined by MacArthur in planning documents in early 1943:

> The general scheme of maneuver [sic] is to … employ air forces … to soften up and to gain air superiority over the initial attack objectives; neutralize with appropriate aviation [the] supporting hostile air bases and destroy hostile naval forces and shipping within range; move land forces forward covered by air and naval forces to obtain first objectives (existing and potential air bases) and consolidate same; displace aviation forward onto captured airdromes.
>
> This process is repeated to successive objectives, neutralizing by air action, or by air, land and sea action, intermediate hostile installations which are not objectives of immediate attack.

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15 Wesley Frank Craven and James Lea Cate, *The Army Air Forces In World War II, Volume Six – Men and Planes, Office of Air Force History*, Washington, 1983, pp. 570–71, 580 and 612; Douglas Gillison, *Royal Australian Air Force 1939–1942*, Australian War Memorial, Canberra, 1962, pp. 656–57.

16 Harry Rayner, *Scherger: A Biography of Air Chief Marshal Sir Frederick Scherger*, Australian War Memorial, Canberra, 1984, p. 71.

17 Letter, Kenney to Arnold, 24 October 1942, quoted in Wesley Frank Craven and James Lea Cate, *The Army Air Forces in World War II, Volume Four – The Pacific: Guadalcanal to Saipan August 1942 to July 1944*, The University of Chicago Press, Chicago, 1964, p. 119.

> The entire movement will be covered by air attack on Japanese air and sea bases … with the objective of interrupting and denying sea supply and/or support or reinforcement of objectives under attack.[18]

The part played by air power in this approach is obviously critical and Allied success depended heavily upon its skilful application.

To this basic formula Kenney at times added other air power capabilities to outmanoeuvre the Japanese. The movement of an entire regiment of American infantry to support the defence of Papua was a revelation of air power's capabilities to MacArthur and his staff.[19] The movement of an Australian battalion to Wanigela and the rapid construction of an airfield there caught the Japanese off guard and provided the Allies with an airbase that threatened the Japanese lines of communication between Papua and Rabaul.[20] The covert construction of an airfield at Tsili Tsili (Marilinan to Kenney) and the employment of parachute troops at Nadzab greatly facilitated the capture of the Lae and Finschafen areas, and the Tsili Tsili base was used in the wholesale destruction of Japanese aircraft (approximately 175 destroyed) at Wewak in August 1943.

Kenney's brilliant execution of this process is demonstrated in each of the SWPA's operations. For example, the initial, Papuan, campaign included attacks against the primary Japanese air bases at Buna, Lae, and Salamaua. Buna was attacked so heavily and consistently that Japanese air units were never permanently based there. Lae and Salamaua became graveyards for the Japanese aircraft operating from them. The resupply of the Japanese forces in Papua essentially ended when Kenney concentrated his air power forces in the decisive Battle of the Bismarck Sea, where all eight transports and four of the eight escorting destroyers of the convoy were destroyed. With the skies over Papua dominated by the Allied air forces and the lines of communication to Rabaul severed, the Allied land and sea forces were able to mount a series of successful amphibious operations along the northern New Guinea coast and drive on to the Philippines. The list of operations is impressive and indicates that these were not minor undertakings:

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18 GHQ SWPA, Elkton III Plan, 26 April 1943, in Louis Morton, *Strategy and Command: The First Two Years*, Office of the Chief of Military History, Washington, 1962, p. 677.

19 Kenney, *General Kenney Reports*, pp. 97–111.

20 ibid., pp. 111 and 118.

Lae/Nadzab	04 Sep 1943	2 Aus div and 1 US para reg
Finschafen	22 Sep 1943	1 Aus div
New Britain	26 Dec 1943	2 US div
Saidor	02 Jan 1944	1 US RCT[21] and 1 Aus div
Admiralty Islands	29 Feb 1944	1 US div
Aitape and Hollandia	22 Apr 1944	2 US div and 2 US reg
Wakde	17 May 1944	1 US RCT
Biak	27 May 1944	1 US div
Noemfoor	02 Jul 1944	1 US RCT
Sansapor	30 Jul 1944	1 US div
Morotai	15 Sep 1944	1 US div
Philippines	20 Oct 1944	1 US army (200,000 men)

After the war Kenney went on to become the first commander of the USAF's Strategic Air Command (SAC) where his organisational skills and operational experience were employed in creating, training and operating the strategic bomber force. While at SAC, however, other requirements often took Kenney away from the running of his command and as a consequence SAC failed a readiness inspection during 1948, resulting in Kenney's replacement. Kenney's final posting was as Commander of the USAF Air University. Kenney retired from the USAF in August 1951 and died on 9 August 1977.[22]

Air Vice-Marshal William Dowling Bostock

William Dowling Bostock was born in Sydney on 5 February 1892. In June 1911 he went to sea as a wireless operator. On 23 November 1914 he enlisted in the Australian Imperial Force (AIF) and was posted as the 2nd Signal Troop, landing with them at Gallipoli on 25 April 1915. He was evacuated in August with dysentery. He then served with the Australian Mounted Division until he transferred to the Royal Flying Corps (RFC) in February 1917, thereby achieving the distinction of having been a sailor, soldier and airman. Bostock was posted to No 48 Squadron RFC on the Western Front in August 1917. Bostock received the Belgium Croix de Guerre in 1918 for his service on the Western Front.[23]

After the war Bostock returned to Australia and joined the newly formed Royal Australian Air Force (RAAF) in September 1921. He was posted to No 1 Flying Training School at Point Cook, assuming command of the unit in 1924. He attended the RAF Staff College in 1926–1928, where he was involved in studying and analysing the theory and practice of air power. Bostock also demonstrated a distinct Australian attitude to overbearing authority when he was criticised in a letter from the college's commandant

21 RCT – Regimental Combat Team.

22 Wolk, 'The Genius of George Kenney', p. 71.

23 John Ritchie (General Editor), *Australian Dictionary of Biography: Volume 13 1940–1980*, A–De, Melbourne University Press, Melbourne, 1993, p. 224.

for doing his own gardening and sending his daughters to the wrong school. Bostock returned the letter with the annotation, 'Noted and ignored.'[24]

Bostock returned to the command of No 1 Flying Training School until he was appointed to the position of Director of Training in RAAF Headquarters on 2 December 1929. On 24 November 1931 he became the Commanding Officer of No 3 Squadron at Richmond, NSW, and combined these duties with that of base commander from 20 March 1933 until 19 April 1936, being promoted to Wing Commander on 1 July 1934. While base commander Bostock earned a reputation of caring for the welfare of the men and families stationed on his base.[25] From July 1936 until July 1938, Bostock served on the staff of No 1 (Light Bomber) Group RAF in England. His performance there was of the greatest assistance to the group and the group commander commended him for sound judgement, above average professional knowledge and his thorough approach to his duties.[26] Bostock returned to Australia and took up the position of Director of Intelligence on 27 August 1938, being promoted to Group Captain on 1 September. It was at this time that Bostock was considered by his contemporaries as one of the best thinkers in the Air Force.[27] A year later on 1 September 1939 Bostock became Deputy Chief of the Air Staff (DCAS) and was promoted to Air Commodore on 1 June 1940.[28]

As DCAS, Bostock worked with three Chiefs; the Australians Goble and Andersen, and the Englishman Burnett. In this position he was involved in all the RAAF's activities, operational and administrative. He was sent overseas to England for two months in 1939 and to the Far East and Middle East for three months in 1941. In these visits he dealt with matters concerning preparedness, personnel, equipment, the Empire Air Training Scheme, operations, organisation, air-ground cooperation and administration.[29]

With the Japanese entry into World War II and the arrival in Australia of American forces, a new combined headquarters was created, the Allied Air Forces (AAF), to control the operations of all air forces in Australia. Bostock was appointed by the Prime Minister to become the Chief of Staff to the AAF commander, General Brett in April 1942. After Brett's replacement and Kenney's reorganisation in September, Bostock became the AOC RAAF Command and exercised operational command of the bulk of the RAAF's units. At the same time Air Vice-Marshal Jones was appointed as Chief of the Air Staff (CAS) with responsibility for administration. This division of the RAAF into separate administrative and operational organisations, both commanded by

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24 C.D. Coulthard-Clark, *The Third Brother: The Royal Australian Air Force 1921–39*, Allen & Unwin, Sydney, 1991, p. 90.

25 ibid., pp. 137–38.

26 Alan Stephens, 'RAAF Operational Commanders', in Alan Stephens (ed.), *The RAAF in the Southwest Pacific Area 1942–1945, The Proceedings of the 1993 RAAF History Conference*, Air Power Studies Centre, Canberra, 1993, p. 43.

27 National Archives of Australia, CRS A705, item 4/4/120.

28 RAAF Historical Records, Star Rank Files – W.D. Bostock, Career Brief.

29 RAAF Historical Records, Bostock File, Reports from Air Vice-Marshal Bostock to CAS October–December 1941.

officers of equal rank was detrimental to the RAAF's operations, as the Americans had previously discovered with their GHQ Air Force experiment.

Politics

The dispute that arose between Bostock and Jones does neither credit, and hindered the RAAF in its acquisition of modern equipment and in its involvement, at times, in major operational activity. In Bostock's defence it must be said that he only ever sought that amount of administrative authority required to support the conduct of his operations, a principle firmly accepted by military forces today.[30] Jones on the other hand, actively and aggressively sought to bring RAAF Command under his own control and openly undermined Bostock's authority in his attempts to do so.

In this dispute MacArthur and Kenney supported Bostock while the Australian Minister for Air, Arthur Drakeford, supported Jones. This alignment of interest provides a perspective on Bostock's political performance that is not always considered. Had he subordinated his will to that of Jones in the interests of harmony within the RAAF it is questionable that the RAAF would have been treated any better by the Americans than it was. Jones was not well respected by Kenney in particular. Kenney twice threatened to use his influence with MacArthur to have Jones removed. Indeed, if Jones had been an American Kenney would almost certainly have sent him home as 'non-operator deadwood'.[31] Jones also comments in his autobiography that on one occasion Kenney become so angry with him that Jones was convinced he was about to be physically attacked.

If Jones had obtained control over the RAAF's operations it is likely that the RAAF would have been reduced to a static garrison force in late 1943. At that time Jones unilaterally removed the RAAF commander of No 9 Operational Group—the RAAF unit assigned to the control of the American Fifth Air Force—who held the confidence

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30 Jones placed severe limitations on Bostock's administrative authority; for example, he was denied disciplinary powers over his own headquarters staff and also denied the authority to confer acting rank upon them (RAAF Historical Records, Bostock File, Notes on a Conference Between Minister For Air, Chief of the Air Staff and AOC RAAF Command, Concerning RAAF Organisation, 8 February 1944). Further, the administration of Bostock's Headquarters unit was vested in a staff officer with responsibilities directly to the Air Board (RAAF Historical Records, Bostock File, Letter Bostock to Drakeford, 19 March 1946). But perhaps the most severe restriction Jones sought to impose on Bostock was his instruction to all RAAF operational formations that communications relating to supply, maintenance, personnel, works and organisation were not to be addressed to RAAF Command. Such communications could be repeated to RAAF Command only when they related to important administrative matters having immediate effect on operations (RAAF Historical Records, Bostock File, Signal NR 3727 dated 16 March 1943, CAS to all Areas and 9 OG).

31 Alan Stephens, *The Australian Centenary History of Defence, Volume II, The Royal Australian Air Force*, Oxford University Press, South Melbourne, 2001, p. 122; David Horner, *High Command: Australia's Struggle for an Independent War Strategy 1939–45*, Allen & Unwin, St Leonards, 1992, p. 358; Alan Stephens, *Power Plus Attitude: Ideas Strategy and Doctrine in the Royal Australian Air Force 1921–1991*, Australian Government Publishing Service, Canberra, 1992, p. 72; Kenney Diaries, entry for 26 April 1945; Kenney, *General Kenney Reports*, pp. 44 and 90.

and respect of the Americans, and replaced him with a commander in whom the Americans had no confidence. In the face of American objections Jones insisted on the changes and the American tasking of No 9 Operational Group ceased.[32] In contrast to Jones, Bostock was able to use his influence with Kenney to have a new RAAF formation, No 10 Operational Group, included in the ongoing American offensive operations as a replacement of No 9 Operational Group.[33]

A similar problem occurred in July 1944 when the AOC of No 10 Operational Group, Frederick Scherger, was severely injured in a motor vehicle accident. On the very day of the accident Kenney's deputy, General Whitehead, visited Scherger with a proposal to send the RAAF's No 78 Wing into a secret airbase in the Philippines to cover the initial assault landings. The proposal was later cancelled when Jones appointed Cobby, whose abilities the Americans did not respect, to replace Scherger.[34] Bostock again had to work hard to have the RAAF entrusted with the responsibility for supporting the Borneo operations in 1945.

Politically then, Bostock was eminently successful in developing a strong working relationship with the American leadership of the SWPA that kept the RAAF involved with the forward moving American operations for most of the war.

Organisation

In organisational matters Bostock proved to be responsive to the needs of operations as two examples illustrate. In 1942 Group Captain Garing of Northeastern Area rang Bostock about the need for an operational headquarters in New Guinea in connection with the imminent Japanese invasion of Milne Bay. Bostock agreed and sent out the orders creating No 9 Operational Group that night.[35] In early 1944 Bostock became concerned at the loss rate of newly arrived aircrew in their first operational flights. Delays of 'many weeks' between graduation from an Operational Training Unit (OTU) and arrival at a squadron, coupled with the difference in environmental conditions between the OTUs based in southern Australia and the tropical operational locations, were seen as causes of the problem.[36] Bostock suggested that replacement aircraft and aircrews should marry up in the operational area and carry out a number of 'war exercises' before they joined their squadrons, similar to the American system. Jones rejected the proposal.[37]

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32 George Odgers, *Air War Against Japan*, 1943–1945, Australian War Memorial, Canberra, 1957, p. 130.

33 RAAF Historical Records, Control of No 10 Ops Group, Microfilm Roll 458, Document 282.

34 National Library of Australia, ORAL TRC 121/52, Interview with Sir Frederick Scherger, 6 January 1975, Chairman of the Australian National Airline Commission [sound recording], interviewer Mel Pratt.

35 RAAF Historical Records, Garrison Files, Interview Air Commodore William Garing.

36 Odgers, *Air War Against Japan 1943–1945*, p. 192.

37 RAAF Historical Records, Bostock File, Letter Bostock to Drakeford, 15 April 1944.

During the war Bostock's headquarters issued some 500 operational instructions on a multitude of matters, ranging from the preservation of sacred sites to the fusing and spacing of depth charge salvoes. Included in these instructions were lessons learned from air operations in the other theatres of the war.[38] In this Bostock appears to have heeded an old Italian proverb—wise men learn by other men's mistakes, fools by their own[39]—and organised his headquarters to ensure that it captured and disseminated whatever lessons were available. Some of those lessons related to the RAF mining campaign carried out in European waters that probably inspired Bostock's mining efforts in the SWPA.

Technology

Bostock was responsible for the initiation of the SWPA mining campaign that was carried out by the RAAF's Catalina flying boats.[40] The Catalina squadrons were under the direct control of RAAF Command and were not part of any other area or group. Strategic mining of the enemy ports in the Netherlands East Indies was carried out by them for over two years and extended to China in the last year of the war. Tactical mining was also used in support of a number of the Allied assault operations and culminated in the operation against Manila Bay prior to the Philippines invasion in 1944 that involved 24 aircraft, including two jamming aircraft.

For the loss of nine aircraft the campaign sank 23 vessels, damaged 27 and forced five other vessels out of sheltered waters into open waters where they were sunk by Allied submarines. In addition, major ports were closed for extended periods, and significant Japanese resources had to be diverted to mine clearance operations. The RAAF effort involved the full-time employment of approximately half a squadron. It has been estimated that to achieve the same affect by bombing the enemy's equipment and resources in the field would have required the full-time employment of some 20 squadrons.[41] The British Admiralty concluded that it 'is clear that the mine laying offensive was well executed and that excellent use was made of the material available'.[42] Those materials included the men that flew the Catalinas and their morale.

Morale

The morale of the forces under Bostock's command is another factor to consider in an evaluation of his performance. Kenney favourably assessed the level of Australian

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38 National Archives of Australia, Series AA1966/5, Headquarters RAAF Command – Operations Instructions, Control Symbols 250–52.

39 World of Quotes, http://www.worldofquotes.com/search.php, accessed 5 August 2005.

40 National Archives of Australia, Series A11093, RAAF Command Headquarters – Aircraft Mine Laying operations – Wewak, Control Symbol 373/21A, Barcode 3079541.

41 National Archives of Australia, Series A1196, Mine Laying operations of the RAAF 1943–1947, Control Symbol 60/501/155, Barcode 201657.

