NATIONAL DEFENSE UNIVERSITY

NATIONAL WAR COLLEGE

AIRPOWER STRATEGY IN THE INTERWAR YEARS:

NOT READY FOR PRIME TIME

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5602
MILITARY THOUGHT AND THE ESSENCE OF WAR
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Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
2004		**00-00-2004 to 00-00-2004**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Airpower Strategy in the Interwar Years: Not Ready for Prime Time	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **National War College,300 5th Avenue,Fort Lesley J. McNair,Washington,DC,20319-6000**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES
The original document contains color images.

14. ABSTRACT
see report

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT **unclassified**	b. ABSTRACT **unclassified**	c. THIS PAGE **unclassified**		**17**	

AIRPOWER STRATEGY IN THE INTERWAR YEARS

Although there are no hard and fast rules in the development of military strategy, a common pattern has developed over the history of warfare that suggests a chronological relationship between military theory, strategy, and execution. Theories are often devised to adapt to the new character of war demonstrated by a recent major conflict. These theories illuminate new strategies, which are then executed in the following war. The strategist's job is to bridge the gap between theoretical concepts and practical application. Given this cycle, it would not be surprising to find that the changing character of war experienced in World War I would produce a new body of theories. The impetus for new theory was even more compelling due to the development of a revolutionary new weapon of war—the airplane. This paper describes the character of World War I and the airpower theories that followed. It posits U.S. airpower strategy followed theory almost to a fault, and that limitations in airpower technology, institutional issues, and failure to adequately challenge assumptions of the early airpower theorists resulted in a strategy that fell short of expectations.

World War I—Total War

In keeping with the framework described in the introduction, it is constructive to examine the change in the character of war during World War I that illuminated theories to follow. While this watershed event can be analyzed in numerous ways, two characteristics stand out as particularly noteworthy. The first was a remarkable increase in the lethality of war, largely due to the technological advancements of the previous half-century. Though the machine gun was introduced in the U.S. Civil War, the failure of all combatant countries to adapt tactics to mitigate its immense killing power resulted in an astonishing number of deaths during infantry charges in World War I. Additionally, artillery continued to improve in the late 19th century both

in range and accuracy. This increased lethality shifted the comparative advantage to the defense, thus negating maneuver tactics and relegating forces to trench warfare. Ultimately, the dominance of defensive positions begged for a more effective way to inflict sufficient casualties to enable successful offensive operations. Poison gas provided a promising, if unattractive alternative. Because of its ability to spread and persist, gas eliminated the need for pinpoint accuracy. In addition, the ability to place it in an artillery shell kept the gas clouds far enough away to protect one's own troops (if the winds were right). Thus by 1918, one in four artillery shells contained poison gas.[1]

Mobilization—both of the armies and of the people—was a second characteristic that defined the First World War. The industrial revolution provided the means by which large armies could move from peace to war in minimal time—mass production and railroads with relatively fast trains. However, the intricate and rather precise timetables and schedules for moving troops gave the warring countries little flexibility in the speed or magnitude of their mobilization. Additionally, social mobilization was a phenomenon that was decades in the making. Beginning in the latter half of the 19th century, differing segments of European society became more polarized as a result of various social movements (Socialism, Marxism, Darwinism). The effect was a entrenched sense of superiority (cloaked in the popular term of nationalism) that served to sustain the will of the people through the hopeless quagmire of World War I. In sum, the belligerents were equipped with increasingly lethal means and mobilized nations in arms. Guided by an ineffective strategy, the combination proved to be a recipe for disaster.

The Aftermath—and Airpower's Promise

The result of World War I was nothing less than tragic. The casualty count was over 37.5 million, with approximately 8.5 million killed—over 5,500 per day for four and a half years.[2] Failed strategies of annihilation and attrition eventually gave way to exhaustion, and the loss of a generation of Europeans overshadowed any sense of romantic heroism for both victor and vanquished. Perhaps the only view shared by all combatants at the end of the war was that this type of prolonged, deadly stalemate must never happen again.

To that end, there were three main paths pursued in the aftermath of World War I. The most idealistic endeavor sought to outlaw war altogether. After ten years of post-war negotiations the Kellogg-Briand Pact was signed, condemning "recourse to war for the solution of international controversies."[3] The agreement had 15 signatories (among them the United States, Germany, Japan, Italy, and Great Britain) and was ratified by 62 nations. This proved to be largely symbolic, as there was no formal measure of enforcement to give the pact teeth.

