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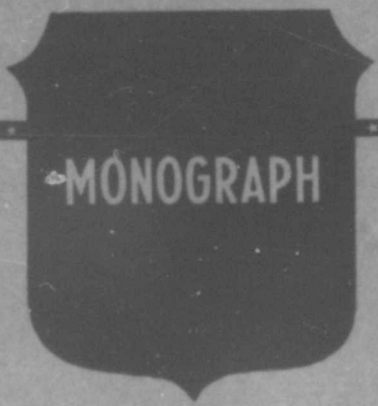
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EARLY THEORIES OF AIR STRATEGY

BY

LIEUTENANT COLONEL DONALDSON D. FRIZZELL

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EARLY THEORIES OF AIR STRATEGY.

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This paper considers the early development of air strategy and air doctrine. The intellectual content of the ideas for employment of the aircraft as a military weapon is the central focus. Technological and political considerations were not treated as primary subjects but only as they impinged upon the development of ideas. A survey of literature revealed three men who were instrumental in shaping the development of air strategy. They were Giulio Douhet of Italy, Billy Mitchell of the United States, and Sir Hugh Trenchard of Great Britain. From their experiences in World War I, these men shaped the early doctrine. By the early 1930s, the role of military aviation in national power was fully recognized. The early aviation theorists agreed on the basic doctrinal issues: some form of air superiority was absolutely essential; air power was essentially offensive in nature; air forces should be unified and organized as independent forces from the ground and naval elements; and strategic bombardment was the primary mission of air power.

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INTRODUCTION

In addressing the development of Air Strategy, the first major problem is to select a place in history to begin. The first recorded ascent was made in 1783; the first successful powered flight came in 1903. These two events were major milestones in aviation history--but clearly did not mark the time when man first started dreaming of flight. The potentialities of aviation and the attendant threads of strategy that embrace the concept of flying machines did in fact predate those historic first flights by many centuries.

The following story serves as a departure point:

Daedalus turned to his son Icarus and said, "My son, be warned! Neither soar too high, lest the sun melt the wax; nor swoop too low, lest the feathers be wetted by the sea."¹

So goes one of history's earliest recorded flight briefings taken from the mythology of ancient Greece. Man has looked heavenward and dreamed of flying for many many centuries--probably since long before recorded history. His dreams were a long time coming true, not reaching fruition until the twentieth century when Orville and Wilbur Wright finally conquered the air in true-powered flight.²

The mythical flight of Daedalus and Icarus was conceived as a means of escape from imprisonment on the island Crete in the Mediterranean. According to the legend, Daedalus, an outstanding craftsman, fashioned two pairs of wings out of feathers, thread, and wax and thereby qualified as the first aeronautical engineer. After donning the wings, the two airmen launched themselves in a north-easterly

direction from Crete, flapped their wings as they passed over the countryside and headed out to sea. Icarus, it seems, was very impressed by the power of flight and began to soar higher and higher, succumbing to a euphoria that many fliers of this century have shared with him. He did not heed his father's warning and soon the heat of the sun melted the wax, bringing him to an untimely end in the Aegean Sea.³

Between the time of the Ancient Greeks and the Wright brothers, many men speculated upon, studied, and experimented with the idea of flying. Carroll Glines wrote " . . . In 1483, Leonardo da Vinci drew his plans for the helicopter and wrote 'there shall be wings! If the accomplishment be not for me, 'tis for some other.'"⁴ Leonardo, the incomparable Florentine, was prophetic beyond even his own expectations--the helicopter was indeed in the future--and so was another Italian, General Gullio Douhet, who was to become the leading air strategist of his time. General Douhet's views will be discussed later in the chapter.

The honor of being the first man aloft was reserved by history for the Frenchman Jean Francois Pilatre de Rozier, who made the first manned balloon ascent ever recorded on October 15, 1783.⁵ To the French also goes the honor of being the first into print with a published prophecy of airpower. Two days after the first successful ascent, de Rozier took a passenger aloft--Andre Girard de Vilette. Monsieur de Vilette's observations appeared in the Journal de Paris on October 20, 1783:

I observed Saint-Cloud, Isty, Ivry, Charenton, and Choisy with ease . . . and perhaps Corbeil, which a light mist prevented me from distinguishing clearly; from this moment I was convinced that this apparatus, costing but little, could be made very useful to an army for discovering the positions of its enemy, his movements, his advances, and his dispositions, and that this information could be conveyed to the troops operating the machine. I believe that it is equally possible, with proper precautions, to make similar use of this apparatus at sea. There, Gentlemen, is an undeniable utility that time will perfect for us.⁶

Ballooning quickly caught the fancy of the public and by 1775 Jean-Pierre Blanchard had achieved the amazing feat of crossing the English Channel in the air.⁷

As intrigued as the world was with ballooning, the art of controlled, powered flight was a long way off. Men could dream and speculate, however, and some fifty years after the first balloon ascent, Alfred Lord Tennyson penned the following:

For I dipt into the future, far as human eye could see,
saw the vision of the world, and all the wonder that would be;

Saw the heavens fill with commerce, argosies of
magic sails,
Pilots of the purple twilight, dropping down with
costly bales;

Heard the heavens fill with shouting, and there
rain'd a ghastly dew,
From the nations' airy navies grappling in the
central blue;

Far along the world-wide whisper of the southwind
rushing warm,
With the standards of the people plunging thro'
the thunderstorm;

Till the war drum throb'd no longer, and the
battle-flags were furled.
In the Parliament of man, the federation of the
world.⁸

Tennyson foresaw not only the act of flight by man, but also its applications to commercial enterprise, aerial combat, and bombardment. He evidently understood the implications of mass warfare by whole nations of people and predicted some form of world government which would attempt to cool the passions of martial nations. In one form or another all these visions have been realized, his belief in a federation of the world excepted.

Like Tennyson, H. G. Wells, visualized great air fleets in his amazing novel "The War in the Air" written in 1907. Wells' German air fleets were composed of both lighter-than-air and heavier-than-air craft. The lighter-than-air dirigibles were:

capable of ninety miles an hour in a calm, so that they could face and make headway against nearly anything except the fiercest tornado. They varied in length from eight hundred to two thousand feet, and they had a carrying power of from seventy to two hundred tons.⁹

The heavier-than-air machine, called the "Drachenflieger" had wide flat wings and a square boxlike nose. This imaginary bird carried one crewmember and was credited with a "bomb throwing" capability by Wells.¹⁰

The Chino-Japanese (SIC), the United States, and the Germans were the world powers in Well's War in the Air. The Germans made a pre-emptive attack on New York City using long range airships; the world was plunged into world war.¹¹ Well's imaginative vision of the future employment of airpower and his speculations on the potential of strategic bombardment in an intercontinental sense made rather startling reading in 1907 and came only four years after the first successful flight.

December 17, 1903 was the day the two bicycle mechanics from Dayton, Ohio finally proved that they had solved the mystery of powered flight. Orville and Wilbur Wright completed four flights off the windswept sand dunes at Kitty Hawk on that historic day. The first flight covered 120 feet and lasted twelve seconds; the longest of the day remained aloft for 59 seconds.¹²

The development of airpower and air doctrine is a many faceted proposition. A comprehensive study of the growth of airpower would probably consider at least the technological, political and intellectual aspects of the subject as interrelated parts of the whole. Research, development and testing by airmen and industry led to better bombers and fighters; aviation proponents in America struggled for over three decades in the political battle for an Independent Air Force; and theoretical concepts for the conduct of a new kind of warfare were introduced and refined by the air strategists. This chapter will be confined to the theoretical aspects of the development of present air doctrine, even though technology and political considerations have had a significant impact upon the development of that doctrine. The weight of evidence seems to justify the view that the doctrinal ideas and theories were the driving force that brought on advances in technology and changes in organization rather than the reverse. The ideas of the early theorists were far ahead of their time; Douhet, Mitchell, and Trenchard constructed theories for the use of airpower long before the engineers constructed airframes, engines and munitions that matched the dimensions and scope of the theory.

MILITARY THEORISTS

The study of military strategy is an ancient and honorable pursuit. Among the classical theorists who enjoy the highest intellectual standing, those men who had the incisive grasp of things strategical, one finds Machiavelli, Jomini and Clausewitz. These strategists laid out the fundamental principles of modern warfare, the traditional principles of warfare as they are known today. While there is not universal agreement on exactly how these principals should be stated, an official United States Army version dates back to 1921. Nine principles were adopted: objective, offensive, mass, economy of force, movement, surprise, security, simplicity and cooperation.¹³

Joining the general theorists on military strategy were a group of specialists in the strategies for employing naval and air forces. Admiral Alfred Mahan's name is indelibly linked with modern concepts for the use of seapower. Margaret Tuttle Sprout said of him that,

No other single person has so profoundly influenced the theory of seapower and naval strategy. . . . He precipitated and guided a long-pending revolution in American naval policy, provided a theoretical foundation for Britain's determination to remain the dominant seapower, and gave impetus to German naval development under William II and Admiral Tirpitz. In one way or another his writings affected the character of naval thought in France, Italy, Russia, Japan and lesser powers.¹⁴

As compared to Mahan, the theorists on employment of airpower had a relatively short span of history upon which to base their theories and indeed the earliest of the strategists were rather

severely handicapped by a lack of relevant experience. They were in fact as much prophets as theoreticians in that the technology and organizations to pursue their ideas did not exist. There are three names that are most intimately associated with the genesis of theory, doctrine, and strategy of airpower. These early champions of airpower had ideas and visions that have withstood the test of time. They were Giulio Douhet of Italy, Hugh M. Trenchard of Britain, and Billy Mitchell of the United States.¹⁵ Of these, General Douhet is recognized by many scholars of aviation as the Mahan of airpower. Bernard Brodie said that Douhet "certainly possessed the largest and most original mind which has thus far addressed itself to a consideration of air power."¹⁶ Beginning in 1909, Douhet constructed a general theory for the use of airpower which has greatly influenced the thinking of the aviation world ever since.

George F. Eliot, in commenting on the impact of airpower on international relations in 1939, said that:

The history of civilized mankind shows us but three . . . revolutionary military inventions, or discoveries: discipline, gunpowder, and the airplane. Discipline, by means of which the prowess of the individual warrior was crystallized into the action of the coordinated group . . . Gunpowder, by making the peasant foot soldier the superior of the armored knight . . . The airplane, . . . has given to warfare the means of striking, not only at the army or navy of the opponent, but directly at the seat and source of his power--at his citizenry, at his capitol city, at his industrial, commercial, and political centers--without first having to overthrow the armed forces with which he seeks to protect them.¹⁷

Douhet, Mitchell, and Trenchard all believed that air forces would be the dominant military arms of the future.¹⁸

DOUHET'S THESIS

General Douhet is acknowledged to have been the first to present "an integrated, coherent philosophy for the employment of airpower."¹⁹ He published his first ideas on the importance of airpower, in 1909, the same year that Louis Bleriot won the London Daily News prize for flying across the English Channel.²⁰ At that time, the airplane was not much more than a curiosity and while it had captured the imagination of the public and the sportsman of the day, it was not being taken seriously by the governments of the military establishments of the world. Douhet grasped the importance of this new development; he saw that it would revolutionize modern warfare; it meant aerial warfare, armed combat in a new medium. Douhet recognized the strategic impact that the aircraft would have and proceeded from 1909 until his death in 1930 to develop and refine his ideas on air strategy.²¹

In 1921, he published his major work; Il Dominio dell' Aria (The Command of the Air), which was a general presentation of his ideas. It represented the first major effort by anyone to expound a comprehensive air theory and while being bitterly attacked by many, this highly controversial work was a major contribution to the growing body of military thought and strategy.²² Revised in 1927 it was translated into English in 1933 and made available to the officers of the United States Army Air Corps.