42 ibid.

morale after the war when he was asked, aside from the Americans, which nationality had impressed him the most with their efficiency and reliability. In his reply he said:

> I would say the Australians they were a red-hot crowd. … The Australians took losses, but they were always ready to go. Their morale was always excellent. It was much easier to keep the morale up with an Australian outfit than it was with an American outfit.[43]

Operations

In the field of operations, few other air commanders have had as great an opportunity to employ air power in all its roles, as did Bostock. This fact found expression in his citation for the American Medal of Freedom that mentions the 'strong air defence of Australia', 'protection for Allied sea routes', 'a devastating aerial offensive against oil centres, harbour facilities and airdromes from Java to New Britain', the heavy toll taken of enemy shipping, and the 'wresting of the air initiative over the Netherlands East Indies from the Japanese'.[44] A list of the major operational activity that came under his direction would include:

Anti-submarine warfare in Australian and Island waters	1939–1945
Maritime patrol in Australian and Island waters	1939–1945
Convoy escort[45] in Australian and Island waters	1939–1945
Air defence of Australia (including the Darwin Area and Northeastern Area)	1942–1945
Air offensive from the Northwestern Area (including 380th Bombardment Group USAAF from 1943)	1942–1945
Catalina bombing campaign	1942–1945
Catalina reconnaissance	1942–1945
Strategic mining	1943–1945
Tactical mining	1943–1945
Anti-shipping operations by 9 OG/Northern Area	1944–1945
Air offensive by 9 OG/Northern Area	1944–1945
Support for army in New Guinea, New Britain and Solomons	1944–1945
Oboe 1 – Tarakan	1945
Oboe 6 – Brunei Bay/Labuan	1945
Oboe 2 – Balikpapan	1945

The operational highlights in Bostock's career include the anti-submarine campaign that he successfully oversaw from 1939, when he was DCAS, until the end of the war. In 1943, when it was suggested that an amphibious assault might be carried out in the

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43 RAAF Historical Records, Oral Reminiscences of General George C. Kenney, New York, 16 July 1971, interviewer D. Clayton James, Microfilm Roll 1234, Document 1028948.

44 RAAF Historical Records, Star Rank Files – W.D. Bostock.

45 Douglas Gillison, *Royal Australian Air Force 1939–1942*, p. 129. Coastal convoys were instituted from 8 June 1942, see Robert Wallace, *The Secret Battle, 1942–1944*, Lamont Publishing, Ringwood VIC, 1995, p. 45.

Arafura Sea, he produced a plan for the air support of such an operation. The mining campaign has been mentioned already and was an outstanding success. The crowning event was his planning and execution of the *Oboe* series of operations that involved the assaults against Tarakan, Brunei Bay and Balikpapan in Borneo. Bostock's efforts were described as 'flawless' by MacArthur and drew strong praise from the Commander-in-Chief of the Australian Army, General Blamey, who 'commended Bostock's "admirable" planning, "thorough and complete" preparations, high order of control and ready and full cooperation.'[46]

Bostock's operational capabilities drew genuine respect from Kenney throughout their association together. In November 1942 Kenney sent Bostock a letter in which he said, 'I not only sincerely believe you the best qualified officer in the RAAF to handle operations but am especially desirous of having you on my side all the way back to Tokio [sic].'[47] In 1943, 1944 and 1945 he placed American units under Bostock's control, which was a significant vote of confidence in his abilities given Kenney's high standards in the employment of air power. Kenney honoured his promise to Bostock to have him by his side at Tokyo when he invited Bostock to the surrender ceremony onboard the USS *Missouri*. Blamey also recognised Bostock's service by having him step forward during the Australian signing of the surrender documents, rather than Jones who was CAS and head of the Service.

In November 1945 Kenney sent a letter to the Prime Minister of Australia expressing his commendation of Bostock. Much of this reflected what was in the earlier Medal of Freedom citation but there were additional comments on Bostock's 'planning, directing, and coordinating' talents that 'showed him to be an outstanding executive and commander', who 'made an outstanding and major contribution to the final success of Allied arms.'[48]

In respect of Bostock's abilities as the RAAF's premier operational air commander it is hard to find any substantial criticism of his performance. Had the issue of the divided command of the RAAF not arisen, Bostock would probably be remembered today primarily as a master air power practitioner and not just as Jones' rival for command of the RAAF.

Bostock was retired from the RAAF against his will on 19 April 1946. From February 1946 he served on the board of management of the Australian War Memorial. He also contributed articles to the *Herald* newspaper as a Special Aviation Correspondent during the late 1940s and 1950s. Bostock was elected to parliament as the Federal Member for the seat of Indi in 1949 and served in this capacity until he was defeated

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46 Alan Stephens and Jeff Isaacs, *High Fliers: Leaders of the Royal Australian Air Force*, Australian Government Publishing Service, Canberra, 1996, p. 52.

47 Australian War Memorial, PR 84/127, File 419/36/30, Folder 15, Item 9 of 11, Letter Kenney to Bostock, dated 30 November 1942.

48 Australian War Memorial, PR 84/127, File 419/36/30, Folder 16, Item 10 of 11, Letter Kenney to Prime Minister, dated 17 November 1945.

in the 1958 elections. He died on 28 April 1968. He was given an air force funeral[49] and his wife received a letter from Kenney in which he confirmed his earlier opinion that Bostock was Australia's most capable airman and had the most to do with Japan's defeat.[50]

Conclusion

Time and word constraints prevent a full examination of all aspects of the careers of these two air power practitioners. What has been presented is mainly the evidence that supports the proposition that both Kenney and Jones were masters of air power. However, it needs to be said that both made mistakes and that both had weaknesses that have not been covered in detail in this paper. These negatives, however, are heavily outweighed by both men's achievements.

Their achievements are all the more significant given the conditions in which they had to operate. Kenney inherited a disorganised force that had suffered defeat and withdrawal for many months. Morale was badly affected in some of the units under his control and the theatre commander had no faith in the theatre's air forces. Aircrew reinforcements were slow to arrive and were of substandard quality for some time. The 'Europe First' policy affected both Kenney and Bostock by limiting the flow of equipment to them in the SWPA.

Bostock's wartime service commenced in earnest during the darkest days of the Japanese advance. He faced continual opposition not only from the enemy but also from his CAS and Minister for Air. The RAAF motto, *Per Ardua ad Astra*, had greater application to his operational career than he probably cared for.

Both Kenney and Bostock rose above their difficulties and applied their knowledge and skills to plan, organise and command successful air operations of great complexity in all of air power's roles and missions.

In evaluating Kenney and Bostock there is one area that does separate them. Kenney had the superior theoretical and doctrinal understanding of the nature of air power and its relationship to land and sea power. His development of a campaign strategy that was adopted in the SWPA convincingly demonstrates his complete mastery of air power in all its aspects. In comparison Bostock was less of a theoretician and more of an imitator and as such can be considered a master but of a lesser degree, perhaps a master of air power application.

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49 Ritchie, *Australian Dictionary of Biography: Volume 13 1940–1980 A–De*, p. 225.

50 Australian War Memorial, PR 84/127, File 419/36/30, Folder 16, Item 10 of 11; Kenney, *General Kenney Reports*, p. 574.

Squadron Leader Alex Post

Squadron Leader Alex Post joined the RAAF in 1993 and graduated as an Air Defence Officer in November of that year. After graduation he served as a Fighter Controller and Senior Controller with No 3 Control and Reporting Unit (3CRU) at Williamtown. He was posted as an Air Defence Instructor to the ADF Air Defence System Training Centre at the start of 1995 and in mid-1996 returned to 3CRU as the Operations Officer.

In 1997 Squadron Leader Post was posted to Project AIR 5333 – Vigilare (replacement of the command and control systems operated by Nos 2 and 3 Control and Reporting Units) in Canberra. As part of the project team responsible for the acquisition of data links he completed the Link-16 Network Management and Design Course conducted in the US.

After two years in the project Squadron Leader Post returned to operations in 2000 as a Surveillance Officer and Crew Chief with No 1 Radar Surveillance Unit (1RSU), which operates the Jindalee Over-The-Horizon Radar (OTHR) from the JORN Coordination Centre at RAAF Edinburgh. In late 2000 he became the Operations Officer at 1RSU.

Squadron Leader Post returned to Canberra in 2002 as the Staff Officer for Air Vice-Marshal Gray, Head Airborne Surveillance and Control Division in the Defence Materiel Organisation. The projects in the division were: Airborne Early Warning and Control (AEW&C), Tactical Unmanned Aerial Vehicle (UAV) for Army, Air 7000 (Multi-Mission UAV) and Space-Based Infra-Red System (SBIRS). While in this position he completed a Master of Arts (War Studies) at the Australian Defence Force Academy.

In 2004 Squadron Leader Post completed a CAF Fellowship at the Air Power Development Centre on the topic of 'Military Experimentation: Hallmark of Professionalism' and is now posted to the Centre as the Staff Officer Future Concepts. He is also undertaking research for a PhD thesis entitled 'The RAAF–USAAF Relationship in the SWPA in World War II'.

Section 4

Masters of More Recent Conflicts

Yaakov Nevo and the Master Air Plan for the Six-Day War

Air Vice-Marshal Peter Nicholson, AO

Introduction and Background

On the morning of Monday, 5 June 1967 the Israeli Air Force attacked Egyptian airfields while the Egyptian Air Force was eating breakfast, having finished its customary dawn patrols over the Suez Canal Zone and the Sinai. In two waves, about two hours apart, the Egyptian Air Force was largely destroyed on the ground. The Israeli Air Force established total air superiority with these initial waves, reinforced by subsequent attacks that afternoon and the next day. The code name for the air campaign was Operation *Moked* ('focus' in Hebrew).

By midday on the first day of the war, Israeli ground forces operated unimpeded by air attack from the Arab nations. By the third day, Israel had defeated the Jordanian forces and taken the West Bank, including East Jerusalem and the Wailing Wall. On the fourth day, Israeli forces reached the Suez Canal and on the fifth day the Golan Heights were captured from Syria. After six days, Israel had defeated the Egyptian forces, taken all of the Sinai and relieved the blockade of the Gulf of Eilat.

With a military strategy of pre-emption and a doctrine of offensive counter air, Israel convincingly and audaciously demonstrated the strategic effect of air power for the first time. This paper explains the rationale and method behind this momentous occasion and explores the background and personality of the architect of the Master Air Plan for Operation *Moked*, Yaakov Nevo.

Strategic Circumstances

The 1956 Suez Campaign (also called the Sinai Campaign by the Israelis who called their part Operation *Kadesh*) was concluded by the intervention of the US and the Soviet Union acting together to force a humiliating backdown by Britain and France. As a corollary, Israel was forced to withdraw from the Canal and her gains in the southern Sinai. Egypt and the other Arab nations fell increasingly under Soviet influence and began to rearm with modern equipment. The Israeli Government formed the view that it was only a matter of time before Israel was attacked again because of the unremitting hostility of the Arab nations and the lack of support from the West for Israel. Recognising that Israel with a population of something less than three million could face alone an attack by a coalition of Arab nations with a combined population of over 60 million had two immediate consequences.

The first was the requirement to rearm with a technological edge that would help balance the demographic disadvantage. Israel had a well-educated and technically literate population and the view was that should be used to counter the much larger Arab populations that were comparatively backward. The second consequence was thinking about measures that could deal with the problem of time for Israel. While Israel had little doubt that she could prevail militarily once mobilised, particularly if her technical edge was increased, mobilisation directly impacted her economy.[1] She could not afford to mobilise early or to hold this state of mobilisation for an extended period because economic conditions would rapidly deteriorate.

The second aspect of time was that the next war would have to be rapid and decisive because the United Nations and the international community would intervene to stop the conflict.[2] Clearly, a defensive posture and a strategy of attrition were untenable and offensive action was necessary to defeat the Arab armies in the field and regain ground to provide strategic depth. A time-limited offensive meant that simultaneous and parallel action was required. Israel could not afford the luxury of preparing the battlespace before launching the attack. In particular, the ground offensive would have to start before air superiority had been achieved.

In April 1967, while these problems were exercising the minds of the General Staff Division, Syria heavily shelled Israeli villages from the Golan Heights. On 7 April, a minor border incident escalated into a full-scale aerial battle over the Golan Heights. This led to Israel shooting down six Syrian MiG-21 aircraft and warning Syria against further attacks. Syria appealed to Egypt for support and in mid-May President Nasser began to apply pressure by moving substantial forces into the Sinai. On 17 May Nasser also demanded that the United Nations Emergency Force (UNEF) be withdrawn from

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1 The exact size of Israel's regular ground forces before the Six-Day War is not clear but the Army had two or three brigades. The small Air Force force structure was largely regular, with a pilot to aircraft ratio of about 1:1 that was augmented to about 1:2 with reservists and staff officers.

2 Later in the decade after the Suez Campaign in the planning for Operation Moked, the Israeli General Staff estimated that only one week would be available before external intervention stopped any Israeli offensive.

the Sinai and the Secretary General U Thant complied. On 22 May Nasser closed the Straits of Tiran, so denying Israel access to the port of Eilat. This was the *casus belli* for Israel who began to mobilise. On 30 May Egypt and Jordan signed a mutual defence treaty that complemented the existing treaty between Egypt and Syria. Israel was now surrounded on three sides by a hostile alliance, the Sinai was re-militarised, and the Straits were closed. A flurry of diplomatic activity convinced the Israeli Government that they were alone and they decided to strike first to avoid a war on three fronts. Execution of Operation *Moked* was authorised for 0745 hours on Monday, 5 June 1967.

Personal Background[3]

Yak Nevo was born in 1932 into a farming family and joined the Israeli Air Force in 1949. He was one of the first Palestinian-born Jews who were to form the Israeli Air Force. He graduated with the fifth group of Israeli pilots in November 1951. He was posted to the Spitfire Operational Training Unit at Ramat David and then flew with the 'One' Squadron at Hazor. He proved so outstanding that despite his limited experience Menahem Bar, the squadron commander, included him in the handful of pilots who made up the first jet fighter squadron. He trained as a flying instructor at Sirkin in 1952, and in September 1952 he converted to the Meteor aircraft at Ramat David, becoming one of the first jet pilots in the Israeli Air Force. Later that year he went to France as a test pilot on Ouragan and Mystère aircraft. He was with the first pilots to fly the Ouragan aircraft in Hatzor and continued to fly Mystère aircraft in France probably as part of the controversy over whether to acquire the Mystère II or Mystère IV model.

In 1956 he was the deputy squadron commander of the new Mystère 'One' Squadron during the Suez Campaign. His squadron commander was Beni Peled, later Commander of the Israeli Air Force during the 1973 Yom Kippur War. After Operation *Kadesh* in October 1956, he returned to France to test fly the Super Mystère B-2 and on December 1958 he formed the 'Bats' Super Mystère Squadron as squadron commander.

Yak Nevo had a total of three enemy kills, comprising two Egyptian MiG-15 with Mystère during Operation *Kadesh* in October 1956 and the first kill of a MiG-17 by a Mystère in December 1958. In February 1961, as a Squadron Leader (Major), he attended Command and Staff School in Israel and became a planner at Air Number 3 Branch – Operational Planning. In 1963, as a Lieutenant Colonel, he became Head of Air Number 3 Branch. Operation *Moked* was planned during this period.

In 1966 he graduated as Master of Arts in business and administration in the US. He returned to Israel on the eve of the Six-Day War and flew Super Mystère aircraft. In August 1967 Colonel Nevo became the Commander of Hatzor Air Base and in mid-

3 This account is drawn largely from personal communication between Eran Mor and Lieutenant Colonel Moti Habakok, Head of History Branch Israeli Air Force, 13 July 2005, that was conveyed to the author on 14 July 2005.

1970 the Head of Training Division. During that time he wrote the Israeli Air Force air combat tactics manual.[4]

His contemporaries described Nevo as 'slim and pixyish … solitary, humourless, and in the air—relentless'. 'Cheetah' Cohen calls him 'quiet and introverted' and says that it was not the number of aircraft he had shot down that made him legendary but the way he had done it.[5] He was a heavy smoker and later in his career was often seen wreathed in pipe smoke while he expounded his theories of air combat.

He retired from the Air Force in 1972 but returned to service in October 1973 as the Commander of the southern Sinai base 'Ophir' in Sharm El Sheik the day before the Yom Kippur War started. Yak Nevo passed away about ten years ago.

Air-to-Air Combat

According to his contemporaries, Yak Nevo had an uncanny ability to visualise in three dimensions and to analyse air combat manoeuvres. He had a philosophical passion for knowledge and an extraordinary memory that enabled him subsequently to reconstruct events in the air for comparison and analysis. At that time, Israel had no access to the tactics, techniques and procedures for air combat of other air forces so Yak began to develop them from scratch. He quickly became the premier theorist and practitioner of the art of dogfighting in the Israeli Air Force.[6]

In Israel he is remembered particularly for two specific manoeuvres. The first is what we now call the 'barrel roll attack', where a barrel roll toward the defending aircraft in a tail chase reduces the angle-off and allows guns tracking. The second is probably a hangover from the early days of jet fighters when pilots had not yet come to terms with the high rate of overtake that could be generated. Yak devised a method of taking advantage of this situation that involved a rapid deceleration by the defending aircraft to force the overshoot, followed by a reversal to exploit the advantage. He called this the 'let him pass' manoeuvre.

He put his theory to the test and on one occasion over the Sinai he deliberately placed himself at a disadvantage to three Egyptian MiG-17 aircraft, while ordering his wingman not to engage. Each of the enemy aircraft attacked and Yak used his technique of idle power, speed brake and hard turn to force the overshoot by each aircraft in turn. Of course, nowadays with the minimum number of two aircraft as a fighting element, this tactic would not work because the aircraft that decelerated rapidly would become an easy target for the second aircraft of a coordinated pair. But at that time, Yak's willingness to demonstrate his theory and the bravery, some might say foolhardiness, required to do this, earned him great respect and engendered tremendous credibility

4 Yak Nevo may have written versions of the air combat training manual earlier than 1970.

5 Eliezer 'Cheetah' Cohen, *Israel's Best Defense: The First Full Story of the Israeli Air Force*, Orion Books, New York, 1993, p. 160.

