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**AWPD-1: America's Pre-World War II Plan for Bombing Germany**

by

Howard David Laine

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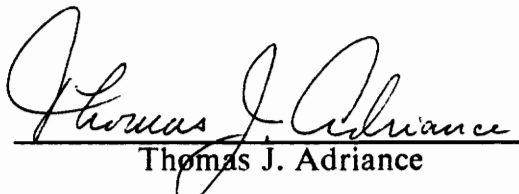
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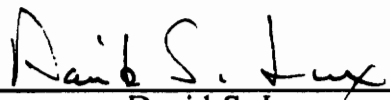
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**APPROVED:**

  
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J. Dean O'Donnell

  
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Thomas J. Adriance

  
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David S. Lux

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# **AWPD-1: America's Pre-World War II Plan for Bombing Germany**

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(ABSTRACT)

This thesis shows how the first plan of the Air War Plans Division (AWPD-1) became the most important document in the development of American strategic bombing doctrine in World War II. This plan was not only the first in the Air War Plans Division, but it was the first of its kind in the world. Beyond the history and importance of the plan itself, this study testifies to the success of a handful of dedicated airmen who believed in the power of a strong air force. General Henry H. Arnold deserves tribute for having had the wisdom and foresight to pick a former Air Corps Tactical School (ACTS) instructor to head the AWPD. Finally, the unofficial acceptance of AWPD-1 was a triumph for the ACTS itself. Significantly, all four officers ultimately responsible for completing AWPD-1 had been instructors at the ACTS.

## Acknowledgements

I want to thank everyone who persevered these past four years with me. First of all, there is my family. Instead of having more family time together during this assignment, it seems that there was less. When we were together, Beth and the children's love and patience gave me strength and encouragement. Secondly, I thank my committee for being patient during these four years of night school. Like most history graduate students, I am indebted to Linda Harris for her pep talks. Peggy Epperly, the Army ROTC secretary and chief of staff, also gave a tremendous amount of help to me on many subjects. I also want to thank Dr. Kenneth Werrell of Radford University for his help and comments. Finally, I owe a great deal to the fine folks, especially Archie Difante, at the United States Air Force Historical Research Center at Maxwell Air Force Base in Alabama for their assistance. They helped me there while I was researching this thesis, and they kindly looked up information while I waited on the phone. The completion

of this thesis owes much to these individuals, but I alone am responsible for its shortcomings.

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## **Years of Frustration**

What eventually became American strategic bombing doctrine in the 1930's was the result of a combination of several factors. These included American experiences in World War I, the contributions of key individuals in the United States and in foreign countries, economic and social influences, the lack of true strategic bombing experience and doctrine, and the contributions of the Air Corps Tactical School (ACTS). Until the 1930's at the ACTS at Maxwell Field, Alabama, discussion about strategic bombing was more theory and imagination than doctrine. The ACTS aviators brought together the experiences of the First World War and the theories of the early air power prophets into a collective body of doctrine.

The refinement of air tactics and the development of strategic bombing theory paralleled the development of air doctrine after World War I. Tactical airplanes carried out operations against an enemy, normally in the presence of that enemy. The types of missions carried out in a tactical sense included close

air support of ground forces, interdiction of supplies or reinforcements, and attacks on the enemy air forces. Generally, tactical targets were those located on or near the immediate fighting zone or theater of operations. Strategic targets, on the other hand, were distant from the front and included major economic and political centers and arteries of enemy transport.

Over twenty years before the great Allied air armadas of World War II laid waste to many German cities, the Air Service of the United States Army had flown its first combat missions in World War I. The speed at which the Air Service grew and the importance its role assumed are remarkable, considering that the Air Service had little to do with developing doctrine or tactics in World War I. The Air Service's first combat unit did not even see action until April 1918. During the war, the Air Service accepted the challenge of formulating American doctrine, using the doctrine, training methods, and tactics already tested by the Allies. From this humble beginning, the aviators in the Army continually improved their tactics and doctrine, sought an autonomous air force, and helped build the powerful air force that was instrumental in the victory of World War II. This chapter will trace how the American strategic bombing doctrine used during World War II came into being.

The Air Service of the American Expeditionary Force played an important role in the 1918 shift of air ascendancy to the Allies, even though its units flew in combat for less than seven months. By the end of the war, forty-five US squadrons with 767 pilots, most of whose 740 airplanes were European, were serving with the armies. In the West, US fighters shot down 781 enemy planes

and flew thousands of missions in support of the infantry, for reconnaissance purposes, and for adjustment of artillery fire.<sup>1</sup> These missions were especially significant considering that no American airplane up to 1917 had ever mounted a machine gun.

During World War I, the greatest concentration of American tactical air power took place under the command of Brigadier General (BG) William (Billy) Mitchell. In the battle of St. Mihiel and the Meuse-Argonne campaign, Allied air power proved to be a significant factor in helping to shorten the war. At St. Mihiel, Mitchell commanded a total of 1,481 aircraft, about one third of which were American. His plan was significant as a forerunner of the means for control and employment adopted for American tactical aviation. He assigned to the ground commanders only what was needed to support ground force operations. He consolidated the remainder of his aircraft, and he used them to gain air superiority. Once the attack began, he utilized these aircraft to pound both sides of the salient, driving off enemy planes and attacking surface targets.

During the Meuse-Argonne offensive in the autumn of 1918, the Allies were attacking from, rather than against, a salient. Mitchell's plan was to concentrate his air power along the main axis of advance. This tactic succeeded in breaking up enemy air formations while giving protection to the American soldiers. At one point during the offensive, Mitchell concentrated his units in order to attack a large enemy force preparing an assault. These units destroyed twelve enemy aircraft, while losing none, and dropped thirty-nine tons of bombs. Combined

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<sup>1</sup> Thomas E. Mackin, *US Air Power: Ascension to Prominence* (Maxwell Air Force Base, Alabama: Academic Publication Division, 1974), 36.

with the thirty tons dropped elsewhere, this was the greatest total of tonnage dropped in one day during the war. Because of these operations, the German attack never materialized, and Mitchell boasted that air power could now produce a decision on the ground.<sup>2</sup>

Despite Mitchell's successful air operations, senior Army leaders still did not realize air power's potential in combat. Most Army personnel continued to believe that the artillery observer and the observation pilot were the most important assets the Army had in the Air Service. Others in the Air Service believed that the infantry would continue to win wars and the Air Service would only serve to aid the infantry. Still others thought that the greatest value of an air force lay in its ability to gather information about both enemy and friendly forces. An early Air Service regulation reflected these sentiments, stating that the mission of the Air Service was to assist the ground forces to gain strategical and tactical successes.<sup>3</sup> The organization and training of all air units was based on this fundamental doctrine.<sup>4</sup>

Strategic bombing in World War I, though limited, was of great significance for the future. The Germans and British learned that the interior of enemy nations could be attacked independently of ground attacks. The British, especially, recognized the implications of Germany's strategic bombing. The German attacks against England made the British government realize the need

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<sup>2</sup> Ibid., 38-39.

<sup>3</sup> Training Regulation 440-15, Air Service, Fundamental Principles for the Employment of the Air Service (Washington: GPO, 1926), 1. This was a small, 16-page publication that cost only a nickel to reproduce in 1926. It is available in the Pentagon Library. Cited hereafter as TR 440-15, 1926.

<sup>4</sup> Ibid., 5.

for adequate air defenses. In addition to increased emphasis on air defense, the German raids on Britain also forced a reorganization of the British air service, which led to the formation of the Royal Air Force (RAF) in March, 1918.

In the later stages of the war, air raids by the Germans and the resulting public demands for reprisals caused the British to form a bomb wing in France. The government established this separate wing to bomb industrial targets inside Germany. This first true strategic air force was the nucleus of the Independent Air Force organized under General Sir Hugh Trenchard in 1918.<sup>5</sup> Part of Trenchard's planning for the remainder of the war included an allied strategic air force, but the armistice ended any future strategic experiences in World War I. An American section that Billy Mitchell would have commanded was included in Trenchard's strategic force.

Strategic bombing theory was already remarkably developed in 1918 due to the efforts of a few key individuals. The leaders in strategic bombing theory were Trenchard and Jan Christian Smuts in England, Giulio Douhet in Italy, and Edgar S. Gorrell and Billy Mitchell in the United States. Even though bombing was oriented more toward support of ground forces during World War I, the ideas of true strategic bombing were refined during that period. Those ideas evolved into the strategic bombing theories and experimental practices used before and during World War II. Among the Allies, Trenchard became the leading prophet and pioneer of strategic aviation.

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<sup>5</sup> Mackin, 42.

Trenchard's approach to strategic bombing clearly required a different attitude toward the use of aircraft in combat. He took his responsibility to bomb German industrial centers, and he related this task to that of defeating the German Army seriously. Trenchard developed a plan that called for the bombing of the sources of supply of the German Army. The target list included centers of production, transportation systems, and communication facilities. He did not, however, advocate the indiscriminate bombing of civilians. Even so, he regarded the loss of civilian life during a bombing raid against a military target as unavoidable. He justified this result by saying that workers in factories were part of the enemy's war effort.<sup>6</sup> In response to those critical or fearful of the bomber, he said that what he proposed was neither unlawful nor inhumane.

His determination to attack enemy targets by bombing both day and night formed a major point in Trenchard's plan. This would prevent the enemy from making repairs and from dispersing their industrial capacity at night. Trenchard acknowledged that the enemy would inflict higher casualties on his bombers during the day, but he argued that without daylight bombing the night missions would lose their effectiveness. A second point in Trenchard's plan was his decision to attack over a wide area instead of concentrating on the destruction of single targets. This decision was due more to insufficient aircraft than to poor judgment. He believed that he lacked a force large enough to destroy targets completely.<sup>7</sup>

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<sup>6</sup> Lee Kennett, *A History of Strategic Bombing* (New York: Charles Scribner's Sons, 1982), 75.

<sup>7</sup> Thomas H. Greer, *The Development of Air Doctrine in the Army Air Arm 1917-1941* (Washington: GPO, 1985), 9.

Another British officer who contributed to the early development of air power was Lieutenant General Jan Christian Smuts. In August 1917, he headed a committee to investigate the problems of air organization and home defense. On August 17, 1917, the committee submitted a report that recommended the immediate formation of a separate Air Ministry. The report saw no limit to an independent air force's role in a war, and it also stated that Britain should secure and maintain air predominance on a large scale. Smuts himself envisioned a time when the air arm would surpass the Army and Navy in importance. The Smuts Report led to the establishment of the Air Ministry in December, 1917, and the RAF in 1918.<sup>8</sup>

The most famous air power enthusiast of the period was the Italian general, Giulio Douhet. General Douhet was more emphatic about air power than was Trenchard. His strategic principle can best be summarized as the defensive on land and sea, and the offensive in the air. He also firmly believed that wars were to be won in the air.<sup>9</sup> This was evident in his philosophy, which led to the conception of total war: war on a nation as a whole, not just on its armies. World War I ended before his concepts could be tested fully, but his dynamic approach to air power had a profound impact on other aviators. His theories had more impact in other countries than they did at home due to the number of his outspoken opponents in Italy. Because of their criticisms, even after Douhet's

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<sup>8</sup> Haywood S. Hansell, Jr., *The Strategic Air War Against Germany and Japan* (Washington: GPO, 1986), 1-2.

<sup>9</sup> Giulio Douhet, *The Command of the Air*, ed. Richard H. Kohn and Joseph P. Harahan, trans. Dino Ferrari (New York: Coward-McCann, 1942), 109.

death, the second oldest independent air force in Europe ended up with no clear air power doctrine of its own.<sup>10</sup>

By the end of the war, American air power theory was well-developed. In large part, Lieutenant Colonel Edgar S. Gorrell was responsible for this early development. As head of the Strategic Aviation Branch of the Air Service in the Zone of Advance, Allied Expeditionary Force, Gorrell was responsible in December 1917 for the planning for future strategic operations. He understood the fact that ground warfare had reached a stalemate and that other means of attacking the enemy must be found.<sup>11</sup> He also thought that the Germans better understood that warfare was changing, and he believed that they were ahead of the Allies in bombing capabilities. His philosophy of bombardment was consistent with that of Trenchard. Both insisted that continuous attacks would deprive the Germans of rest and the time needed to repair damaged factories. Gorrell believed that bombers would accomplish this task during massive, concentrated raids, as opposed to Trenchard's tactic of widely-spread, light attacks.<sup>12</sup>

Billy Mitchell may have had the greatest impact on American air power. He and General Douhet had much in common, but Douhet received more credit worldwide because of his systematic, literary approach to the subject. Mitchell was much more intense and outspoken than Douhet. Both men shared the conviction that air forces should attack the enemy's economic and industrial

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<sup>10</sup> Kennett, 82.

<sup>11</sup> Greer, 10-11.

<sup>12</sup> Mackin, 44.

structure and morale. They were also in agreement in believing that the enemy's army in the field was a false objective; the real objectives were the vital centers. A translation of Douhet's *The Command of the Air* was available at the library of the ASFOS at Langley Field, VA, as early as May 1923.<sup>13</sup> It appears, however, that a translation was not available at the ACTS until 1933, and by then the ACTS was at variance with his advocacy of mass bombings at night.<sup>14</sup>

As similar as Douhet and Mitchell were in some respects, their approaches to the advancement of air power were quite dissimilar. Mitchell, who irritated his superiors and made many enemies, was eventually court martialed in 1925. He used his trial as a forum for his ideas, and he gained widespread public support during the trial. The trial received front page coverage in all of the major newspapers in 1925, and he often received standing ovations during his testimony.<sup>15</sup> The court found him guilty of conduct prejudicial to military discipline and sentenced him to five years' suspension at half pay. He resigned his commission rather than accept a suspension from active duty. Thereafter he continued to work for an autonomous air force until his death in 1936. Ironically, the bureaucracy that chastised him in the 1920's, honored him posthumously in 1946 with a special Congressional Medal of Honor.

One other difference between Douhet and Mitchell was their idea about fighter aircraft. Whereas Douhet believed in all-purpose aircraft, Mitchell

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<sup>13</sup> Mackin, 53.