Douhet formulated his theory against the backdrop of World War I. He saw a fundamental difference between the situations on the ground and in the air. The experience of static trench warfare

on the Western Front had ostensibly proved once and for all the intrinsic superiority of the defensive over the offensive in land warfare. The terrible price paid by both sides in the Allied victory of 1918 cried out for alternatives--for new thinking, new approaches, new horizons. The airplane offered the military strategist a new dimension for warfare and in the mind of Giulio Douhet a clearly superior means of prosecuting modern warfare.

Douhet's basic theory starts with the fundamental idea that the airplane is completely unique, is capable of ubiquitous presence in the battle area and beyond, is relatively invulnerable to defensive measures in the target area, and possesses the power to strike and destroy all surface installations, on land or at sea.²³ Another major assumption underlying Douhet's theory centers around his belief that civilian populations will suffer "prompt and thorough moral and social disintegration"²⁴ under strategic bombardment of their cities. This idea is mentioned again and again in Douhet's writing and must be considered a major premise.

The first and most essential requirement in the employment of airpower is command of the air. Douhet said:

In order to assure an adequate national defense, it is necessary--and sufficient--to be in a position in case of war to conquer command of the air. . . Command of the air cannot be conquered except by an adequate air force.²⁵

This idea of command of the air was central to Douhet's thesis--he believed that in future wars the nation that could control the air, and win the air battle, would win the war. The surface forces were

to be assigned essentially defensive tasks, while the air forces took the offensive. After achieving command of the air, the air forces would proceed to destroy the enemy's capacity and will to fight by attacking his vital industrial and population centers. In a military sense then, a nation's national policy should be to build a force capable of attaining air supremacy. This called for organizing an "Independent Air Force," or as Douhet wrote, "an air force fit to strive for conquest of the command of the air . . . that state of affairs in which we find ourselves able to fly in the face of an enemy who is unable to do likewise."²⁶ In order to accomplish its mission, the Independent Air Force must be able to win the air battle and, secondly, have the capability to exploit this advantage by crushing the material and moral resistance of the enemy.

The battle for air superiority is carried out in two modes: (1) by engaging the enemy air forces in the air or (2) by destroying the enemy forces and their bases on the ground. Douhet recognized two separate and distinct roles for aircraft in the battle for air superiority: the aerial combat role (combat plane) and the bombardment role (bombing plane). He discussed the relevant characteristics of each and concluded that:

All characteristics except armament shall be the same for both combat and bombing planes. The difference between the two types of plane lies in the difference in distribution of weight for armament in the combat plane and for bomb-load in the bomber.²⁷

Douhet concluded then that one airframe suitable for both aerial combat and bombing would be suitable--he called this plane the "battleplane."

It would have the required radius of action, speed and armor protection and would have armament for both aerial combat and bombardment. Employed in formations, the battleplane would have adequate firepower for the aerial battle while still having the weight carrying capability to launch offensives against surface targets. The B-17 flying fortress of World War II and the B-36 Strato fortress of the Cold War era came close to Douhet's battleplane concept.

The idea of offensive action was another key element of Douhet's ideas on the proper concepts for air strategy. He believed that air power was inherently an offensive force, and "it depended on the attack for its own best defense."²⁸ Local defense against air forces was not feasible; the only possible defense against enemy aerial offensives lay in the attack. Douhet said,

The only really effective aerial defense cannot but be indirect; for it consists in reducing the offensive potentiality of the opponents air forces by destroying the source of aerial power at its point of origin. The surest and most effective way of achieving this end is to destroy the enemy air forces at its bases, which are found on the surface. This is the principle which governs the situation: it is easier and more effective to destroy the enemy's aerial power by destroying his nests and eggs on the ground than to hunt his flying birds in the air. And every time we ignore this principle we commit an error. Therefore, even if a nation has no other end in view than self defense, it should be armed with an Independent Air Force capable of launching powerful offensives on land and sea.²⁹

Douhet's arguments ranged over a wide spectrum of ideas. He was concerned with economics, strategy, organization, tactics, politics, engineering and technology. All his discussions, however, were centered on one theme, "Command of the Air," and the many

implications and ramifications of what this meant. A summary of his thesis follows.

The major premises behind his arguments were:

- (1) That the aerial machine is completely unique and potent as a instrument of war.
- (2) That the offensive is absolutely supreme in aerial combat.
- (3) That civilian morale will quickly crumble in the face of aerial bombardment.
- (4) That victory based on superior airpower will be swift and complete.
- (5) That air defense is useless because the war will be over before the attritive effects of air defense become operative.
- (6) That defense is the superior mode in land warfare and that land fronts will be static in future wars.

Based on these assumptions or premises, his major conclusions are summarized as follows:

- (1) The nation that can gain command of the air will win the war.
- (2) Command of the Air is achieved by destroying the enemy air forces. The best way to destroy them is by bombing their planes and installations on the ground.
- (3) After gaining air superiority, offensive action should be directed to cut off the surface forces from their bases of support, and to attack the enemy industries and centers of population in the interior of his country.

(4) The basic type of aircraft should be a dual purpose "battle-plane" that can fight in the air battle and also launch air to ground offensives.

(5) All resources should be put into offensive airpower, allocating the army and naval surface forces enough for an adequate defensive posture.

(6) The strategic importance of airpower requires an "Independent Air Force" and the three branches of service, land, sea and air should be organized under a "Supreme Command" which will have sufficient authority to determine needs and make proper allocation of resources.

ANALYZING DOUHET

While Douhet's arguments were logically presented and coherent, his treatment of his subject very thorough, all of his ideas have not withstood the test of time. His first premise, that the airplane was a unique and potent weapon is now universally accepted. Few would deny that the advent of airpower has changed the character of warfare in a major way. The ability of the aircraft to strike anywhere, with great speed, over long ranges, and with relative immunity to defenses makes it a weapon of unique potential.

Douhet's belief in the absolute supremacy of the offense in aerial warfare is also an assumption on which there is near universal agreement. This is especially true in the tactical sense; for aircraft cannot effectively defend against enemy aircraft by orbiting over the friendly target system waiting for the enemy to attack.

Such a deployment disperses friendly forces over a wide area, allows the enemy to concentrate his aircraft at a location of his choice in such a manner that he has at least local air superiority and hence cannot be denied in his attack. On this point, the superiority of offensive action, General Douhet had the support of his allied contemporaries, Mitchell and Trenchard.³⁰

One major flaw in Douhet's thesis was his assumption that civilian morale and will to resist would be quickly shattered under the pounding of an aerial attack. It has not been demonstrated that this premise is valid. Populations in cities all over the world have successfully withstood the psychological terror of strategic bombardment for extended periods of time. The populations of London and Berlin in World War II held up admirably despite terror and suffering. While it is certainly true that a city can be completely destroyed or neutralized as was the case at Hiroshima and Nagasaki, this does not constitute a breakdown in the social structure. The United States Strategic Bombing Survey was established by the Secretary of War on November 3, 1944 pursuant to a directive from President Roosevelt to study the effects of the air attack in Europe. They found that the morale of the German people did deteriorate under aerial attack, the night raids being far more feared than the day raids.³¹ But this drop in morale stopped far short of a "quick collapse" as envisioned by Douhet. The Strategic Bombing Survey concluded on this particular point:

The mental reaction of the German people to air attack is significant. Under ruthless Nazi control they showed surprising resistance to the terror and hardships of repeated air attack, to the destruction of their homes and belongings, and to the conditions under which they were reduced to live. Their morale, their belief in ultimate victory or satisfactory compromise, and their confidence in their leaders declined, but they continued to work efficiently as long as the physical means of production remained. The power of a police state, over its people cannot be underestimated.³²

Douhet's faith in the ability of offensive airpower to prevail over the enemy was not poorly placed, but it appears that he was "right" for reasons other than he thought. In the quotation above, for instance, the operative clause may be the one that reads "they continued to work efficiently as long as the physical means of production remained." Physical property and populations can be destroyed from the air; this has been adequately demonstrated.³³ But the swiftness and completeness of defeat is evidently not a function of psychology and depends instead on the amount of destructive force that can be brought to bear.

Strategic bombing of Germany during World War II demonstrated that ". . . even a first class military power . . . cannot live long under full scale and free exploitation of air weapons over the heart of its territory."³⁴ This, from the Strategic Bombing Survey, supports Douhet's contention that airpower is decisive in the sense that a nation without adequate airpower cannot win. Also introduced was the idea that command of the air (or air superiority) is essential for victory. This conclusion is another cornerstone of his theory and is agreed upon by all air strategists.

Most strategists agree with Douhet, that the best way to gain air superiority is to destroy the enemy air forces and installations on the ground with offensive strikes. A starkly successful example of this strategy in action was afforded by the Arab/Israeli War of 1967. The Israeli Air Force, in a series of surprise attacks, destroyed some 374 enemy planes, most of which were caught on the ground.³⁵

On technical matters dealing with problems of aeronautical engineering, Douhet showed a decided lack of knowledge and understanding.³⁶ His belief that civil aircraft could be easily converted into fighting planes is a good example. He overestimated the ease with which armament and armor could be substituted for passengers, cargo and mail.³⁷ This belief in the universality of equipment was carried also into his concept for the dual purpose "battleplane." His arguments again assumed that tradeoffs between bombardment armaments and air-to-air armaments would be relatively easy in a technical sense. Further, in discussion the advantages of the battleplane, he erred again in judgement that speed was a secondary consideration to firepower in combat aircraft.³⁸

Quoting General Douhet:

What determines victory in aerial warfare is firepower. Speed serves only to come to grips with the foe or to flee from him, no more. A slower, heavily armed plane, able to clear its way with its own armament, can always get the best of the faster pursuit plane. A unit of combat, composed of slower, heavily armed planes is in a position to stand up to the fire of enemy pursuit planes and carry out its mission successfully.³⁹

In this same series of discussions, he stated that a pursuit plane optimized for quick takeoff, rapid climb, speed and maneuverability was the best type aircraft for point defense or policing the sky. But he felt that the tradeoffs of fuel (range) and armaments (firepower) in order to get speed and maneuverability were not justified--given the fact that he had little faith in the role of air defense.⁴⁰ Douhet showed an understanding of the economics of national defense by arguing that "a nation has a definite sum total of material resources"⁴¹ and must, therefore, allocate these resources efficiently. Since he believed that offensive attacks on the enemy's vital centers and centers of population would bring a very quick victory, any money or resources expended for air defense or for pursuit aviation was, in effect, misplaced and wasted. The whole of a nation's effort must be put into forces that would carry the fight to the enemy--to his heartland. This required, in his judgement, more range than could be built into a pursuit plane. While his arguments were well grounded logically, there were errors in his assumptions. He underestimated the aeronautical engineers on the one hand, in not believing that high speed and long range could be built into one airframe. He overestimated their ability to construct dual purpose machines that would be effective in performing two different missions. He also showed a lack of understanding of aerial tactics in believing that firepower would always be able to offset speed and maneuverability. Also, a combination of speed, maneuverability and

firepower was not a combination that he considered in his arguments and this omission reflected his judgement that this combination was not feasible in a technical sense.