A more practical, if equally ineffective tactic was to attempt to limit war through the limitation of its means. One of the better known efforts of the time was the Washington Naval Conference of 1922. The five-nation treaty that emerged limited the size and number of capital ships and aircraft carriers for the major sea powers of the day (United States, Great Britain, France, Italy, and Japan).[4] This also proved to be a naïve attempt, as there was no provision for inspection to ensure all parties remained in compliance.

The most realistic approach was taken by those who realized that warfare was as old as human history, and the surest path to success was to find ways to adapt the conduct of war to its new character. To this end, Sir Basil Henry Liddell Hart communicated the concept of the indirect approach, a strategy of enlightened concentration and dispersal in which objectives

could be obtained without reducing warfare to mass-on-mass confrontations.[5] This strategy required substantial maneuverability, and the entry of the tank into warfare at the end of World War I provided operational credibility to this body of thought. Another technological marvel—the airplane—made its debut at the beginning of the century, but was far from reaching its potential by the end of World War I. Consequently, the early theorists used the power of extrapolation to articulate the promise of airpower.

The most intriguing element of airpower thought after World War I was the idea that aircraft were uniquely capable of striking the heart of the enemy. The allure of such a capability was certainly justified: the concept of strategic aerial attack provided the ideal response to the new character of war. The ability to "invade" sovereign territory without being exposed to the increased lethality of automatic weaponry, long-range artillery, and poison gas renewed the promise of effective offensive action. In addition, the fact that entire nations mobilized for war exposed a new and softer target behind enemy land forces. Italian General Giulio Douhet and U.S. Army General Billy Mitchell, two of the most prominent airpower theorists of the early 20th century, capitalized on this potentiality and made it the centerpiece of their advocacy. Douhet identified the will of the civilian population as the primary target, most effectively attacked through inflicting mass casualties in quick and decisive first strikes on cities. In order to maximize devastation and rapidly bring about social collapse, he proposed the use of high-explosive, incendiary, and poison gas bombs. At first glance the theory may seem counterintuitive in the quest for more humane war, but Douhet argued: "Mercifully, the decision will be quick in this kind of war, since the decisive blows will be directed at civilians, that element of the countries at war least likely to sustain them."[6]

Mitchell preferred targeting the enemy's means as a path to national will and advocated attacking vital centers—"the manufactories, the means of communication, the food products, the fuel and oil"[7]—in order to compel surrender. While Mitchell and Douhet may have disagreed on the margins as to the most appropriate targets, both firmly believed that airpower's *raison d'etre* was strategic bombardment. Armed with this revolutionary concept, airmen within the Army Air Corps set out to design a comprehensive airpower strategy to adapt to warfare's new character.

In an effort to coalesce airpower thought and develop a cogent doctrine, the Army created the Air Service Field Officer's School in 1920—later renamed the Air Corps Tactical School (ACTS).[8] As it developed, the central theme of this school became airpower's ability to independently strike deep with strategic effects, as Mitchell and Douhet had espoused. The detailed strategy developed at the ACTS fell closer to Mitchell's concepts, and came to be known as the Industrial Web Theory. In short, the thinking was that industrialized nations had critical elements of production and power that were vulnerable to attack. The destruction of such targets would at least cripple the war-making capability of that country and at best result in social collapse and relatively quick defeat. Because these targets were usually located well beyond the fielded forces, success of strategic attack depended upon the ability to fly significant distances and drop large payloads with the highest accuracy possible. Therefore, as the strategy matured in the late 1930s, the "queen of the battle" for airpower became the most technologically advanced aircraft of the day—the long-range strategic bomber.

On the eve of World War II the Army Air Forces had the Industrial Web Theory "operationalized" in the form of the Air War Planning Division's Plan-1 (AWPD-1). It also possessed the long-range B-17 Flying Fortress (an aircraft that closely resembled Douhet's vision of a battleplane) to accomplish this mission.[9] However, in the final analysis the results of

strategic bombardment in World War II—with the exception of dropping atomic bombs on Japan—have been mixed. Though the US Strategic Bombing Survey declared, "airpower was decisive in the war in Western Europe"[10] it did not imply that airpower had the ability to win wars on its own. The assessments of success were couched in terms of support for other services ("combined with naval power, brought an end to . . . the U-boat," "made possible the success of the invasion"[11]), asserting that it was necessary for victory, but never suggesting airpower alone was sufficient as Douhet and Mitchell insisted. Additionally, the victory came at significant cost. The Army Air Forces lost nearly 23,000 aircraft and sustained 121, 867 casualties during World War II.[12] It certainly did not achieve Mitchell's vision of victory "in an incredibly short time . . . and months and even years of contest of ground armies with a loss of millions of lives will be eliminated in the future."[13] Why did the results of strategic bombing in World War II fall short of Mitchell and Douhet's vision?