<sup>14</sup> Robert T. Finney, "History of the Air Corps Tactical School 1920-1940," USAF Historical Studies: No. 100 (Maxwell Air Force Base, AL: Air University 1955), 27.

<sup>15</sup> *New York Times*, October 1, 1925.

believed that there should be bombers and separate fighter aircraft. Mitchell's opinion would become the accepted starting point of the formulation of American air power doctrine. Mitchell also emphasized a well-balanced mixture of bombers, pursuit, and attack aircraft. The role he assigned to the bomber as a defender of the American homeland was comforting to the American people during a period when the bomber was portrayed as a doomsday machine. The press coverage of his court martial helped spread his ideas about bombers. This image of the bomber will be covered in a broader social context later in this chapter.

The period of the 1920's and early 1930's was one of stagnation for the development of strategic bombing doctrine in all the major countries. Military budgets shrank, the Treaty of Versailles left Germany with very little air power, and technological advances in aircraft production could not keep pace with the grandiose plans that air power theorists had for the bomber. Just how much influence foreign doctrine had on American theorists is difficult to assess. Lieutenant General Ira C. Eaker commented after World War II that the Air Corps received information about foreign air forces from American attachés in foreign countries.<sup>16</sup> On the other hand, Major General Haywood S. Hansell, Jr., a World War II planner, gave credit to only the British, Germans, and Italians.<sup>17</sup> An understanding of those countries' air power doctrine is, therefore, important in appreciating the evolution of American doctrine.

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<sup>16</sup> LTG Ira C. Eaker, oral history interview by Richard Tobin, March 1974: Typed transcript, p. 8-9. K239.0512-918, in USAF Collection, United States Air Force Historical Research Center (USAFHRC).

<sup>17</sup> BG Haywood S. Hansell, oral history interview by Bruce C. Hopper, 8th Air Force Historian, October 5, 1943, p. 3. Container 135 of the LTG Ira C. Eaker collection, Library of Congress.

In England, the Royal Air Force's strategic bombing doctrine was mostly the result of Trenchard's work. The experiences of World War I proved to Great Britain that she could no longer think of herself as an isolated island empire. It was not until Hitler came to power, however, that the British began to modernize their air force in earnest. They began their rearmament by emphasizing the offensive character of aircraft, but because of the lack of good targets in Germany, the limited capabilities of Bomber Command, and the quality of the German Air Force, the British began to move away from the offensive spirit that Trenchard had believed in. By the beginning of World War II, England was unable to mount any significant bomber offensive against Germany.<sup>18</sup>

The Germans' strategic bombing doctrine could be characterized as a shift from the defensive in the late twenties to the offensive in the thirties. They originally saw the bomber as support for the ground forces, but as their bombers improved, their doctrine called for the attack of enemy aircraft on the ground, in particular, French warplanes. Since a future war would probably include France, the Germans put their stock in medium-range bombers. Because they were planning for a blitzkrieg-type war, the Germans put less importance on strategic bombing. They thought it took too long for the effects of strategic bombing to be realized.<sup>19</sup>

The Italians showcased their air force and Douhet's theories in a series of air shows and maneuvers in the early 1930's, followed by actual combat missions

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<sup>18</sup> Kennett, 77.

<sup>19</sup> *Ibid.*, 78-79.

in both Ethiopia and Spain. The most impressive of these maneuvers occurred in the summer of 1931 when nearly a thousand planes fought mock battles. After one simulated bombing attack against Milan, the umpires ruled that the city was destroyed and the population decimated by poison gas.<sup>20</sup> But Douhet's theories were not useful in Africa. Ethiopia had no air force to oppose, and because it had no large cities, the Italians could not adequately test their strategic bombing doctrine. Even in Spain, most of the bombing missions were tactical support of ground troops, with little true strategic bombing.<sup>21</sup> Therefore, Douhet's ideas about strategic bombing were hardly verified in the Italian Air Force.

In addition to the experiences of World War I and the influences of other countries on American strategic bombing doctrine, there were other factors with which the early air power theorists had to contend. The first of these was the perception most civilians and some military personnel had of the bomber. Due to well-known authors, like B.H. Liddell Hart and H.G. Wells, the bomber came to be seen as some futuristic weapon from hell. The writers and the media in the early days of the airplane should not be chastised for producing imaginative books and articles. Their portrayal of the warplane, however, gave the general public a false picture of air power. That led, in turn, to a second factor that affected both air power theorists and the public, that was, the tendency to put too much faith in aircraft, especially the bomber. A fine example of the prevailing attitude occurred in 1932 in the House of Commons, where Prime Minister

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<sup>20</sup> Ibid., 82.

<sup>21</sup> Ibid., 73-74.

Stanley Baldwin stated that the bomber would always get through. More somberly he continued that the only defense is in the offense. He understood that to mean that one had to kill more women and children quicker than the enemy.<sup>22</sup> As a result of over-confidence in the bomber, the development of bombing doctrine in the twenties and mid-thirties outpaced the capabilities of contemporary technology.

Historian Michael Sherry has claimed that air war had its origins in the relationships between fantasy, patterns of technological improvisation, and the immediate context of war and peace. Of these, he contends, fantasy sometimes became the most important. Fantasy referred to the predictions of the effects of air power and also aircraft technology. Sherry also said that the themes of air power remained remarkably consistent. The reasons people either liked or dreaded the airplane were the same in 1900 as they were in 1940, or later.<sup>23</sup> Despite of, or possibly because of, all the literature on the bomber, by the end of the 1930's, average citizens had lost some of their uneasiness about bombers. The less than dramatic effects of bombing raids in Europe also calmed some of the general public's fears.

The third factor in the development of strategic bombing doctrine was economic. Many countries could not maintain their existing inventories of aircraft adequately, let alone modernize with newer models. In America, the increased fascination with flying was, however, a blessing for the air power

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<sup>22</sup> Eugene M. Emme, *The Impact of Air Power: National Security and World Politics* (Princeton: D. Van Nostrand Company, Inc., 1959), 51-52.

<sup>23</sup> Michael S. Sherry, *The Rise of American Air Power: The Creation of Armageddon* (New Haven: Yale University Press 1987), 3.

enthusiasts. The U.S.economy in the early thirties was in shambles, but the aircraft industry was expanding. This enabled the bomber lobby to ride the coattails of the civilian airline industry. The bomber also benefited during these bad economic times because many believed that building bombers to protect the coasts would be cheaper than maintaining a large navy.

A fourth factor in the development of strategic bombing was psychological. Civilians and governments really feared what the bombers might do in a future war. The air power theorists' misinterpretation of these fears resulted in an overestimation of the effect bombing would have on morale. Like the theorists, the civilians had no practical experience on which to base these fears. The aforementioned literary works contributed to the psychological effect on the civilian population, which, in turn, caused government officials to try to limit the number of aircraft each country could have. The most notable of these attempts were the Washington Conference on the Limitation of Arms in 1921-22, a conference at the Hague from December, 1922 until February, 1923,<sup>24</sup> and the Geneva Disarmament Conference that began in February, 1932.<sup>25</sup> The spectre of massive gas attacks probably alarmed people more than anything else, but diplomats who tried to limit the number of aircraft a nation could have still preferred what a bomber could do over the horrors of the last war.<sup>26</sup> During this period of hysteria Mitchell's defensive role for an air force gave comfort to the American people.

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<sup>24</sup> Kennett, 63-64.

<sup>25</sup> Ibid., 68-71.

<sup>26</sup> Sherry, 34.

Another important factor in the development of strategic bombing doctrine in the 1920's and 1930's was the lack of strategic bombing lessons in World War I. That lack of good examples made it difficult for airmen to sell strategic bombing in the years after World War I. Strategic bombing by the Allies, especially in the American air service, failed to prove anything except that the effect on morale was less than expected. This fact, more than anything else, led to the attitude that strategic bombing doctrine, or even theory, should not be taken too seriously because it was based almost entirely on speculation. The German bombing raids against London were had succeeded, however, in causing a panic. That resulted in the British adjusting their philosophy of airpower mentioned earlier.

The final, and most important, factor in the evolution of American strategic bombing doctrine was the work done at the ACTS, whose instructors translated concepts and theories about strategic bombing into doctrine. This small Air Corps school in Alabama became a hotbed of revolutionary ideas in the field of bombardment. The ACTS began as the Air Service Field Officers' School (ASFOS) in 1920. World War I had demonstrated that the United States needed a school where air officers could master the employment of aircraft. Once the Air Service was officially recognized as an arm of the Army, the War Department provided for the education of air officers by creating several schools. The ASFOS was one of these schools, and when the name of the Air Service was changed to the Air Corps in 1926, the school became the Air Corps Tactical School. The

basic mission of the schools was to train air officers in the strategy, tactics, and techniques of airpower.<sup>27</sup>

Although the founders of strategic air power laid the groundwork for American strategic bombing doctrine during World War I, their combined concepts lay dormant for many years. Some of their works, and other influential publications, that were available to the instructors at the ACTS were those by Karl von Clausewitz, Frank Simon, Hermann Goering, and Giulio Douhet. The first translation of Douhet's *The Command of the Air* that reached the ACTS was a mimeographed copy from the French translation. It appears that none of these individuals an influence at ACTS equal to that of Billy Mitchell.<sup>28</sup>

Nowhere were the theories of these individuals developed into specific principles and doctrine, until the instructors at the ACTS did that. The ACTS instructors accepted the ground support role of an air force, but its instructors also codified the Army Air Corps strategic bombing doctrine. The ACTS instructors believed that if bombers were used properly the strategic mission of the air force could become more important than the close support role. That optimism was not shared, however, by all Army officers during the 1920's and 1930's. In fact, these were decades of turmoil for those who wanted to change the accepted role of air power. Many people in the War Department were not convinced that strategic air power alone could achieve a decisive victory in battle.

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<sup>27</sup> Mackin, 52-53.

<sup>28</sup> Wesley F. Craven and James L. Cate, eds., *Plans and Early Operations, January 1939 to August 1942*, vol. 1, *The Army Air Forces in World War II* (Chicago: University of Chicago Press, 1948), 51.

Only a few dared to say that the air forces could eventually become more important than the other services.

There are two documents which illustrate and summarize the overall opinion in the 1920's as to the importance of the Air Service. The first resulted from Secretary of War Baker's appointment in August, 1919, of Major General Charles T. Menoher as head of a board of general officers who were to report on a number of congressional bills proposing a separate aviation establishment. The board reported to Congress that an independent air force could not win a war against ground forces, but it also stated that ground forces could no longer be effectively employed without air support. The board recommended that, in order for an air force to be effective, it should remain under control of the Army. The second document, the Army Field Service Regulations of 1923, stated that the mission of the infantry is the general mission of the entire force. These regulations also considered pursuit aviation more important than bombardment. In these documents it became apparent to aviators that an independent air force for conducting strategic bombing missions was not going to be established soon.<sup>29</sup>

Other early Air Service and Air Corps regulations and manuals supported this doctrine. Until 1935 they provided little inspiration to strategic bombing enthusiasts at the ACTS. For instance, Training Regulation 440-15 listed four classes of aircraft: pursuit, attack, bombardment, and observation, in that order.<sup>30</sup> The emphasis in this 1926 regulation was on pursuit aviation, but the

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<sup>29</sup> Mackin, 56-57.

<sup>30</sup> TR 440-15, 1926, 3.

observation aircraft section had more information than any of the sections on the other three types of aircraft. The main design characteristic of pursuit aircraft had to encourage the pilot to attack. Offensive spirit was the very essence of pursuit employment.<sup>31</sup> The description of the bomber aircraft, on the other hand, listed speed, climb, ceiling, and cruising radius as important. There was no mention of offensive operations in the section dealing with bombers.

Pursuit aviation was responsible for the destruction or dispersion of enemy air forces and for the protection of friendly attack aviation. Attack aviation assisted directly in the operations of the infantry by attacking enemy ground forces and establishments.<sup>32</sup> The organization of all air power assets was still tied closely to the plans of the ground commanders, and there was very little mention of strategic bombing.

In the TR 440-15 of 1926 there was the provision for a separate air division to be part of the General Headquarters air force. The air division's objective was to "obtain command of the air."<sup>33</sup> It is possible that Douhet's influence had also permeated the War Department, as suggested by the statement of obtaining command of the air in TR 440-15. This document also stated that an air offensive should begin immediately after hostilities began, another Douhetan idea.

In a separate chapter of TR 440-15 entitled "The Special Role of each Class of Military Aviation," there was clearly an emphasis on pursuit aircraft. In

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<sup>31</sup> Ibid.

<sup>32</sup> Ibid., 6.

<sup>33</sup> Ibid., 7.

addition to the reference to an offensive spirit in pursuit aircraft, TR 440-15 stated that the full value of observation, bombardment, and attack aviation could only be achieved with adequate pursuit protection.<sup>34</sup> The offensive spirit of pursuit was again emphasized in the statement that "offensive missions are carried out by pursuit acting alone or in cooperation with attack or bombardment."<sup>35</sup> Furthermore, whether an operation was of an offensive or defensive nature, the principal mission of pursuit was offensive; defensive missions were carried out only under special conditions. Regardless of the mission, pursuit would achieve its goal by offensive action.<sup>36</sup> The confidence in pursuit was also evident in the principle that important bombardment missions should not be undertaken without detailed plans for cooperation with pursuit.<sup>37</sup>

The role of bombardment was the attack of enemy military and naval objectives by means of projectiles launched from aircraft. Ancillary roles could include the effect of the bomber on morale and its use as emergency transportation.<sup>38</sup> A list of possible targets for bombers in 1926, however, did not specifically address morale, industrial centers, or cities. Nor was there any reference in that chapter to an offensive spirit in the discussion of the role of bombardment aviation in the 1926 version of TR 440-15.

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<sup>34</sup> TR 440-15, 8.

<sup>35</sup> *Ibid.*, 9.

<sup>36</sup> *Ibid.*

<sup>37</sup> *Ibid.*, 11.

<sup>38</sup> *Ibid.*, 10.