Douhet believed intensely in the preeminence of airpower. He saw that airpower had changed the world, that strategic use of aerial warfare held the key to the balance of world power. He also saw that the leaders of the surface forces were not willing to accept these ideas, that the Army and Navy would try to use airpower to further the immediate objectives of their own forces. He judged such use of aircraft as wasteful and argued convincingly for an Independent Air Force.

Douhet also shrewdly foresaw the need for a new level of military authority above the services "to determine and allocate the proper proportions of national resources to the three branches of the service--land, sea, and air forces."⁴² He judged that the services would be unable to satisfactorily apportion scarce resources, given each with its jealous prerogatives on this conclusion he has certainly been proved correct.

On balance, Douhet was a man of vision, formulating a comprehensive set of strategic concepts for the creation of air forces and the employment of airpower at a time when the science of powered flight was in its infancy. He made many technical errors, overestimated capabilities, and underestimated the human will to resist, but at the same time he understood the vital importance of airpower in a new era. History has certainly not confirmed

all of his ideas but as the age of thermonuclear power and intercontinental delivery vehicles advances, his strategic ideas do merit their share of attention by the leaders of the world today.

BILLY MITCHELL, AVIATION ENTHUSIAST

The second of the early air strategists and champions of air-power was Brigadier General William Mitchell of the United States. Mitchell's name in literature brings forth probably as much comment on the man, his personality and temperament, as upon his ideas. General William Mitchell is a major and controversial figure in the history of American aviation. One of his biographers, Alfred F. Hurley, described his impact as follows:

Mitchell must be ranked among the more extraordinary figures in American history. He did not have the scholarly temperament to be a seminal thinker or a systematizer of thought. Rather, his forte was his brilliant understanding of the application of the multitude of significant fundamental ideas and scientific advances which have studded the early history of this century. Mitchell's achievements in this regard enabled him to foresee, to an impressive degree, the direction of aviation development and its role in World War II and subsequent military policy stimulated him to be the trailblazer in preparing the American people to accept the role of aeronautics in their nation's military and diplomatic policies; and made him one of the founding fathers of the United States Air Force and an important agent in the growth of U.S. Naval aviation.⁴³

Another commentator, Edward Warner made this observation:

Mitchell wrote and spoke as an intense partisan, becoming more and more impatient of opposition and increasingly disposed to denounce it as stupidly reactionary, blinded by self-interest or dishonest.⁴⁴

Mitchell's strident tones and unbending attitudes in his advocacy of airpower for the United States ultimately were his undoing. Proclaimed by his admirers as a "Pioneer of Airpower," he was an anathema to the established military leaders of postwar America in the 1920's. The trial of Billy Mitchell was front page news in 1925 after he had been daringly critical of the War and Navy Departments regarding a series of aeronautical accidents. The Navy, smarting because of the Army's successful round-the-world flight in 1924 was trying to demonstrate its air capability to the public. The Department of the Navy sent the dirigible, Shenandoah, on a barnstorming trip in the mid west. She was lost in a thunderstorm over Ohio. Two naval seaplanes went down in the Pacific while attempting to fly nonstop from San Francisco to Honolulu. One ran out of gas 400 miles short of Honolulu and was missing for nine days, the other developed engine trouble 300 miles west of San Francisco. Mitchell regarded these flights as unnecessary and inspired by bureaucrats, not aviators. His reaction was strong; he accused the War and Navy Departments of "incompetency, criminal negligence and treasonable administration."⁴⁵ He was charged under article ninety-six of the Articles of War with ". . . conduct of a nature to bring discredit upon the military service . . ."⁴⁶ On December 17, 1925 he was found guilty as charged.

Douhet, the Italian has been characterized as the systematizer, the integrator, the general theorist. Mitchell was the American

air leader, his role was not that of the original thinker but that of the doer. If Douhet was the theoretician, then Mitchell was the practitioner; he understood how to take the fundamental concepts for the employment of airpower and make them work.

Who was Billy Mitchell? Scion of the Mitchell dynasty of Milwaukee, Wisconsin, he was born into a setting of financial and political success. Billy was the grandson of a Scottish immigrant who came to Milwaukee in 1839 and went on to become Milwaukee's greatest financier and railroad magnate.⁴⁷

Mitchell was born on the Riviera, lived in France until he was three and spoke French better than English as a child. He grew into an energetic and talented young man, one who was cut out for the strenuous outdoor life of the soldier and airman.

Mitchell began his military career in 1898, as a Spanish-American enlistee in the First Wisconsin Regiment. Although his father, Senator John Lendrum Mitchell, was opposed to the imperialist mood that led to the war, the Senator's influence was such that Mitchell was tendered a second lieutenant's commission in a volunteer signal company.⁴⁸ Later, in 1901, he accepted an appointment as a regular first lieutenant in the Signal Corps. The Signal Corps was the most technically oriented branch of the Army at that time and offered him a wide choice of interests in new fields ranging from electricity to aeronautics. Mitchell accepted the challenge and was soon an instructor at the Signal School at Fort Leavenworth, Kansas. In 1906 he delivered a lecture there titled "The Signal

Corps with Divisional Cavalry and Notes on Wireless Telegraphy, Searchlights, and Military Ballooning," showing his early interest in aeronautics.⁴⁹ The lecture was published in the U. S. Cavalry Journal in April, 1906. In it he discussed the use of free-balloons as a means of reconnaissance, the effects of hostile artillery fire against balloons, the role of photography in balloon reconnaissance, and limitations on the use of balloons imposed by the direction and strength of the wind.⁵⁰ His comments on the dirigible balloon were also significant:

It could course at will over a battlefield, carry messages out of a besieged fortress, or sail above a beleaguered place, immune from the action of men on the earth's surface. By towing another balloon loaded with explosive, several hundreds of pounds of guncotton could be dropped from the balloon which is towing in the midst of the enemy's fortifications. . . One interesting fact connected with dirigible balloons is, that when cruising over a body of water at a height of some one hundred or two hundred feet, objects in the water can be perceived at a great depth; some day, therefore, we may see dirigible airships acting as scouts for the Navy to detect the presense of submarine vessels.⁵¹

While serving on the Army General Staff in Washington, Mitchell testified before the House Military Affairs Committee in 1913 on the subject of Aeronautics in the Army. Some of his ideas on the progress of aviation follow:

Our object, as I understand it, is to develop aviation in this country. We have all of a sudden awakened to the knowledge that we are behind all these other nations in the matter of aviation, and a great many people, seeing the necessity of this thing, are asking "Why not develop it"?⁵²

He identified several missions for aviation at that time:

We know absolutely that aeroplanes are valuable for reconnaissance service . . . Airplane reconnaissance means finding out about the enemy; that is, getting information about large units and not little details about small detachments . . . Now, the offensive value of this thing has not been proved. It is being experimented with--bomb dropping and machine carrying guns are being experimented with--but there is nothing to it so far except in an experimental way . . . There is a third use for them which is very important . . . That is, the fire control of field artillery by means of aeroplanes.⁵³

These hearings were in consideration of a bill (H. R. 5304) "to increase the efficiency of the aviation service of the Army."

The bill, sponsored by the Honorable James Hay of Virginia, proposed to create a separate Aviation Corps within the Army, removing it from the Signal Corps. It is interesting to note that almost all the flyers were against this proposal. Such future American aviations greats as Benjamin D. Foulois, Henry H. Arnold and William Mitchell were all opposed to a separate corps for aviation at that time.⁵⁵ Aviation stayed in the Signal Corps.

Two years later, Mitchell is credited with authorship of one of the earliest comprehensive statements of American aviation policy and thinking of that period. Published by the War Department, the report "theorized that aviation would be a particularly valuable adjunct to the Army" in the coastal defense of the United States. Aviation would be used for reconnaissance, denying the enemy reconnaissance, as spotters for the coastal artillery, and to attack enemy aircraft, ships and submarines.⁵⁶

Mitchell's interest in aviation continued to grow and when his General Staff tour was completed in June 1916, he returned to the Signal Corps Aviation Section as the deputy. He was promoted to Major in July of that year and by fall had enrolled in the Curtiss Aviation School in Newport News, Virginia for pilot training. Issac Levine quoted Mitchell's comments on his flying training:

The only time I could get away was on Sunday . . . I used to take a boat down the Potomac River from Washington to Newport News, Virginia, on Saturday night, fly all day Sunday, and be back in the office on Monday. . . After four days of this instruction, I was turned loose on my first solo flight. . . I knew practically nothing about flying. Fortunately, I cracked up the machine in making a bad landing, which taught me more than anything that ever happened to me in the air.⁵⁷

Mitchell paid for his pilot training lessons himself; he tried to bill the government for the \$1470 sum but the Comptroller of the Treasury ruled against him. Mitchell was emerging as one of this countries most qualified field grade officers in the aviation field and when the War Department decided to send an officer to Europe in 1917 as an aeronautical observer, Mitchell was selected. On this mission Mitchell was to meet many of the leading airmen of the Allied armed forces and would begin to shape more comprehensive ideas on the employment of airpower.

MITCHELL'S WAR EXPERIENCE

By the time Mitchell arrived in France in April 1917, the French, English and Italians had three years of combat experience

with aviation. There was much to be learned and Mitchell was equal to the task. Under the pressure of war, the progress of aviation in Europe had been very rapid. The performance of aircraft, pilots and organization far surpassed anything the Americans had envisioned. Since 1914 the inventories had grown from small fleets of 65 mph, short range, observation planes to large forces that included 120 mph fighters and 85 mph bombers.⁵⁸ More advanced aircraft were then on the drawing boards and the British would shortly let a contract for a four engine Handley-Page superbomber which would be able to carry 7,500 pounds of bombs from England to Berlin.⁵⁹ As might be expected, the Italians, influenced by Douhet, were building one of the better bombers in 1917. Gianni Caproni, aircraft designer, inventor, and close friend of General Giulio Douhet's, had produced the three-engine Caproni bomber. The Italians fielded the first functioning Allied long-range bombing program and had put together mass raids with up to 250 bombers from Italy into Austria.⁶⁰

On April 6, 1917, the United States declared war on Germany; Mitchell arrived in Europe four days later. At this point in the war, "those who planned to use the new aerial weapon lacked a clearly defined doctrine of warfare."⁶¹ Mitchell was the vanguard of the air element of the American Expeditionary Force and his education in air strategy and employment was proceeding without delay.