Interwar Airpower—A Work in Progress

As Douhet and Mitchell were first articulating their thoughts on airpower, the airplane was only a teenager. The first flight in 1903 was made by a 605-pound Wright Flyer that cruised at an average of seven miles per hour (mph), had an endurance of 12 seconds and a range of 120 feet.[14] Fifteen years later, the massive British Handley-Page V bomber weighed in at an impressive 24,700 lb, with a maximum speed of nearly 100 mph.[15] With such an exponential growth rate, the realm of the possible for airpower appeared nearly boundless to the theorists. As the ACTS airmen set about formulating strategy, it was critical for them to extract the finite body of what was realistic from the possibilities developed in theory. To the strategists' detriment, there were several assumptions inherent in the theories of Douhet and Mitchell that were not technologically valid at the time of strategy development.

One critical assumption that proved invalid was that a target attacked equaled a target destroyed. Mitchell communicated his confidence in precision by introducing such untested technological possibilities as gyroscopically guided, radio-controlled bombs. In describing bombardment, he concluded: "The progress made since the war is phenomenal. The sights which are used now are very accurate. Airplanes can launch their projectiles with great accuracy from practically any height."[16] Douhet reduced targeting to simple math, explaining the calculations to determine the number of battleplanes would be required to destroy certain surface areas.[17] In reality, the Army Air Force bombers in World War II were not technologically advanced enough to provide the accuracy assumed away by the theorists. Even with the advent of the Norden bombsight on the B-17, the fact that the bombers were forced to fly at higher altitudes to avoid anti-aircraft artillery and harassment by Luftwaffe fighters yielded an accuracy far short of that envisioned by Mitchell and Douhet.[18]

A key area on which Douhet and Mitchell differed was the perceived invincibility of the bomber, and the importance each placed on fighter (pursuit) aircraft. For both, command of the air was essential, but Mitchell believed pursuit aircraft were of significantly more value than did Douhet. For Mitchell, pursuit aircraft were necessary to secure command of the air and protect the bomber aircraft. He even went on to prescribe that the pursuit aircraft should have a radius equal to bombardment aircraft, and that they be fielded at a 2:1 ratio to bombers.[19] Douhet espoused that to pursue enemy aviation would not only detract from the primary offensive aim of airpower, but also that such a mission would be ineffective. Speaking to his belief in the futility of defense and aerial warfare, he asserted: "Unfortunately, we can not dig trenches in the air, nor throw up barbed wire entanglements, nor prevent infiltration."[20]

This significant difference between the two theorists manifested itself in a fierce debate at the ACTS--the resolution of which future airpower doctrine rested.

> The weakest link in the theory of air power lay in this question whether bombers could reach their targets in the face of pursuit and anti-aircraft opposition, without prohibitive losses. On this question the Air Corps Tactical School in 1932 was split by the intense and deep convictions of two rival elements: the Bombardment Section under the driving intensity of Ken Walker and Harold George, and the Pursuit Section, under the equally partisan convictions of Claire Chennault. The whole concept of strategic air power hung upon the validity of the rival claims, and there seemed little hope of a practical test which would resolve the problem. If the bombers could reach their targets and deliver their bombs with acceptable accuracy, and if they could do so with a tolerable loss rate, then a whole new vista of warfare was opened up. If they could not, then a new weapon simply had been added to the arsenals of land and sea warfare.[21]

In the end, strategic bombardment won out and became the driving force behind the air war plan in World War II. Why was pursuit ignored? The issue is a complex one, but there were both technological and institutional issues at play. In the 1930s, the bomber was the most advanced aircraft in the US inventory, largely due to the fact that strategic bombardment had gained favor in the late 1920s. Consequently, scarce research and development funds were allocated toward the production of advanced aircraft for that mission. As a result, by the time the pursuit-bombardment debate took shape, the pursuit aviation advocates were at a disadvantage because they were forced to make their case using inferior equipment.[22] The result was the lack of development of a suitable long-range fighter escort aircraft in the interwar years. This would prove costly in the early months of the Combined Bomber Offensive as Major General Haywood Hansell, Commander of the First Bombardment Division, recalled:

> The Schweinfurt raids had indeed been costly, too costly to pursue at that rate of combat losses. The escort fighters, whose assistance had been predicted, were sorely needed. Penetration of German air space had to be limited until long-range fighters could be provided. The solution came in the form of droppable auxiliary tanks. Why no one had thought of this earlier defies explanation.[23]