The 1935 edition of the same title listed bombardment aviation first, followed by attack, pursuit, and observation.<sup>39</sup> All air operations were considered offensive in nature, but there was no mention of an offensive spirit as there had been in the 1926 edition.<sup>40</sup> The mission of pursuit was to support bombardment, attack, and observation aircraft, to interdict enemy bombers and attack aircraft, and to deny operations to hostile observation aircraft.<sup>41</sup> This was almost a complete reversal in the importance of the role of pursuit since 1926. Bombardment missions were conducted "in cooperation with, or independent of other arms."<sup>42</sup> There had been no mention of bombers conducting independent missions in the 1926 edition of TR 440-15. There was also a rearrangement of target priorities between 1926 and 1935. In 1926, the attack of land forces was listed first and the enemy's interior zone was second. In 1935, targets beyond the sphere of influence of ground forces (strategic targets) was first, and support of ground forces was second.<sup>43</sup> The 1935 TR 440-15 was published at the same time that strategic bombing was under keen discussion at the ACTS. In 1935, a year when the authors of AWPD-1 either had been or were teaching at the ACTS, the new TR 440-15 was definitely an improvement to strategic bombing enthusiasts.

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<sup>39</sup> TR 440-15, Air Corps, *Employment of the Air Forces of the Army* (Washington: GPO, 1935), 2. This edition was only seven pages, but it still cost a nickel to reproduce. Also available at the Pentagon Library.

<sup>40</sup> *Ibid.*, 3.

<sup>41</sup> *Ibid.*, 2.

<sup>42</sup> *Ibid.*, 3.

<sup>43</sup> *Ibid.*, 5.

Unfortunately, in 1940 Field Manual 1-5 was a step back for published strategic bombing doctrine.<sup>44</sup> Defensive operations for the continental United States replaced the offensive theme of TR 440-15. Gone also was Douhet's theory of gaining command of the air. FM 1-5 stated that this was impracticable because it involved the total destruction of the enemy's air force.<sup>45</sup> Although FM 1-5 featured the first discussion of an air offensive and a separate chapter on bombardment in FM 1-5, there was an obvious lack of offensive spirit in that manual. Another interesting shift in FM 1-5 was the replacement of the term observation by reconnaissance as it related to types of aircraft.

In the atmosphere caused by regulations like the 1926 publication of TR 440-15 and by events like the report of the Menoher Board, Billy Mitchell and other aviators broke with the accepted way of employing aircraft. They agreed with Trenchard's idea of consolidating control of aviation assets in order to exploit their flexibility and apply their mass. However, they believed that Trenchard was overly concerned with the contribution of air forces to the success of the ground forces.

The ambitious aviators at the ACTS had greater expectations for the airplane. They particularly saw promise in Douhet's philosophy that air forces could bring an enemy to its knees by direct attack on its seat of political power. This was similar to Mitchell's main argument that air power was an equal power with ground and naval forces. His sinking of two ships off the coast of Virginia

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<sup>44</sup> Field Manual 1-5, Air Corps Field Manual, Employment of Aviation of the Army (Washington: GPO, 1940), 51 pages. This manual superseded TR 440-15, dated October 15, 1935. Available at the US Army Military History Institute, Carlisle Barracks, PA.

<sup>45</sup> *Ibid.*, 9.

had proven that aircraft could sink naval vessels, at least in peacetime conditions. vessels. Mitchell's successes shocked the Navy.

They also breathed fire into the hearts of young aviators, especially those at the ACTS. Two of those, Kenneth Walker and Robert Olds, were aides to Mitchell at that time, and they became bombing instructors together at the ACTS in the 1930's.<sup>46</sup> Others among the influential instructors at the ACTS in the 1930's deserve mention: Harold L. George, who later worked in the Air War Plans Division (AWPD) in 1941, was in 1935 the director of the Department of Air Tactics and Strategy at the ACTS. He had also been a bomber pilot during Mitchell's navy tests.<sup>47</sup> His contemporaries at the ACTS considered him a prophet of airpower. Muir Fairchild was another instructor at the ACTS in the 1930's. He later became Vice Chief of Staff of the United States Air Force. Haywood S. Hansell, Jr. and Laurence S. Kuter were roommates at the ACTS, and both worked with Colonel Harold George in the AWPD in 1941. Kenneth Walker was an ACTS instructor who later worked with Colonel George in the War Department. The friendships these men developed and the ideas they shared in the 1930's had great importance when they met again in 1941. Other aviators who were not instructors at the ACTS in the mid-'30's, but who made outstanding contributions to the advancement of air power, were Generals Henry H. Arnold and Carl Spaatz.

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<sup>46</sup> Draft, interview with BG Laurence S. Kuter by MAJ C.W. Williams, October 21, 1942, as quoted in "History of the Air Corps Tactical School 1920-1940" by Robert T. Finney, USAF Historical Studies: No. 100, Research Studies Institute USAF Historical Division, Air University, Maxwell Air Force Base, AL, 27.

<sup>47</sup> Haywood S. Hansell, Jr., *The Air Plan that Defeated Hitler* (Atlanta: Higgins-McArthur/Longino & Porter, 1972), 2.

The greatest contribution that Harold George and his associates made to the evolution of air warfare was the attainment of a new perspective.<sup>48</sup> The structure, principles, and doctrine of air warfare developed at the ACTS in the 1930's emphasized, first of all, that modern great powers were dependent upon industry in peacetime and in war. Destruction of even some selected industrial targets could paralyze the war-supporting industry of an enemy. Secondly, the ACTS asserted that modern bombs could now be delivered accurately enough to destroy any man-made structure. Thirdly, the school considered air forces capable of reaching their targets without incurring intolerable losses. If the losses became unacceptable, the enemy fighter forces would then become an intermediate or preliminary priority.<sup>49</sup> The theories and lectures presented at ACTS will be covered in greater detail in chapter three.

In the ACTS, if nowhere else in the Army, air power was more important than the ground forces. According to the ACTS, the basic functions of American air power fell into five categories. The first was a strategic air offensive against the enemy's capability to wage war and against his will to resist. The targets included those that were necessary to the industrial systems which sustain the enemy's war effort. This first function also included the destruction of the enemy's air force if it posed a threat to one's own air offensive. The second function was the air support of ground forces, to include the provision of local air superiority. The third function of air power was support of naval forces and

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<sup>48</sup> Ibid., 30.

<sup>49</sup> Ibid., 40.

the performance of certain naval functions in the absence of sea power. The final two functions were the defense of American air space and air operations against surface invasions threatening home shores.<sup>50</sup>

According to the Department of Air Tactics and Strategy at the ACTS, the strategic employment of an air force embraced five optional categories. The first of these was the direct attack of enemy forces on land, sea, and in the air, and also the air defense of friendly forces. The second was the indirect attack of enemy forces by destroying munitions factories, major supply concentrations, steel production, military fuel sources, and systems supporting military production, such as electric power plants and transportation systems. Those targets, indirectly related to military operations, were, therefore, distinct from political and civilian targets. The third category of strategic employment was the indirect attack of the economic and social structure of the enemy state, including the destruction of systems of electric power, communications, water supply, and food. The destruction of these targets would affect both military personnel and the civilian population. The fourth was the direct attack of enemy social centers, including cities and factory worker dwelling areas. The fifth category was the strategic air defense of America.<sup>51</sup>

The previous list is just one example of how a department in the ACTS could have a different outlook on a subject. It was not uncommon for heated arguments between instructors to last well into the night, hurling expletives as

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<sup>50</sup> Ibid., 40-41.

<sup>51</sup> Ibid., 47-48.

well as objects. The atmosphere in the instructors' offices and in their quarters was one of non-cooperation. Practically everything that the ACTS published was a compromise, and on occasion an instructor would sneak out his opinions and publish them in an Army manual. What was healthy, and fortunate, was that the command climate at the ACTS in the 1930's allowed instructors to have these arguments without risking their rank.<sup>52</sup>

The preceding pages document that, as far as American strategic bombing is concerned, the single most significant event in the evolution of doctrine was the work at the ACTS. There a few energetic airmen took all of the bombing experiences, past and present, and all of the theories, fears, and fantasies, and translated them into practical doctrine. Clausewitz' *On War* was available to those ACTS instructors, but they disagreed with his first tenet, that the destruction of the enemy's forces in the field should be the primary objective in war. The airmen at the ACTS also had access to a translation of Douhet's *The Command of the Air*; his influence, however minor, was evident in their writings. They believed, as did Trenchard, that an autonomous air force was capable of taking the war directly to the enemy's industrial centers. The ACTS also taught that if losses became unacceptable, the enemy's fighter defenses would become a preliminary or intermediate priority. This part of American doctrine remained a constant throughout World War II. The strategic bombing doctrine applied during World War II was to a great extent the same taught at the ACTS in the

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<sup>52</sup> COL(R) Haywood S. Hansell, III, interview with the author, March 8, 1991.

1930's. Former ACTS instructors wrote this doctrine into the first Air War Plans Division document in 1941.

## **"The Plan"**

By 1940 President Franklin D. Roosevelt knew that both the industrial and the military complexes of the United States had to increase their efforts in order to prepare for war. The Army Air Corps had been trying to assert itself for years, and it was apparent to the President that a modern air force could be very effective. Events occurred in the next two years that not only changed the name of the Air Corps, eventually leading to a separate branch, but also changed the role of the Air Corps. These changes affected the plans that were made to defeat potential enemies if the United States entered World War II. Two important documents in the evolution of these plans and American strategic bombing doctrine were the American-British Conversations (ABC) and RAINBOW No. 5.

The United States was in a period of military expansion that had seen the development of bomber aircraft and, in 1935, the General Headquarters Air Force. With the establishment of the GHQ Air Force came the basic principles

of air power that were the blueprints for all future planning. They were based on the needs and problems associated with the Western Hemisphere. It was felt that if the Air Corps could conduct operations there they could fly anywhere. Some of the principles under which the Air Corps operated were that the primary mission of an air force was bombardment and that the Air Corps needed long-range bombers to attack the enemy. Lieutenant Colonel Kenneth Walker, who was one of the pre-war planners and later a general and Medal of Honor winner, said that bombardment was to air power what the infantry was to the Army--the basic arm. It was Walker who provided airmen with a rallying point when he stated that a well planned and well conducted bombardment attack, once launched, could not be stopped.<sup>1</sup> The Air Corps also believed in precision daylight bombing of key targets deep in enemy territory, such as electric power systems, industrial complexes, and airplane factories. The Air Corps also planned combined operations with the ground forces and the Navy.<sup>2</sup>

By 1939 the B-17 heavy bomber was already in production. In January of 1939, General Henry H. Arnold asked that the United States produce another heavy bomber. The result was the B-24 Liberator, which was first flown the following December. The Air Corps' heavy bomber production program began in the fall of 1940 when contracts were let for 500 additional B-17's and 500

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<sup>1</sup> Hansell, *The Air Plan*, 15.

<sup>2</sup> George C. Marshall, Henry H. Arnold, and Ernest J. King, *The War Reports of Marshall, Arnold and King* (Philadelphia and New York: J.P. Lippincott, 1947), 304-305.

B-24's. In the spring of 1941 the President announced that production of the heavy bombers would be increased to 500 per month.<sup>3</sup>

The German victories in the spring of 1940 influenced President Roosevelt's decision to ask Congress for 50,000 planes for the defense of the Western Hemisphere. On 12 July 1940, the Air Corps was authorized to expand to 54 combat groups as part of the Army's First Aviation Objective. Laurence S. Kuter, another of the pre-war planners, was one of the War Department General Staff officers responsible for organizing the larger air force.<sup>4</sup> The program called for 498 heavy, 453 medium, and 438 light bombers--that is, fourteen heavy, seven medium and seven light bombardment groups. Before the end of October, General Marshall asked if the Air Corps' expansion should not be increased even more. As a result of this, the Second Aviation Objective was approved on 14 March 1941, and the overall combat strength of bombers was authorized to increase to a total of 3349 bombers.<sup>5</sup>

As previously mentioned, an important decision had already been made prior to the serious planning for air power in World War II. That was the decision to conduct daylight precision bombing missions if war were forced on the United States. The official doctrine favored daylight bombing, but it did not rule out the possibility of night operations. The Air Corps Tactical School and the Air Staff in Washington also believed that the bombers would normally have to

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<sup>3</sup> Mackin, 84.

<sup>4</sup> GEN(R) Laurence S. Kuter, oral history interview by Hugh N. Ahmann and Tom Sturm, 30 Sep-3 Oct 1974. Typed manuscript, 205. K239.0512-810, in USAF Collection, USAFHRC.

<sup>5</sup> Robert F. Futrell, *Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force 1907-1960*, vol. 1, (Maxwell Air Force Base, AL: Air University Press, 1989), 102.

fly without fighter escort because the bombers had a greater range than the fighters. Heavily armed bombers flying in defensive formations would be able to reach their targets, drop their ordnance, and return to base without high losses. The bomber enthusiasts at the ACTS did everything possible to establish the dogma that the bomber was superior to pursuit and attack aircraft. They closed their minds to everything except the bomber.<sup>6</sup> This zeal was directly responsible for the B-29, the B-36, and AWPD-1.<sup>7</sup> The early planners refused to change their policy even after the British experiences showed that daylight bombing was very costly. Kuter believed that the United States' decision to pursue long-range bombers, daylight precision bombing, and self-protected bombers was the result of good logic at the ACTS.<sup>8</sup> Most of those new ideas at the ACTS originated with Kuter, Harold L. George, Santy Fairchild, and Haywood S. Hansell, Jr.<sup>9</sup>

In 1940 the Air Corps underwent organizational changes within the War Department. The General Headquarters, US Army, was established, and it received command of the GHQ Air Force. General Arnold disagreed that GHQ Air Force should not remain under the Chief of Air Corps. In lieu of the GHQ plan he proposed setting up three deputy chiefs of staff, one each for ground, air and services. The War Department General Staff disapproved the plan, observing, "The Air Corps believes that its primary purpose is to defeat the

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<sup>6</sup> Kuter interview, 112-113.

<sup>7</sup> Ibid., 133.

<sup>8</sup> Ibid., 141.