6 'War Online', http://www.waronline.org/forum/sutra121420.html, accessed 13 July 2005.

among the fighter fraternity in Israel. Nevo's penchant for taking chances was more than the ordinary aggressiveness of a fighter pilot. It stemmed from a philosophical passion for knowledge.

Doctrine

Any discussion of doctrine of the Israeli Air Force must start with the background and experience of the small group of pilots operating a handful of outdated planes who formed the Air Service or Sherut Avir of the Haganah. Most of the first pilots who made up the executive and leadership of the Air Service had gained their operational experience with the RAF during World War II. This experience was almost entirely with Fighter Command flying Spitfires and Hurricanes. Indeed, some of the first aircraft of the Israeli Air Force (Heyl Ha'avir) after the formation of the State of Israel were Spitfires provided by Britain. In 1949, the first pilots of the new State of Israel trained on Messerschmitt 109 aircraft in Czechoslovakia.[7] So these young men were strongly influenced by the doctrine of the time that was called air defence, now known as defensive counter air (DCA). This was reflective of the argument that flowed to and fro throughout all air forces of the time.

RAF doctrine espoused most particularly by Trenchard was of air power as a strategic effect. Much of the re-equipment program of the 1930s was directed toward development and production of the long-range bomber. It was only late in the 1930s (and just in time) that Dowding's views were finally accepted and full-scale production of fighters was begun. Together with the Chain Home HF radar system and the associated command and control arrangements, these provided the air defence system that prevailed during the Battle of Britain in the summer of 1940.

This same argument was replicated only in the US Army Air Force where Billy Mitchell had also tried to demonstrate the strategic effect of air power. In the US, the fighter community won the argument initially and the cause of the long-range bomber languished until into the 1940s and the air war against Japan. However, in most other Air Forces, air power was not thought of as delivering a strategic effect and fighters were primarily for defensive counter air (DCA) operations otherwise known as air defence.

The other powerful influence on the thinking of the men who established the Israeli Air Force was the tradition of close air support (CAS) of land forces. All operations against the British in Palestine before independence by the Haganah and its predecessors were essentially ground operations by light infantry without armour or indirect fire support. The example of most air forces, except the RAF and later the USAAF, was of air power in support of ground operations. Indeed, the Luftwaffe was frequently cited as a role model for the use of air power in direct support of mechanised and armoured land formations, later the main force structure components of the Israeli Defence Force.

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7 Ezer Weizman, *On Eagles' Wings: The Personal Story of the Leading Commander of the Israeli Air Force*, Macmillan, New York, 1977, pp. 60–64.

And in 1956 during the Operation *Kadesh* in the Suez Campaign, the fledgling Israeli Air Force was employed either in close air support or air defence operations.

However, with the swing of Egypt into the Soviet sphere of influence after Suez and the consequent rearming of the Egyptian armed forces with modern weapons systems, the balance of power moved inexorably against Israel. It was clear that she could not survive a war of attrition and rapid and decisive action by her ground forces could not be guaranteed in the face of Arab air power. 'Cheetah' Cohen says that '… the idea that the best defense of the nation's skies and the achieving of air superiority must lie in a devastating pre-emptive strike on the enemy's air bases was not easy to assimilate after years of defensive thinking'.[8]

As early as 1953, the Commander of the Israeli Air Force, Dan Tolkowsky, had issued operations orders for strikes against the Egyptian bases in the Sinai but these were never implemented. In the early 1960s the commander of the Operations Branch, Rafi Bar-Lev, together with Rafi Sivron began discussions about a new plan for the early neutralisation of Arab air bases.[9] This plan became Operation *Telem* ('furrow' in Hebrew) but was heavily criticised because of the difficulty of execution and lack of attention to detail, such as assigning targets within range of the aircraft type nominated for their attack. In 1963, at the direction of the Commander of the Israeli Air Force, Ezer Weizman, the Operations Branch under Yak Nevo started planning for Operation *Moked*.

Operation *Moked* ('Focus' in Hebrew)

The air campaign conducted by the Luftwaffe against the Soviet Air Force in the opening stages of Operation *Barbarossa* has been cited as an example for Operation *Moked*. Although there are some similarities, this is an incorrect and tactical analogy because the bulk of the Soviet Air Force was not destroyed, only that relatively small part deployed forward. However, one similarity is that in both *Barbarossa* and *Moked*, winning air superiority was a prelude to an armoured thrust.

The objective of Operation *Moked* was to paralyse the enemy air force by hitting the runways and destroying as many aircraft as possible on the ground while protecting the air space of Israel and performing other air force duties as the war developed. The principles established by Nevo were:

> Enemy airfield runways will be attacked first, then parallel runways and then aircraft on the ground. Enemy air defences should be attacked as a secondary priority and in relation to its effect on slowing the attack.[10]

8 Cohen, *Israel's Best Defense: The First Full Story of the Israeli Air Force*, p. 193.

9 ibid., p. 194.

10 Noam Ofir, 'Thunder on a Clear Day', *Israeli Air Force Bulletin*, No. 145, June 2002.

The key operational construct that underpinned the plan was closure of the runways with the aircraft on the ground. These were well-known, fixed targets that enabled detailed preplanning and preparation. The trapped aircraft were then destroyed using cannon fire.

The *Moked* plan had three options: Plan A for Egypt only, Plan B for Syria only and Plan C that called for combined attack on Egypt and Syria with possible combination attacks in Jordan, Lebanon and Iraq. In the event, Plan A was executed with a combination of Plans B and C put into action later on the first day as the success of Plan A became evident. What is not generally known is that Plan B against Syria was very nearly implemented in 1965.[11]

Intelligence

The success of *Moked* depended on a number of factors, including accurate and current intelligence, the ability to muster sufficient mass to neutralise the Egyptian airfields and a high level of training of the air and ground crews. The plan was circulated and endorsed by the squadron commanders and then approved by the Commander, Major General Ezer Weizman. The Israeli Air Force started to prepare for its execution, with emphasis on these factors of intelligence and concentration of force.

The first and most important aspect was to readjust the focus of intelligence collection and analysis. Until that time, the intelligence function was centralised in the General Staff and had a strong ground force flavour. Knowledge of the opposing Air Forces was gained only spasmodically and somewhat incoherently. So, against some opposition, an Air Intelligence Branch was formed with the responsibility to concentrate on air matters. The Air Intelligence Branch began to coordinate the collection of intelligence on the opposing Air Forces, to analyse their strengths and weaknesses and to indicate areas where these could be exploited.

Reconnaissance flights were flown regularly over the Sinai and into Egypt using initially Mosquito and then primarily Vautour and Mirage aircraft. These sorties were intercepted only infrequently and no aircraft were lost in gathering this intelligence. Significantly, considerable effort was made not only to establish the Air Order of Battle (AOB) but to keep it up to date. This quickly showed patterns of activity and behaviour of the Egyptian Air Force that revealed the adoption of Soviet tactics. Most importantly, it also revealed the most important bases and the likely location of the key aircraft types, despite them being frequently relocated by the Egyptians.

11 ibid.

Training

Yak and his planners realised that concentration of effort was necessary to achieve the required effect. With only about 190 combat aircraft available, two waves were necessary to deliver the ordnance required to neutralise the most important Egyptian airfields. Obviously, surprise with the first wave was a key factor in success but so also was the ability to rapidly turn the aircraft around between sorties. As soon as the plan for *Moked* was approved in 1963, the Israeli Air Force put in place a training regime to ensure that these elements could be reliably accomplished.

A competitive atmosphere was engendered among the ground crew to reduce turnaround times in refuelling and rearming aircraft and to complete unscheduled maintenance. *Moked* called for radio silence, precise low-level navigation and very disciplined take-off times so aircrew training focused on these factors. Air combat training was considerably reduced in favour of ground attack and a dummy airfield was constructed in the Negev so that aircrew could practice against a realistic target.

Targets were assigned by aircraft type, so squadrons began training using the actual sortie profile that was required for their particular target. Because the aircraft were operating at the extreme of their range and to maximise the fuel and time available for combat, performance was measured during these realistic training sorties to refine flight manual data. This enabled very precise and confident planning of the actual sortie profile for the attack.

Air Order of Battle (AOB)

Israel was effectively under an arms embargo from the US and Britain, and turned to France to expand and modernise her forces, particularly the Israeli Air Force. The Israeli Air Force had previous experience with French aircraft, having entered the jet age with Ouragan and Mystère aircraft. Yak Nevo had two MiG-15 kills during the Suez Campaign flying the Mystère and was the first to down a MiG-17 in December 1958 flying a Super Mystère.[12] During the decade, the Israeli Air Force added Vautour, Super Mystère and Mirage aircraft to its inventory. The Mirage was as advanced as any aircraft of its type in the world and the Israeli Air Force was the first operator outside France.

The driving force behind the modernisation was Ezer Weizman, who had an unprecedented eight years as Commander of the Israeli Air Force from 1958 to 1966. The main difficulty at first was funding for what the Air Force regarded as a sufficient number of aircraft. For example, the initial buy of Mirages was only 24 aircraft but as the urgency to re-equip was recognised by the political leadership, more funding was made available and eventually 72 aircraft were purchased.[13]

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12 Cohen, *Israel's Best Defense: The First Full Story of the Israeli Air Force*, pp. 130–31 and 161.

13 Shiman Peres had played a significant role in supporting additional funding for modernisation.

Estimates of the Air Orders of Battle of the opposing air forces vary slightly but are more or less in agreement in general terms (see Table 1). The Israeli Air Force is credited with up to 207 fighter-bombers, while the Egyptian Air Force (also known as the United Arab Republic Air Force) had between 420 and 431 fighter and bomber aircraft on its AOB.

Some accounts mention as many as 45 Tu-16 Badger aircraft and this is a significant difference because these, and to a lesser extent the Beagles, had the capacity to attack Israel from bases deep inside Egypt. A number closer to 30 is probably more accurate because 31 Tu-16s were reported destroyed on 5 June 1967 and the Iraqi Air Force may have had up to ten Tu-16s.[14] Another possible cause of the discrepancies is that the Egyptians redesignated their squadron numbers and moved their aircraft between bases frequently in the weeks preceding the war. Of the other air forces only the Syrian is significant with a strength in June 1967 of 35 MiG-15s and MiG-17s in three squadrons, 60 MiG-21s in four squadrons, and only two Il-28s in a sole light bomber unit.[15]

Israeli Air Force	Egyptian Air Force
67 Mirage IIICJ/BJ/CJ(R)	124 MiG-15/17 Fresco
35 Super Mystère B.2	80 MiG-19 Farmer
19 Vautour IIA/N/BR (18 serviceable)	108 MiG-21 Fishbed
35 Mystère IVA (33 serviceable)	60 Su-7BMK Fitter
51 Ouragan (48 serviceable)	29 Il-28 Beagle
	30 Tu-16 Badger

Table 1 – Air Orders of Battle[16]

Operational Concept

The military strategy of pre-emption was implemented by a massive strike against the Egyptian Air Force in the early morning of Monday, 5 June 1967. The maximum number of Israeli aircraft available was launched to conduct near simultaneous strikes on the critical airfields and the aircraft parked on them. The Israeli aircraft took off from the three airfields of Ramat David, Tel Nof and Hatzor and headed west out into the Mediterranean at very low altitude, flying separate routes as flights of four aircraft. The complete operation was conducted under radio silence and the nascent Israeli electronic warfare capability was used against Egyptian radar sites, SAM sites and communications as the aircraft came within detection range.

14 http://www.answers.com/main/ntquery?method=4&dsid=2222&dekey=Six-Day+War&gwp=8&curtab=2222_1&linktext=1967%20War, accessed 5 August 2005.

15 Tom Cooper & Franz Vajda, 'Arab Air Forces on 5 June 1967', http://www.acig.org/artman/publish/article_262.shtml, accessed 3 August 2005.

16 ibid.

The targets were 13 Egyptian air bases in the Sinai Peninsula, the Suez Canal, the Nile delta and Upper Egypt.[17] The range of the attacking aircraft, the level of threat at each target and the attack capability of each aircraft type determined allocation of the targets. The Sinai bases were allocated to Ouragan, Mystère and Fouga Magister aircraft that were slower and had shorter range. The Suez bases and the Nile delta were assigned to the faster and more sophisticated Super Mystère and Mirage aircraft. The Vautours were sent to the distant bases in Upper Egypt.[18] Destruction of the Tu-16 Badger, Il-28 Beagle and MiG-21 Fitter aircraft of the Egyptian Air Force was given priority.

To maximise effect all available aircraft, about 160 in the initial plan, were assigned to the offensive counter air role, leaving only 12 aircraft for defensive counter air. Of the aircraft assigned to air defence, four were on combat air patrol and eight on ground alert but these aircraft were assigned to the strike role immediately before the attack. The Israeli Air Force reported that 178 aircraft were employed in the first wave.

Timing for the simultaneous attacks was 0745 hours, based on the observed pattern of Egyptian air activity. Typically, the Egyptian Air Force would conduct dawn patrols along the Suez Canal and the Sinai, recovering to their bases before 0700. At 0745 the enemy aircraft would be on the ground attended by ground crew while the aircrew were at breakfast. In addition, the ground fog that was common in the early morning would have dissipated by 0745 and visibility would be good. In fact, the timing was not the time-over-target (TOT) but the time when the attacking formations were first likely to be detected. As it turned out, Egyptian air defence radars were not active that morning and detection of some the Israeli strike force over the sea by a Jordanian radar unit near Amman was attributed to air activity by the US 6th Fleet. Complete surprise was achieved.

Weapons

The plan was to crater the runways on the first pass using bombs and then destroy parked aircraft using cannon fire on the second pass. A third pass against the aircraft on the ground would be attempted if anti-aircraft fire did not endanger the Israeli attackers. The very thorough operational planning emphasised avoiding the loss of valuable aircraft because two waves would be required to accomplish the objective of neutralising the Egyptian Air Force.

The limited load capability of the majority of the Israeli aircraft led to the development by Israeli Military Industries of a lightweight bomb for cratering runways.[19] This special bomb was released in a level pass at low altitude and slowed by a parachute. A rocket

17 Some accounts state there were eleven airfields and eight radar stations attacked while others include ten airfields, one of which was not preplanned but attacked when MiG-21 aircraft were seen there.

18 Cohen, *Israel's Best Defense: The First Full Story of the Israeli Air Force*, p. 196.

19 ibid., p. 195.

fired after activation of the parachute, propelling the warhead into the runway surface where it was fused to detonate after penetration. The explosion resulted in a crater typically five metres in diameter and one to two metres in depth. This was sufficient to close the runway to jet aircraft operations for several hours. Conventional HE bombs must also have been used because reports describe pop-up from low altitude and diving attacks. These were the same tactics practiced during the 1970s by RAAF Mirage aircraft in a threatening SAM and AAA environment.

In addition to their cannon, the Israeli fighters also carried the newly developed *Shafir* infra-red guided air-to-air missile. Several of these were fired but with only limited success.

The Outcome of Operation *Moked*

Despite the trepidation of the General Staff, the success of *Moked* was evident within a few minutes of the first wave reaching their targets as they reported the number of aircraft destroyed. Like the estimates for the Air Orders of Battle, some of the reported numbers vary. However, in the first wave 11 airfields were attacked by 183 Israeli aircraft and 197 Egyptian aircraft and eight radar stations were destroyed. In the second wave, about two hours later at 0950, 164 aircraft attacked 16 airfields. In the third wave at about midday, there were 85 flights against Egypt, 48 against Jordan, 67 against Syria and one against Iraq. In subsequent waves there were two more attacks against the H-3 airfield in Iraq, in addition to strikes against Syria and Jordan. Over the course of the war of six days there were 736 interception and patrol flights and one aircraft was downed.[20]

Nearly half of the Egyptian Air Force, 187 aircraft, was destroyed in the first few minutes of Operation *Moked*, practically winning the war for Israel in its first hour. All Egyptian Air Force bases and aircraft in the Sinai were destroyed, as well as all of Egypt's heavy bombers. The Israeli Air Force lost eight aircraft, most from ground fire, but at one base, Abu-Sweir, four MiG-21 aircraft managed to take off and shoot down one of the attacking Vautours before Israeli Mirages, which had arrived to assist the bombers, downed three.

On the second day of the war the Israeli Air Force continued its operations against Arab air bases, raising the total number of destroyed Arab planes to 416, which included more than two-thirds of the Syrian Air Force.[21] Having attained total air superiority, all aircraft were switched to the close air support role to assist the Israeli armoured forces fighting in the Sinai and shortly thereafter in the Jordan salient and the Golan heights.

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20 'Wikipedia', http://en.wikipedia.org/wiki/Operation_Focus, accessed 3 August 2005.

21 'June 5th, 1967 – operation "Moked"', http://www.geocities.com/CapeCanaveral/Hangar/2848/operate6.htm, accessed 3 August 2005.