Shortly after his arrival in France, Mitchell toured the French sector of the battlefield and witnessed the bloody Nivelle offensive northeast of Paris.⁶² He observed the performance of French aviation all along the front and was very much impressed with the efficiency of the French units. He commented in his World War I memoirs:

I formed an impression that the French Air Service was very efficient. This was due to their excellent planes, their splendid mechanics and their well-trained aviators. . . There was a great esprit de corps in the French service, and each branch had all sorts of confidence in its own outfit. The bombardment people were sure that if they were given enough planes and explosives, there would be nothing left of Germany in a short while.⁶³

Mitchell was undoubtedly greatly influenced by the French airmen and by French equipment as well. Since his first European experience was with the French Air Service, it seems reasonable to conclude that these airmen had an important influence on his thinking.⁶⁴ He studied the French aircraft, methods, aerodromes, and organizations exhaustively; he observed the German anti-aircraft weapons and German fighters in action against the French and he investigated French reconnaissance and aerial photography. Mitchell was also interested in their ideas on aerial bombardment and methods for dropping the 100 pound projectiles used at that time.⁶⁵ He also experienced his first air raid, a night attack on Chalons by the Germans. Mitchell commented on the raid:

Captain Dourif and I returned to town, and by the time we had finished dinner at the little mess, it was night and a beautiful moon had risen. We remarked that it would be a good

night for a bombing. . . The shades of my room were drawn tightly to prevent any light from shining out and being seen by hostile bombers. . . I heard the hum of a strange airplane motor and almost immediately--Zing! Zing! Zing! and all the windows and doors shook. . . Searchlights were immediately turned in the sky. The anti-aircraft guns opened. Another series of strong explosions, then machine gun and anti-aircraft fire.⁶⁶

Mitchell's comments on the effectiveness of aerial bombing as a result of this and other observations during his visit with the French were as follows:

Not only was the material effect of bombardment to be reckoned with, and it was constantly increasing, but the moral effect on the people was even greater. Women and children were paralyzed with fear. It was a menace from an entirely new quarter. Fighting on the ground and on the water had gone on since the beginning of time, but fighting in the air had just started; and several generations will have to be born and pass away before people can adopt and maintain the same attitude toward this form of warfare as they exhibit toward the old familiar ones.⁶⁷

Other important lessons were derived from his contacts with the French in April 1917. After the disastrous French offensive under General Neville, the French Army reverted to a defensive posture, and a badly battered French air effort struggled for survival. Mitchell commented, "French aviation was on the defensive, or at best was holding its own. Its tactics and strategy were defensive." The situation was desperate and the French wanted relief from the United States. Mitchell observed, "It was necessary to have command of the air; the enemy had such a force, we had to have an equal force. The lessons of the last three years made this

no longer a matter of guesswork, but a sure thing. . ."68 Mitchell reasoned that the logical role of aircraft should be offensive.

His comments were:

This type of defensive role, while necessary at the time for French aviation, could never be successful in the end. Aircraft had to act on the offensive. It could not dig a hole in the air and go on the defensive as the infantry does on the ground. The Germans knew this full well and rather than keep patrols in the air the way the French did, they kept their men on the ground until such time as they could send a strong patrol capable of breaking through the scattered detachments of French aviation.⁶⁹

Mitchell discussed these problems with French airmen, two of whom he identified as Captain Dourif and Captain Menard. He acknowledged his debt to these gentlemen implicitly by explaining their discussions at length in his memoirs. French losses on the ground and in the air were having profound effects on the morale of their fighting forces. Mitchell was concerned that the "pilots in the squadrons had been at this work too long, and had lost their nerve, in most cases."⁷⁰ He reasoned that this battle fatigue was part of the reason the French airmen had gone over to the defensive; it was a case of too few forces and men, too tired to fight on. Mitchell felt that this defensive posture was disastrous and had to be changed. At that time, he felt that pursuit aviation would be the instrument for gaining command of the air, and that its role should be to "seek the enemy and wherever found, attack and destroy him."⁷¹

After spending several weeks working with the French, Mitchell set out to get the views of the British. The foremost British

airmen was General Hugh Trenchard, Commander of the Royal Flying Corps (RFC) of the British Army. Mitchell, with characteristic sense of purpose, sought an interview with the top man and proceeded to his headquarters. The first meeting between General Trenchard and Major Mitchell was an interesting encounter that revealed something of the essence of these two men.

On the day that Mitchell first arrived at the Royal Flying Corps headquarters, General Trenchard was about to leave the office on an inspection of some squadrons. Trenchard's aide, Captain Maurice Baring, suggested that perhaps Major Mitchell might return another day to which Mitchell is said to have "coolly remarked that as an official observer attached to the American General Staff, he had no mind to waste his own or anyone else's time."⁷² At this point General Trenchard entered the room and confronted Mitchell in person. Andrew Boyle, Trenchard's biographer, describes the scene:

'What can I do for you? Have you an appointment?'

'No, General, but I still want to see as much of your organization as you can show me. I'd like to see your equipment, your stores, and the way you arrange your system of supply. Also, I need to know all you can tell me about operations, because we will be joining you in these before long.'

Trenchard stared quizzically at the business-like absurdly boyish looking intruder. 'That's quite a large order. How many weeks do you have to spare?'

'We could take in the equipment and supply part of it today,' said Mitchell. 'Then tomorrow we could start --'

'One minute, Major,' interrupted Trenchard. 'Do you suppose I've got nothing better to do than chaperon you and answer questions?'

Mitchell shrugged and grinned in the friendliest way. '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, no matter how bad you say things are.'

The explosion expected by Captain Baring did not follow. Trenchard was intrigued by Mitchell's good-natured impudence. 'All right,' he said. 'Come along with me, young man. I can see you're the sort who usually gets what he wants in the end.'

For the best part of three days, Mitchell seldom left Trenchard's side. A good listener and a shrewd interrogator, he made no apology for 'picking the other men's brains'.⁷³

The central theme of Trenchard's ideas was his intense belief in airpower and his conviction that airpower was inherently offensive and must be employed in the offensive rather than the defensive mode. Trenchard's ideas will be covered more completely later in this chapter; it suffices to say that Mitchell was very impressed by the tall lanky Briton and his conception of the meaning of airpower. He later said of Trenchard:

He was a man of about six feet in height, erect of carriage, decided in manner and very direct in speech. His judgement inspired my immediate confidence and his whole personality my deep respect, and we became fast friends at once. He was really the father of the British fighting aviation. At the beginning of the war he was a man of about forty-five, a pilot and thoroughly convinced of the enormous value of this great arm of the service. Under his compulsion, the British air service grew from a few second-class airplanes to a great force, with more than two thousand airplanes on the line.⁷⁴

Mitchell talked to many British airmen, and his education continued in June when he visited the Royal Naval Air Service Unit at Dunkirk. This unit, commanded by Wing Captain C. L. Lambe "had a more unusual mission--the bombardment of German inland targets."⁷⁵ This task was given to them by Winston Churchill, then First Lord of the Admiralty. After the Zeppelins had bombed London in May 1915, he suggested that the naval airmen attack the Zeppelin staging bases in Belgium.⁷⁶ The Naval pilots, led by Squadron Commander Spenser D. A. Grey, responded with outstanding results:

Seven days after the first bombs had fallen in the east end of London, the naval pilots had destroyed two of the Zeppelins . . . had damaged the third, and had made the Belgian sheds untenable as permanent bases.⁷⁷

By 1917, when Mitchell visited the Wing, the Naval fliers were experimenting with new weapons and night bombardment techniques. Commander Gray showed Mitchell a 1,650 pound bomb, the biggest air weapon produced in the war. He also saw the Handley-Page bomber, the best British bomber at that time. It could carry a 2,000 pound bomb load but was too slow, at 65 mph, for other than night service because of its vulnerability to enemy fighters.⁷⁸ The naval airmen had ideas for deeper, more ambitious raids into Germany but did not have the equipment for the task. The Handley-Page was a good airplane but only had a 200 mile combat radius, which was inadequate. As Alfred Hurley so aptly phrased it;

This gulf between the dreams and the actual performance of the naval airmen illustrated much of what Mitchell had learned from his

first two months in France. He consistently imagined AEF aviation as a force of airplanes borrowed or copied from the French and utilized in keeping with the most promising of the British ideas. In his more realistic moments, however, Mitchell knew that his country lacked even a respectable reconnaissance capability.⁷⁹

Mitchell's ideas continued to form. He recognized that there were two types of aviation: tactical and strategical. He spoke to General Pershing of tactical aviation that would provide observation and fighter units for each division, corps and army. He described strategic units under Pershing's personal control that would attack the Germans well behind the front lines.⁸⁰

Mitchell was part of a board of officers appointed by General Pershing on June 19, 1917 to study the aviation requirements of the American Expedition Force (AEF) and to make recommendations for its establishment. In these recommendations the following statement appears:

The board believes that is is now a cardinal principle in warfare that a decision in the air must be sought and obtained before a decision on the ground can be reached. Absolute and unchallenged superiority in the air can perhaps never be attained although possibly it may be attained for short periods of time; but experience of three years' war has amply shown that the side which can at critical times dominate the enemy in the air has taken the first, if not the vital, step toward victory.⁸¹

The influence of the French and British airmen on Mitchell's thinking is well documented. There were other influences at work in the development of airpower among the allies in Europe. The Italians were doing important work, however, their contribution

is not as well documented as the British and French effort nor was it acknowledged in Mitchell's writings after the war. The doctrinal contributions of Giulio Douhet, discussed previously, received worldwide attention in the 1920's and 1930's but his impact upon American thought during World War I is not so certain. Douhet was in prison when Mitchell first came to Europe, having been court-martialed for criticizing his government's policy on the war.⁸² Mitchell, therefore, did not meet or talk to Douhet in 1917 and he does not credit the Italian with any influence upon his thinking or the development of his ideas on the use of aviation during the war.⁸³

An American aviation mission that arrived in France in mid-June was subjected to some Italian influence. The Mission, headed by Colonel R. C. Bolling, was sent to Europe in June 1917 by the US Army Signal Corps to seek much needed technical and doctrinal information upon which to base critical aircraft production decisions in the United States.⁸⁴ Dr. J. L. Boone Atkinson, writing in 1957 after extensive research in Italy, made these observations about Italian influence on Bolling and his group:

If the voice of Douhet presumably did not reach the Americans, there was one Italian airpower enthusiast whose ideas most certainly did reach them--Gianni Caproni, the famous aircraft designer and builder, and Douhet's close friend and collaborator. Evidence recently uncovered . . . points to Caproni as one of the most important single sources of influence on the Bolling Mission, the report of which was destined to have such a marked effect on the whole subsequent doctrinal position of the wartime Air Service.⁸⁵

The Bolling Mission was composed of two aeronautical engineers from the Signal Corps, two Naval aviation officers, and two civilians from the automobile industry to represent production interests.⁸⁶ Major Edgar S. Gorrell was one of the two Signal Corps engineers and the one through whom Caproni's ideas on the air war were injected into the American doctrinal debate of 1917.⁸⁷ Gorrell was impressed by the concept of strategic bombardment, and he later took over Mitchell's efforts in developing strategic bombardment plans for the AEF. The Mission found that the French and the British were interested in bombardment but both nations were constrained from using it because they lacked adequate numbers and types of planes for bombing campaigns.⁸⁸