<sup>9</sup> LTG(R) Earl W. Barnes, oral history interview by Hugh H. Ahmann, 22-23 January 1975. Typed manuscript, 135. K239.0512-828, in USAF Collection, USAFHRC.

enemy air force and execute independent missions against ground targets. Actually, its primary purpose is to assist the ground forces in reaching their objective."<sup>10</sup> Even after the recent changes in regulations and after the expansion of the Air Corps, the General Staff was still not only against a separate air force, but they did not believe the Air Corps could have a decisive role in a future war. Marshall, nevertheless, appointed General Arnold as Acting Deputy Chief of Staff for Air (DCSA) on 30 October 1940. In June of 1941 the Air Corps became a subordinate element in the Army Air Forces (AAF), which General Arnold commanded. General Arnold also continued to serve as the DCSA. As part of this re-organization, the Air War Plans Division (AWPD) was established to prepare the overall plans of the AAF. This division of the Air Staff later played a major role in planning the use of air power in World War II.

In September, 1940, Japan joined the Axis powers in the Tripartite Pact. By then the collapse of France and the Battle of Britain had opened the eyes of many Americans to the possibility of a world dominated by Hitler in the West and by Japan in the East. As a result of world events, the United States was in the process of offering material aid to those fighting the Axis powers.<sup>11</sup> President Roosevelt decided that military staff conversations with the British should be held "to determine the best method by which the armed forces of the United States and British Commonwealth, with its present allies, could defeat Germany

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<sup>10</sup> Futrell, 103.

<sup>11</sup> Hansell, *The Air Plan*, 57.

and the Powers allied with her, should the United States be compelled to resort to war."<sup>12</sup>

From 29 January 1941 to 27 March 1941, a United States staff committee from the Army and Navy met with a British delegation in Washington, in response to the President's request. The three aviation experts at the conference were Air Vice-Marshal John C. Slessor of the Royal Air Force (RAF); Colonel J. T. McNarney, an Air Corps officer; and Captain Dewitt C. Ramsey of the U.S. Navy. It was evident that there was no official representative of US air power that corresponded in position to the RAF representative. The products of this conference, American-British Conversations-1 (ABC-1) and ABC-2, were submitted for approval on 27 March and 29 March, respectively.

The ABC reports were the first formal agreements reached by the American and British planners concerning common objectives in the event the United States entered the war. The strategic objective of the Allied Powers, as outlined in ABC-1, was the defeat of Germany and her allies. The strategic defensive policies of the United States and Great Britain were that the United States' paramount interest was the defense of the Western Hemisphere, that the security of the United Kingdom must be maintained, and that the security of sea communications of the two powers was essential.<sup>13</sup>

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<sup>12</sup> American-British Conversations report with annexes, 27 March 1941, and the Air Collaboration Report (ABC-2), 29 March 1941, Exhibit 49, pages 1485-1550 of Part 15, *The Hearings of the Joint Committee on the Investigation of the Pearl Harbor Attack*, 79th Congress, 1st Session, 1487. In paragraph 2 of the original draft the military advisors had written, "... should the United States desire to resort to war." The President changed it to its present form. Mark S. Watson, *US Army in World War II, the War Department, Chief of Staff: Prewar Plans and Preparation* (Washington: GPO, 1950), 373.

<sup>13</sup> Congressional Hearings, 1489-1490.

ABC-1 outlined four major offensive objectives that pertained to the formulation of air plans. They included the application of economic pressure by all means upon Germany, including air forces and, secondly, an air offensive against German military power and other regions that contributed to that power. A third policy was the employment of air forces in minor offensives and raids against German strength. Finally, those policies included the building up of the necessary forces for an eventual land offensive against Germany.<sup>14</sup>

The general mission of the air forces of the United States and Great Britain would be to achieve air superiority as rapidly as possible. The US Army Air Corps was to support land and naval forces in the Western Hemisphere, overseas, and in the Atlantic area. It would also conduct bomber operations against Germany in collaboration with the RAF.

On 28 May 1941, the Secretary of the Navy approved ABC-1, and five days later the Secretary of War approved it. Neither Roosevelt nor Churchill, however, approved the document. Though never recognized as official policy, this important document laid the foundation for planning future air operations against Germany and her allies. It was also the basis for more detailed logistical and operational planning. When war did break out for the U.S., the overall strategy adopted was basically that of ABC-1. Due to ABC-1, the Joint Army-Navy Board began developing in more detail RAINBOW No. 5. The first Air War Plans Division report, AWPD-1, was also based on ABC-1.<sup>15</sup>

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<sup>14</sup> Ibid., 1490-1491.

<sup>15</sup> Craven and Cate, footnote 118, ch. 4, 681.

A strong air force was finally considered so important that on 29 March 1941 a subcommittee of the United States staff committee and the British delegation submitted a report, ABC-2, which stated that "the general subject of Air Collaboration, in which the policy pertaining to the supply and distribution of aircraft is an essential factor, is considered of such immediate and vital importance as to deserve special treatment."<sup>16</sup> This report estimated the size of an air force needed by the United States to secure its interests if Britain were no longer available for use as air bases. This amounted to an air force of fifty-four combat groups, plus the necessary personnel and facilities to undertake an expansion to 100 groups. The British requirements for air strength and their expansion program were also outlined.

In March, 1941, at the time of the writing of ABC-2, the United States was already in the process of building an air force of 84 groups, including 24 heavy, 12 medium and 13 light bombardment groups.<sup>17</sup> Maximum effort was not realized in pursuing this objective because combat planes were to be shipped to the British to assist them in their war effort. The United States would begin sending aircraft as soon as possible and would continue so long as the United States was not at war. There was also in ABC-2 the provision that any aircraft built from new capacities would be made available to the British.

ABC-2 was never officially approved, either, but was important because it recommended increased aircraft production and brought still more attention to

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<sup>16</sup> Congressional Hearings, 1543.

<sup>17</sup> Futrell, 55.

the necessity of a strong air force. In order to satisfy the contingencies anticipated in ABC-2, the United States would have to produce 4,200 planes a month for the AAF and Britain.<sup>18</sup> Throughout 1941 and 1942 an astounding number of aircraft were planned for production in the United States. It is commendable that the planners could make such high estimates for aircraft production while the AAF began flying missions from England using aircraft that required a spotter.<sup>19</sup>

The American-British delegation submitted ABC-2 with ABC-1, and the Secretaries of War and the Navy also approved ABC-2. On the basis of ABC-1, the Joint Planning Committee of the Joint Army-Navy Board completed War Plan RAINBOW No. 5. The Secretary of War approved RAINBOW No. 5 on 2 June 1941, and the plan then went to the President for approval.

The Joint Board's RAINBOW Plans had their origin in the 1890's when the Navy began developing "color plans," one color for one country which might become an enemy of the United States. Japan, for instance, was covered by Plan Orange. In the spring of 1939 the Joint Board recognized that those plans that had been recognized as necessary now had to be implemented. The Joint Planning Committee then began producing five basic war plans in line with certain military and political stipulations. They submitted the Joint Army-Navy War Plan I (RAINBOW 1) to the Joint Board on 27 July 1939. After some

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<sup>18</sup> Craven and Cate, 131.

<sup>19</sup> Some of the smaller aircraft required this only to taxi to the end of the runway. Once the aircraft began accelerating down the runway, the tail of the plane would rise up, allowing the pilot to see.

revision the Board submitted it to the President, who approved it orally on 14 October.<sup>20</sup>

The color plans had envisioned war with only one nation, but the RAINBOW Plans addressed the probability of war with more than one nation and in more than one theater. This was the reason for dropping the color plans and using the new names of RAINBOW 1, 2, 3, 4 and 5. The five plans may be summarized as follows: (1) To prevent violation of the Monroe Doctrine, and to protect the United States, its possessions, and its sea trade; (2) To carry out No. 1, and also to sustain the authority of democratic powers in the Pacific zones; (3) To secure control of the Western Pacific; (4) To afford hemisphere defense, through sending U.S. task forces, if needed, to South America and to the eastern Atlantic; and (5) To achieve the purposes of 1 and 4, and also to provide ultimately for sending forces to Africa or Europe in order to effect the decisive defeat of Germany or Italy, or both. The plan assumed U.S. cooperation with Great Britain and France.<sup>21</sup>

Plans 1-4 were eventually canceled, but RAINBOW No. 5 was continually restudied and revised because of continued coordination with the British. The offensive planned in the European Atlantic area and the defense against Japan in the East as outlined in RAINBOW 5 fitted most accurately the strategy outlined in ABC-1. Consequently, the Board completed RAINBOW No. 5 in March, 1941 and submitted it to the President with ABC-1. RAINBOW 5

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<sup>20</sup> Watson, 103.

<sup>21</sup> Ibid., 103-104.

provided a more detailed plan for the accomplishment of the tasks, including those pertaining to air power, that were assigned to the United States during the staff conversations.<sup>22</sup>

On 9 July 1941 President Roosevelt sent letters to the Secretaries of War and the Navy asking them to prepare an estimate of "overall production requirements required to defeat our potential enemies."<sup>23</sup> In this memorandum he specifically stated that he did not want a detailed plan. He received from the newly created Air War Plans Division in General Arnold's Air Staff the first purely AAF concept of strategic air power. This document was titled AWPD-1, "Munitions Requirements of the Army Air Forces to Defeat Our Potential Enemies." The completed document was very detailed; over 120 pages containing 7 maps, 6 charts, over 44 lists, and 30 tabs. (See Appendix 1 for a list of the tabs.) In accordance with a memorandum from Colonel George titled, "Form and Outline for Preparation of Tabs," the planners organized all of the tabs in the same manner to facilitate easy reading.<sup>24</sup>

Only four relatively junior officers were responsible for completing AWPD-1. They were: (1) Colonel Harold L. George, Chief of the AWPD; (2) Lieutenant Colonel Kenneth N. Walker, Chief of the War Plans Group of the AWPD; (3) Major Laurence S. Kuter, on loan from the operations section of the General Staff; and (4) Major Haywood S. Hansell, Jr., Chief of the European

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<sup>22</sup> Craven and Cate, 139-140.

<sup>23</sup> AWPD-1, Tab A.

<sup>24</sup> Harold L. George, memorandum to the AWPD, AWPD-1 scrapbook, Air University Library, Maxwell AFB, AL, and in the Carl Spaatz collection in the Library of Congress.

branch of the War Plans Group. All four had been instructors at the Air Corps Tactical School.<sup>25</sup>

Several difficulties faced the planners as they began preparing AWPD-1. They had little time to respond to the President, and they had received no high level guidance. They were tasked with providing a mobilization plan that would build the country's air force, and they had little information they could use to compare with enemy aircraft. Another major problem was determining the air objective. The AAF planners believed that ground support was only one of the many uses of air power, whereas, the Army still felt that ground support was its major mission. The four AWPD planners feared that somehow the Army would end up writing the air annex of the report due in the White House in a few weeks. This was just the moment for which Billy Mitchell and his followers had been waiting--the chance to write the plan that would help create American air power.<sup>26</sup> Colonel George and his group did not let the opportunity slip away.

The Army's task was monumental in terms of the requirements for the ground forces alone, and the War Plans Division (WPD) did not make steady progress toward preparing the air annex. The AAF members in the WPD seized the opportunity to begin writing that portion themselves. One AAF officer requested that the AWPD assist them under WPD leadership. Colonel George protested and argued that the AWPD had been organized to meet just that type of requirement. General Arnold agreed and convinced the WPD that Colonel

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<sup>25</sup> Craven and Cate, 146.

<sup>26</sup> Hansell, *The Air Plan*, 64.

George was correct and that the AWPD was capable of writing the annex.<sup>27</sup> Colonel George stated that the AWPD would give first priority to an air offensive the likes of which no one had ever seen.<sup>28</sup> In planning an air offensive, Kuter said that the greatest threat to the bombers was bombing inaccuracy. They believed that anti-aircraft should be ignored and that nothing could stop the bombers--not fighters or pursuit aircraft.<sup>29</sup> They had nine days remaining to complete the plan. The fact that the AWPD wrote the annex was not only a victory for the AAF, but it also enabled the WPD to devote more of its time to the requirements of the ground forces.

The WPD estimated that it would take two years to raise, equip, train and deploy the necessary forces for an invasion of Europe. It would take several months more to prepare the forces and facilities for this operation. Weather and high tides mandated late spring, summer or early fall as the best time for an invasion. The Allies would also require air superiority and must have attenuated Germany's war-making industry sufficiently to make an invasion cost-effective in terms of lives and equipment. WPD established a target date for the invasion for the summer of 1944. This meant that the AAF would have to be ready to begin bombing Germany in late 1943. This date matched the estimate of the members of AWPD. They believed that to be an attainable goal because the President had requested the buildup of aircraft over six months earlier.

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<sup>27</sup> Ibid., 65.

<sup>28</sup> James C. Gaston, *Planning the American Air War: Four Men and Nine Days in 1941* (Washington: National Defense University Press, Ft. McNair, 1982), 25.

<sup>29</sup> Kuter interview, 132.

Much of the information needed to complete the plan was at the ACTS, and the planners called Maxwell and asked for information.<sup>30</sup> The school believed that other great nations were not unlike the United States and that an analysis of American industry would lead to sound conclusions about any other great power's industry. Research conducted at the ACTS on the American industrial structure resulted in the conclusion that the American economy was highly specialized. For instance, while the New England States made the great majority of our brass and copper items, raw materials for these items were transported by rail primarily to New England, where they were processed or manufactured and shipped out to using plants elsewhere in the country. Likewise, almost all the shoes in the country were made in one locality. The ACTS' analyses of United States industry further pointed out the tremendous importance of electric power and of rail transportation.<sup>31</sup>

Hansell also brought back from England valuable information about targets in Germany. He had worked closely with the British intelligence agencies before he returned to work on AWPD-1. The British were making analyses of German industry and kindly gave him everything that he wanted. Hansell returned to the United States in the summer of 1941 with 500 pounds of the most secret information the British Air Ministry had.<sup>32</sup>

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<sup>30</sup> Ibid., 202.