Another Significant Person

When he was tasked to develop Operation *Moked*, Yak Nevo teamed with an experienced navigator and helicopter pilot named Raphael (Rafi) Sivron. Sivron was born in Palestine in 1935 and graduated with the 19th intake of the Israeli Air Force Navigator School as a Fighter Navigator. He flew Mosquitoes and Meteor aircraft in the fighter/ground attack role, and Dakota and Nord aircraft in the transport role. In 1964 as the Israeli Air Force started to build its helicopter force, he converted to fly on Bell 205 helicopters. In 1966 as a Squadron Leader he joined Air Branch 3 working in Operations Branch under Yak Nevo. In 1968 as a Wing Commander he was the head of ground and navigator training in the Israeli Air Force pilot training school. In the early 1970s as a Group Captain he worked as financial adviser to the Israeli Defence Force. In the Yom Kippur War in 1973 he was the commander of Israeli Air Force forward post in the north of Israel.[22] He was promoted to Air Commodore upon nomination as Military Attaché in London, which was his last job in the Israeli Defence Force.

Rafi Sivron was the Commander of Ground Training in the Israeli Air Force Flight School when Eran Mor was a cadet in Navigator School in 1969–1970. Eran recalls that the cadets were told then that Sivron was a legend and the real brain behind the 1967 victory.[23]

The Elements of Success

The main elements in the success of Operation *Moked* are easy to discern. First and most important was the *doctrinal change* of the Israeli Air Force from the defensive counter air and close air support roles to offensive counter air. Gaining air superiority was recognised as a prerequisite for success in all other environments. The significant change was accepting that this could be best achieved through offensive counter air. Operation *Moked* demonstrated the strategic effect of air power.

The second element of success was adherence to the *principles of war*, particularly selection and maintenance of the aim, and concentration of force. Having decided on the importance of offensive counter air, all planning, preparatory arrangements and training were focused on achieving this capability. Effort was not diverted into other important but less significant matters with a view to achieving the concentration of force necessary for decisive action.

Reorganisation of *intelligence* arrangements was the third crucial element of success. Over a period of time a detailed picture of the enemy air forces was developed, including their patterns of activity, disposition, doctrine and tactics. This enabled a target selection process that met the strategic effect required.

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22 Personal communication with Eran Mor, from the Israeli Air Force History Branch, 25 July 2005.

23 ibid.

Implementation of the operational concept by careful, detailed operational *planning* was the fourth element of success.

Ensuring that the Israeli Air Force was capable of executing the plan through extensive *training* and rehearsals was the fifth element of success. Turnaround times were minimised to be able to launch the second wave as soon as possible after the first wave had recovered. Realistic training sorties and dummy targets were put in place to replicate the routes and profiles to be flown to the actual targets.

Although the old adage is that no plan survives first contact with the enemy, the sixth element of success was skilful and courageous *execution* of *Moked* by the Israeli Air Force. Disciplined airmanship was required to launch virtually the whole force at tightly specified intervals, to join up and transit to the targets at very low altitude in complete radio silence and then deliver their ordnance with the extraordinary precision revealed by post-strike photography.

The importance of the specially developed runway penetration *weapons* is by no means fully accepted.[24] Nevertheless, the matching of weapons to targets and closing the runways before attacking the grounded aircraft was the seventh element of success.

Finally, the eighth element of success was the strong *support* for the strategy of pre-emption by first the military and then the political leadership.

The Part Played by Yak Nevo

Yak Nevo was clearly not the sole creator of the Master Air Plan for Operation *Moked* and it is likely that Rafi Sivron deserves equal credit for the concept. But it was the close involvement of Nevo that ensured its success. First, his prowess, personal courage and theoretical knowledge of airpower gave him great *credibility* with successive Commanders of the Israeli Air Force, Ezer Weizman and Moti Hod, who had to approve the plan.

Second, his intellectual *flexibility* is evident in his passionate advocacy of the use of air power for strategic effect, despite a long and well-developed background of tactical employment. He strongly reinforced Weizman and Hod's belief in the need for a change in doctrine and helped project this through the ranks of the Israeli Air Force squadrons.

Third, his *professional mastery* shines through in the detailed and meticulous plans for Operation *Moked*. That these plans were translated into a change in the training regimes of ground and air crew that was sustained for several years reinforces the credibility, foresight and dedication of Yak Nevo.

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24 Cohen, *Israel's Best Defense: The First Full Story of the Israeli Air Force*, pp. 195 and 350.

However the kudos are distributed, both Yaakov Nevo and Raphael Sivron showed in the formulation and implementation of Operation *Moked* that they were Masters of Air Power.

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Air Vice-Marshal Peter Nicholson, AO

Air Vice-Marshal Peter Nicholson is the Director of Government Relations for BAE Systems Australia. He retired as a permanent member of the RAAF in October 2001 after 33 years service. Educated in Northam he holds a Bachelor of Engineering from the University of WA and a Master of Public Administration from Auburn University at Montgomery (USA). He is a graduate of the National Defence College of Canada, the USAF Air War College and the RAAF Staff College. He is a graduate of the Executive

Management course of the Graduate Business School of Stanford University and the National University of Singapore.

The first integrated Knowledge Staff in any Defence Department was formed in Australia in 1999. Air Vice-Marshal Nicholson was the inaugural Chief Knowledge Officer, responsible for the capability development of all operational and management systems for the ADF including Command, Control, Communications and Computers, Intelligence, Surveillance, Reconnaissance and Electronic Warfare (C4ISREW). Before that he was the Head of Strategic Policy and Plans.

Air Vice-Marshal Nicholson has extensive operational experience in both Air Force and joint positions. As Air Commander Australia, he led the RAAF combat force and was awarded the Officer of the Order of Australia (AO) for this work in 1999. He was the first RAAF officer appointed Commander Northern Command, where he formed the first integrated Joint Force Command of the ADF. This was recognised with the award of the Member of the Order of Australia (AM) in 1995. He was the inaugural Officer Commanding of RAAF Base Tindal, the first manned Australian air base built since World War II.

Air Vice-Marshal Nicholson has over 3000 hours flying fighters and test flying on more than 40 types of aircraft. He holds a Commercial Pilots Licence with a command multi-engine instrument rating. His interests include current affairs, military strategy and history and he speaks conversational *Bahasa Indonesia*. He is an enthusiastic but inexpert golfer, snowboarder and surfer.

He is a Fellow of the Royal Aeronautical Society and President of the Australian Division. He is also a Fellow of the Institution of Engineers, Australia; a Fellow of the Australian Institute of Management; a Fellow of the Australian Institute of Company Directors; and a Member of the Society of Experimental Test Pilots. He is patron and member of the Australian Chapter of the Association of Old Crows.

Air Vice-Marshal Nicholson lectures on the Revolution in Military Affairs, Effects-Based Operations and Knowledge Warfare to a Masters program at the Strategic and Defence Studies Centre of the Australian National University. He also contributed chapters on two books on regional and Australian military capabilities to be published in 2005. In his capacity as a member of the RAAF Reserve Staff Group, he assists the Defence Strategy Group as a Senior Concept Developer or 'Greybeard'. Most recently he has acted as an expert commentator on the Iraq conflict with the *7:30 Report* on ABC television. He is a Director of the Kokoda Foundation, a strategic think tank that provides advice on national security to Government and industry.

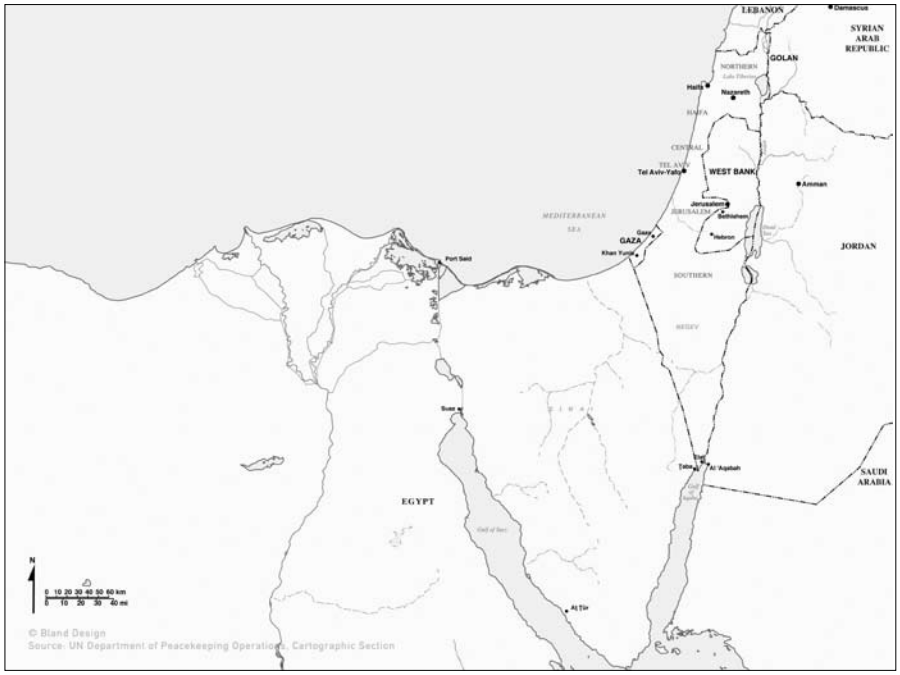

Figure 1 – Six-Day War: Prewar Boundaries

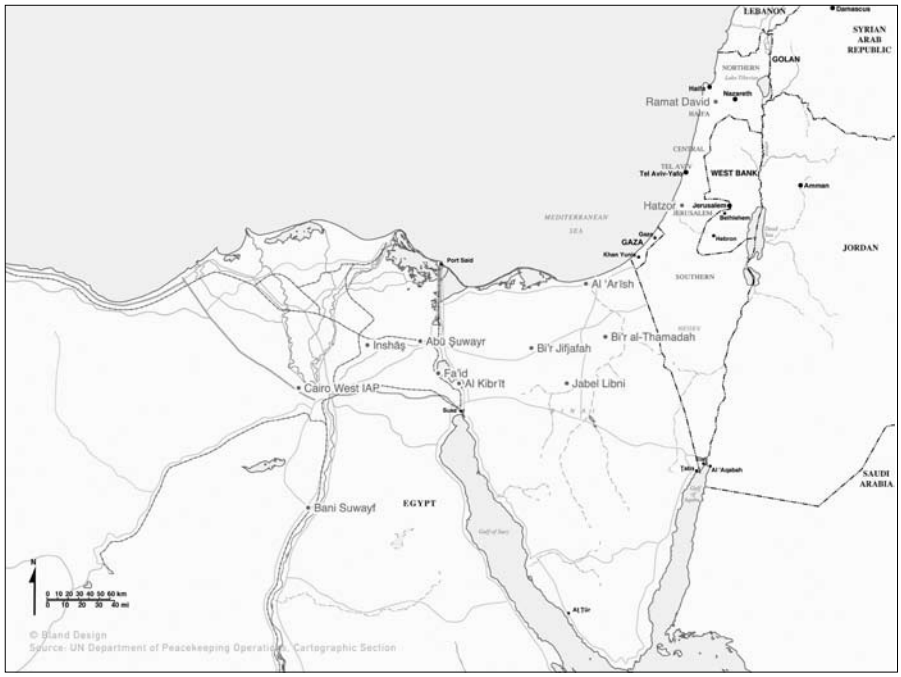

Figure 2 – Six-Day War: First Wave Targets (Sinai, Suez Canal Zone and Nile Delta)

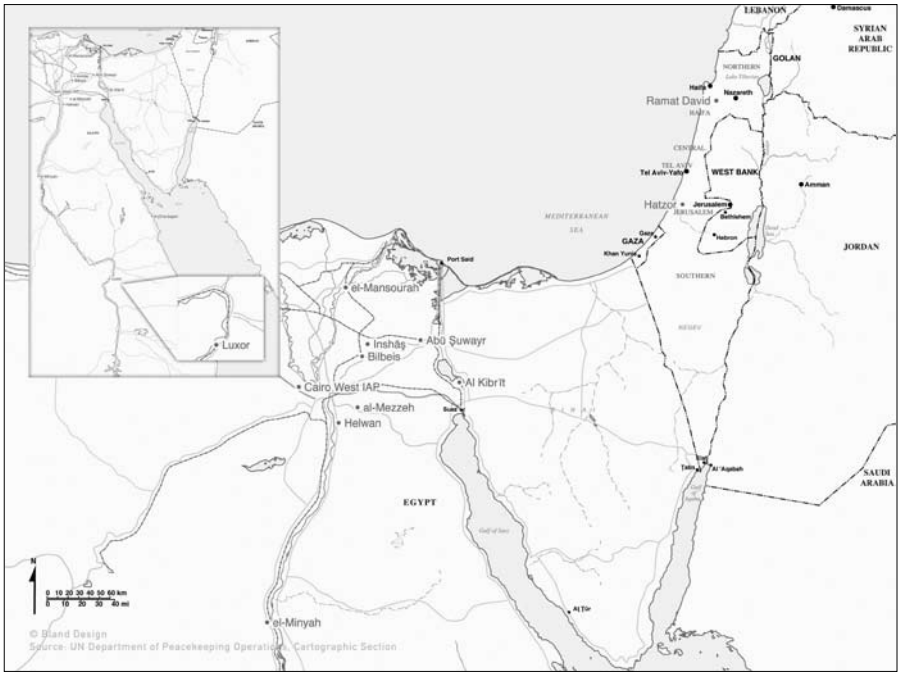

Figure 3 – Six-Day War: Second Wave Targets (Canal Zone, Nile Delta and Upper Egypt)

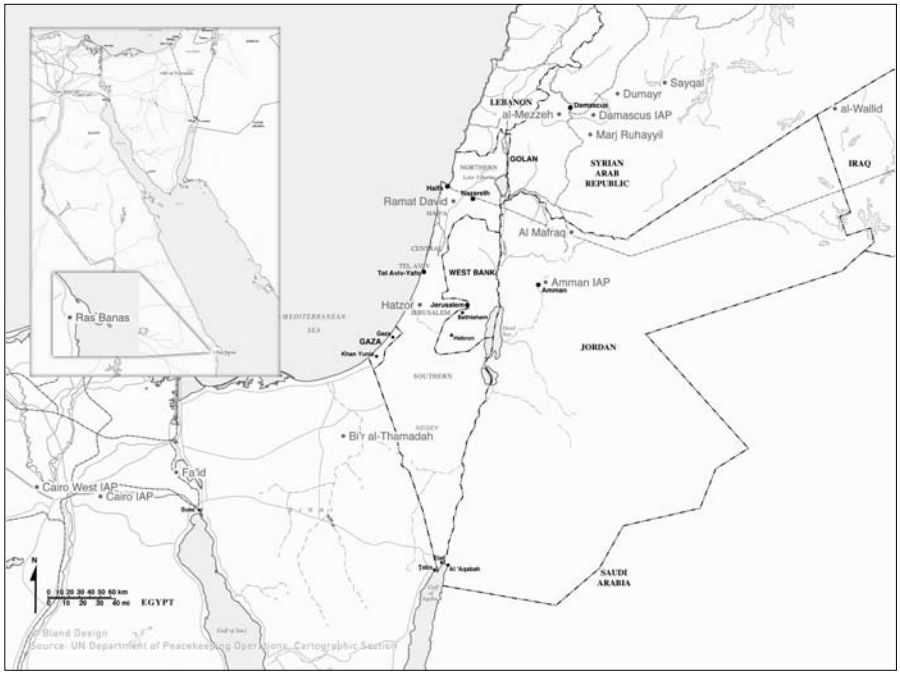

Figure 4 – Six-Day War: Third and Fourth Wave Targets

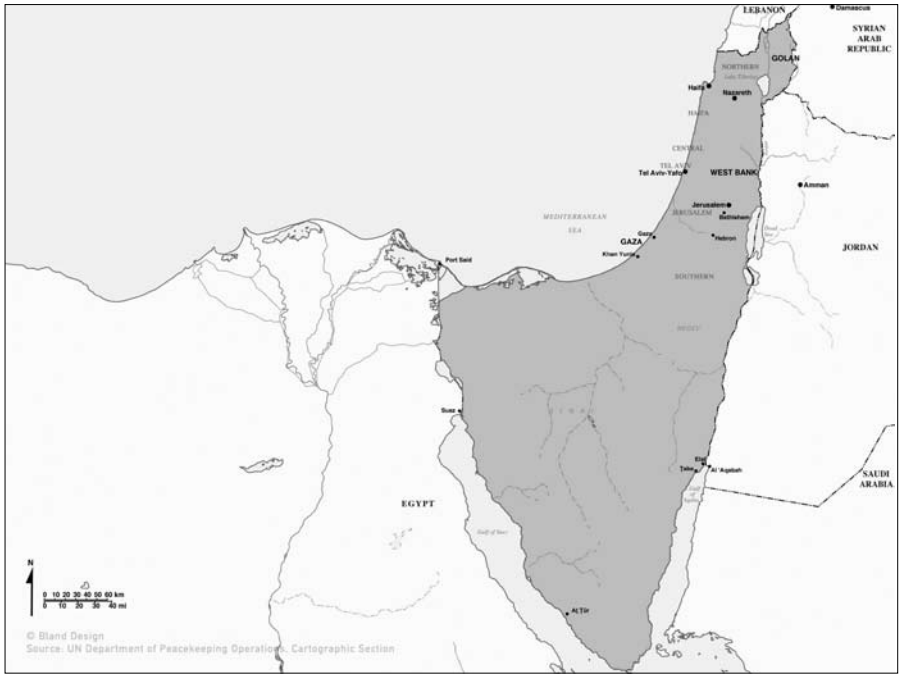

Figure 5 – Six-Day War: Postwar Boundaries

Air Chief Marshal Pratap Chandra Lal, DFC: Architect of the Modern Indian Air Force

Mr Sanu Kainikara

Introduction

Air Chief Marshal Pratap Chandra Lal, DFC, was the Chief of Staff of the Indian Air Force from 1969 to 1973. For those who are not familiar with Indian history, these years encompass the Indo-Pakistan War of 1971 that led to the birth of Bangladesh, a momentous event in the independent history of the Indian sub-continent. It was also during this short and sharp war that the Indian Air Force (IAF) came into its own and joined the ranks of modern air forces with a clear strategic outlook regarding its role in the overall context of national security. Air Chief Marshal Lal was instrumental in instituting many of the changes that were brought about in this transformation of the force, and he can rightly be called the 'architect of the modern Indian Air Force'. Doubtless, leaders who have followed him have contributed their might to the building of the force, but it was he who laid the foundation—a strong and well defined one—on which the current IAF stands tall.