The official report of the Bolling Mission contained a recommendation for a procurement policy which gave first priority to training aircraft, second priority to tactical aircraft for pursuit and reconnaissance, and third priority to bombardment aircraft.⁸⁹ These priorities recognized the realities of the times and reflected the thinking of most of the Allied aviation experts. The potential of strategic aviation was recognized but the fliers could barely keep up with the tactical needs of the ground commanders and had little capability to mount an effective strategic campaign.⁹⁰ Even though the Bolling Mission recommended tactical aircraft ahead of bombers, members of the group were greatly impressed by the possibilities for bombardment aviation.⁹¹ I.B. Holley described the reactions of the individual members as follows:

In the early fall of 1917, Colonel Bolling noted that it was the 'settled conviction' of the mission that the importance of 'bombing operations with direct military ends in view' could not be exaggerated. Lieutenant Colonel V. E. Clark took an even stronger position, declaring that intensified night bombing would 'put an end to the war far more quickly, than sending one or two million men to line the trenches.' Major E. S. Gorrell was even more specific in assessing the role of bombardment. He felt that the Air Service, AEF, would be certain to wreck 'immense destruction' upon German morale and material if it could place in the field a sufficiently large number of night bombers to carry out a 'systematic bombardment' of Germany.⁹²

General Pershing's first plans for the American Expeditionary Force (AEF) in July 1917, called for 59 squadrons of tactical aircraft to work with the field armies. No strategic aviation was proposed. The 59 squadrons were divided into 39 for observation, 15 for pursuit, and 5 for bombardment. Mitchell wanted more emphasis on strategic aviation and recommended a strategic force of 201 squadrons in addition to the 59 already programmed. The 201 squadrons would be divided into 41 for observation, 55 for bombardment and 105 for pursuit. Mitchell was persuasive and his proposal became the official program for the AEF Air Service in October 1917.⁹³ In December, a new staff organization, the Strategical Aviation Branch of the Air Service was created to handle the planning. Mitchell had already been gathering target information which he turned over to Colonel E. S. Gorrell who was named chief of the new office. Gorrell worked with Gianni Caproni and the British airman, Commander Spenser Grey to develop a comprehensive bombardment plan against targets in Germany.

Continued shortages of bombers and opposition from members of General Pershing's staff kept Gorrell's plan from coming to full fruition.⁹⁴

As the war progressed and the American air force grew, Mitchell became a very effective combat leader. This was recognized by his superiors, his contemporaries and his subordinates alike. General Pershing saw that Mitchell possessed unusual fighting skills and at one point intervened in a nasty disagreement between Mitchell and another famous airman, General Benjamin Foulois. Foulois was his superior and under ordinary circumstances Mitchell might have been sent home. Pershing, however, wanted him to remain in France and his wishes prevailed.⁹⁵

Mitchell's greatest air battle was at St. Mihiel in September 1918. During this action, Mitchell applied two principles that the allied airmen had shown to be fundamentally correct: "concentration of force and the priority of counter-air action."⁹⁶ At St. Mihiel, Pershing's overall plan was to eliminate a German salient in preparation for the Meuse-Argonne offensive. The American First Army was the primary ground unit and as its air leader Mitchell was assigned the task of gaining air superiority and assisting in the offensive. Mitchell recognized that the success of the battle could turn on the situation in the air and he set about to make certain he had control and use of the skies over St. Mihiel. He requested additional air elements and, with Marshall Foch's and General Pershing's approvals, put together the greatest concentration of airpower ever seen in the war. There were 1,481 aircraft in all;

most were not American but were borrowed from the British, French and Italians.⁹⁷

Mitchell's staff drew up the operational plans; logistics and communications requirements were unprecedented. The force was organized to achieve concentration and mass. Each corps was assigned only that aviation required for its own direct support-- observation squadrons plus pursuit aircraft to protect them. The remainder of the force, approximately 1,000 aircraft, was organized into two brigades of mixed bombardment and pursuit.

Dr. Thomas H. Greer described the employment as follows:

The brigades, 500 planes each, alternated in striking the salient, driving off and destroying enemy planes, and attacking all possible surface targets in the salient. The concentration of force gave the Americans virtually complete protection from German air interference.⁹⁸

The following month at Meuse-Argonne Mitchell again used the principle of concentration to advantage. Employing two pursuit groups* and one bomber group against a given target, he was able to achieve local air superiority, even when the Germans had an overall numerical superiority in the general area. These 180 plane attacks were not trivial by any means and forced the enemy air force to come up and fight. Mitchell's massed pursuit squadrons successfully broke up the enemy air formations and in general the force was able to inflict more damage upon the Germans than was done to the allied squadrons.⁹⁹

*A group had approximately 100 aircraft assigned of which about 60 would be operational.

Mitchell used offensive tactics, concentrated his airpower and gave priority to counter-air activity. This enabled him successfully to support and protect the American troops even though the enemy had built up a numerically superior force in the region. The primacy of the air superiority mission in the conduct of war emerged as one of the important lessons of World War I. The potential of strategic bombardment was recognized and had many enthusiastic supporters; however, supremacy over the battlefield was seen as the first mission of an air force. Thus pursuit aviation, whose primary duty was the destruction of enemy aircraft in the air, emerged from the war as the most important branch of American military aviation.¹⁰⁰

AFTER THE WAR

Mitchell's thinking immediately after the war was tied very closely to support of and cooperation with ground forces in battle. He believed firmly that air forces could defeat enemy surface forces and he devoted considerable attention to the use of air attack to destroy surface military targets.¹⁰¹ The bombing and sinking of the battleships *Osfriesland* and *New Jersey* off the Virginia Capes in 1921 was an excellent example of this effort. Mitchell's emphasis immediately after the war was different from that of Douhet, who considered the enemy heartland as the primary target. Douhet was not concerned with destroying enemy surface forces in the field, concentrating instead on the power centers they were deployed to protect.

Mitchell's concept of airpower evolved as he came to recognize the potential of the airplane in larger terms. He began to see aviation as the great wave of the future, as the key to national power, just as seapower had been so important for the great commercial nations of the past. Mitchell was interested in all aspects of aviation, particularly in its potential in transportation and commerce. In 1925*, he published Winged Defense; The Development and Possibilities of Modern Air Power--Economic and Military. As the title suggests, Mitchell discussed aviation in a broad context. In Chapter I he said:

The world stands on the threshold of the 'aeronautical era.' During this epoch the destinies of all people will be controlled through the air . . . Airpower has come to stay. But what, it may be asked, is airpower? Airpower is the ability to do something in or through the air, and, as the air covers the whole world, aircraft are able to go anywhere on the planet.¹⁰²

In exploring his thoughts on airpower he discussed both civil aviation, which he saw as "the aviation that is used by the civil departments of government," and commercial aviation in the private sector.¹⁰³ The third cornerstone of airpower in Mitchell's equation was, of course, military aviation. He devoted a major portion of his writing to it. In 1930 Mitchell published the following in Skyways, A Book on Modern Aeronautics:

*This was the year of his courts-martial by the U.S. Army.

Military aviation is that part of the national defense which relates to the prosecution of military campaigns by air. Nothing in the world's history has brought about as great a change in the employment of military power as the coming of the airplane.¹⁰⁴

By 1930, he was a civilian and was carrying his message on aviation and airpower to the people. Mitchell's ideas had crystallized into a more comprehensive set of theories. He believed that modern airpower "which can go straight to the vital centers and entirely neutralize or destroy them has put a completely new complexion on the old system of making war."¹⁰⁵ Significantly, he went on to say that "the hostile main army in the field is a false objective and the real objectives are the vital centers."¹⁰⁶ This statement represented a definite change in Mitchell's ideas. In the twelve years since the war he had come to view airpower as a strategic force in its own right, with a mission quite different and unique from that of the conventional ground and naval forces. Perhaps he had read Douhet.

Mitchell had come to the same conclusion as Douhet--that the surface forces were of secondary importance. He said:

The old theory, that victory meant the destruction of the hostile main army, is untenable. Armies themselves can be disregarded by airpower if a rapid strike is made against the opposing centers. . . . The conceptions we have always had that wars must be waged by armies and navies must be revised, as these two branches of the military service will take a position second to that of airpower and will act principally as aide to it.¹⁰⁷

Mitchell saw attacks on the great population centers as a certain feature of future wars. He believed that one of the

principal weapons would be gas bombs, that the people would be practically helpless and unable to protect themselves. A quick surrender would be the likely outcome of such attacks, if they went unopposed.¹⁰⁸

Mitchell was firm in his belief that future wars would be quick ones. He agreed with Douhet in that respect, and viewed it as a definite step forward in the art of warfare. He said, "The result of warfare by air will be to bring about quick decisions. Superior airpower will cause such havoc . . . that a long drawn out campaign will be impossible."¹⁰⁹

In Skyways, Mitchell divided military aviation into three branches: bombardment, pursuit, and attack. He also discussed the defensive role, such as that employed to protect London against the Gotha bombers during World War I, and the surveillance role, but saw these as additional missions for pursuit type aircraft. The primary role of airpower would be strategic bombardment thus "the basis of air force power is the bombardment airplane or bomber."¹¹⁰

Mitchell, being an experienced combat leader and an accomplished pilot himself, did not make the mistake that befell Douhet of believing in the efficiency of an all-purpose aircraft. He noted that the bomber, because of its size, weight and carrying capacity would not be very maneuverable or speedy. It would have to be protected by its own firepower and probably by "swifter and more maneuverable airplanes."¹¹¹ These pursuit aircraft would be optimized for aerial combat and would be able to engage the enemy

in the air and destroy him. Mitchell spoke of the third major branch, attack aviation, as being "created for the purpose of attacking troops and other formations on the ground with machine gun fire and light bombs."¹¹²

Mitchell continually emphasized the offensive use of airpower:

It was proved in the European war that the only effective defense against aerial attack is to whip the enemy's air forces in air battles forcing the enemy to the defensive in his own territory so he will be forced to take to the air and defend (his airdromes and factories). To sit down on one's own territory and wait for the other fellow to come, is to be whipped before an operation has even commenced.¹¹³

As previously mentioned, Mitchell did not restrict his interests entirely to the military applications of aviation. He saw airpower in its global ramifications both militarily and commercially and felt that both aspects were of vital importance to the future of the United States. Mitchell was one of the first to advocate the arctic air routes between the continents; he saw the route to Europe by way of Greenland and Iceland as a vital one for United States interests. In the Pacific, he saw Alaska as the key to military supremacy and stressed the feasibility of air routes through Alaska to Siberia, and from the Aleutians to the Kurile Islands, Japan and China.¹¹⁴ As early as 1924, he foresaw that the airplane would drastically change the power relationships in the Pacific, specifically between Japan and the United States. He stressed the strategic value of Alaska as a base for air operations against Japan, pointed out the vulnerability of Hawaii and the Philippines to air attack, and forecast that surface naval power would not

intimidate Japan because of the superiority of land based aircraft over naval ships. These and many other of Mitchell's ideas were ignored.¹¹⁵ In many cases he was so far ahead of his time that his ideas did not appear realistic or feasible to this military and civilian contemporaries. Technology would rescue many of his ideas and convictions in later years and later wars.