<sup>31</sup> BG(R) Haywood S. Hansell, Jr., "The Development of the United States Concept of Bombardment Operations," a lecture presented at the Air War College, Air University, Maxwell AFB, 16 February 1951. K239.716251-75, in USAF Collection, USAFHRC, 10-11.

<sup>32</sup> Hansell interview by Hopper, 7.

When the planners began writing AWPD-1, they extracted the national mission statement directly from the President's letter of 9 July; that was to defeat our potential enemies. The broad strategic objective, in accordance with ABC-1, was to defeat Germany and her allies. The basic conception was that the Allies should defeat Germany first, and that her allies, including Japan, should be decisively dealt with after achieving that aim. Basing their conclusions on those points, the planners decided that the air mission was threefold. The first was to wage a sustained air offensive against German military power, to including lands that Germany controlled. Secondly, American air power was to support a final offensive, if it became necessary to invade the continent. The planners did not believe that an invasion could occur before the summer of 1944. They did, however, believe that if the sustained air offensive were successful, an invasion might not be necessary.<sup>33</sup> This statement gave the AAF a decisive role in the war, but it was such a strong statement that it irritated the Army of which they were still a branch. Thirdly, the AAF's mission was also to conduct effective air operations in connection with hemispheric defense and a strategic defense in the Far East.<sup>34</sup> The AAF mission against Germany proper, which the planners condensed from ABC-1, was to weaken Germany, restrict Axis air operations, and support a final offensive.<sup>35</sup>

The planners sought target systems which, first, would accomplish the mission and, second, were within the capabilities of an air force which the United

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<sup>33</sup> AWPD-1, Tab 1, 2.

<sup>34</sup> *Ibid.*, 1.

<sup>35</sup> AWPD-1, Tab 2, 1.

States could develop. First of all, to weaken Germany, the AAF would attack the electric power system, inland transportation, the petroleum industry, and, possibly, the German civilian morale. Secondly, to restrict Axis air operations, the AAF would attack German airplane assembly plants, aluminum plants, and magnesium plants. Finally, in order to support a final offensive, the AAF would attack the targets listed above and also military targets in the interior of Germany and battlefield targets or tactical targets.<sup>36</sup>

The program outlined in AWPD-1 was designed to allow the final phase of operations to begin by July 1943. The AAF would complete the final campaign against Germany during the six month period, April-September, 1944. The air force required to accomplish this represented greater-than-tenfold increase in the already expanded 1941 air force.<sup>37</sup> That timetable included the expediency of double combat crews for bombers required for the German offensive.<sup>38</sup> The eventual strength and composition of the AAF required to accomplish the mission included new 4000-mile radius-of-action bombers and were established as the ultimate requirement. The initial strength and composition of the air forces were indicated as the interim expedient. The interim expedient included 59,727 total aircraft, 2276 monthly replacements, and 2,061,119 personnel. The ultimate requirement included 63,467 aircraft, 2133 monthly replacements, and 2,164,916 personnel.<sup>39</sup> Kuter was proposing to recruit,

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<sup>36</sup> Ibid.

<sup>37</sup> Gaston, 44.

<sup>38</sup> AWPD-1, Tab 4.

<sup>39</sup> Laurence S. Kuter, memorandum to GEN Marshall, 20 August 1941.

train, and equip an air force that would outnumber the entire 1941 Army by half a million.<sup>40</sup> The requirement for bombers alone in AAF bombing operations against Germany totaled ninety-eight bombardment groups. That was further broken down into 11 groups of heavy or medium bombers for the inland waterway targets, 19 for rail transportation, 17 for the petroleum industry, 32 for electric power targets, and 19 for the airplane manufacturing industry.<sup>41</sup>

The manufacture of the necessary airplanes and the training of the required personnel would require the all out effort of the United States. Even with such an effort it appeared impractical to manufacture the total necessary number of airplanes until 1944. As an undesirable expedient, however, it would be possible to employ double combat crews on the shorter range and more easily procured airplanes in order to initiate operations in force in 1943. It was also imperative that the United States immediately develop escort fighters with ranges equal to the bombers that they supported. This was important in order to ensure daylight bombing missions despite enemy pursuit aircraft developments expected in the near future.<sup>42</sup>

In the tabulations of aircraft requirements section in AWPD-1, two charts listed the numbers and types of aircraft required for missions against Germany, for hemispheric defense and strategic defense in Asia, the total bombers by type, and the bombers needed for air support commands. The first chart gave the requirements for bombers, the second for pursuit aircraft. An example of the

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<sup>40</sup> Gaston, 42.

<sup>41</sup> AWPD-1, Tab 2, 2-5.

<sup>42</sup> Kuter memo.

level of detailed planning in the preparation of AWPDP-1 was the inclusion of the number of training aircraft, photographic and observation airplanes, transport planes, and even towed gliders.<sup>43</sup> Further evidence of the detailed planning was in Tab D-1, "Air Corps Organizational Equipment." The list included not only the number of planes, but also certain types of government-furnished equipment and the number of bombsights and cameras. Tab D-2, "Planning Project--Ship Tonnage," outlined the necessary initial shipments and sustaining shipments in gasoline, oil, and other supplies for one year for all air units based outside the continental United States.<sup>44</sup> AWPDP provided tabs D-1 and D-2 to the G-4(Logistics) and the WPD of the General Staff, and they, in turn, incorporated the tabs into their computations.<sup>45</sup> The dates that the equipment and tonnage were required depended on the dates that the United States could manufacture the combat planes at the required monthly rate (MRR). The MRR for bombers, for instance, was 1,379.<sup>46</sup>

Since the study was based upon the initiation of operations in July 1943, the War Department had to meet all training and other requirements earlier than the Office of Production Management could manufacture the necessary tactical combat planes. Therefore, the United States should manufacture the combat airplanes at the earliest possible date, and all other actions would be coordinated

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<sup>43</sup> AWPDP-1, Tab C, 3.

<sup>44</sup> See Appendix 1 for examples of how AWPDP-1 became less a document about munitions requirements and more about building an air force.

<sup>45</sup> *Ibid.*, 1.

<sup>46</sup> *Ibid.*, 2.

accordingly.<sup>47</sup> Another prerequisite was that all of the United States' air bases and all sea routes had to be secure.<sup>48</sup>

The planners identified Germany as the center of Axis power, and recommended that the Allies apply pressure there. The war placed a considerable strain on the economic structure of Germany, and the Russian Campaign engaged a major portion of the German Army and Air Force in Eastern Europe. The war against the Soviet Union also improved the conditions for enforcing the sea blockade against Germany and for applying economic pressure. The planners felt that, even if the Soviet Union collapsed, the German economic structure would continue to operate under heavy strain. There would be a period of at least a year before the Soviet economy could be resuscitated and incorporated into the German system.<sup>49</sup> The fact that nearly 17 million men were directly engaged in the war, to the exclusion of all normal civil pursuits and production, put additional strain on Germany.<sup>50</sup> That was a very heavy drain on the social and economic structure of the state. Disruption of that structure could virtually break down the capacity of the German nation to wage war.

The basic tenet of AWPD-1 was the application of air power in order to destroy the industrial and economic structure of Germany. That conception involved the selection of a system of objectives vital to Germany's war efforts and to the means of livelihood of the German people. The most effective manner of

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<sup>47</sup> *Ibid.*, 1.

<sup>48</sup> AWPD-1, Tab 1, 2.

<sup>49</sup> *Ibid.*, 1.

<sup>50</sup> *Ibid.*, 2.

conducting such an offensive was by the destruction of precise objectives, at least initially. As German morale began to crack, area bombing of civil concentrations would become effective.<sup>51</sup>

Based on an analysis of military and economic factors, the planners proposed three courses of action for consideration. Those actions whose completion would accomplish the air mission in Europe included the disruption of a major portion of the electric power system in Germany, the disruption of the German transportation system, the destruction of the German oil and petroleum system, and the undermining of German morale by air attack of civilian targets. Those actions representing intermediate objectives, whose accomplishment might be essential to the realization of the principal objectives above, included neutralization of the German Air Force (GAF) by attacking airbases, aircraft industries (engine and airframe), and aluminum and magnesium factories. Finally, those actions representing diversionary objectives included the attack upon submarine bases, surface seacraft, and invasion bases.<sup>52</sup>

The discussion of each course of action, or more appropriately, each target system, began with the German electric power system. Nearly all industry, civil and military, depended crucially on electric power. The German electric power system, the second largest in the world, was greatly expanded for the war. It was very important to both the German war effort and to the civilian economy. Some of the industries that depended on electric power were aircraft manufacture,

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<sup>51</sup> Ibid.

<sup>52</sup> Ibid., 2-3.

aluminum production, synthetic rubber production, textile industries, all the armament industries, shipbuilding, automobiles, the cold storage of food, and urban transportation.<sup>53</sup>

Hansell had gathered much of the information about the electric power system when he was in England. He and his colleagues were also able to gather valuable information about the electric systems from major American banks and Wall Street. Many of the new German power plants were financed through these banks, which would not have loaned the money without investigating everything, including the structures of the plants.<sup>54</sup>

The electric power industry was a closely integrated "power grid." The careful selection of major power stations and switching stations and their destruction would make it possible to isolate the principle manufacturing and population centers from their sources of electric energy. These precision targets were small, but readily distinguishable in daylight. They were susceptible to destruction by bombs, but many hits were required. A typical plant covered an area about 500' X 500', and the British estimated that seventeen hits in that area would guarantee destruction of the plant.<sup>55</sup>

Analysts estimated that the destruction of about fifty power plants would reduce the total capacity to about 60% of the present total. By destroying selected switching stations, however, this number could be reduced to about 20%, and the industrial power to key manufacturing centers would be almost

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<sup>53</sup> Ibid., 3.

<sup>54</sup> Hansell, *The Air Plan*, 51; Kuter interview, 144.

<sup>55</sup> AWPD-1, Tab 1, 3.

completely shut off. Eighty percent of electric power consumed in Germany was utilized by industry.<sup>56</sup>

The second area covered in AWPD-1 was the transportation system, to include rail, waterways, and highways. In anticipation of the war, Germany dispersed critical industry as much as possible. This improved the security of the industrial complex, but it made the transportation system even more vital to the German economy. The German transportation system carried an extremely heavy load and was divided approximately as follows: railroads, 72%; waterways, 25%; and long haul truckage, 3%.<sup>57</sup>

The German railways especially were working at capacity, with the great majority of rail traffic entering or leaving the Ruhr. The importance of the transportation system was emphasized by the facts that 70% of the steel industry was concentrated there, and 66% of the iron ore for steel production had to be transported into Germany from outside sources.<sup>58</sup> It was estimated that eight marshalling yards handled almost all of the traffic to the Ruhr. The yards were not particularly vulnerable to air attack because the damage to the tracks was easily repaired. But traffic could be seriously delayed if the AAF would bomb them repeatedly. The planners estimated that disruption of the marshalling yards of the Ruhr for twenty-four hours would set back the production of the Ruhr about two weeks. They also believed that repeated attacks upon a total of fifteen marshalling yards would cause such traffic confusion as to break down the

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<sup>56</sup> Ibid., 4.

<sup>57</sup> Ibid.

<sup>58</sup> Ibid., 6.

operating system. In addition, important bridges across major waterways were difficult to replace. Repeated attacks were necessary to prevent replacements with temporary structures. Fifty targets were set up for the entire transportation system.<sup>59</sup>

The German inland waterway system was vulnerable because of two factors. First of all, the waterways carried 25% of the total freight and, secondly, the railroads were already taxed to capacity and could not stand a 25% increase. The destruction of an estimated fourteen targets would neutralize the effectiveness of the main east-west canal system. These fourteen targets consisted of three ship elevators, nine locks, and two inland harbors. The greatest effect would be achieved by an attack on the canal system at the time of greatest traffic in the late summer and fall seasons. In addition to the effect on the war industry, crippling of the German transportation system would bring severe suffering to the German people by denying them the necessary foodstuffs, common utilities, and coal for heating. These locks and ship elevators were also precision targets, and their destruction would have an immediate, relatively permanent effect.<sup>60</sup>

The planners selected a total of forty-seven targets for the transportation systems: railroad marshalling yards (15); bridges over the Rhine, Oder, and other sensitive points (15); ship elevators (3); existing locks and harbor works (11); and later targets (3) including the Rhine-Main-Danube Canal.<sup>61</sup>

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<sup>59</sup> *Ibid.*, 4.

<sup>60</sup> *Ibid.*, 5-6.

<sup>61</sup> *Ibid.*, 6.

The third target system was the petroleum and synthetic oil industry. The transportation system, the German Air Force and Navy, and industry were all dependent upon oil. About 60% of aviation gasoline came from synthetic production in Germany proper. Eighty percent of this came from twenty-seven plants. They were precision targets and were 400-1000 miles from England. About 22% of the oil for aviation came from Rumania. It was refined there and the Germans moved it primarily by water transportation up the Danube to Germany. The prospect of bombing missions along the Danube caused the planners to emphasize the importance of maintaining secure bases in Asia Minor or Syria. There were twenty-seven targets for the petroleum and synthetic oil industries.<sup>62</sup>

The AWPD planners did not agree with Douhet's theories of morale bombing, and, therefore, did not identify any targets in that category. When considering conducting attacks against civilian morale, they believed that timeliness of attack was most important. If the morale of the people was already low because of sustained suffering, and sustained bombing of cities might crush their morale entirely. If these conditions did not exist, however, area bombing of cities could actually stiffen the resolve of the population, especially if the attacks were weak and sporadic. The planners, nevertheless, believed that all bombing operations could be applied toward morale bombing if the proper psychological conditions existed.<sup>63</sup>

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<sup>62</sup> Ibid., 7.

<sup>63</sup> Ibid.