Lal had an extremely distinguished career of over 30 years that spanned combat during World War II, the tumultuous days of independence for India from colonial rule, two clearly delineated wars with neighbouring Pakistan in 1947–48 and then again in 1965 before the crowning achievement of his career as Chief during the 1971 conflict. This fourteen-day war has often been described as IAF's finest hour and the credit must go to Lal's extraordinary leadership and steadfast guidance. But he himself was modest about his own contribution to the success of the operation. Modesty, while characteristic of Lal, is not a common quality found among extraordinary military leaders—especially pilots.

In order to understand his success as a practitioner of air power it is necessary to look at his background, experiences as a young officer and other important factors that impacted on his perceptions throughout his career. These are the elements that shape an outstanding leader of vision and foresight. In analysing the Air Chief Marshal's career and his contribution the development of the IAF I will try to lay fundamental emphasis on the two major wars that he was involved in at the highest levels of command.

To be considered a 'Master' in any profession requires assiduous study and single-minded devotion to the task at hand. This is perhaps even more so in the profession of arms and especially in the practice of the relatively new military capability generated in and from the third dimension. When air power is discussed in general terms, there is a tendency among all of us who dabble in its strategy and doctrine to consider the capabilities of air forces that are large in their size, capacity for sustained operations and technological developments to formulate our opinions. This is inherently flawed, because the majority of air forces around the world would not fall into the category of 'large forces' in at least two of the three attributes that I have mentioned. An analysis of the principles that guided the actions and thinking of Air Chief Marshal Lal while he steered the future of the IAF would give us a graphic example of effectively dealing with constraints not only in air power terms but also in political and other external influences.

Background, Education and Flying

Pratap Chandra Lal was born on 6 December 1916 at Ludhiana, in Punjab, into a family of lawyers and civil servants. During his early years in India, he had been enthralled by the sight of aircraft flying low over the town and in 1929 had gone up for a ten-minute joy-ride in an open cockpit. His family being well-to-do and the tacit support of his father facilitated his fulfilling the childhood fascination with flying by taking flying lessons and becoming a licensed amateur pilot when he turned 17 in 1933. However, the family wanted him to follow in the footsteps of his grandfather who was a barrister of the Middle Temple, and in September 1937 Lal left for England to study law, also at the Middle Temple. Once there, he simultaneously took up a course in journalism at the King's College in London, completing it in 1939. The early journalistic training gave him the capacity for attention to detail, while his literary inclination ensured more than adequate capability for abstract thought. This combination provided the background for a comprehensive development of clear foresight tempered with the ability for detailed long-term planning as his career progressed.

In 1939 he returned to India to visit his parents, paying for the trip with money earned by writing a number of articles for the *Manchester Guardian*. When World War II broke out the Middle Temple was closed and Lal was stranded at home.

The IAF had been formed on 8 October 1932, but had only one squadron of three flights at the outbreak of World War II. The Indian Government appointed a committee in 1939 to suggest measures for India's defence and on its recommendation Coastal Defence Flights were formed, to be manned by IAF Volunteer Reserves. All Indians

who held flying licences were invited to join this Volunteer Reserve and Lal grabbed the opportunity in November 1939, as an alternative to the uncertainty of returning to England to complete his studies. The prospect of flying military aircraft also played an important role in the decision that changed his entire future.

Lal graduated as a navigator and because of his excellent performance was made an instructor almost immediately. Although he was rated as an above average instructor, his ambition to be a pilot made him simultaneously take flying lessons. He was declared an operational pilot in 1941. He was an exceptional pilot and was employed as a flying instructor immediately on completing his own training.

To have become an instructor in navigation and then in flying immediately on completing training is a unique distinction. This achievement is also demonstrative of Lal's temperament and professional attitude towards flying. He continued instructional duties until mid-1943.

World War II

By early 1943, the war reached South-East Asia and the Japanese Army was threatening India. Although ensconced in a comparatively safe instructor's position, Lal was not comfortable living in a peace station while others were risking their lives to defend the nation. On his persistent request, he was posted to No 7 Squadron in October 1943. The squadron was based at Campbellpore near Lahore for conversion to the Vultee Vengeance dive-bomber, the Allied answer to the famous German Stuka. A particular incident at this juncture is indicative of the single-minded devotion to detail and the capacity for planning and executing solutions to complex problems that Lal was to display throughout his further career. The squadron did not have a qualified instructor to convert them and after a number of urgent and repeated requests, an instructor was made available from the factory. Sadly, in the first demonstration flight the instructor failed to pull out of a steep dive and was instantly killed.

This not only raised the question of the airworthiness of the new bomber, but also left the squadron to find its own ways to convert. Flight Lieutenant Lal rose to the occasion and, with his astute intelligence and exceptional flying skills, assumed the role of the squadron flying instructor and not only converted the squadron but also formulated the standard operating procedures.

The squadron took part in a close support exercise with General Wingate's Chindits in preparation for the General's second Burma expedition and received a letter of appreciation from General Syms for their excellent performance. Flight Lieutenant Lal was by now the Flight Commander and on 10 March 1944 the squadron moved to Kumbhigram, from where they were almost immediately employed in close air support duties. During this three-month deployment, Lal was mentioned in despatches for his excellent flying skills and leadership under extremely difficult conditions.

On 21 June 1944, Squadron Leader Lal took over command of No 7 Squadron and after four months, in November 1944, was asked to convert the unit to Hawker Hurricane

fighter-bombers. Once again Lal displayed the planning skills and passion for efficiency that were to become his hallmarks. While the aircraft were made available, the technicians were not trained on them. The new squadron commander, however, planned the conversion to its minute details. The achievement was that the unit flew a total of 1293 hours in conversion in a span of six weeks, while the technical personnel were being trained on-the-job. Lal paid special attention to the cooperation between the maintenance crew and operators, again a trait that stood him in good stead in years to come. The squadron was fully operational by February 1945 and left for the Burma theatre on 21 March 1945.

No 7 Squadron operated from Sinthe in Burma, mainly in the photo-reconnaissance role in support of 33 Corps of the 14th Army. The unit flew extensively, doing 754 hours in May alone, and an appreciative 33 Corps presented it with a trophy to commemorate their assistance. The squadron was withdrawn from further active duty and returned to Lahore by September 1945. On 19 October 1945, Squadron Leader P.C. Lal was awarded the Distinguished Flying Cross (DFC) for his initiative, leadership and operational flying in hazardous conditions in the face of strong enemy opposition.

This recognition once again gives us an insight into the dedication, steadfastness and professional no-nonsense approach that Lal was to display throughout. It is noteworthy that he received the DFC not for an act of flamboyant gallantry, but for cool determination and calculated and repeated attention to detail for getting the job done. His attachment and loyalty to his colleagues and juniors was later to become almost legendary, but the first inkling of this aspect of his nature was perhaps openly displayed at this time. When asked how much the DFC meant to him he replied, 'Well, I value my DFC perhaps more than anything else, but believe me, I would gladly give it up ten times over if it can bring back any one of those great friends I lost in the war.'

Independence and After (1947–1963)

Independence and the partition of the sub-continent into India and Pakistan took place in August 1947. The young Royal Indian Air Force, all of ten squadrons, was divided between the two newly independent nations. India got six squadrons and one flight, and a commensurate amount of manpower. However, nearly all the permanent air bases were located in the region that became Pakistan and the fledgling IAF had to build its infrastructure almost from scratch.

There were very far-reaching changes taking place in the command level appointments within the IAF. Until then, RAF officers had held the senior appointments in Air Headquarters and most of them left within a short span of time after independence. Lal was promoted to Group Captain and became the Director of Training and Plans. His primary task was to lay a strong foundation for the subsequent development of the IAF into an effective fighting force. Since India was drawn into a war with Pakistan in 1947, Lal's first task was to find aircraft and equipment to meet the immediate needs of the force.

There were instances during this time when the Group Captain ran foul of very powerful political leaders with vested interests in obtaining certain military equipment. But his upright and straightforward approach to such situations and his meticulous attention to detail ensured that the Service's interests were never compromised, at times to his own personal detriment. In hindsight, it is clear that it was fortuitous that the IAF had such a man of integrity at the head of the procurement team.

He also visualised a centralised officer training academy for the IAF and set in motion the process to build one. He was convinced that without proper training the IAF would not be able to progress as a fighting force of calibre. It took a number of years for the fulfilment of this cherished dream and it must have been particularly satisfying for him to inaugurate the Air Force Academy in 1971 as the Chief of the Air Force. The Academy is today the cradle of leadership for the IAF and the Service has only Lal's vision to thank for it.

In 1954, as an Air Commodore, he was the leader of a team that visited various aircraft design and manufacturing facilities to find a suitable fighter for the IAF. He was personally involved in test flying a number of aircraft and although the Indian Government was on the verge of signing a contract to obtain the Supermarine Swift, based on his personal flying experience on the type, he stopped the deal a few hours before it was ratified. Instead he selected the Folland Gnat for the IAF and this aircraft gave sterling service in two wars.

From 1957 to 1963 Lal was on deputation as the General Manager of Indian Airlines Corporation, the state-owned domestic air transport operator. His extraordinary managerial skills were once again demonstrated when he turned the company around to earn profits for the first time in its history. His vision was once again flawless and he put in place a long-term acquisition program that stood the airline in good stead years after he had relinquished the leadership of the organisation.

Indo-Pakistan Conflict 1965

The Indo-Pakistan war broke out on 1 September 1965 and was fought bitterly for 22 days until a cease-fire was effected on 23 September. The reasons for the conflict or the politics of the time in the Indian sub-continent are not pertinent to this paper and therefore will not be examined. During this critical period, Lal now an Air Marshal, was the Vice Chief of Air Staff and Air Marshal (now Marshal of the Indian Air Force) Arjan Singh was the Chief.

The IAF carried out counter air, offensive sweep and close air support missions from the first day of the war. It was responsible for virtually halting the Pakistani armour advance in the Chhamb sector. The higher command under Lal ensured that field commanders were given prompt reinforcement and replenishment, which in turn ensured increased staying power for the force. While the IAF considered that it had acquitted itself well during the conflict, the Vice Chief analysed its performance more critically. Although he was full of praise for the operators, he analysed the operation

from a larger perspective of the Air Force, cognisant of the fact that even though the IAF had played a vital role in the Kashmir Operations of 1947–48, this was the first modern war that it had fought.

The lessons that he carried from the conflict were to have a great impact on the further development of the IAF in all aspects of its operations. There were six major lessons that Lal identified and set out to correct. First, was the lack of laid down procedures for the provision of close air support to the ground forces. Since the IAF had undertaken a substantial number of missions in this role, it was glaringly visible that this deficiency adversely affected its effectiveness and delayed it at vital moments. Further, he realised that these deficiencies were apparent at all levels of command. Stemming from this, the second lesson was the failure of communications between the Army and the Air Force starting from the highest level to the tactical. Lal has in later years remarked that the dominant personality of the Chief of Army, General J.N. Chaudhari, and his penchant to act as the Chief of Defence Force and relegate the air force to a subservient role, was at least partially responsible for the communication debacle. Throughout his subsequent career, Lal was vehemently opposed to the proposal to have a Chief of Defence Force as the single commander for all three Services and supported strategic level planning to be conducted by a Chiefs of Staff Committee.

Air Marshal Lal accepted the lack of, what he termed, inter-Service cooperation and became the most ardent supporter of the need for what in today's military jargon is called 'jointness'. He pointed to the fact that the Indian Navy did not have an air defence plan for its naval bases as a prime example of this deficiency. He constantly espoused the crucial role of inter-Service cooperation and was convinced that the necessary level of cooperation could only be achieved by it being cultivated from early training days at the beginning of a career. The fourth lesson that he identified was the lack of operational bases with sufficient infrastructure to support and sustain operations near the border, especially in the Rajasthan sector. To ameliorate this situation he commenced the build-up of satellite diversionary airbases capable of supporting fighter operations. These airfields came to be called Forward Based Support Units and played a significant role in the next war that the IAF was required to fight. It was also under his direction that the airfield at Car Nicobar in the Andaman Islands was made into an operational military airfield.

A serious drawback that the IAF suffered from at this time was that almost one third of its aircraft inventory consisted of obsolete aircraft. Lal realised that the IAF would have to strive for greater self-sufficiency by the indigenous manufacture of spares and ammunition, as well as establishing a better system for the disbursement of stores. He initiated procurement of the latest fighter aircraft as well as other air defence and support equipment. The last major lesson he grappled with was his personal understanding that the losses the IAF suffered in the conflict, both in terms of aircraft and pilots, were not commensurate with the value achieved. Having been himself an operational squadron commander in a very high attrition war, he was acutely aware of the impact such a situation would have on the morale of the force. He constantly

exhorted operational commanders to devise innovative tactics to optimise the performance capabilities of their equipment.

The incisive analysis that Air Marshal Lal carried out regarding the performance of the IAF led to some far-reaching changes to its organisation. For his efficient leadership of the IAF during these trying times and his untiring efforts to improve the performance of the force, Air Marshal Lal was honoured with the award of 'Padma Bhushan'—the equivalent of the AO (Officer of the Order of Australia).

Chief of the Air Staff

Between 1966 and 1968 Lal was seconded as the Managing Director of Hindustan Aeronautics Limited (HAL), the only aerospace manufacturing facility in the country. With his characteristic zeal to improve performance, he revamped the moribund and lethargic organisation towards an efficient production planning and control system, established a management information system and formalised the training of the entire workforce. It is a tribute to his untiring effort that all this was achieved within a short three-year span, without the loss or reduction in actual output from any of the factories. His enthusiasm for improving HAL can be found to have its roots in his vision of self-sufficiency for the IAF in terms of equipment and technical support.

In 1969 Lal was promoted to the rank of Air Chief Marshal and appointed Chief of the Air Staff. Although there was no indication that the IAF would be at war again in a couple of years time, the events to follow made it seem as though Lal had some premonition of the ultimate test to come. An exceptional multi-faceted management expert by now, he set out to redress the drawbacks in the concepts, infrastructure and organisation of the Service.

A 'thinking-statesman-pilot', he brought with him a few well-formulated beliefs that he had arrived at after a great deal of critical analysis and deep thought, that were buttressed by his own varied and incomparable practical experience in almost all areas of aviation. First, he firmly believed that the military situation and the political environment from which it arises change constantly, and he took that as a warning against complacency and misguided belief in one's own invincibility, irrespective of the size of the opponent. Lal's clear understanding of this unbreakable yet intangible aspect of civil-military relationship led to the Services having the best relationship with the Government in a long time. This was perhaps one of the high points of his tenure as the Chief.

Second, he was committed to the equality of all three Services at the highest command level and believed that defence planning must be done jointly at the Chiefs of Staff Committee. Only this would ensure complete cooperation in operations. He realised that interdependency and equality of the three Services with each other can only be ignored at one's own peril and, by extrapolation, the peril of national security.

Third, he believed that joint planning at all levels was the key to success and for this to happen the planners needed to be fully aware of the different attributes of the

Army, Navy and the Air Force. Air Chief Marshal Lal felt it was necessary to have a clear understanding of the capabilities of each Service and not so much the detailed individual plans. He considered mutual trust between the Services to be the cementing factor in war winning combinations.

Fourth, Lal believed that although joint planning was of the essence, operational planning as opposed to peacetime training exercises needed to have a built-in capacity to be innovative and should retain the capability to encompass and prevail over the unexpected.

At the tactical level he believed in giving complete independence to the field commanders and supported innovation in battle. He was also a great believer in procuring only suitable equipment and then doing the best possible with it, even if the numbers were inadequate. Lal is on record as saying that unsuitable equipment is a millstone around the neck of field commanders.

With these core beliefs, he started to overhaul the Indian Air Force with rare foresight. He concentrated on three areas—Air Headquarters, logistics and maintenance, and operational readiness. It is testimony to the force of his personality and well thought out arguments that the Government agreed to the reorganisation of Air Headquarters, until then modelled on the World War II pattern, into a modern apparatus, system managing policy and planning. Lal organised the supply, repair and maintenance on a weapon-system basis that paid a very high dividend a few years later.