Mitchell was an extraordinary man, an extraordinary airman; he was immensely imaginative and creative. He had a vision of the future world in which the airplane was the primary vehicle, able to span the oceans and the continents, with the inherent capability of changing the old relationships among nations and people in a fundamental way. He was impatient of his fellow men because they couldn't see this future as he did, and because they were more sanguine about its rapid approach than he. He was a tenacious and ready advocate of American airpower but did not win his battle for recognition of the air arm. He sacrificed his career and died in 1936 without seeing the great American air forces of World War II.

TRENCHARD, ROYAL AIR FORCE

Sir Hugh Trenchard of the British Royal Air Force is the third member of the airpower triumvirate under discussion here. As previously discussed, he was very influential in the thinking of Mitchell. Trenchard's name is intimately linked with the develop-

ment of the Royal Air Force (RAF); he is widely acclaimed as the undisputed Father of the RAF.¹¹⁶ Sir John Slessor, former Chief of Staff of the RAF, worked with General Trenchard for many years and is a staunch admirer. He described Trenchard in these words:

There are some rare people in whose presence one instinctively and immediately feels: Here is a really great man. Not a great soldier, or airman or statesman, but a great man. They are very rare, but when one meets them they are unmistakable. Smuts was one of them, Trenchard another. . . It is difficult to define that quality of real greatness. Self confidence without a trace of arrogance; a contemptuous, yet not intolerant, disregard for anything mean or petty; the capacity to shuffle aside the non-essentials and put an unerring finger on the real core of a problem or the true quality of a man, a sort of instinct for the really important point; a selfless devotion to the cause of what he believed to be true and right.¹¹⁷

Trenchard was a modest man with a single minded faith in the future of airpower. He fought for his ideas and for the Royal Air Force. The RAF became a separate service in 1918 but was in real danger of being split up between the British Army and the Admiralty after the war. In the demobilization after World War I, the Tank Corps and the Royal Air Force came under heavy attack and the British, who had invented and deployed the tank, disbanded the Tank Corps. They entered World War II in 1939 without a single armoured division.¹¹⁸ Trenchard was able to save the RAF; as Chief of Staff from 1919 to 1929 he led the struggle for British airpower.¹¹⁹ The payoff for his work came in 1940 when the RAF engaged and defeated the German Luftwaffe in the Battle of Britain.¹²⁰

Trenchard began his military career in 1892 by joining the militia; a year later he was commissioned in the Royal Scot Fusiliers.¹²¹ He came to flying at the relatively old age of 39, and like Mitchell, paid for his own pilot training. He graduated from Mr. Tom Sopwith's flying school in August 1912 and went on to the Royal Flying Corps (RFC) Central Flying School at Upavon.¹²² By October 1912, he was an instructor and squadron commander and within another year he was assistant Commandant of the Combat Flying School (CFS). During this period, the air arm of Great Britain was organized into three elements. The Royal Flying Corps (Army Aviation), the Royal Naval Air Service and the Central Flying School. The CFS trained all aviators, Army and Naval, and was early to recognize the problems of multi-service concern over aeronautics. The first Commandant, Captain Godfrey Paine, called the CFS a mixed experimental unit and recognized that it would need firm control in order to avoid trouble caused by conflicting service regulations, traditions and customs.¹²³ As assistant Commandant, Trenchard recognized the problem and of necessity melded a set of standing orders which combined the best and most useful of the Army and Navy regulations and jettisoned the rest.¹²⁴ He fostered the spirit of a single unified air service by "sheer force of character and a massive indifference to his pupils' parent services or arms of service."¹²⁵

BRITAIN ENTERS THE WAR

Britain entered the war in August of 1914 at a time when aviation was in its infancy. Aircraft were used for reconnaissance

and courier service but little else. Artillery adjustment, close support of the infantry, bombardment of lines of communication, air superiority battles and strategic bombardment were to come in the future. The first British Air Commander in France was Brigadier General Sir David Henderson.¹²⁶ Trenchard was in Britain at the time working feverishly to build up the reserves of the Royal Flying Corps. When Henderson took the No. I Wing to France with the Expeditionary Force, he drained nearly all assets of the RFC for the deployment; Trenchard was left with the dregs. He protested at not being sent into combat but was reminded by Henderson that "there was equally important work to be done building up new squadrons at home."¹²⁷

Trenchard was equal to the task. His knowledge, experience and power of command were instrumental in turning raw recruits into airmen and skilled mechanics.¹²⁸ On October 7th, the first of the new squadrons was on the way to Belgium under the command of Major J. H. Beck to participate in the invasion of Antwerp.¹²⁹

Trenchard was not happy with training duty, nor was he happy with the tactics being used by the RFC, nor with the progress of air units in the war. When Henderson came back to Britain toward the end of October, Trenchard questioned the tactics being used in France. He was particularly upset by the use of aviation in humdrum patrol duties, observation, and reconnaissance. Trenchard favored a more aggressive policy. There was an air battle to be fought, if air ascendancy was to be gained. RFC pilots and observers

were chaffing at the ready; their morale was weakened because the enemy was allowed to maintain an unhampered air initiative. Characteristically, Trenchard concluded his arguments with an impassioned demand to be sent back to his regiment.¹³⁰ As Andrew Boyle put it: "Fortunately for him, Henderson was a man of almost excessive calmness and forbearance."¹³¹ He explained his plan to decentralize the squadrons in France, creating three operational wings to serve the three Army Corps. Trenchard was offered command of the First Wing. Would he be interested? Trenchard left Britain on November 18, 1914 for duty with the fighting squadrons in France.¹³² He was determined to take more positive action in the air. He spoke to Sir Douglas Haig, Commander of the First Army, about taking the battle into the air against the German aircraft and about the use of machine guns and bombs. Haig was very interested in air-power. He told Trenchard about secret plans for a British offensive set for March, 1915. What could Trenchard's aircraft do for him? Trenchard said of this encounter:

I explained rather badly about artillery observation (then in its infancy), reporting to gun batteries by Morse and signal lamps, and of our early efforts to get wireless going. On the map I showed him the position of my squadrons, and what their several tasks could be.¹³³

That spring, at the Battle of Neuve Chappelle, Haig put his trust in the airmen; the battle would begin when the weather was favorable for the aerial artillery observers. Trenchard's airmen were up and flying but the artillery batteries did not cooperate. Artillery adjustment from the air was less than a success and Trenchard

debriefed his pilots and observers intensely to find out why. The artillery men just weren't interested, "I could not get these gentlemen to take any interest," said Trenchard. "In fact, one of them said to me: Don't you see, Colonel Trenchard, that I'm far too busy fighting to have time for playing with your toys in the air?"¹³⁴ Haig was not happy about the cavalier attitude of his artillerymen and told them that he intended to use the air observers and that they must either follow suit or go.¹³⁵ Haig and Trenchard developed a relationship of mutual confidence and trust. Haig knew he could depend on Trenchard and Trenchard was firmly committed to supporting the field armies in every way possible with his air assets.¹³⁶

Trenchard's aggressive tactics raised the combat losses of the Royal Flying Corps and garnered him some sharp criticism, to which he simply replied that wars could not be won without losses.¹³⁷ The losses were in fact relatively light, especially when compared to the slaughter in the trenches below and Trenchard was taking steps to cut down on his own casualties through better tactics and techniques.¹³⁸

In August 1915, Sir David Henderson returned to England and Trenchard was elevated to temporary Brigadier General, Commanding the First Brigade, R.F.C. In effect, he was in command of all British air forces in France.¹³⁹ Trenchard remained in France for most of 1916 and 1917, except for a brief reassignment to the War Office as Director General of Military Aeronautics.

The American observer, Major William Mitchell, visited General Trenchard's Headquarters in May 1917; an account of that meeting was presented in an earlier section of this chapter. Mitchell and Trenchard developed an immediate rapport--mutually recognized common interests, developed respect and a degree of affection. Trenchard, the elder, shared his ideas with Mitchell and the young American Major absorbed the information with alacrity.

Trenchard talked about the lessons learned in three years of war; he believed intensely in the air offensive and that was the major thrust of their first conversations. He spoke of "the aeroplane as a weapon of attack [that] cannot be too highly estimated."¹⁴⁰ He argued vigorously against the use of aircraft in a defensive mode because of the inherent weakness of such a policy. Trenchard reasoned that the best defense against aggressor aircraft was a relentless offensive carried to the enemy. A barrier type defensive posture, with aircraft patrolling over the lines, could easily be penetrated and defeated. He cited the French experience at the battle of Verdun as an example:

When the operations at Verdun began, the French had few machines on the spot. A rapid concentration was made, and a vigorous offensive policy was adopted. The result was that superiority in the air was obtained immediately and the machines detailed for artillery cooperation and photography were enabled to carry out their work unmolested, but 25 new army ground units were put into the line which had less experience of working with aeroplanes, a demand arose in some quarters for machines of protection, and these demands were for a time complied with. The result was that the enemy took the offensive, and the French machines were unable to prevent the hostile raids

which the enemy, no longer being attacked, was now able to make. The mistake was at once realized and promptly rectified. A policy of general offensive was once more resumed, and the enemy at once ceased to make hostile raids, all this time being taken up in fighting the machines which were attacking him. Superiority in the air was thus once more regained.¹⁴¹

Trenchard was impressed by the moral effect that the aircraft had upon those on the ground. He said, "The mere presence of a hostile machine in the air inspires those on the ground with exaggerated forebodings with regard to what the machine is capable of doing."¹⁴² The best way to exploit this psychological effect was to stay on the offensive "by attacking and continuing to attack."¹⁴³ Trenchard was also impressed with the fact that the airplane could be used to attack the enemy at places other than the front lines. According to Mitchell,

He considered it a perfectly practical thing for airplanes to attack the rear of the German army through the air and destroy all of its means of supply, subsistence and replacement. The Ruhr district around Essen is the arsenal of the Teutonic powers, and if this could be destroyed, it would be a terrible blow to Germany.¹⁴⁴

This mission was reserved for the future, however, as the British had neither the machines nor the personnel for such ambitious projects. Alfred Hurley believes that:

Trenchard was firmly committed to ground support first in the day-to-day struggle for command of the air over the battlefield. Given even ampler means, Trenchard plainly intended to support a ground effort as the best way to win.¹⁴⁵

Trenchard also had some definite ideas on organization of air forces. The Royal Navy and the Royal Flying Corps both had air units at the front in France and this caused many problems--two separate organizations deployed, both doing exactly the same task. Trenchard had operational command of all the British air forces in France, but felt that the arrangement was exceedingly complicated. Things were even worse in the air defense of Great Britain. The Navy claimed jurisdiction of the airspace over all the water, and the Army over the land. The result was a poorly coordinated defense, which gave the German raiders an advantage that they should not have enjoyed. It was Trenchard's firm conviction that all airpower should be unified under one command.¹⁴⁶

He organized the British air units so as to utilize the principles of mass and concentration. A minimum of aircraft were assigned to dedicated unit support, working directly with the ground units. The bulk of his forces were assigned to the General Headquarters Brigade. These forces were organized into bomber and pursuit units and with central control could be concentrated at specific localities for specific objectives.¹⁴⁷

The General Headquarters Brigade was similar in concept and mission to the French "Aviation de combat," air units of bombers and fighters controlled from the French Army Group level.