To ensure the feasibility of precision bombing attacks upon the principal objectives, the planners identified an "intermediate objective of overriding priority." This was to overcome the German fighter defenses, including bombing all phases of fighter production, armament, and supply.<sup>64</sup> The Germans, however, had gone to great lengths to fortify their bases. There were approximately 500 of these bases, protected by exceptionally strong light-flak defenses. The Germans had dispersed their aircraft from the landing areas, and they had built concrete taxiways and revetments for each plane. They had also quartered the crews throughout neighboring towns. The whole system was carefully camouflaged, and their security was far superior to the RAF's.<sup>65</sup>

The German aircraft industry furnished another intermediate objective. Most of the factories were concealed and dispersed, and parts and assembly manufacturing were decentralized. Older plants were well known and were 500-700 miles from England. They represented area targets or areas of precision targets. They were not so susceptible to bombing as had been anticipated, as factory bombing resulted in less damage than had been estimated. Adequate forces of bombers, however, should be capable of seriously reducing production if used in quantity and for considerable periods of time. The planners selected the eighteen principal assembly plants as targets.<sup>66</sup> The aluminum and magnesium plants were other intermediate objectives, and they were both precision targets. The aluminum plants were highly essential to aircraft

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<sup>64</sup> Ibid., 8-10.

<sup>65</sup> Ibid., 8.

<sup>66</sup> Ibid., 9.

production, and six plants produced approximately 90% of the aluminum. There were also six magnesium targets.<sup>67</sup>

The possible loss of security in the British Isles made it necessary to plan for the use of bomber forces against other less important objectives, such as submarine bases, invasion ports, and surface raiders. Those targets, however, represented only a diversion from the true objective and were to be avoided altogether, if possible. The planners believed that the British bomber force should have been responsible for these missions, except in actual emergencies.<sup>68</sup>

Consideration of these courses of action led to the conclusion that, by employing large numbers of aircraft with high speed, defensive fire power, and high altitude, it was feasible to make deep penetrations into Germany in daylight. This would be greatly enhanced by development of an escort fighter.<sup>69</sup>

The authors of AWPD believed that success in the air offensive against the objectives outlined above might cause a collapse of the German government. In the event that such an air offensive was not conclusive, however, it would be necessary to invade the continent. The targets listed for the air offensive would continue to be appropriate as bomber objectives in that final phase. In addition, targets of opportunity in the combat zone and on the battlefield proper would be identified as the situation progressed.

Once they completed the plan, the AWPD had to sell it to the WPD of the Army and eventually to the War Department. This had to be done delicately

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<sup>67</sup> Ibid., 10.

<sup>68</sup> Ibid.

<sup>69</sup> Ibid., 12.

because the plan originated in a very small part of a subordinate element in the Army. The planners were proposing that the War Department should change its doctrine on employing air power and that the Army should abandon a joint agreement they had recently signed with the Navy (RAINBOW No 5).

The sequence of events leading up to the approval of the plan was not only important to the plan itself, but also because during the approval process, the AAF cleared the last hurdle before becoming a separate branch. The AWPD first submitted the plan to the WPD, who simply attached it to theirs as an annex because they lacked time to look at it. They then presented it to Brigadier General H. L. Twaddle, G-3 of the War Department General Staff. It was he who had loaned Major Laurence S. Kuter to the AWPD to help draft the plan. Next they presented it to Robert Lovett, the Assistant Secretary of War for Air. It was presented to these two out of order, but this was a deft political move because General Twaddle was sympathetic to the desires of the AWPD planners. On 22 August they presented it to General George Brett, Chief of the Air Corps, and then on 30 August to General Marshall. Marshall said that it had "merit" and that he wanted it presented to the Secretary of War. He did not include the Joint Board, which should have been the next step. He knew that the Board would disapprove it and the Navy would try to discredit it. The AAF owed a great deal to General Marshall. On 11 September they presented it to Secretary of War Stimson, who liked it and wanted it presented to the President. Many people approved the plan, partly because it was more offensive than the RAINBOW plans and ABC- 1, but also because everyone was hurrying to

complete his portion of the Victory Plan. On 25 September 1941 the Victory Program was submitted to the President, with AWPD-1 included.

While the planners waited to brief the President, two events occurred affecting all of the planning that had been done. On 4 December the *Chicago Tribune* and the *Washington Times Herald* published verbatim almost the entire Victory Program, including AWPD-1. Both were classified SECRET and the leak was an embarrassment to the United States, both politically and diplomatically. Then, the 7 December attack on Pearl Harbor jeopardized almost all of the plans made for conducting the war except AWPD-1.<sup>70</sup> The true effect of AWPD-1 on American strategic bombing doctrine and airpower during World War II would be evident in the years following 1941.

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<sup>70</sup> Hansell, *The Air Plan*, 90-96.

## The Momentum Continues

AWPD-1 was the most important document in the development of American strategic bombing doctrine in World War II for several reasons. First of all, the AWPD planners synthesized the ideas and theories that the ACTS formulated and taught in the 1930's. Secondly, until August 1941, there was no detailed, purely American air force plan for conducting strategic bombing. Thirdly, AWPD-1 provided the foundation for all other American strategic bombing planning during World War II. This included the other AWPD plans, especially AWPD-42, and the Combined Bomber Offensive (CBO). Finally, AWPD-1 was a triumph for the four former ACTS instructors that were mainly responsible for drafting AWPD-1. Instead of providing President Roosevelt an outline of munitions requirements to defeat potential enemies, the planners wrote a plan that was instrumental in building the United States air force and also gave that air force unprecedented freedom of operations and responsibilities.

When the AWPD planners wrote their first plan in August, 1941, they drew upon their experiences at the ACTS and also their knowledge of the doctrine taught there. Their task became a matter of putting on paper what they had gathered from the ACTS. Fortunately for the AWPD planners, Colonel McNarney had opened the way in ABC-1 by calling for an initial air offensive.<sup>1</sup> Since the four principal planners of AWPD-1 had taught at the ACTS, they were fortunate in having a common background upon which to base their arguments. Their camaraderie also helped them endure great stress during the nine days that they had to write the plan. The idea of the air offensive obviously sprang from many dissociated sources. As one airman put it, however, it was one matter to produce a brilliant idea, but it was quite another to develop practical doctrine for the accomplishment of that idea.<sup>2</sup> It is difficult to determine which specific ideas prevalent at the ACTS in the 1930's caused the planners to write AWPD-1 as they did, but it is obvious that some of those ideas influenced the AWPD-1 authors. The fact that the planners synthesized ACTS doctrine was significant because the official Army doctrine in 1941 continued to place more emphasis on defensive actions and on conventional support of ground forces than did ACTS doctrine.<sup>3</sup>

In the early 1930's, ACTS textbooks stated that the organization of the air force should be based on the defense of the country. Accordingly, the composition and strength of the Air Corps should be developed for the purpose

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<sup>1</sup> Haywood S. Hansell, Jr., "The Development of the U.S. Concept of Bombardment Operations," 3.

<sup>2</sup> *Ibid.*, 4-5.

<sup>3</sup> FM 1-5 mentioned earlier.

of successfully driving home bombardment attacks against invaders.<sup>4</sup> The only way to gain control of the air was through a determined bomber offensive, not by pursuit aircraft. In 1930, the ACTS instructors asserted that an air force with a preponderantly pursuit mission could not materially affect the ground situation except through the indirect method of destroying hostile aircraft. But, they asserted, an air force comprised primarily of bombardment and attack aircraft could affect the ground situation not only indirectly by participating in the counter-air campaign but directly by attacking ground targets.<sup>5</sup>

By 1933, instruction in the employment of air forces centered on the interdependence of the segments of the economic structure of a nation. The school viewed transportation, steel, iron ore, and electric power complexes as lucrative targets for an air force. The farmer depended upon industrial centers for clothing, tools, and machinery; the urban population depended upon the farmer for food; the miner depended upon the farmer for his food and upon the industrial laborer for other necessities and luxuries. Transportation systems frequently brought together the producer and consumer.<sup>6</sup> That early analysis of industrial nations was very similar to the reference of a power grid in AWPD-1.<sup>7</sup>

In 1935 the ACTS was beginning to move away from the idea of a defensive air force. In proposing a doctrine that year, the ACTS stated that the principal and all important mission of air power was the attack of those vital

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<sup>4</sup> Greer, 52.

<sup>5</sup> Finney, 31.

<sup>6</sup> Ibid., 32.

<sup>7</sup> See ch. 2, 20.

objectives in a nation's economic structure which would paralyze a nation's ability to wage war. This would contribute directly to the attainment of the ultimate objective of war, the disintegration of the hostile will to resist. In teaching the subject of air employment, the ACTS faculty ignored national defensive objectives and began discussing theory. They used actual studies of United States cities to develop a doctrine of offensive air operations. Although the instructors were thinking in terms of operations against foreign enemies, they found it much more practical and tactful to discuss offensive actions as they related to defending the United States. They used the information gathered by instructors, Captain Robert Webster and Major Muir Fairchild, and also information that Walker provided about the American railroad system. They developed a doctrine in terms of general capabilities because the United States did not possess planes that could reach the vital centers of industrialized nations. They also did not restrict themselves to the expressed national policy, probable combinations of enemies, or existing aircraft.<sup>8</sup>

The ACTS instructors attempted to bring coherence to the general theme of air power.<sup>9</sup> It was in the area of the methodology of air warfare that the ACTS made its most original and significant contribution to the development of strategic bombing doctrine.<sup>10</sup> In preparing the "how to" the instructors continued to ignore the strategic situation of the United States and the existing limits of

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<sup>8</sup> Greer, 53.

<sup>9</sup> Haywood S. Hansell, Jr., "A Case Study of Air Force Programming--Air Force Build-up, 1941-1942," a lecture presented at the Air War College, MAFB, AL, December 1, 1954, 12, USAFHRC.

<sup>10</sup> Greer, 52.

range, bases, and equipment. AWPD-1 was the manifestation of that methodology in that the AWPD planners took an eclectic collection of mostly ACTS theories and wrote AWPD-1. They believed firmly that modern air forces could penetrate enemy air defenses and deliver their destructive firepower on selected targets. That attitude was prevalent in the ACTS during the 1930's, as evidenced by Kenneth Walker's rallying cry of bombardment, mentioned earlier, which was approved by the faculty as accepted doctrine.

Modern armies, and nations as well, were dependent on physical structures and facilities that were susceptible to destruction from the air. This premise was widely disseminated throughout the ACTS in the 1930's. Once a nation was deprived of its means to sustain military operations, it was hoped the fighting spirit of its forces would be destroyed or, at a minimum, greatly reduced.<sup>11</sup>

The basic bombardment doctrine developed at the ACTS was that of sustained, precision attacks by heavy bombers against the industrial structure of an enemy nation. Until then, such ideas were clouded in generalizations. The ACTS refined those theories and also provided the methodology for carrying out that doctrine. It was during the 1930's that the ACTS split away from the Douhet-Mitchell thesis of mass, area bombing and began developing precision bombing theories.<sup>12</sup> By 1935, the doctrine of bombing precision targets was well established, and it remained only to work out the guidelines for conducting those bomber attacks. ACTS theorists continued to build the theory and tactics of

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<sup>11</sup> Hansell case study, 6.

<sup>12</sup> Greer, 57.

strategic attacks as if the enemy lay within the radius of action of American bombers. They also held to their convictions that bombers could hit small targets and that they could penetrate enemy defenses without escort aircraft.<sup>13</sup> According to Hansell, the ACTS developed a syllogism upon which the entire ACTS structure of air doctrine depended. The first premise was that modern nations could not wage war if an enemy destroyed their industries. The second premise was that aircraft could penetrate any known air defenses and destroy any known target with bombs. The conclusion was that air warfare was a method of destroying the enemy's ability to wage war.<sup>14</sup>

The basic conception on which AWPD-1 was based was the application of air power to break down the industrial and economic structure of Germany.<sup>15</sup> This concept was at variance with Clausewitz' thesis that the armies in the field were the true objective, but it was in agreement with Douhet's idea that the vital centers were the main objective. Fairchild echoed the ACTS theory in a lecture in which he stated that information about potential targets must be gathered in peacetime. Included as possible targets were the petroleum and transportation industries and electric power.<sup>16</sup> They were also targets in AWPD-1. In short, during the years 1935-1940, instructors at the ACTS surveyed American industry

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<sup>13</sup> Ibid., 80-82.

<sup>14</sup> Hansell bombardment lecture, 7.

<sup>15</sup> Hansell case study, 16-17.

<sup>16</sup> Muir S. Fairchild, "National Economic Structure," ACTS lecture, November 2, 1939, 6-18, K248.2021A-1, USAFHRC.

with the object of determining the points of vulnerability of industrial systems in general.<sup>17</sup>

Although the ACTS analyzed industries and produced doctrine for the destruction of great industrial structures, they made no real effort to translate that analysis into practical application against potential enemies such as Germany and Japan. Even though the school devoted a great amount of thought to offensive operations, those outside the circle of bombing enthusiasts fell short of applying their attention to potential enemies. They wasted too much time and effort on fruitless arguments about sinking battleships.<sup>18</sup>

The second premise mentioned above, the ability of the bombers to penetrate defenses, caused the development of United States escort doctrine to lag behind that of bomber doctrine. It was not so much a choice to make bombers operate unescorted, but rather a conclusion that the United States could not quickly enough develop fighters with sufficient range to accompany the bombers.<sup>19</sup> One of the great criticisms of AWPB-1 was that it lacked proper emphasis on escort aircraft.

The selection of targets was a problem that confronted both the ACTS instructors and the AWPB planners. The difficult task was to arrange in sequence the targets whose destruction would accomplish the purpose. It was also necessary to list them in the order of desirability without any reference to the

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<sup>17</sup> Finney, 35.

<sup>18</sup> Hansell bombardment lecture, 12.

<sup>19</sup> *Ibid.*, 13.

ability to destroy them.<sup>20</sup> That type of thinking, done without regard to existing capabilities, exemplified how the ACTS planners developed their theories.

The leading concept of bombardment attacks on the enemy national structure, was fully developed by 1940. The instructors hoped that strategic bombing would place pressure on the enemy's war producing capacity and also on the civilian population.<sup>21</sup> The problem, as Major Don Wilson saw it, was to select targets whose destruction would disrupt the entire fabric of an enemy's economy while also disrupting the civilian population's normal day-to-day existence. The destruction of these targets would break the population's faith in the military establishment to such an extent that public clamor would force the government to sue for peace.<sup>22</sup> The AWPD planners felt the same way, and they selected the electric power and transportation target systems because damage to each of them would affect both the military forces and also the civilian population.