Institutional challenges further complicated the pursuit-bombardment debate in the interwar years. During the development of airpower doctrine, the Army Air Corps was struggling to forge its own identity. Mitchell and Douhet both adamantly believed that an independent air force was necessary if airpower's true potential was ever to be realized. However, the contextual realities of the time—limited budgets, strong opposition from the mainstream Army, and airpower's unproven potential—made such reorganization improbable. If the Army Air Corps could prove that it had a decisive, independent *mission,* the path toward *organizational* independence would be significantly easier to walk. Any chink in that armor such as the demonstrated vulnerability of strategic bombers could have significantly hindered progress in the quest for an independent service.[24]

Even if the previous two assumptions were valid (the bomber will get through and it will hit the target), victory still depended on one additional leap of faith—that the enemy's war-making machine could be destroyed. By the time the strategic bombing campaign in Europe began in earnest, Germany had already achieved substantial territorial gains and access to additional means of production. This increased the complexity of the strategy by expanding the target set and magnifying the tyranny of distance. In addition, the German production capacity was not significantly stressed for the majority of the war, giving it "slack" and recuperative powers beyond that of a fully mobilized economy. The US Strategic Bombing Survey explained:

> The industrial plant of France, The Low Countries, Poland and Czechoslovakia had been added to that of Germany. After the defeat at Moscow in early 1942, armament production increased rapidly. However, such increase was more the result of improvements in industrial efficiency that economic mobilization. Studies of German manpower utilization show that throughout the war a great deal of German industry was on a single shift basis, relatively few German

> women (less than in the first war) were drawn into industry and the average work week was below British standards.[25]

It is difficult to estimate how much the effectiveness of strategic bombing would have increased if the Germans were operating at full capacity, but this case illustrates an important point. Theorists may easily assume the link between targeting and effects, but strategists must rigorously study it, for it is the most important link in the strategy. Technological shortcomings can be overcome, new tactics, techniques and procedures can be developed, but the perfect execution of a poor strategy will usually fall short of the ends it was designed to achieve. In the case of the German "Industrial Web," accurate intelligence and analysis were at least as important as precision strike capability.

In summary, the rapid shift in the character of war in World War I and the introduction of airpower provided ample fodder for bold and imaginative new theories. In adapting theory to strategy, the validity of key theoretical assumptions regarding aircraft invulnerability and bombing accuracy was limited by technology. Additionally, analysis of the link between targets and effects fell short of that required for strategic bombardment to achieve maximum success. To be fair, the bombing campaign was successful, but not in the way the theorists—and even the strategists—had envisioned. The *cumulative* effects of strategic bombing took their toll on the enemy in Europe, but there was no rapid, decisive victory as pundits had predicted. One can certainly claim that on the whole, airpower was extremely effective in World War II and the unrealistically high expectations held by many diminished what was a great success story. While this is arguably true, success was due more to determination and perseverance than strategic excellence.

Implication for Strategists

If it has served its purpose, this paper has identified flaws in the development of airpower strategy in the interwar period. The intent is not to assess blame, but rather to expose pitfalls for strategists to avoid in the future. The road from theory to strategy is fraught with the peril of assumption, and the burden is on the strategist to identify and dissect assumptions that link critical elements of theory. Theorists enjoy substantial intellectual freedom, unconstrained by context or the real consequences of "getting it wrong." Using Douhet's theory as an example, the path to military victory starts with a dominant air arm consisting of heavily armed battleplanes. These battleplanes will overfly enemy ground forces and destroy enemy air forces on the ground. This will ensure command of the air, allowing the battleplanes to bomb enemy cities with impunity. Using the predetermined amount of overwhelming bombardment, the devastation of population centers will lead to a terrorized civilian populace that will soon lose the will to resist.[26] Obviously, this theory is linked by several interdependent events. Each link carries with it the assumption that the previous event had the intended effects. One can envision a scenario in which each of those events could happen—*in theory.* The strategist must intensely scrutinize each assumption's validity and importance to the overall theory because unlike theorists, strategists are held accountable for results.

The strategist also deals with the reality of limited means, opportunity costs, technological advances, constraints and opportunities, personalities, organizational dynamics, the political context, and countless other elements in the strategic environment. It is important to address as many of these as is practicable to assess the risks associated with a selected strategy. Finally, it is imperative not only to challenge the theory during strategy development, but also to challenge the strategy. "Red Team" exercises and critical evaluations in an effort to defeat the strategy will

either serve to strengthen it or discard it as a failed strategy before it costs significant blood and treasure.