Mitchell discussed Trenchard's brigade aviation employment:

His idea was to send them across in one big formation which attacked the object with bombs and machine guns, fought whatever air battles were necessary and then get back as best it

could. This is the proper way to use airpower and I am sure the future will see operations conducted in this way by thousands of airplanes.¹⁴⁸

Thus Mitchell was schooled in 1917 under the informal tutelage of the foremost airpower practitioner of the era, "'Boom' Trenchard, nicknamed for his fog horn voice and explosive personality."¹⁴⁹

Isaac Don Levine, one of Mitchell's biographers had these words about Trenchard:

It was Trenchard who built up British aviation from a handful of second-class planes into a powerful force. And it was Trenchard who had a complete philosophy of airpower which projected a new kind of warfare in the world. Probably no one throughout his life had a greater influence on Mitchell's aviation views than General Trenchard.¹⁵⁰

While Trenchard and Mitchell were waging war and exchanging ideas in France, the Germans were planning for bombing raids over London. On June 13, 1917 the Kaiser's bombers "shook Whitehall to its foundations" with a daring daylight raid by a squadron of twin-engined Gothas.¹⁵¹ Andrew Boyle described the results:

The raid caused minor damage to property, major havoc to morale; nearly 600 people were killed or maimed; none of the fourteen raiders was brought down; and the manifest ineffectiveness of the anti-aircraft defenses, to say nothing of the ensuing public outcry, led the Government to react vigorously . . . Trenchard was recalled from France for immediate consultations.¹⁵²

Trenchard presented his views and recommendations to the Cabinet at a special session of June 20. The best way to stop the raids would be for the British to capture the Belgian coast, forcing the Germans to fly over territory occupied by the British. This would

afford not only warning but would allow the Gothas to be attacked before they arrived over London and on their way home. The next best alternative would be to attack the German aircraft on the ground behind the Western Front. The problem with this solution was twofold: Britain didn't really have an effective bomber and secondly, she lacked the numbers of machines and pilots in France to do the job.¹⁵³ Trenchard counseled against trying to defend with a system of patrols over the English Channel. Such a system would require large numbers of aircraft and pilots if it were to have any hope of success; the resources were not available. He thought that a modified system of patrols, working on both sides of the channel with the help of an extensive communications system might be a workable interim solution. Success for such a project would require "unity of command" over all elements in the system; this view supported his conviction that an adequate air defense was very difficult, given the rivalry between the Navy and Army air organizations.¹⁵⁴

Prime Minister Lloyd George wanted reprisal raids on Mannheim, Germany at once. Trenchard was against it. He stated that any attempt to bomb Mannheim would fail, since the city was beyond the range of his aircraft. The debate raged on. Two fighter squadrons were brought back from RFC assets in France and were put on daylight defensive patrols over the Channel, in spite of Trenchard's objections. The Germans retaliated against the weakened RFC in France causing an immediate outcry from the British ground commanders; Trenchard and the politicians were caught in the middle.¹⁵⁵

Trenchard explained the German motives:

By bombing raids against London and in England, they have tried, trusting to their effect on public opinion and to the political agitation which was bound to follow, to make us dislocate our flying forces in the field . . .¹⁵⁶

Much to Trenchard's surprise, the Commander-in-Chief of British forces sent the two fighter squadrons back to France. The Germans responded to that move with renewed attacks on London. "The psychological shock of this second daylight attack within a month was prodigious."¹⁵⁷ The fighters returned to patrol duty over the Channel and another message was sent to General Haig, British Commander in France, again urging reprisal raids against Mannheim. In order to comply, Trenchard asked for a squadron of De Havilland 4's with the new six-cylinder Beardmore engine; this engine had the range and power for the job. He said, "We must stop the bombing of London, but the only way to do it is to knock out completely the German aviation here" (on the continent).¹⁵⁸

One of the major results of the German strategic attacks on London in the summer of 1917 was the creation of a separate Air Ministry and the Royal Air Force, by combining the RFC and the Royal Naval Air Service into one command.¹⁵⁹ Trenchard was named Chief of the Air Staff of the new service on January 3, 1918. He resigned the post in March because of irreconcilable differences with the Air Minister over air policy and the division of civil-military authority in the New Ministry.¹⁶⁰ Lord Rothermere, the Air Minister, wanted to bring squadrons back from France for the defense of Britain.

Trenchard refused to order the moves. His policy was to concentrate the air forces to support the army in France and to defeat the German army in the field.¹⁶¹

Trenchard's resignation was announced on April 15; Lieutenant General Sir David Henderson, vice president of the Air Ministry resigned within a week. Parliament was in turmoil over this new crisis in the air picture--Lord Rothermere resigned on April 25, 1918.

THE BOMBER COMMAND

The new Air Minister, Sir William Weir, was an experienced engineer who had worked with the RFC since 1914, had been a member of the Air Board since January 1917 and was well acquainted with Trenchard. He knew and respected Trenchard for his capabilities and was well aware of his eccentricities.

Weir was working on an idea for a new strategic air element which would be called the Independent Air Force (IAF). He was looking for a man capable of building this new force and was also anxious that Trenchard's experience and talent not be wasted in inactivity. Weir knew that Trenchard was the man for the job as head of the bomber command, but Trenchard was reluctant. Weir was persuasive; he talked Trenchard out of his self imposed exile and installed him as commander of the IAF.¹⁶³

Trenchard was enthused about the possibilities of strategic bombing but was not in favor of any radical shifts in priorities in order to get a strategic force. As previously stated, Trenchard

was firmly committed to the support of Haig's army forces in France. In a memorandum to Air Minister Weir on 23 June 1918, he reiterated his sense of the priorities. He stated that the first requirement was for sufficient air forces for the tactical support of the army in France. This force should be large enough to meet and defeat the enemy air force in the area of the battlefield; once that capability was reached it would serve no purpose to build more tactical units. At that point the air battle should be extended to the enemy homeland. Trenchard recognized the potential of the strategic role and said in a memo:

It seems to me unanswerable that if it is possible to hit the German armies in France and at the same time hit the Germans in Germany, this is a better concentration of effort than if we hit only one part of Germany . . . As long ago as June, 1916, I asked for . . . squadrons for fighting the Germans in Germany . . . In my opinion, the British aviation is now strong enough both to beat the German aviation in France and to attack the industrial centers of Germany . . .¹⁶⁴

The Royal Air Force and the Independent Bombing Force were created as a result of the public and political pressure to do something about the German raids on London. Trenchard accepted the bombing mission and stated that the objective of his force was "the break-down of the German Army in Germany, its Government, and the crippling of its sources of supply."¹⁶⁵ He described two alternative courses of action.

1. A sustained and continuous attack on one large centre after another until each centre was destroyed, and the industrial population largely dispersed to other towns;

2. To attack as many of the large industrial centres as it was possible to reach with the machines at my disposal.¹⁶⁶

He chose the second course of action because of the small size and limited capability of his force. The force started as two wings with three day squadrons and two night squadrons. There were plans for a total of 60 bomber squadrons, but the force reached only 10 squadrons by the end of the war.¹⁶⁷

Trenchard placed great faith on the demoralizing effect of aerial bombardment and estimated that the ratio of the moral effect to material effect was on the order of 20 to 1. With the small force that he had available he reasoned it would be prudent to exploit this moral effect over a wide area, taking advantage of the fact that the German people were growing very weary of the war and its attendant sacrifices by the summer of 1918.¹⁶⁸

During the five months from June 6, 1918 until the armistice in November, the IAF dropped 543 tons of bombs. Of this total, 220 tons were directed at enemy airdromes in counter-air operations and the remainder were targeted against industries in some fifty German towns and cities.¹⁶⁹ The effort was spread out rather thinly and the results were inconclusive as a true test of the concept of strategic bombardment. H. A. Jones in The War in the Air, a history of the British air effort in World War I, reported the following:

There is evidence to show that the effects off the air raids on the morale of the workers was uneven. Where attacks were only infrequent, but also comparatively harmless, air-raids did not

cause undue worry . . . There were occasions when impromptu dances were held in shelters for the duration of an alarm.

Where, however, severe damage had once been inflicted, and the attack in general had been of a terrifying nature, subsequent alarms worked upon raw nerves and there was no inclination to dance. At the Volklingen, Burbach, and Hagendingen steel works, all of which suffered severe damage at times, the frequency of air-raid warnings . . . so affected the weary and undernourished operatives that their efficiency diminished sharply.¹⁷⁰

German steel plants in many cases suffered only minor physical damage because of the massive construction of the buildings with walls of three foot thickness. For instance, at the Badische works in Mannheim, a total of 230 bombs fell in or close to the steel plant during some 15 air raids. Most of the bombs were of the 112 lb. type which were inadequate for the task. Toward the end of the war a few 1650 lb. bombs were being carried by the Handley-Page bombers but most of the ordance delivered by the IAF was a much smaller variety.¹⁷¹

Trenchards decision to use about fifty perccent of his bombing effort against the German airdromes was a direct reflection of his belief that this was a proper way to conduct the battle for air supremacy. The Independent Air Force bombing of aerodromes had two objectives:

1. To inflict damage on the German night-bombing squadrons and generally to subdue them in order to make them unable, or unwilling, to attack the aerodromes of the Independent Force, and
2. Similarly to damage and subdue the German fighter squadrons so as to make the way of the British day bombers easier.¹⁷²

It is important to note that the IAF was really a collection of makeshift bombers. The primary day bomber during most of the five month life of the force was the De Haviland 4 (D.H. 4) which had been designed as an observation plane. One of the night bomber squadrons was equipped with the F.E. 2, a fighter-reconnaissance aircraft which had become obsolete in 1916. Better equipment was on order, the D. H. 9* to replace the D.H. 4 and the twin-engined Handley-Page for night bombing. Trenchard was not particularly impressed with the larger Handley-Page bomber, he considered it too slow and vulnerable and unsuitable for daylight bombing which he preferred. RFC squadrons had little experience in night flying and were not keen to participate in the night work, but naval fliers had more experience with night bombing and with the Handley-Page and were in favor of night operations. Proponents of night bombing cited the following reports from naval squadrons at Dunkirk to support their cases:

1. There are more clear and calm nights than days during the year, therefore, night operations can be more regular.
2. Owing to the inaccuracy of anti-aircraft fire at night a high performance is not required, and about four times the weight per horsepower of bombs can be carried in a night bomber as can be carried by day.
3. The aeroplane can descend lower over a target at night, which makes for increased accuracy.

*The D.H. 9, however, ran into development troubles. It's performance was not as good as the D. H. 4 when it finally got into production.

4. When attacks are made on aerodromes, enemy fighting aeroplanes will be in their sheds at night, whereas in the day empty sheds may be bombed.

5. A night-bombing aeroplane can operate night after night, but as day bombers are nearly always hit over well-protected areas by anti-aircraft and machine gun fire, it is found that only one-half of them can be kept in commission.