The ACTS instructors were concerned with determining how air power would be employed in the next war and what constituted the principles governing its employment. They emphasized to their students the use of common sense and logic, rather than wild imagination. In pursuing that purpose, they realized that air power had not proven itself under the actual test of war. They also pointed out that land power and sea power had not proven themselves in the face of modern air power. Instructors urged students to inquire into the very depths of

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<sup>20</sup> Ibid., 16-17.

<sup>21</sup> Ibid., 115.

<sup>22</sup> Finney, 31.

the philosophy of war. They discussed basic questions such as: What is war? Why does war occur? What is the object of war? How has it been waged in the past, and why has it been waged in that manner?<sup>23</sup> That approach to training at the ACTS was one of Harold George's contributions to the new perspective at the ACTS that was mentioned earlier.

With the appearance of the B-17 many bomber enthusiasts declared that nothing could stop the bombers, and that escorts were unnecessary. The impact of the B-17 on thought at the ACTS was profound. It was made more so by the development of an improved bombsight, which strengthened the formula for successful strategic air operations. Since the close of World War I, airmen had recognized the need for improvements in bombsight equipment. By 1936 the full-blown theory of high-level, daylight precision bombardment of pinpoint targets was being taught at the ACTS.<sup>24</sup>

As for primary air force objectives, the ACTS continued to place emphasis upon dislocation of the enemy nation's structure through precision attacks against vital points. Creation of the GHQ Air Force in 1935 presented the school theorists with an offensive air striking force for whose employment they could plan. National policy remained one of defense, and ACTS instructors viewed the GHQ Air Force as a means of implementing that policy. The instructors at the ACTS proceeded to refine their theories and tactics of strategic attacks on the theoretical basis of eventually sending the GHQ Air Force against the interior of

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<sup>23</sup> Harold L. George, ACTS lecture, "An Inquiry into the Subject of "War," 1935, 1-2, 248.11-9, USAFHRC.

<sup>24</sup> Finney, 31.

a hostile nation. Most instructors were convinced that the extreme accuracy required for knocking out small targets could be achieved with the improved planes and bombsights. They were just as firmly convinced that airpower should be employed against small vital targets during the initial phase of hostilities, because only in this way could a long costly surface war be avoided. The Air Force text for 1935 noted that interlaced social, economic, political, and military divisions made up a national structure and that dislocation in one of these divisions would produce sympathetic disturbances of varying intensity in all of the others.<sup>25</sup>

The similarities between the doctrine and ideas taught at the ACTS are clearly evident. From Walker's credo that the bomber was the basic arm of an air force to the Fairchild lectures on the selection of certain targets, the ACTS interpretation of strategic bombing operations influenced the writing of AWPD-1.

The second reason that AWPD-1 was the most important document in the development of American strategic bombing doctrine was simple, but unarguable. That was the fact that until AWPD-1 there was absolutely no plan of its kind. That plan put into writing the original statement of American airpower. ABC-1 was an important joint American-British agreement, but it did not provide the details that were in AWPD-1. Nor did ABC-1 address the purely American philosophy of prosecuting an air war as did AWPD-1. RAINBOW No. 1 was an American plan, but it was a joint venture with the Navy and it too lacked the details present in AWPD-1.

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<sup>25</sup> Ibid., 35.

The third and most obvious reason AWPB-1 was important was that it laid the groundwork for all other American strategic bombing planning in World War II. Regardless of the merits and demerits of AWPB-1, the AWPB planners so impressed President Roosevelt with their professionalism and attention to detail that he asked for a similar study one year after AWPB-1. What was once only discussed among airpower enthusiasts as speculation was becoming routine.

One week after Pearl Harbor, the AWPB tried to commit the United States and Great Britain to an air strategy against the Axis forces. Their proposed strategy was embodied in AWPB-4, which recommended giving first priority in war production to the AAF. The Anglo-American Combined Chiefs of Staff meeting at the Arcadia Conference in January of 1942 did not favor such an overriding priority on aircraft production. So they approved AWPB-1, with some modifications. On 19 January the Secretary of War authorized the AAF to expand to 115 groups during 1942.<sup>26</sup>

For the next several months the country's efforts were devoted to supporting the war, including building the air force outlined in AWPB-1. On 24 August 1942 the President requested that General Marshall ask General Arnold to provide the number of combat aircraft by type which should be produced for the Army and our Allies in the United States in 1943 in order to have complete air ascendancy over the enemy. He asked that they prepare the report without consideration for existing schedules or production possibilities or any other

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<sup>26</sup> Mackin, 94.

competing military requirements.<sup>27</sup> The President asked for this because he wanted to know what the theoretical requirements would be to get complete control and domination of the air.

The key air officers responsible for preparing the answer to the President included Hansell and Kuter, by then both brigadier generals. Hansell returned from General Dwight Eisenhower's staff in England, and Kuter was still in Washington working as the Deputy Chief of the Air Staff. Hal George, the former head of the AWPD, was a major general and commander of the Air Transport Command. General Kenneth Walker was assigned to Port Moresby, New Guinea, as Commander, Vth Bomber Command.<sup>28</sup>

On 9 September, the AWPD submitted its response to the President's letter. The document was entitled AWPD-42, "Requirements for Air Ascendency."<sup>29</sup> This served as the basis for all AAF strategic planning prior to the Casablanca Conference of January 1943. It described the air offensive against Germany as a combined effort of the AAF and the RAF. The AAF would concentrate on the daylight bombing of precision targets, and the RAF on the night bombing of area targets associated with munitions manufacture. The strategic objectives of AWPD-42 were to destroy Germany's will and capability to fight, to support surface forces in the Mediterranean and Pacific, and to provide for the defense

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<sup>27</sup> Franklin D. Roosevelt, memorandum to General Marshall, August 24, 1942, Arnold collection, Library of Congress.

<sup>28</sup> Gaston, 105.

<sup>29</sup> Air War Plans Division, "AWPD-42, Requirements for Air Ascendency," 145.82-42, USAFHRC.

of the Western Hemisphere, which had been the first strategic mission in AWPD-1.<sup>30</sup>

The Americans very nearly did not convince Churchill that the US should use precision bombing during the day. It was not until the Casablanca Conference that General Ira C. Eaker convinced him. He said that the AAF, bombing during the day, and the RAF, bombing at night, would crush Germany by "bombing around the clock." Churchill was won over by the sound of that, and he decided to withdraw his request that America not conduct daylight bombing.<sup>31</sup>

AWPD-42 called for 281 combat groups in the AAF with 63,068 tactical aircraft, supported by 2217 long-range transports, 8,284 gliders, and 116 liaison aircraft. The total number of aircraft required during calendar year 1943 for the AAF was 83,700.<sup>32</sup>

There were two distinct differences between AWPD-1 and 42. The first was that AWPD-1 envisioned a large buildup of B-29 and B-36 bombers because the planners believed that there would not be enough airdromes in England on which to base the aircraft needed in the AWPD-1 estimates. Therefore, the emphasis in AWPD-42 was put on the B-17 and B-24, since they then knew that there would be enough bases in England. A few B-29's would be produced, but

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<sup>30</sup> Ibid., Part IV, 2-4.

<sup>31</sup> GEN Ira C. Eaker, lecture entitled "Some Observations of Wars and Warriors," Squadron Officers School, Air University, Maxwell AFB, AL, 23 September 1974, Attachment #4 to the Eaker interview by Richard Tobin, K239.0512-918, 7-10.

<sup>32</sup> AWPD-42, Part IV, 3 and Tabs G and H.

no B-36's were scheduled for production in 1943. Secondly, there was a new list of target priorities in Germany.

The priorities for bombing Germany as outlined in AWPD-42 were basically the same as AWPD-1. They included the destruction of the German Air Force using 22,374 sorties or 44,748 tons of bombs. The factories would be bombed at two month intervals to ensure total destruction. The second priority was submarine building yards. The Navy had exerted much pressure to have that target added because the Allies had lost so many tons of shipping. The AAF would fly a total of 10,332 sorties against that target system, dropping 20,664 tons. The third priority was the inland transportation system, including locomotive building shops, locomotive repair shops, marshalling yards, and inland waterways. The bomber force would attack that target with 9,348 sorties. The fourth priority was the electric power grid. That target system required 13,449 sorties and 26,894 tons of bombs. The German electric systems had been the first priority among the priority systems in AWPD-1. The fifth priority in AWPD-1 was the German oil industry. The sixth target system on the list was the aluminum industry. Destruction of that target system would be a severe blow since aluminum was used as a replacement for copper, which was in short supply. The last target was the rubber industry.<sup>33</sup>

Once German strength was weakened to a point where an invasion was possible, the Allies would launch a combined land, air, and sea offensive from the British Isles. The strategic objective of the invasion would be the decisive defeat

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<sup>33</sup> Ibid., Part IV, 3.

of Germany and the occupation of key industrial and political areas. The air operations in support of the invasion would be the direct attack of enemy troops, attack of enemy air forces, attack of logistic facilities supporting the enemy ground forces, attack of transportation means of all kinds, and the attack of munitions factories. The allied air forces would also provide fighter defense for friendly troops and their vital establishments. The total number of targets identified in AWPD-42 amounted to 177, compared to 154 in AWPD-1.<sup>34</sup>

Both AWPD-1 and 42 addressed the possibility of targeting morale by bombing areas of civil concentrations to break the will of the German people completely. The American policy continued to assert that the tactic of bombing civilians would only be used when the German morale was already severely weakened. In 1942, the AAF could use as an example the RAF's combat experience which showed that bombing to break morale could have the opposite effect if employed too early. The RAF, throughout the war, attacked the German morale through urban area bombing. Even when they achieved air superiority and were free to fly daylight missions in 1945, they preferred to continue area bombing instead of attacking precision targets.<sup>35</sup>

By 15 October 1942 the War Department General Staff and the President had approved the 1943 estimates for aircraft production. But the Navy had not participated in the planning (the president did not ask for their contribution), they rejected the figures for Navy aircraft production. Admiral Ernest J. King

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<sup>34</sup> Ibid., Tab B-1-a and Part IV, 4.

<sup>35</sup> Hansell, *The Air Plan*, 269.

expressed his displeasure in a letter to General Marshall, stating that many points in the study were entirely unacceptable to the Navy. Among those, he referred to the tabulations of naval air requirements, to the deployment of naval forces in the Pacific, and especially to the strategic concept and strategic courses of action necessary for winning the war.<sup>36</sup>

One of the criticisms of AWPD-42 was its selection of targets. It was completed in September, and not enough intelligence was available to produce a good target list. Discussions progressed, and the limitations in target analysis became more apparent. Regardless of its shortcomings, AWPD-42 came very close to being a comprehensive bombardment plan.<sup>37</sup> It represented a complete and detailed plan for the attack and destruction of the resources of the Axis Powers by aerial bombing. Although it did not receive official approval, it represented the basis for a working plan for accomplishing the objectives outlined in the President's memorandum of 24 August. It also served later as a reference for other planning agencies, and it had considerable influence on future plans for air operations.<sup>38</sup>

AWPD-42 officially suffered a slow death in Washington. An exchange between General Arnold and Robert A. Lovett, Assistant Secretary of War for Air, was typical of the bickering that occurred after the AWPD personnel submitted their plan. After Lovett received the plan, he wrote Arnold stating

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<sup>36</sup> Ernest J. King, memorandum to the Chief of Staff, General Marshall, September 22, 1942, National Archives.

<sup>37</sup> Craven and Cate, vol. 2, 353.

<sup>38</sup> A.C. Wedemeyer, memorandum for the Assistant Chief of Staff, OPD, November 21, 1942, National Archives.

that he had studied the paper, which purported to be a schedule of 1943 aircraft production. Lovett claimed that it was not a schedule, but rather "fantasy." He compared it to asking a hen to lay an ostrich egg; it was unlikely that anyone would get the egg and the hen would never look the same.<sup>39</sup> In his response, Arnold reminded Lovett that the President asked them to respond without considering existing schedules or production possibilities or other competing military requirements. Arnold agreed that the problem was much like asking a peacetime hen to lay a wartime egg of ostrich proportions, but he felt that if they could induce the hen to lay it, he would accept the wear and tear on the hen.<sup>40</sup> On 3 February 1943, after months of discussion, the 57th meeting of the Joint Planning Section dropped AWPD-42 from its agenda. The official discussions about the plan may have ended that day, but unofficially planning based on AWPD-42 continued until the end of the war.

In January 1943 President Roosevelt and Prime Minister Churchill met in Casablanca. One objective agreed upon during the conference was the eventual destruction and dislocation of the German military, industrial, and economic system and the undermining of the morale of the German people to a point where their capacity for armed resistance would be fatally weakened. To some airmen, that meant the termination of Germany's ability to wage war effectively. That joint agreement was the foundation of the CBO.

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<sup>39</sup> Robert A. Lovett, memorandum to General Arnold, October 14, 1942, Arnold collection, Library of Congress.

<sup>40</sup> Henry H. Arnold, memorandum to Robert A. Lovett, October 19, 1942, Arnold collection, Library of Congress.

A joint American-British team wrote the CBO in England in March-April 1943. Hansell was the only one of the primary AWPD planners to work on that plan. AWPD-1 and -42 were production plans, but the CBO was an operations plan that showed what should be done to achieve an objective using forces already committed to production.<sup>41</sup> The plan called for the attack of seventy-six targets to begin in late 1943. The list of target systems comprised: (1) submarine construction yards and bases; (2) German aircraft industry; (3) ball bearing plant; (4) oil; (5) synthetic rubber and tires; (6) military transport vehicles. The successful prosecution of the air offensive against the principal objectives was dependent upon a prior or simultaneous offensive against the German fighter strength.<sup>42</sup>

Without exception, AWPD-1, -42, and the CBO adhered to the American judgment that daylight precision bombing attacks against an enemy's means of waging war was the best method for attacking Germany. Britain denied this and, in fact, had switched from daylight bombing to night bombing because their losses became too high. As the Germans perfected night fighter defenses, the RAF's losses rose until they were more costly than the AAF's daylight missions. The AAF lost 9,949 bombers in 754,818 sorties, or one bomber per 76 sorties. The Bomber Command lost 11,965 bombers in 687,462 sorties, or one bomber per 57.5 sorties.<sup>43</sup>

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<sup>41</sup> Hansell, *The Air Plan*, 158.