The contextual elements that shaped the development of interwar strategy—a change in the character of war and a major technological advancement—are not necessarily unique to that period. As the third year of the Global War on Terrorism dawns, one can argue that the character of war is currently in the midst of change. Couple that with the continued growth of space technology and capability, and it is likely that radical new theories of space warfare are on the horizon. The strategists of the future will be tasked to make tough choices on untested concepts and choose the best path meet the security challenges ahead. The medium may change, but the lessons of airpower strategy development during the interwar period should endure.

NOTES

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[1] "Gas Warfare," http://www.worldwar1.com/armoo6.htm, (26 October 2003)

[2] "Casualties: First World War," http://www.spartacus.schoolnet.co.uk/fWWdeaths.htm, (29 October 2003).

[3] "Kellogg-Briand Pact," http://www.encyclopedia.com/html/K/KellogB1.asp, (26 October 2003).

[4] "Conference on the Limitation of Armament," http://www.ibiblio.org/pha/pre-war/1922/nav_lim.html, (26 October 2003).

[5] B. H. Liddell Hart, Strategy (London: Faber & Faber, 1954), 332.

[6] Giulio Douhet, The Command of the Air (New York: Coward-McCann, 1942), 61.

[7] William Mitchell, Winged Defense (New York: Dover, 1988), 126.

[8] Lt Col Peter Faber, "Interwar Army Aviation and the Air Corps Tactical School," Paths of Heaven (Maxwell AFB, Al: AU Press, 1997), 186.

[9] Douhet, 117.

[10] United States Strategic Bombing Survey (Washington, D.C.: 1 July 1946), 37.

[11] United States Strategic Bombing Survey, 37.

[12] Air Force Historical Research Society, 26 July 2001, http://www.maxwell.af.mil/au/afhra/wwwroot/aafsd/aafsd_pdf/t158.pdf, http://www.maxwell.af.mil/au/afhra/wwwroot/aafsd/aafsd_pdf/t34.pdf, (27 October 2003).

[13] Mitchell, 127.

[14] "Milestones of Flight," Smithsonian National Air and Space Museum, http://www.nasm.si.edu/galleries/gal100/wright1903.html, (27 October 2003).

[15] "Handley Page V/1500," The Aerodrome, 15 March 2002, http://www.theaerodrome.com/aircraft/gbritain/handley/v1500.html, (27 October 2003).

[16] Mitchell, 165.

[17] Douhet, 57-58.

[18] The Norden bombsight was a significant advancement in bombing precision technology. This instrument was a "gyroscopically stabilized synchronizing bombsight . . .computed the correct dropping angle and, in connection with an autopilot or pilot direction indicator, determined the proper course for the aircraft to target." See Haywood S. Hansell, Jr., The Strategic Air War Against Germany and Japan, (Office of Air Force History, Washington, D.C., 1986), 292.

[19] Mitchell, 190.

[20] Douhet, 130.

[21] "Concepts, Principles, and Strategy of the Air Corps Tactical School," Air War College Gateway, http://www.au.af.mil/au/awc/awcgate/readings/awpd-1-jfacc/awpdproc.htm#ii, (28 October 2003).

[22] During the 1933 Command and Staff Exercises at March Field, the primary pursuit aircraft was a P-26, open-cockpit aircraft with a top speed of 234 mph (USAF Museum, 28 April 2003, http://www.wpafb.af.mil/museum/research/p26.htm, (29 October 2003)). The bomber aircraft were B-12s, able to reach speeds of 212 mph (USAF Museum, 28 April 2003, http://www.wpafb.af.mil/museum/research/bombers/b2-8.htm, (29 October 2003)). This relatively similar performance made it difficult for pursuit aircraft to succeed in these exercises. Chennault criticized this fact, stating that there were more advanced pursuit aircraft in other countries that would provide a more honest evaluation of pursuit capabilities. For an analysis of ACTS exercise in the 1930s, see: Major Hugh Severs, The Controversy Behind the Air Corps Tactical School's Strategic Bombardment Theory: An Analysis of the Bombardment Versus Pursuit Aviation data Between 1930-1939, Air University: 1997, http://www.au.af.mil/au/awc/awcgate/acsc/97-0126C.pdf, (29 October 2003).

[23] Hansell, 91.

[24] This statement is certainly not intended to impugn the leading airmen of the interwar period. It is more an expression of the opinion that the airmen's belief in independence ran so deep that evidence to the contrary was perhaps dismissed as irrelevant, or at least incidental in comparison with the value of the object. For an examination of schema theory and analogical reasoning, see Yuen Phoong Khong, Analogies at War: Munich, Korea, Dien Bien Phu and the Vietnam Decision of 1965, Princeton, N.J.: Princeton University Press, 1992.

[25] United States Strategic Bombing Survey, 8.

[26] Douhet, 128.

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