6. No difficulty is found on clear nights, even when there is no moon, in locating an objective.

7. Train activity, movements of convoys and movements of men, nearly always take place at night.¹⁷³

After considering this evidence, Trenchard expressed agreement with night bombing concepts, stressing only that careful training of aircrews held the key to successful night operations. Other more dramatic improvements were on the way by mid-1918. The super Handley-Page V/1500 bomber was test flown in May and again in October. This was a four-engine plane that could carry thirty 250 lb. bombs and had a crew of six. When the armistice was signed there were three ready for service; they had brought Berlin into range. No missions were flown but a significant technical capability had been demonstrated.¹⁷⁴

The significance of the Independent Air Force cannot be over-estimated. Trenchard's program of day and night bombing operations against enemy industry was the forerunner of the Allied Combined Bomber Offensive of World War II. Doctor Thomas H. Greer assessed Trenchard's World War I contributions:

Trenchard became widely recognized as the leading prophet and pioneer of strategic aviation, and he strongly influenced the thinking of later air leaders like Mitchell and the Italian Douhet . . .

Within the limits of his planes' range and numbers, General Trenchard broke the trail for strategic doctrine and practice.¹⁷⁵

CHIEF OF AIR STAFF--1919 TO 1929

After the Armistice on November 11, 1918, Trenchard returned to London almost immediately. He saw no future for himself in the RAF having once been the Chief of Staff and having resigned from office. Besides, one of his old enemies, General F. H. Sykes was the incumbent Chief and did not look vulnerable. Trenchard applied to the Colonial office for an overseas post as an economic advisor.¹⁷⁶

Winston Churchill was the new post war Minister of Air and was simultaneously the Minister of War. Churchill, on the advice of the outgoing Air Minister, Sir William Weir, summoned Trenchard to Whitehall for discussions. Churchill asked if Trenchard would like to return to his post as Chief of Air Staff. He also requested Trenchard's recommendations for the reorganization of the Air Ministry. That evening, Trenchard outlined a clear, concise plan for a severely simplified Air Ministry. Churchill used the plan in cabinet level deliberations and Trenchard took office as Chief of Staff on February 15, 1919.¹⁷⁷

Trenchard served as Chief of Air Staff of the Royal Air Force from 1919 to 1929, a period critical to the survival and development of the air service. He devoted his energy toward preserving the independence of the RAF which was under attack from several quarters.

Dr. Harry H. Ransom described Trenchard's problems:

Trenchard fought three formidable adversaries during his tenure as Air Chief: The Admiralty, the War Office, and economy-minded political leaders. Postwar retrenchment decimated the RAF. Meanwhile the Navy and Army worked to regain their own air services.¹⁷⁸

The cutbacks immediately after the war were drastic. Trenchard abolished the Independent Air Force while reducing the RAF from 400 operational and training squadrons to 12 with a total strength of 28,000 men.¹⁷⁹ Believing that trained personnel were more important than aircraft, Trenchard decided to stress men instead of machines. He determined to produce a small but highly efficient technical force that would provide a solid basis for later expansion. Trenchard's program produced permanent barracks and schools for the training of officers and men. Among the schools that he started during his tenure were the RAF Apprentices School at Halton, the RAF College at Cranwell, and the RAF Staff College at Andover. He also created the RAF Reserve and the Auxiliary Air Force.¹⁸⁰ These institutions were funded at the expense of buying new aircraft in some cases and Trenchard suffered criticism for his decisions. However, these organizations formed the foundations from which the RAF grew in strength and professional ability and in the long run were instrumental in enhancing the survival of the junior service.¹⁸¹

As the postwar RAF rebuilt its strength from 12 squadrons in 1919 to 25 squadrons in 1920, the staff began casting about for new missions. By 1921 it appeared that the new service would survive and Trenchard was looking for ways in which the new force could be used economically in a peacetime role.¹⁸² He conceived the concept of "Air Control," a bold departure from conventional thinking in which air squadrons instead of ground forces were used to maintain military control of an area.¹⁸³ Air Control featured the use of aircraft working with small units of ground troops in armoured cars, for use as occupation forces in the overseas territories.¹⁸⁴ Sir John Slessor told how the first application came about:

At the Cairo Conference in 1921, Mr. Churchill, on Trenchard's advice, undertook the bold experiment of giving the responsibility for the maintenance of law and order in Iraq to the Air Ministry, to be exercised mainly through the medium of eight squadrons of the Royal Air Force, supported by a relatively small force of troops on the ground.¹⁸⁵

The experiment in Iraq was successful and the Air Ministry was later assigned control over Palestine, TransJordan, and the Aden Protectorate. Air Control seemed suitable for use in the undeveloped portions of the middle East especially in covering sparsely populated desert areas and tribal populations. Air Control was controversial and subject to much criticism by its detractors in the War Office and the Admiralty. However, the concept had its supporters outside the Air Ministry, especially among the Political Officers in the mandated territories under control. Slessor quoted from the text of a report from Sir Percy Cox to the High Commissioner in Iraq in 1923:

Without air transport, the niceties of administration and military touch are impossible with other existing means of travel in Iraq, and perhaps the greatest achievement of Air Control in Iraq during the six months under review has been the introduction of this inestimable asset. By its means it has been possible to achieve a highly centralized yet widely understanding intelligence, which is the essence of wise and economical control.¹⁸⁶

Air Control was also economical. The army estimates for the defense of Iraq had been quoted at 25 million pounds per year. Trenchard offered to do it for 8 million pounds and actually got by on 5 million pounds.¹⁸⁷

This was but a fraction of the War Office estimates, a factor that was enthusiastically appreciated by the Treasury. This saved the RAF much criticism from high places in the government.¹⁸⁶

The Admiralty did not give up easily and persisted in its attempts to break up the Air Ministry. By 1922, however, Trenchard's battle for independence for the airman was largely won. When a motion was made in the House of Commons for the return of the Naval Air Service to the Admiralty, Austen Chamberlain made the following remarks:

Believing as we do that the Air Forces have immense potentialities of their own, and in their own element, distinctive from their other and vitally important duties in connection with the naval and military services. The great importance of which is not in the least underrated, and convinced as we are in the future that the greatest danger to this country may well be from the action of air forces rather than of naval and military forces, we consider that it would be a retrograde step at this time to abolish the Air Ministry and to reabsorb the Air Service into the Admiralty and the War Office.¹⁸⁷

Trenchard retired from active service in 1929 but continued to serve aviation as its senior spokesman in The House of Lords.¹⁸⁸

Many years later in 1945, still an active and able spokesman, he published a pamphlet titled "The Principles of Air Power on War."

In the pamphlet he said:

These four principles were conceived on the day the air was conquered. They have stood the stress of war to enable airpower to save countless casualties both in the field and at sea . . .

1. To obtain mastery of the air, and too keep it, which means continuously fighting for it.
2. To destroy the enemy's means of production and his communications in his own country, that is by strategic bombing force.
3. To maintain the battle without any interference by the enemy, which means to enable the commanders to build up the colossal supplies and reinforcements necessary for the battle, and to be able to maintain them without interruption by the enemy.
4. To prevent the enemy being able to maintain the battle, that is, to prevent him being able to build up adequate supplies for his armies and navies or air force.

The above principles were implicit in airpower as used even in the War of 1914-1918, but the technical means for their application were not then sufficiently developed to give airpower the influence which it has exercised in 1939-1945.¹⁸⁹

Trenchard lived until 1956. He was the longest lived of the airpower triumvirate. Douhet had died in 1930 and Mitchell in 1936. Thus Trenchard was the only one to see their ideas and visions come to fruition and test in World War II. He also was on hand for the dawn of the atomic age, that moment in history which marked the zenith of strategic aviation.

SUMMARY OF EARLY AIR THEORIES

By the early 1930's, Douhet, Mitchell and Trenchard had digested the experiences of World War I. Their ideas had been formulated, debated, modified, and published in one form or another. Trenchard had been successful in building an independent air arm in Great Britain. Douhet's ideas found fertile ground in the Italian fascist movement and resulted in a centralized Department of Defense with an independent air force. Mitchell had made a strong bid for aviation in America, but had not succeeded in gaining independent status for military air forces.

The role of military aviation in the international power equation was recognized. Nations that maintained military forces in peacetime all had significant air forces to complement their naval and ground forces or at least recognized the need for air forces. The debate by governmental decisionmakers was not whether nations needed airpower, but rather what kind of airpower was needed, how much was required, how it should be organized, and what its relationship to ground and naval forces should be? These questions were asked and debated all around the world. Naturally, different nations arrived at different answers.

The early aviation theorists recognized and agreed upon certain basic doctrinal ideas for the employment of airpower. They were all convinced that some form of air superiority was essential in modern warfare. Douhet called it Command of the Air; Mitchell recognized

its importance in his tactics at St. Mihiel and Meuse Argonne; and Trenchard had preached the idea since 1914.

They agreed that airpower was essentially otherwise immature. Douhet even went so far as to say that air attacks by the enemy would simply have to be absorbed since adequate defense was not possible. Mitchell and Trenchard didn't subscribe to such an extreme position as that, but both knew from experience that air tactics had to be aggressive, forward, and offensive if success was desired--even if the air campaign was strategically defensive.

Organization of the military forces was another area where the early airpower supporters were in agreement. All air forces should be under one ministry for air; air forces should be independent of naval and ground forces; and air forces should be commanded by airmen. Airpower was the most important of the three military forces and it should be recognized organizationally in the military structure of nations.

Douhet and Mitchell agree that the role of strategic air forces was central in the strategy of air employment. Tactical aviation had been primary in World War I but strategic bombardment was the wave of the future. Douhet was completely adamant on this point. He recognized the role of auxiliary air forces as he called them--but considered them a waste of resources because they detracted from the overall strength possible for the strategic forces. Mitchell was not so adamant; he expressly recognized three branches of military aviation: bombardment, pursuit, and attack. He was a

strategic bombardment advocate, however, and saw this as the primary role of airpower. Douhet and Mitchell both believed that the surface forces were of secondary importance in the balance of forces and this was consistent with their views on strategic bombardment. It does not appear that Trenchard was in agreement with this aspect of the theory. He believed intensely in strategic bombing as a proper and vital role for airpower but did not join his compatriots in relegating naval and ground forces to a position of inferiority or insignificance.

The idea that strategic bombardment was primary (as Douhet put it--necessary and sufficient) was perhaps the most controversial aspect of the military strategy debates between the world wars. It was argued in the high councils of government in many countries of the world. The official doctrine of the United States Army in 1940 was published by the War Department in Field Manual 1-5, Air Corps Field Manual, Employment of Aviation of the Army. FM 1-5 reflected the institutional position of the U.S. Army just prior to U.S. entry into World War II. It contained the following statement:

Military aviation constitutes a powerful weapon for the conduct of strategic air operations and support of operations of the field forces.¹⁹⁰

Strategic aviation was recognized as one of two roles for military aviation--the other being support of the armies in the field. This statement would not have pleased Douhet; Mitchell probably could have lived with it if only the U.S. Army Air Corps

were independent of the U.S. Army; and Trenchard, who had built the independent Royal Air Force, would probably have found the dual strategic/tactical mission quite comfortable.

DONALDSON D. FRIZZELL
LTC USAF

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