<sup>42</sup> Combined Chiefs of Staff Plan for Combined Bomber Offensive from the United Kingdom, 14 May 1943, 178.20, USAFHRC, 2, 4.

<sup>43</sup> Hansell, *The Air Plan*, 254.

The final reason that AWPD-1 was important was because when the former ACTS instructors wrote the plan, they were writing for all American airmen who wanted an air force equal in stature to the older branches. The planners could have answered the President's letter by providing only the munitions requirements, but they seized the opportunity to build a powerful air force that would play a significant role in a future war. They not only provided the doctrine for strategic bombing, but they also forecasted the means to carry out that doctrine.

It was fortunate that the small group of airpower zealots at the ACTS and in the AWPD did not allow themselves to be swayed either by the popular disillusionment with World War I or by the strongly-held view that American military strength should be designed solely for defense. Had air concepts been limited to defense of the American coast line, the AAF would not have had the theory, organization, or planes necessary for the planning and execution of the strategic air war of World War II.<sup>44</sup>

In the course of eighteen months, from March 1941 until the spring of 1943, the value of American air forces was realized, and the planning for the bombing of Germany was refined. The development of strategic bombing doctrine evolved from the pre-war plans like RAINBOW 5 and ABC-1, and it continued to mature through AWPD-42. These plans were the foundations of the Combined Bomber Offensive, the combined American-British plan approved on 18 May 1943. The impact these plans exerted on the outcome of the war is outside the

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<sup>44</sup> Finney, 35-36.

scope of this study. Their impact, especially that of AWPD-1, however, on the growth of the Air Force and the change in doctrine concerning air power has been illustrated in this thesis.

## Conclusions

Several years ago when I began researching this subject I telephoned General Hansell to ask for guidance and to clear up some questions that I had. When I told him that I had read his book, *The Air Plan that Defeated Hitler*, he made a comment about its bad title. His feelings about the title jibed with the attitudes about AWPD-1 that I found during my research. One was the impression that Hansell tried to make AWPD-1 something it was not. Another was that the title of the book is what he and the other AWPD planners were trying to create when they wrote AWPD-1. The intent of this thesis has not been to show that their ulterior motives were even relevant. The title of the book and most of the criticisms of AWPD-1 miss the point. AWPD-1 was an estimate of "overall production requirements to defeat our potential enemies." It was also the attempt of some energetic airmen to improve the AAF's status in the War Department.

The AWPDP planners relied on their experiences at the ACTS in the 1930's to write AWPDP-1. Just how much their lectures and conversations at Maxwell Field affected the official doctrine of the 1930's and vice-versa is a topic for later researchers. Another important area worth investigating is the amount of planning that England and Germany conducted before World War II. Initial research has uncovered very little information which indicates that either Germany or England produced any document as detailed as AWPDP-1.

Whether it is more exciting to argue that AWPDP-1 was the air plan that could have defeated Hitler is also a moot point. Recent events in the Persian Gulf have demonstrated what an air force could do if it had the backing of the entire country. The original target systems in AWPDP-1 were still valid in Baghdad in 1991. Although the target lists were similar, it is dangerous to assume that the AAF would have had the same success if they had had more support. In 1941, doctrine and theory were ahead of the technology, whereas, in the Persian Gulf, it was just the opposite. When taken in the context of 1941 strategic bombing doctrine, especially against Germany, AWPDP-1 was an excellent blueprint for strategic bombing doctrine in World War II.

# APPENDIX 1

Tab A President Roosevelt's letter of 9 July 1941

B Brief of the Strategic Concept

C Tabulations of Aircraft Requirements

D Requirements in Critical Items of Equipment and Tonnage

1 Intelligence

2 Bombardment Operations Against Germany

2b Calculations for Types of Planes

3 Escort Fighters

4 Bomber Operating Bases

5 Aircraft Required for Control of the Seas

6 Bombardment Aviation Required for Hemispheric Defense

7 Bombardment Aviation Required for Strategic Defense in Asia

8 Pursuit Aviation Required to Support an Air Offensive Against  
Germany

- 9 Pursuit Aviation Required to Support Hemispheric Defense
- 10 Pursuit Aviation Required to Support Strategic Defense in Asia
- 11 Pursuit Aviation Required for Support of Ground Forces
- 12 Air Support Aviation Required for Support of Ground Forces
- 13 Transportation Aviation Required to Maintain Aerial LOC's
- 14 Air Corps Requirements
- 15 Training Aircraft Required to Meet the Objectives
- 16 Personnel Requirements
- 17 Production Program in Aircraft
- 18 Weather--Its Influence in all Theaters

## **Bibliographical Essay**

By far, the most fertile ground for primary sources on this subject is the United States Air Force Historical Research Center at Maxwell Air Force Base, Alabama. Although some material, such as the Admiral King and General Wedemeyer memoranda, is available at the National Archives, it is not enough to provide a thorough understanding of this subject. The same is true for the Arnold, Eaker, Lovett, Roosevelt, and Spaatz collections in the Library of Congress. These collections contain information about AWPD-1 and strategic bombing doctrine, but they do not provide the amount on file at Maxwell AFB. Bolling AFB in Washington, D.C., has a good library, but what they have is on microfilm from Maxwell. One must reserve a microfilm viewer before arriving.

The Maxwell AFB papers of Eaker, Fairchild, George, Hansell, and others contain the original notes that the instructors used in their lectures there. The oral history interviews of Barnes, Eaker, Hansell, and Kuter are all useful, but caution must be taken since no one's memory is perfect and interviewees may

have an axe or two to grind. The most important documents at Maxwell relating to this subject are the copies of the Air War Plans Division material. Copies of the originals are in the library, and microfilm copies are available for a fee.

The Pentagon Library and the Army War College Library at Carlisle Barracks, Pennsylvania, have copies of the early Army manuals and regulations. These were very helpful in comparing what the airmen wanted in an air force, and what the Army wanted. Copies of these documents may be ordered through interlibrary loan.

## Selected Bibliography

### *Primary Sources*

- Air War Plans Division, Air Staff, Army Air Forces. "AWPD-1, Munitions Requirements of the AAF to Defeat Our Potential Enemies." 12 August 1941. Air University Library, Maxwell AFB, AL, and in the Carl Spaatz collection in the Library of Congress.
- Air War Plans Division, Air Staff, Army Air Forces. "AWPD-42, Requirements for Air Ascendency." 9 September 1942. Air University Library, Maxwell AFB, AL.
- Arnold, Henry H. Memorandum to Robert A. Lovett, 19 October 1942, Arnold collection, Library of Congress.
- Barnes, Earl W. Oral history interview by Hugh H. Ahmann, 22-23 January 1975, USAFHRC.
- Combined Chiefs of Staff. "Combined Chiefs of Staff Plan for Combined Bomber Offensive from the United Kingdom," 14 May 1943, USAFHRC.
- Eaker, Ira C. Oral history interview by Richard Tobin, March 1974. USAFHRC.
- Eaker, Ira C. "Some Observations of Wars and Warriors." A lecture presented to the Squadron Officers School, Air University, Maxwell AFB, AL, 23 September 1974, USAFHRC.

- Fairchild, Muir S. "National Economic Structure." ACTS lecture, 2 November 1939, USAFHRC.
- George, Harold L. "An Inquiry into the Subject of 'War.'" ACTS lecture, 1935, USAFHRC.
- George, Harold L, memorandum to the AWPD, AWPD-1 scrapbook, Air University Library, Maxwell AFB, AL, and in the Carl Spaatz collection in the Library of Congress.
- Hansell, Haywood S., Jr. Oral history interview by Bruce C. Hopper, 5 October 1943. Eaker collection, Library of Congress.
- Hansell, Haywood S., Jr. "The Development of the United States Concept of Bombardment Operations." A lecture presented at the Air War College, Air University, Maxwell AFB, AL, 16 February 1951, USAFHRC.
- Hansell, Haywood S., Jr. "A Case Study of Air Force Programming--Air Force Build-up, 1941-1942." A lecture presented at the Air War College, Air University, Maxwell AFB, AL, 1 December 1954, USAFHRC.
- Hansell, Haywood S., Jr. Interview with the author, November 1987.
- Hansell, Haywood S., III. Interview with the author, 8 March 1991.
- King, Ernest J. Memorandum to the Chief of Staff, General Marshall, 22 September 1942, National Archives.
- Kuter, Laurence S. Memorandum to General Marshall, 20 August 1941.
- Kuter, Laurence S. Oral history interview by Hugh N. Ahmann and Tom Sturm, 30 September-3 October 1974, USAFHRC.
- Lovett, Robert A. Memorandum to General Arnold, 14 October 1942, Arnold collection, Library of Congress.
- New York Times*. 1 October 1925.
- Roosevelt, Franklin D. Memorandum to General Marshall, 24 August 1942, Arnold Collection, Library of Congress.
- Wedemeyer, A.C. Memorandum for the Assistant Chief of Staff, OPD, 21 November 1942, National Archives.

## *Secondary Sources*

- Craven, Wesley, F., and James L. Cate, ed. *The Army Air Forces in World War II*, 2 vols. Chicago: University of Chicago Press Press, 1948.
- Brodie, Bernard. *Strategy in the Missile Age*. Princeton: University of Princeton Press, 1965.
- Clausewitz, Karl von. *On War*, ed. and trans. Michael Howard and Peter Paret. Princeton: University of Princeton Press, 1976.
- Davis, Burke. *The Billy Mitchell Affair*. New York: Random House, 1967.
- Douhet, Giulio. *The Command of the Air*, ed. Richard H. Kohn and Joseph P. Harahan, trans. Dino Ferrari. New York: Coward-McCann, Inc., 1942.
- Emme, Eugene M. *The Impact of Air Power: National Security and World Politics*. Princeton: D. Van Nostrand Company, Inc., 1959.
- Finney, Robert T. "History of the Air Corps Tactical School 1920-1940," USAF Historical Studies: No. 100. Maxwell AFB, AL: Air University, 1955.
- Futrell, Robert F. *Ideas, Concepts, Doctrine: A History of Basic Thinking in the United States Air Force 1907-1960*, vol. 1. Maxwell AFB, AL: Air University Press, 1989.
- Gaston, James C. *Planning the American Air War: Four Men and Nine Days in 1941*. Washington: National Defense University Press, Ft. McNair, 1982.
- Greer, Thomas H. *The Development of Air Doctrine in the Army Air Arm, 1917-1941*. Washington: GPO, 1985.
- Hansell, Haywood S., Jr. *The Air Plan that Defeated Hitler*. Atlanta: Higgins-McArthur/Longino and Porter, 1972.
- Hansell, Haywood S., Jr. *The Strategic Air War Against Germany and Japan*. Washington: GPO, 1986.
- Kennett, Lee. *A History of Strategic Bombing*. New York: Charles Scribner's Sons, 1982.
- Mackin, Thomas E. *US Air Power: Ascension to Prominence*. Maxwell AFB, AL: Academic Publications Division, 1974.

- Marshall, George C., Henry H. Arnold, and Ernest J. King. *The War Reports of Marshall, Arnold and King*. Philadelphia and New York: J.P. Lippincott, 1947.
- Maurer, Maurer. *Aviation in the U.S. Army, 1919-1939*. Washington, D.C.: Office of Air Force History, United States Air Force, 1987.
- Parton, James. *"Air Force Spoken Here:" General Ira Eaker and the Command of the Air*. Bethesda, MD: Adler & Adler, Publishers, Inc., 1986.
- Schaffer, Ronald. *Wings of Judgment: American Bombing in World War II*. Oxford University Press, 1985.
- Sherry, Michael S. *The Rise of American Air Power: The Creation of Armageddon*. New Haven: Yale University Press, 1987.
- Speer, Albert. *Inside the Third Reich*, trans. Richard and Clara Winston. New York: Macmillan, 1970.
- U.S. Army. *Training Regulation 440-15, Air Service, Fundamental Principles for the Employment of the Air Service*. GPO, 1926.
- U.S. Army. *Training Regulation 440-15, Air Corps, Employment of the Air Forces of the Army*. GPO, 1935.
- U.S. Army. *Field Manual 1-5, Air Corps Field Manual, Employment of Aviation of the Army*. GPO, 1940.
- U.S. Congress. *The Hearings of the Joint Committee on the Investigation of the Pearl Harbor Attack*. 79th Cong., 1st Sess.
- Warner, Edward. "Douhet, Mitchell, Seversky: Theories of Air Warfare." In *Makers of Modern Strategy, Military Thought from Machiavelli to Hitler*, ed. Edward M. Earle. Princeton: University of Princeton Press, 1943.
- Watson, Mark S. *U.S. Army in World War II*, vol. 4, pt. 1. The War Department, Chief of Staff: Prewar Plans and Preparations. Washington: GPO, 1950.
- Watts, Barry D. *The Foundations of US Air Doctrine: The Problem of Friction in War*. Maxwell AFB, AL: Air University Press, 1984.
- Webster, Sir Charles, and Noble Frankland. *The Strategic Air Offensive Against Germany, 1939-1945*, 4 vols. London: Her Majesty's Stationery Office, 1961.

Weigley, Russell F. *The American Way of War: A History of United States Military Strategy and Policy*. New York: Macmillan Publishing Co., Inc., 1973.

Wells, H. G. *The War in the Air*. New York: The Macmillan Company, 1908.

## Vita

Howard David Laine was born on 6 March 1957 in Richmond, Virginia. In 1979, he was graduated from Virginia Polytechnic Institute and State University with a Bachelor of Arts degree in History. Upon graduation, he was commissioned a Second Lieutenant in the Field Artillery. In September 1979, he married Beth Bryant of Collinsville, Virginia. They are still happily married, and they are raising three children. He will be promoted to major on 1 June, and in July he will move to Fort Leavenworth, Kansas, to attend the Command and General Staff Officers Course.