It was at the operational level that his progressive outlook made the biggest changes. In order to improve inter-Service cooperation, the theme closest to his heart, he established Advanced Headquarters of each operational air command that were collocated with the corresponding army command. Tactical Air Centres were established at all Corps and independent Division level, and trained Ground Liaison Officers placed at the Brigade level. He also instructed the staff to implement a better system for the provision of close air support and to reduce the response time.

He also fast-tracked the replacement of obsolete aircraft like the Vampire and Mystère with more sophisticated aircraft, within the prevailing political constraints. His main achievement in the first few years as Chief was the complete overhaul of the air defence system with the expansion of the radar network and the institution of mobile observation units to plug the gaps that existed in the network.

Lal concentrated on improving the inherent flexibility of the Air Force by creating composite teams of interceptors, fighter-bombers and ground support aircraft that could be switched from one task to the other, and from one theatre to another. He was tireless in his efforts to provide the necessary support to field commanders and personally visited every single station of the IAF. In a little over two years, Air Chief Marshal Lal changed the face of the Indian Air Force and the way it did business by his dynamism, drive, exceptional leadership and foresight.

Crowning Glory – Indo-Pakistan Conflict 1971

In the evening of 3 December 1971, between 1740 and 1745 hours, Pakistan launched simultaneous strikes against IAF bases in Srinagar and Awantipur, Pathankot, Uttarlai, Jodhpur, Ambala and Agra in imitation of the deadly Israeli attacks on Egyptian air bases in 1967. Although it took the Indians by surprise the attack was a poor parody of the brilliant Israeli action. Lal had anticipated such a pre-emptive strike and the IAF aircraft were all either in protected blast pens or in rear bases outside the range of Pakistani aircraft. The IAF responded within a few hours by attacking Pakistan Air Force bases and radar installations. The Indo-Pakistan Conflict of 1971 had officially begun.

Air Chief Marshal Lal had laid down the IAF roles in order of priority as air defence of the homeland and air control, close air support, attacks in the counter air role and other operations. His idea of persistent onslaught on Pakistan air bases was aimed at causing unsustainable attrition to the Pakistan Air Force and the crippling of their airworthiness by destroying support infrastructure. This offensive had the salutary effect of ensuring that the Pakistan Air Force was forced on the defensive and were unable to provide the necessary level of support to their Army and Navy.

Lal had also laid down targets for what he termed the 'air war' as air superiority targets, energy targets and road and rail transportation and communication hubs. The IAF was able to dominate the communication network of the adversary for the duration of the conflict.

The IAF also provided close air support far in excess of expectations. They played a direct part in crucial battles and the close cooperation with the Army and Navy was in stark contrast to that of the 1965 conflict. Apart from traditional and effective close air support, the innovative spirit of the IAF saw a significant contribution provided that altered the course of the war in Bangladesh. The IAF used the Mil Mi-4 helicopters for air-hopping troops, guns and equipment over the formidable riverine obstacles across the Meghna in support of IV Corps in their race to Dhaka. Between 9 and 12 December, a fleet of 12 such helicopters lifted 4061 personnel and over 43 tonnes of material, greatly expediting the fall of Dhaka and the eventual surrender of the military commander.

The IAF also carried out the first post-independence battalion-sized paradrop in Tangail in Bangladesh. A total of nearly 900 paratroopers and their allied equipment were dropped from 50 aircraft in a span of 40 minutes, with only one drop landing outside the specified drop zone. This drop enabled the rapidly moving Indian Army to bypass entrenched enemy positions in Jessore and Khulna, thereby overcoming the geographical barrier of the great Brahmaputra River in their race towards Dhaka.

There is one particular episode that stands out as an example of the highly developed conceptual thinking that Air Chief Marshal Lal possessed. Based on intelligence, he ordered a rocket strike by MiG-21s to be carried out on 14 December on the Government House in Dhaka where the Pakistani Cabinet was meeting. Rockets were

preferred to bombs because, in Lal's own words, '… the aim was not destruction, but psychological effect'. The strike was successfully carried out without any casualties or collateral damage, and the entire Cabinet resigned within the hour! Effects-based operations were already being thought about and implemented without the benefit of a catchy term to identify it.

In a nutshell, the IAF achieved unprecedented air superiority in the Eastern theatre within 48 hours of the start of the conflict and thereafter assisted the ground forces in their rapid advance by offensive strikes on pockets of resistance and the provision of airlift on an as required basis. In the Western theatre, the IAF frustrated Pakistan's Chhamb offensive, disrupted its thrust towards Bhatinda, destroyed Pakistan armour at Longewala and raided infrastructure and energy installations at the main port and commercial centre of Karachi in the south. This was in accordance with the overarching strategic plan that had been fully prepared in advance by the Chief of the Air Force and was achieved with minimal loss. From the IAF's perspective, the operation was a resounding success.

Major General Sukhwant Singh in his book *Defence of the Western Border* writes, 'The credit for this must go to Air Chief Marshal P.C. Lal for the overall conduct of operations and the gallant air units which executed his plan with skill and daring.' Pran Chopra, a distinguished writer of contemporary Indian history, described Lal in his book *India's Second Liberation* as the 'cleverest head' among India's military commanders. In recognition of his sterling services, especially during the Indo-Pakistan War of 1971, a grateful nation conferred the 'Padma Vibhushan' (equivalent of the AC – Companion of the Order of Australia) on Air Chief Marshal Lal.

Lal's tenure as the Chief of the IAF is significant in more ways than its exemplary performance during the 14-day conflict. It was under his direct guidance that the force was reorganised according to modern managerial concepts and turned into an efficient fighting force. On his retirement on 15 January 1973, he handed over as fine a body of professional military aviators as to be found anywhere in the world. Pratap Chandra Lal, would-be barrister and aspiring journalist, had crowned himself with glory as a military aviator and leader of men. On his retirement he received many messages, but one particular telegram from a fighter squadron epitomises the affection the entire air force felt for this unusually modest man. It read, 'You made us touch the skies with glory and paint it shades of "Lal" [Red]. The colour shall be fast for ever. Our "Pratap" [Glory] shall be our light in all weathers. Farewell Sir.'

Conclusion

To summarise the achievements of Air Chief Marshal Lal is an almost impossible task. One can only touch on some of the more visible signposts that he left for posterity within the organisation to which he dedicated his life. More than the actual changes that he instituted to make the Indian Air Force a force to reckon with, it is his intellectual

rigour and forward thinking that lasts as his legacy to a Service that he nurtured and guided from infancy to glorious maturity.

Lal paid meticulous attention to detail and insisted on thorough planning throughout his career, while at all times being fully aware of the larger picture and the contribution his flight, squadron, base and finally the Air Force had to make towards national security. He had the intelligence and the intellectual bent of mind to be a long-term visionary but he tempered it with a fighter pilot's pragmatism and purposefulness to achieve the vision against opposition, fighting all odds by sheer force of character and unsurpassed integrity. He led by example at all times, but was a tough and tenacious commander who did not suffer incompetence easily. He was a demanding leader, but shared the hardships of the people he led in equal measure.

From an air power perspective he summarised the factors he considered to be the most vital elements to winning wars as:

> The two indispensable factors, of equal importance in winning a war it is stressed again, are firstly efficiency within the limits of one's own responsibilities and secondly cooperation among the three Services from the beginning till the end, from the senior most level to the junior most.

Air Chief Marshal Lal was one of the main pillars on which the edifice of the Indian Air Force was built. It was he who set the IAF up with all the other modern air forces of the world. A man blooded in battle, brilliant in his appreciation of the security needs of a struggling nation, unparalleled leader of fighting men, successful commander with an intense love for the Service that he so ably served and the men that he led. A self-effacing, extremely modest man, who while addressing officers and men at an Air Force base on one of his farewell visits said:

> I do not like war myself. But it is our duty to be ready to protect our country against any misadventure by the enemy.

I am proud and feel privileged that it was such a man as this who pinned on my fighter pilot's wings and commissioned me into the Indian Air Force as a Pilot Officer 34 long years ago.

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Mr Sanu Kainikara

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Master of Air Power: General Buster Glosson

Mr Gary Waters

Introduction

Buster Glosson has been referred to as the 'architect of the air campaign'[1] against Iraq in 1991. Before exploring Glosson's experience, personal qualities and characteristics, we need to set his success in 1991 in context.

The initial air campaign plan was devised by Colonel John Warden from his Checkmate Cell[2] in the Pentagon. The Joint Force Air Component Commander—Glosson's boss—was Lieutenant General Chuck Horner. So, if we wish to see Glosson as the architect of anything, it is probably the Air Tasking Order (ATO) that set out the detailed missions the aircraft were to fly. In essence, Warden architected the concept, Horner architected the strategy and Glosson architected the tasking order, using Lieutenant Colonels Dave Deptula and Sam Baptiste to prepare the plan for attacking strategic and tactical targets respectively. Indeed, Horner referred to Deptula as 'the guru of the strategic air campaign that rewrote history'.[3]

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1 General Sir Peter de la Billiere, *Storm Command: A Personal Account of the Gulf War*, Harper Collins, London, 1993, p. 114. The General was the UK ground forces commander in the Gulf War of 1991.

2 Checkmate was a unique directorate in the USAF Plans area in the Pentagon known for encouraging independent thinking and analysis on important combat employment issues. See Richard T. Reynolds, *Heart of the Storm: The Genesis of the Air Campaign Against Iraq*, Air University Press, Maxwell Air Force Base, Alabama, January 1995, p. 16.

3 Rick Atkinson, *Crusade: The Untold Story of the Persian Gulf War*, Houghton Mifflin Company, Boston and New York, 1993, p. 63.

If we turn to Rich Reynolds, we receive a useful perspective on Glosson and Deptula—'Glosson became the engine that drove the Desert Storm air campaign. If Glosson was the air campaign engine, then surely Dave Deptula was the fuel.'[4]

Turning to the ATO, it was Air Marshal Sir William Wratten (who was the UK one-star air commander in the Gulf) who said, 'Planning an ATO in such detail demands that one man only such as General Glosson had overall responsibility, supported by an experienced and cohesive team working to clear priorities assisted by computerised planning aids. Otherwise it simply cannot be done.'[5]

The Man

Buster Glosson joined the United States Air Force (USAF) in 1965 as a Second Lieutenant. By the time he retired in 1994, he had reached the rank of Lieutenant General. Schooled and raised in North Carolina, Glosson flew in Vietnam, commanded the 414th Fighter Weapons Squadron at Nellis Air Force Base (AFB) (Nevada), commanded the 347th Tactical Fighter Wing at Moody AFB (Georgia), and commanded the 1st Tactical Fighter Wing at Langley AFB (Virginia). And he spent the seven months from August 1990 to March 1991 in planning, executing and commanding all participating Air Force fighter wings in Operation *Desert Storm*.[6]

Glosson believed that of all the ways of waging war, the only sane one was the one that accomplished national objectives with the minimum loss of life. He believed wholeheartedly in the importance of surprise and deception, but felt that too many military tacticians paid only lip service to that and still ended up in frontal attacks that saw thousands die.[7]

He confesses he is aggressive and ruthless, but demanded of himself and others the intellectual capacity to avoid unnecessary losses.[8] Indeed, one of Glosson's quotable quotes was 'minimum loss of life—there is no compromise'.[9] This probably had more to do with his experience in Vietnam than anything else, where he lost 14 out of 26 aircraft over a three-month period from May 1971.[10]

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4 Reynolds, *Heart of the Storm: The Genesis of the Air Campaign Against Iraq*, pp. 133 and 134.

5 Air Marshal Sir William Wratten, 'Operation Desert Storm – The Air Commander's View', in Group Captain N.E. Taylor (ed.), *The Gulf War and Some Lessons Learned*, Proceedings of an Air Power Conference held in London on 4 September 1992, pp. 59–60.

6 This is expanded on in General Buster Glosson, USAF [Ret.], *War With Iraq: Critical Lessons*, Glosson Family Foundation, Charlotte, North Carolina, 2003, p. x.

7 ibid., p. xi.

8 ibid., p. xii.

9 ibid., back dust jacket and p. 290.

10 Atkinson, *Crusade: The Untold Story of the Persian Gulf War*, p. 65.

Glosson was known for his fiery temper and fighter pilot get-it-done attitude.[11] Atkinson refers to him as brusque and profane, tireless and supremely confident.[12] This confidence would have been helped by the investiture from Horner and the Commander-in-Chief (CINC) General Norman Schwarzkopf, as the chief planner and commander of the tactical air forces, which lent Glosson the authority of a three or four-star General. The profanity comes across in a number of regular comments attributed to him such as 'pimples on the ass of progress' and 'Bullshit! Do you think I'm brain dead.'[13]

'Moon-faced, with a shock of white hair, incipient paunch and North Carolina drawl, Glosson resembled less the prototypical fighter jock than a Capitol Hill lobbyist.'[14] At the end of his Service career, Glosson was said to have left behind more enemies than friends. He was disliked and referred to in some circles as 'Bluster'.[15] He blended 'cajolery, dialectic, and raw resolve to prosecute the air war as he thought best. Never quite disobeying, he could be wilfully dense, feigning confusion or choosing to clarify the CINC's intent at a later time.'[16]

Glosson looked to conserve force where he could, to limit destruction, to concentrate on vital centres, and to be smart about all of this. Not surprising, he comes across as a strong air power advocate who argued that air power could bring mass to a culminating point in a timely fashion, with the flexibility to move from one point to another as necessary. Used correctly, air power could go beyond brute force.[17]

He was an avowed Billy Mitchell[18] fan and believed that the Gulf War of 1991 underscored Mitchell's basic thesis that air power could evolve sufficiently to shape and dominate war itself. To quote Glosson, 'Operation Desert Storm was the watershed change. Mitchell had it right, only he did not have the technology to make it happen. I did.'[19]

His blustery temperament 'obscured a shrewd, analytical intelligence and a gift for innovation. Bold enough to risk failure, Glosson infused the strategic air campaign with elan and contributed several tactical triumphs. He served well the cause.'[20] Michael Gordon and Bernard Trainor refer to Glosson as 'one of the few larger-than-

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11 Reynolds, *Heart of the Storm: The Genesis of the Air Campaign Against Iraq*, p. 133.

12 Atkinson, *Crusade: The Untold Story of the Persian Gulf War*, p. 64.

13 ibid.

14 ibid.

15 ibid.

16 ibid.

17 Glosson, *War With Iraq: Critical Lessons*, p. xii.

18 Mitchell was a US combat pilot in World War I, who saw the value of air power and argued its merits as a decisive, strategic weapon, even to the extent of being court-martialled for his outspoken criticism of the prevailing doctrine. For further discussion on his theories see Edward M. Warner, 'Douhet, Mitchell, Seversky: Theories of Air Warfare', in Edward Meade Earle (ed.), *Makers of Modern Strategy*, Princeton University Press, Princeton, 1943.

19 Glosson, *War With Iraq: Critical Lessons,* p. xii.

20 Atkinson, *Crusade: The Untold Story of the Persian Gulf War*, pp. 310–11.

life personalities that could be found at the Pentagon.'[21] He had a rapport with his superiors, cared about his people, was well-connected, was a skilful politician and was good at getting things done.[22]

The Early Lead-up – August 1990

Glosson found himself in Bahrain when Iraq invaded Kuwait on 2 August 1990, where he was the deputy commander of the Joint Task Force Middle East—possibly then in his terminal posting as a Brigadier General. The Joint Task Force Middle East had been in place since the late 1970s as a counter to the then Soviet Union's growing influence in the Middle East.

Glosson was a great believer in the value of command relationships so it was not surprising that on receiving his posting—just under a month before Iraq invaded—he sought out his CINC, General Norman Schwarzkopf, at his Headquarters in Tampa, Florida (MacDill AFB). Schwarzkopf had been in post for two years at that stage.

At squadron officer school, the then First Lieutenant Glosson studied the relationship between Douglas MacArthur and his air commander in the South-West Pacific during World War II, George Kenney.[23] It would seem that the strength of this relationship made an enormous impression on Buster Glosson and he was adamant that he would understand his CINC and earn his trust and confidence.

Lieutenant General Charles (Chuck) Horner was the Central Command (CENTCOM) Air Component Commander, and he deployed to Riyadh to act as the forward commander in charge of the joint force deployments and the defence of Saudi Arabia.

Horner and Glosson knew each other and had worked together before, so it is not surprising that Glosson arrived in Riyadh on 17 August 1990 to offer his help to Horner in any way possible. He realised that if he was to become involved in evicting Iraqi forces from Kuwait, he would follow Mitchell's line, he would remember the lessons of Vietnam and not use air power as long-range artillery that simply serviced targets, and he would adopt innovative tactics and use new technology as the Israelis had done in

21 Michael R. Gordon and General Bernard E. Trainor, *The Generals' War: The Inside Story of the Conflict in the Gulf*, Little, Brown and Company, New York, 1995, p. 94.

22 ibid.

23 For insights into General Kenney, see John L. Frisbee (ed.), *Makers of the United States Air Force*, Office of Air Force History, Washington DC, 1987, pp. 127–50. See also George C. Kenney, General Kenney Reports, USAF Warrior Studies, Office of Air Force History, Washington DC, 1987.

the Beka'a Valley[24] in 1982, having learnt from their mistakes in 1973 during the Yom Kippur War.[25]

Glosson started planning the air campaign on 18 August and on the 20th Horner asked him to move permanently to Riyadh, which he did on the 21st, just after John Warden had departed after unsuccessfully briefing Horner on his initial campaign plan. Warden had written a book on planning the air campaign[26] when he was at the National Defense University in the late 1980s and devised an Iraq air campaign plan with his Checkmate team. While the essence of Warden's and Deptula's plan was used, Horner had difficulty with the practicality of some of Warden's assumptions. Deptula was part of the Checkmate team and arrived with Warden to brief Horner, who sent Warden home but kept Deptula in theatre. Schwarzkopf and the Chairman of the Joint Chiefs of Staff, General Colin Powell, had been impressed by Warden's briefing on offensive options back in Washington and had asked him to fly to Riyadh to brief Horner.

Horner's deputy, Major General Tom Olsen, was busy running the deployment of US forces and planning the air defence of Saudi Arabia, which is why Horner found the need to task Glosson with developing a 'full-fledged offensive air campaign'.[27] Glosson asked to be briefed on Warden's *Instant Thunder* plan, which was delivered by Dave Deptula. Glosson felt the plan was naive, but it was a good start.

Various arguments have been raised over that initial Warden plan—it originated in Washington, clearly the wrong place; it was conceptually sound but lacked tactical 'sense' in that so much tactical detail was missing; and it was more of a briefing than a campaign plan.[28] Debate over the Warden plan centred more around strategic bombing versus air support than anything else. The first suggests an offensive strategic air campaign at the outset of hostilities, while the second suggests that one waits for the land manoeuvre and fire support plan and then determines the air effort needed to support it. Horner and Glosson realised the need to do both, concurrently if necessary.

Horner wanted someone to take control of the planning and to keep others at arm's length from him (Horner) so he could focus on the bed down of forces. Even though Horner was the Joint Force Air Component Commander, he gave unprecedented freedom of action to Glosson, who not only planned but also commanded the fighter units.

Glosson had clearly made an impression on Schwarzkopf, who offered Glosson a direct line to him as things progressed. Schwarzkopf needed a plan and quickly, so Glosson

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24 See M.J. Armitage and R.A. Mason, *Air Power in the Nuclear Age*, University of Illinois Press, Urbana and Chicago, 1985, pp. 139–43.

25 ibid., pp. 119–21.

26 Colonel John A. Warden III, USAF, *The Air Campaign: Planning for Combat*, Pergamon-Brasseys, Washington, 1989.

27 Glosson, *War With Iraq: Critical Lessons*, p. 14.

28 Edward C. Mann III, *Thunder and Lightning: Desert Storm and the Airpower Debates*, Air University Press, Maxwell Air Force Base, Alabama, April 1995, p. 3.

had little option but to reach for something that already existed. Warden's *Instant Thunder* did that and his deputy Deptula was also in theatre. Glosson was convinced that the six to nine days estimate in Warden's plan was well short of the mark and that the air campaign would need to run longer, and that land forces would ultimately have to go in.

Glosson says that he wanted to apply Mitchell's vision using current technology, to avoid the mistakes of Vietnam, to seek to emulate the spirit evident in the Beka'a Valley campaign and, above all, to keep Schwarzkopf's trust and confidence.[29] He would need to keep both the political and military dimensions in synchronisation if he was to succeed. He would also need a strong Executive Officer, selecting Lieutenant Colonel Rodgers Greenawalt, a RF-4 pilot.

Glosson's immediate challenge was to deal with the notion that *Instant Thunder* would allow air power to win the war single-handedly, to deal with the defensive mind-set that had set in to air force thinking, and to ensure absolute secrecy. In terms of the latter, his planning headquarters became known as the 'Black Hole', chosen for its 'allusion to astrophysics because, like a gravitational sink, information would get in, but nothing would get out'.[30]

While many commentators have lauded the Black Hole team's planning efforts for the strategic air campaign, Glosson is adamant that while his staff saw it as a strategic air campaign, he saw it as a retaliatory plan that Horner and Schwarzkopf could use in the event of an Iraqi attack on Saudi Arabia.[31] At the height of planning, the Black Hole strategic air campaign planners numbered around 45.[32] Glosson and his team had to 'create strategic paralysis and simultaneously prepare the battlefield for a possible ground assault'.[33] This meant coordinating thousands of sorties each day. While Warden's initial target list was 84, Glosson expanded this to over 400.[34]

Glosson's Planning – September 1990 to January 1991

Glosson's recollections indicate that his two greatest challenges as the planning started were the shortage of targeting intelligence and the lack of awareness.[35] He had to argue against the in-theatre status quo and derive the very best intelligence, so he reached back to Washington for raw data, such as photographs from U2 aircraft and satellites. Glosson worked hard to expand his intelligence sources and drew heavily on Rear

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29 Glosson, *War With Iraq: Critical Lessons*, p. 21.

30 Richard P. Hallion, *Storm Over Iraq: Air Power and the Gulf War*, Smithsonian Institution Press, Washington, 1992, p. 143.

31 Glosson, *War With Iraq: Critical Lessons*, p. 25.

32 Mann, *Thunder and Lightning: Desert Storm and the Airpower Debates*, p. 76.

33 ibid., p. 77.

34 Hallion, *Storm Over Iraq: Air Power and the Gulf War*, p. 143.

35 Glosson, *War With Iraq: Critical Lessons*, p. 25.

Admiral Mike McConnell (the J2), who ran the intelligence operation for the Joint Chiefs of Staff back in the Pentagon, and Warden's Checkmate Cell. He also drew on the British, the Kuwaiti resistance and the royal families of the Gulf region.[36]

He also had to argue with Horner over the value of precision—being adamant that the F-117 would be key. Glosson had been involved in the classified prototype program known as 'Have Blue'[37] and was a strong advocate of stealth and precision; hence, he factored in F-117 and Tomahawk Land Attack Missiles (TLAMs) as his key pillars for attacking strategic nodes. In a US oral history series, Glosson says that he saw that the combination of the F-117s at night and TLAMs during the day would apply pressure continuously on the Iraqi leadership in Baghdad and they would not be able to move freely around the city.[38] Indeed, they would know that war had arrived on their doorstep.

Initially, Glosson thought the air campaign would last two months but was hoping for three weeks. He set Deptula to putting the detailed plan together. Glosson had prioritised the strategic targets a little differently from Warden—operations centres; leadership; communications; and Nuclear, Biological and Chemical (NBC) targets.[39]

Horner heard the plan on 26 August and was not impressed—he did not think it flowed, was too mechanical and would be difficult for Schwarzkopf to comprehend immediately. Glosson freely admits he was not astute enough to allay Horner's early concerns and too dictatorial with his planners to bring them in on all of his innermost thoughts. Glosson learnt quickly and the briefing to Horner on the 28 August went far more smoothly.

There were too many targets for resources, so Glosson adopted an effects-based approach, allocating effort to destroy NBC sites, bridges and mobile assets, but reducing the effort against leadership, communications, aircraft shelters and general facilities to cause disruption rather than outright destruction.

Glosson railed against the inadequacy of CENTAF intelligence[40] so he drew increasingly on the Checkmate team of Warden's, back in the Pentagon. This was crucial to Glosson's success. And he demanded the material direct as he did not want Horner distracted by too much material and he did not want Horner automatically pulling out and discarding Warden's material.

The deployment through mid-August to mid-September that constituted Operation *Desert Shield* was not Glosson's business so he could really focus on building the air campaign plan. He briefed the plan to the unit squadron commanders and weapons officers on 2 September, asking for feedback to ensure that he had a sound plan. They

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36 ibid., p. 98.

37 ibid., p. 27.

38 From Frontline's Oral History, http://www.pbs.org/wgbh/pages/frontline/gulf/oral/glosson/1.html.

39 Glosson, *War With Iraq: Critical Lessons*, p. 29.

40 ibid., pp. 25–26.

offered some very useful comments and Glosson chided himself for not having brought them in sooner, remembering how the squadrons had no input into the planning during the Vietnam War. Indeed, Glosson made sure that all fighter units had people involved as the plan evolved and he visited all the units that were to come under his command. He wanted his crews to know why they were doing things.

On 5 September, Glosson and Deptula briefed Schwarzkopf. The CINC was exuberant and praised their efforts as he now had a plan that could be effected within 36 hours from 13 September if need be.[41] Next, he had to brief Powell. In the lead-up to the Powell briefing, Glosson had to pacify the Navy and Marines as he needed all of the available air power to hit the critical targets early and overwhelmingly. That he was able to manage this in the midst of differing doctrines and competing priorities is surely a tribute to his communication skills and powers of persuasion.

The Powell briefing on 13 September was scheduled for 45 minutes and ran for 90. Just as Glosson had to persuade Horner on the efficacy of the F-117s, so too had he to persuade Powell on the importance of TLAMs. Other than that, the briefing went well, with a clearly heavily engaged and supportive Powell.[42]

With his plan in place, Glosson started getting edgy—he now wanted to launch it and October provided almost perfect weather. After a flurry of activity to get ready, nothing was happening and he was starting to become impatient.

Glosson then went to Washington in October to brief the President on the air campaign, in concert with others who briefed on the ground offensive and the CINC's perspective, noting that Powell had specifically asked Schwarzkopf to stay in theatre. On the day before the briefing, Powell and others warned Glosson not to oversell the air campaign and to play it down.[43] He chafed at this, sought Schwarzkopf's advice, which was to brief the plan as he had done before. Glosson did just that. At 1500 on 11 October 1990, Glosson briefed President Bush, Vice President Quayle, Secretary of Defense Dick Cheney and other key executives.[44]

As Glosson was rehearsing his briefing for the President, Powell had also remonstrated with him that he could not guarantee the President that the Iraqi Army would pull out of Kuwait, to which Glosson's rejoinder was 'That's right ... But I can guarantee him that if he'll wait long enough, I'll destroy it in place.'[45]

While in Washington, Glosson also visited key Congressmen and Senators, showing his political side, as well as his wife and daughter (his son being away), demonstrating that he did have a sense of balance as well as political astuteness.

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41 ibid., pp. 37–38.

42 ibid., pp. 47–48.

43 ibid., p. 58.

44 The details of the briefing are outlined in Glosson, *War With Iraq: Critical Lessons*, pp. 59–63.

45 Atkinson, *Crusade: The Untold Story of the Persian Gulf War*, p. 217.

Back in theatre, Glosson found himself waiting as the order to attack was not given; so he turned his attention to fleshing out the detail of the subsequent phases. Thus far he had concentrated on the six-day Phase I (attack the strategic targets), now he had time to lay out the detail for the one-day Phase II (establish air supremacy in the Kuwaiti Theatre of Operations) and the fifteen-day Phase III (attack the Republican Guard units and Kuwait to shape the battlefield). As October rolled into November, Glosson was feeling a lot more comfortable with the planning and he had heard (on the 'grapevine') that he had been selected for promotion to Major General.

Glosson's direct approach worked again when he convinced Schwarzkopf to call Powell and get authority to release the TLAMs on command, which flew in the face of established procedures.[46] That happened, showing both Glosson's persuasiveness with his superiors and his reluctance to be constrained by established protocols. He felt that unity of command was crucial and simply did something about it.

Another example that underscores Glosson's political astuteness is when he heard Schwarzkopf referring to his 'theatre campaign', he (Glosson) instructed his Executive Officer, Greenawalt, to remove the 'Air Campaign' title from all briefings and replace it with 'Theatre Campaign.'[47] Yet another example of Glosson's 'get on with it' approach was that when he was alerted to concerns over the F-15E's capabilities, he got himself into a simulator to understand the nature of the concerns and ensure that they were not 'show-stoppers.'[48] Indeed, in the face of a lot of nervousness on the part of others, he had to hold out for the F-117s, F-15Es and JSTARS.[49]

In December 1990, Horner appointed Glosson as commander of the 14th Air Division and gave him command of all the USAF fighter units in the Gulf. So, not only had he controlled the planning of the air campaign, Glosson was about to command its execution.

The F-15Es were based at Thumrait in Oman and Glosson moved to get them to Al Kharj in Saudi Arabia, some 1100 kilometres closer to their targets. Again, his political astuteness and connections, this time with the Saudis, came to the fore, as Horner doubted the Saudis would ever agree to basing at Al Kharj. By 17 December, Glosson had the aircraft established at the Al Kharj bare base.[50]

That same day, Glosson assembled all of his Wing Commanders in the Black Hole in Riyadh. He told them that he wanted them to lead by example and to each fly a mission in the first 24 hours. He told them that he would not compromise on integrity and any mistakes were to be relayed to him immediately. He told them not to lose people unnecessarily, saying do not accept a single loss unless you can convince yourself that everything

46 Glosson, *War With Iraq: Critical Lessons*, p. 71.

47 ibid., p. 74.

48 ibid., p. 85.

49 JSTARS – Joint Surveillance and Target Attack Radar System.

50 Glosson, *War With Iraq: Critical Lessons*, pp. 89–90.

possible was done to prevent it.[51] Glosson's parting comment to them was 'command and lead as if they are your own sons and daughters.'[52]

Further insights into Glosson's thinking can be seen through reference to his strategic principles for the Gulf War. These were:

- Minimum loss of life—the outcome of war is a given—we win!
- People win wars—so I reviewed the abilities of each commander and leader in my mind.
- Backbone would be stealth and precision, the F-117. I reminded myself not to overload them.
- Precision, using F-15E, F-111 and A-6, must be maximized night after night.
- Aggressive and ruthless—timidity loses lives.
- Sequence and degree of destruction—must constantly review and update—the most fluid part of the strategic air campaign—Saddam's actions could dictate changes.
- NBC—I wished I could have higher confidence in our intelligence for those targets.
- Republican Guard—only force to support Saddam after the war—be ruthless with them!
- Iraq's leadership and communications—must ensure massive disruption maintained day after day.
- Baghdad and the entire country had to know they were at war—no exceptions.[53]

In his own words, Glosson is hard-nosed. He does not accept fools nor mistakes very well. He felt that he had a lot of personal baggage, but at least he knew that and he knew how to fireproof himself against that baggage and his own weaknesses.[54] To that end, he relied on a select team that included Dave Deptula to test all of the assumptions, to do the 'what-if' analysis, and to look at the operational implications of certain decisions. However, in the end he knew that it was his responsibility and his alone to ensure that there was no strategic mistake in his plan.

Notwithstanding his hard-nosed approach to subordinates, he could display signs of rebelliousness himself. On 27 December he went to Al Kharj and flew one of the F-15Es, knowing the rules about general officers flying solo. Horner rebuked him, but

51 ibid., p. 90.

52 ibid., p. 91.

53 ibid., p. 97.

54 ibid., p. 99.

Glosson felt it had been worth it.[55] One hazards to guess how Glosson would have handled one of his subordinates breaking any rule like that that he had laid down.

Glosson did seem to read his superiors well. For example, he knew Schwarzkopf was concerned about there being enough air power overhead the ground forces once the land campaign started, and indeed, had asked for the A-10s to be held back until Phase IV (the ground offensive against the Iraqi forces in Kuwait and beyond). In January 1991, as Schwarzkopf became concerned over the amount of air power available for Phase I, Glosson quickly added the A-10s, assuring Schwarzkopf that none would be lost and that they would be available for the land campaign as he had directed at the outset.[56]

In January 1991, Glosson again visited the squadrons—by now he had 600 aircraft and 1400 aircrew in the 14th Air Division fighter units.[57] His briefing as he travelled around the units from 10 to 14 January explained the broad plan and how each unit and crew fitted in. His advice to his crews was to 'make sure your take-offs and landings stay equal'[58] and that there was 'not a damn thing in Iraq worth dying for until the first American or allied soldier crosses the border'.[59]

On the eve of battle, Glosson wrote his rules for war execution in his diary:

Care more than others think is wise

Risk more than others think is safe

Expect more than others think is possible.[60]

The War – 17 January to 28 February 1991

The War started at 0300 local time on 17 January 1991. The execute order simply stated: 'Execute Wolfpack. H Hour is 0100 Zulu.'[61] On the night before the launch (with just hours to go) Glosson was restless so he went for a haircut and then tried to sleep. He could not so he found himself in the Black Hole several hours before launch.

As the first hour of the war closed, Glosson kept his staff on their toes by continually asking questions about why one aircraft had diverted, why another had not checked in, and so on. In those early hours, Glosson chided himself that he had not considered

55 ibid., p. 100.

56 ibid., p. 107.

57 ibid., p. 108.

58 ibid., p. 110.

59 ibid., pp. 110–11.

60 ibid., p. 116.

61 ibid., back dust jacket.

rapid enough bomb damage assessment (BDA), and he simply could not get enough up to date information.

Notwithstanding the early success, Glosson continually reviewed what was working well and not working well, making adjustments accordingly. Some 68 changes were made to the Air Tasking Order on the second day, 449 on the third, 813 on the fourth and over 975 on the fifth day. By the sixth day they had settled down to 552, which was typical from then on.[62]

The relationship that Glosson built with Mike McConnell was a useful one, with Glosson obtaining great situational awareness of what the issues were back in the Pentagon with the Joint Chiefs of Staff. This enabled Glosson to 'get on the front foot fast' on several occasions, particularly in relation to Scud attacks, where he was advised to carry out some 'what-if' analysis in case Powell asked the question. The closeness of the Glosson/McConnell relationship was certainly supported by effective and reliable strategic communication links that enabled either to get through whenever they wished and for Glosson to receive responses in a very timely fashion, such as four hours for target photographs.[63]

Glosson believed in his intuition for warfighting and at times did take unpopular courses of action, which seem to have worked. He drove his good people almost mercilessly and was quick to find fault. That said, he does seem to have supported them and backed their suggestions when they accorded with his own intuition.

Glosson saw first-hand the potential limits of attacking targets for effect rather than destruction. This required superb intelligence about the targets and absolute precision. These factors did not always come together and there were times when insufficient effort was used. Hence, Glosson looked at targeting in detail and even felt he was micro managing—but he saw what he was doing as crucial.

While he gave his key planners a fair degree of latitude, he would come in and change things, which he accepted must have been frustrating for his people. There is a hint of arrogance that comes through in some of his dealings with people. For example, he argued that 'there's no reason to spend a lot of time trying to explain something to a group of people who are not going to understand what you just explained. I made sure that the key decision makers and the key planners understood, and they'd keep the rest of the team moving in the right direction.'[64]

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62 Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey*, Volume I, Part II, Washington DC, 1993, pp. 216–18; Glosson, *War With Iraq: Critical Lessons*, p. 135.

63 Mann, *Thunder and Lightning: Desert Storm and the Airpower Debates*, p. 155.

64 Glosson, *War With Iraq: Critical Lessons*, p. 156.

Glosson was adamant that from Day Four on, his planners had to be able to make adjustments very quickly—adlibbing would be key. He had a problem with the F-117s that depended on very strict mission planning for success and while Glosson appreciated this, he did have to push them on a couple of occasions to move away from their usual approach and afford him the flexibility he needed for particular short-notice missions.[65]

Glosson's view (which accords with Horner's) of the battle for Khafji, where Iraqi armour was decimated, showed that where one side has total air superiority, the other side cannot do anything on the ground.[66] The preference throughout, of course, was to get the Iraqis on the move so they could be attacked more easily than when in their dug-in positions.

As the weather deteriorated, Glosson found himself taking more risks than he had anticipated, especially with the F-117s and in-flight refuelling tankers, and was criticised by fellow officers. He would not be swayed and went with his instincts and in the end did not lose any F-117s or tankers, so he is probably entitled to claim some sense of vindication.[67] On the negative side, however, he ignored advice from Horner and his experts on one occasion that resulted in the loss of two A-10s because he pushed them too far north and insisted they fly too low.[68] He also made other mistakes, particularly in adopting incorrect tactics for dropping the bridges, where he initially used unguided munitions despite protestations from his targeteers, but later accepted advice and successfully used laser-guided bombs.[69]

By the tenth day, Glosson realised that he had become caught up in the 'activity trap' and was not taking time out to think ahead, so he set aside about an hour to an hour and a half each day as a 'think period'.[70] As Glosson's role emerged, CNN started to refer to him as the 'intellectual guru of the air campaign',[71] which might explain why Horner was later to bestow that very title on Deptula.[72]

Time lapses between receiving intelligence and re-targeting caused problems. For example, a memo dated 31 January listed a number of targets that had not been struck or damaged. All of those targets were destroyed on 1 February. However, the memo was not received until after 1 February, which meant Glosson had to review all of the targets. This wasted his time and was very frustrating. He also had several arguments

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65 ibid., pp. 160–61.

66 Frontline's Oral History at http://www.pbs.org/wgbh/pages/frontline/gulf/oral/glosson/2.html. The battle for Khafji is discussed in Glosson, *War With Iraq: Critical Lessons*, pp. 177–85.

67 Glosson, *War With Iraq: Critical Lessons*, pp. 163–67.

68 Atkinson, *Crusade: The Untold Story of the Persian Gulf War*, pp. 311–13.

69 ibid., p. 311.

70 Glosson, *War With Iraq: Critical Lessons*, p. 168.

71 ibid., p. 185.

72 Horner is quoted in Atkinson, *Crusade: The Untold Story of the Persian Gulf War*, p. 63.

with Lieutenant General Cal Waller, who had responsibility for putting forward the prioritised list of ground targets from the Army and Marines. Glosson was clearly stubborn with Waller and he shored up his position with Schwarzkopf by reinforcing with Schwarzkopf that he would only attack targets that accorded with the CINC's priorities and that he (Glosson) deemed to be worthwhile. The relationship between Glosson and Waller never improved, but Glosson had ensured 'top cover' for his continuing disagreements with Waller.[73]

This stubbornness or hard-nosed attitude is also in evidence in his dealing with the Navy, where he refused to provide tankers for Navy support aircraft because he believed their doctrinal ratios of tankers to aircraft to be too high. This arose mainly because, in Glosson's view, the air threat did not warrant the large numbers of air-to-air aircraft the Navy wanted to support their attack missions, which had its basis in Navy doctrine.[74]

He was also prepared to stand up to Schwarzkopf when he thought Schwarzkopf was wrong or being misled. One example was when Schwarzkopf wanted the Republican Guard bombed before the surface-to-air missile sites had been destroyed. At the same time, Glosson was loyal to Schwarzkopf and his diary entries sometimes reflected his concern at having to go against his preferences to support Schwarzkopf.[75] This was especially so with what he thought was a premature abandonment of the strategic air campaign.

As the air attacks on the Republican Guards progressed, it became clear that attrition rates were not as high as anticipated, particularly of tanks. Consequently, Glosson drove his planners to come up with more innovative tactics—such as tank plinking,[76] bombing from lower altitudes, and use of killer scouts.[77] Similarly, he also had to encourage the F-15C/AWACS combination against Iraqi aircraft to adopt innovative tactics, one of which was the mounting of barrier combat air patrols along likely exodus routes from Iraq, to catch the Iraqi aircraft as they fled to Iran.

Glosson freely admitted that he made many mistakes, a key one being his estimation that Iraqi aircraft would not fly west to Iran and so the initial patrols covered only routes to the east. That was quickly remedied.[78]

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73 Glosson, *War With Iraq: Critical Lessons*, pp. 202–205.

74 ibid., p. 214.

75 Atkinson, *Crusade: The Untold Story of the Persian Gulf War*, p. 221.

76 Tank plinking involved the use of F-111s and F-15Es with laser-guided bombs (GBU-12s) against dug-in tanks.

77 These innovations are expanded in Glosson, *War With Iraq: Critical Lessons*, pp. 193–96. A-10s and F-16s flew as killer scouts by operating in designated boxes (by latitude and longitude) 30 miles by 30 miles and then divided into quadrants. They identified targets in these kill boxes, relayed the coordinates to other A-10s and F-16s, known as killer bees, that then prosecuted the attacks.

78 Lieutenant General Buster C. Glosson, 'The Desert Storm Air Campaign', in Group Captain N.E. Taylor (ed.), *The Gulf War and Some Lessons Learned*, Proceedings of an Air Power Conference held in London on 4 September 1992, p. 47.

The use of killer scouts saw an order of magnitude increase in effectiveness of the F-16s. Another innovation was for F-16s from the United Arab Emirates (Al Minad) to fly a bombing mission, then refuel and rearm at King Khalid Military City (KKMC), which was 70 miles from the Saudi/Kuwaiti border, fly another mission, land again at KKMC, and carry out a third bombing run on their way home to Al Minad. These multiple short missions with high payloads delivered superior results.[79]

The innovative procedures that Glosson and his team adopted allowed their planning to be more responsive to changing priorities than the traditional formal system. Glosson certainly exploited innovation and informality[80] to get the job done, and done well.

Another insight into Glosson emerges where he refers to two major responsibilities as a combat leader: 'make sure the people understand the mission and take care of the people'.[81] Even in the midst of the ongoing air campaign, he realised the need to make notes on how individuals were performing and coping with the stress of battle.

There were many times when Glosson valued the wearing of his two hats—as campaign planner and commander of all the fighter units. He could approve changes and execute them seamlessly, with no chance of misunderstanding, which helped minimise any friction.[82]

We see further insights into Glosson when he refers to his two principles of war—winning and minimum loss of life.[83] He expands on these as 'winning—there is no substitute' and 'minimum loss of life—there is no compromise'.[84]

After the al Firdos bunker was hit Powell intervened, wanting to approve all targets and to limit severely any attacks on Baghdad. Here we see Glosson chafing at what he saw as unwarranted interfering that went against his professional judgment.[85] Yet, it would seem that is precisely what he had been doing with his key people.

Through the Saudis, Glosson learnt that Allied prisoners of war (POWs) were receiving rough treatment and had been moved to a Baghdad site. Glosson asked Deptula to target it but did not discuss this with Horner or Schwarzkopf so as to keep them insulated from any negative fallout. His intent was to bomb the building with its torture facilities sufficient to force the Iraqis to move the POWs.

The attack happened on 23 February, with the facility being listed as the Ba'ath Headquarters for an intelligence facility and security forces, not as a holding pen for POWs. Glosson had decided to hit just one of the four buildings—the one where the POWs were least likely to be held. As it turned out, the building that the F-117s hit

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79 Glosson, *War With Iraq: Critical Lessons*, p. 207.

80 Mann, *Thunder and Lightning: Desert Storm and the Airpower Debates*, p. 159.

81 Glosson, *War With Iraq: Critical Lessons*, pp. 200–201.

82 ibid., p. 211.

83 ibid., p. 214.

84 ibid., back dust jacket and p. 290.

85 The al Firdos attack is discussed in Glosson, *War With Iraq: Critical Lessons*, pp. 223–28.

actually housed the POWs. However, they were unhurt as they were being held in the lower levels of the building and the weapons used (GBU-27s with instantaneous fuses) were designed to take out the upper floors only.[86]

On 24 February, Glosson called his planning team together and they rehearsed the air support that would be needed for the coming land campaign. It was just as well as they found a glaring omission—they had not allocated any air support to the Egyptian Corps. Once again, Glosson claims his intuition made him go over the planning, feeling that something was not quite right. The date was important because it also heralded the start of the ground war.

At the crucial time that Iraqi forces started leaving Kuwait, Glosson realised he needed as much air support as possible, so he waived the crew rest rule and argued that aircraft would fly as long as the ceiling was above 2000 feet, noting that many units preferred not to fly if the ceiling was below 6000 feet. Glosson accepted full responsibility for any subsequent losses, but he wanted to ensure absolutely that ground forces would have total support.[87]

This risk-taking was consistent with an earlier glimpse we got into Glosson's make up. When he needed his crews in the air nonstop to halt the exodus of Iraqi aircraft to Iran early on in the conflict, he reportedly said he did not care if his pilots were on uppers and downers for the duration, he would straighten them out with doctors after the war.[88]

On 26 February, Glosson devoted 309 sorties to attacking targets on Highway 6, the road out of Kuwait (also referred to as 'Highway of Death').[89] As a result of these and other sorties flown, some 128 tanks, 38 APCs and 401 trucks were destroyed that day.[90] He went after them hard as he had said he would in his strategic priorities.[91]

Glosson's irritation comes through when the cease-fire is declared. He felt it was too soon and had more to do with setting the scene whereby it could be referred to as the 'five-day' war, one less than the Israelis' Six-Day War in 1982 in the Beka'a Valley. What riled Glosson most was the fact that the first three phases of the joint campaign—the air attacks—were virtually ignored as many celebrated the Allied success on the ground.[92] In the end, it came to be known as the '100-hour' war.

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86 This attack against the facility housing the POWs is described in Glosson, *War With Iraq: Critical Lessons*, pp. 240–43.

87 ibid., p. 266.

88 Atkinson, *Crusade: The Untold Story of the Persian Gulf War*, p. 311.

89 Glosson provides his view on the attacks against Highway 6 in Glosson, *War With Iraq: Critical Lessons*,
pp. 264–66.

90 See Keaney and Cohen, *Gulf War Air Power Survey*, Volume V, entry for 26 February 1991, which cites US CINCCENT situation report; Glosson, *War With Iraq: Critical Lessons*, p. 267.

91 These strategic priorities were listed earlier in this paper.

92 Glosson, *War With Iraq: Critical Lessons*, p. 278.

At 0500 local time on 28 February 1991, the war came to a halt (midnight Washington time). Glosson was incensed at the premature end, based as he surmised on Powell's misleading President Bush on just what had and had not been achieved militarily. Most of the commanders in theatre would support Glosson's view, with many thinking that they had finished about 24 hours short of their objectives of finishing the Republican Guard units.[93] When it was over, Glosson called all of his wing commanders and went out a few days later to visit them all, once again.

Schwarzkopf said to Glosson at the end, 'You made this victory possible … Our nation is in your debt. It is impossible for you to get enough credit.'[94] That said, in Schwarzkopf's account of the war he says that Buster Glosson 'gave us a broad range of attack options [that] could be conducted as a stand-alone operation or as part of a larger war'.[95] Of significance, Schwarzkopf refers to Glosson only twice in his book, *It Doesn't Take a Hero*.

As testament to the regard for Glosson after the event, Michael Gordon and Bernard Trainor note in their discussion on the planning for the ground war that the planning staff did not have a Warden 'with a bold plan for victory' nor a Glosson 'to make it happen'.[96]

In terms of aircraft losses, Glosson had estimated at the outset that the coalition could lose 80 aircraft, although he felt it would more likely be around 50. Many others expected much higher losses, including Horner who put potential losses at over 100. In the end, the coalition lost 42 aircraft, of which the USAF lost 14.[97] Glosson was adamant that he had more than enough aircraft in theatre to accomplish the mission[98] and not suffer unnecessary losses.

Immediately the cease-fire was called, Glosson started work on drafting the lessons learnt. At the top of his list was how well the Joint Force Air Component Commander concept had worked. Precision and stealth had proven their worth. His rating at the end was an outstanding strategy, excellent planning and good execution.[99] He felt that all three could and should be improved.

Glosson felt there had only really been two phases—the strategic air campaign and the tactical support of the land campaign. Doctrinally, most airmen would probably have to agree. And the first phase had really continued through until the last day, even if it had been curtailed significantly over the last 100 hours. Notwithstanding the enormous tactical successes of all air assets, the undermanning of the central planning staff and

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93 ibid., pp. 279–82.

94 ibid., p. 285.

95 General H. Norman Schwarzkopf, *It Doesn't Take a Hero*, Bantam Books, New York, 1992, pp. 353–54.

96 Gordon and Trainor, *The Generals' War: The Inside Story of the Conflict in the Gulf*, p. 128.

97 Hallion, *Storm Over Iraq: Air Power and the Gulf War*, pp. 195–96.

98 See Frontline's Oral History at http://www.pbs.org/wgbh/pages/frontline/gulf/oral/glosson/2.html.

99 Glosson, *War With Iraq: Critical Lessons*, p. 287.

the importance of involving the wings in the planning are valuable insights for the future.

In an interview after the war, Glosson commented 'We were not running an air campaign off in one section oblivious to the fact that a land campaign was going to take place in three or four days or three weeks down the road. We were trying to tie it all together in the way that General Schwarzkopf wanted it tied together.'[100]

Glosson kept diaries throughout the war, filling about 340 pages in four different note books. His last entry read, 'The war is over … we won! I pray for the families that lost loved ones … thank you God for your guiding hand.'[101] There are many references to God throughout his diary entries.

When Cheney asked Glosson to identify the most important technology that needed to be developed, Glosson replied, a conventional weapon of at least 500 pounds that can be dropped in any weather with one metre accuracy.[102] The Joint Direct Attack Munition (JDAM) was to become that weapon, and be used subsequently in Kosovo, Afghanistan and Iraq. Glosson's most important operational lesson was the effect of air power, when properly executed, on armies and nation states.[103]

That said, Glosson did expand on that in 1992 at a conference in London, where he listed what he called his 'life saving factors' as: unified objectives, unity of command, air superiority, realistic training, all weather precision guided munitions, stealth, increased range and payload, and positive identification capability (both air and ground).[104]

Conclusion

Buster Glosson did some remarkable things during those seven months from August 1990 to March 1991, but so did many of his key staff, especially Dave Deptula. Glosson was given a lot of latitude by his two immediate superiors, Horner and Schwarzkopf, which no doubt helped him. While he does not sound like an endearing person he was probably the right man at the time, with his good communication skills, strong powers of persuasion, and 'can do' attitude.

Aggressive and ruthless, uncompromising but with a high intellectual capacity, he suffered neither fools nor mistakes. He looked to innovation and a degree of informality to get things done, and he got things done. He was proactive and politically astute. He knew his warfighting business.

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100 Frontline's Oral History at http://www.pbs.org/wgbh/pages/frontline/gulf/oral/glosson/2.html.

101 Glosson, *War With Iraq: Critical Lessons*, p. 288.

102 ibid., p. 289.

103 ibid., p. 290.

104 Glosson, 'The Desert Storm Air Campaign', p. 54.

At the end of the day, we should look no further than Rick Atkinson's parting comment: 'He served well the cause.'[105]

Figure 1 – Western Asia

105 Atkinson, *Crusade: The Untold Story of the Persian Gulf War*, p. 311.

Figure 2 – Iraq

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Air Commodore Gary Waters (Ret'd)

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