THE UNITED STATES STRATEGIC BOMBING SURVEY AND AIR FORCE DOCTRINE

BY

JOHN K. MCMULLEN

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About the Author

Lt. Colonel John K. McMullen was commissioned through the Officer Training School in 1988. Graduating from pilot training in 1989, he went on to fly the F-15C at Langley AFB where he participated in OPERATION DESERT SHIELD/STORM. Other assignments for Lt. Colonel McMullen include F-15C instructor pilot at Tyndall AFB, Florida and instructor pilot at the USAF Weapons School at Nellis AFB, Nevada. Lt. Colonel is a senior pilot with over 2000 hours of fighter time. He has a bachelor and Master's degree in Aerospace Engineering from Virginia Polytechnic Institute and State University, and a Master's degree in National Security and Strategic Studies from the US Air Force Air University. In July 2001, Lt. Colonel McMullen was assigned to PACAF as a combat planner.

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Abstract

This study analyzes the impact of the United States Strategic Bombing Survey (USSBS) on the post World War II doctrine of strategic bombing. It begins with an investigation of pre-war theory and doctrine with special emphasis on the Air Corps Tactical School. While this organization developed an elaborate theory of strategic bombing, key assumptions, especially in light of current technology, led to shortfalls in its applicability to war. From here the study transitions to the USSBS. The first objective was to show that the findings of the USSBS were based on fact rather than bias. Next, the pertinent findings of the USSBS were analyzed. With the findings in hand, post World War II doctrine was analyzed to assess whether the Air Force included the important conclusions from the USSBS in their doctrine. The findings were that the Air Force did heed the recommendations in part, but also let some recommendations fall by the wayside. The study ends by making recommendations for the future toward the importance of developing a post-war survey team framework prior to war, so that they are poised to execute on a moment's notice. Additionally, comments are made to support the idea that civilian participation in a military survey team is as important today as it was in World War II.

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Chapter 1

INTRODUCTION

> *It seems to me that it would be valuable in connection with air attacks on Japan and with postwar planning to obtain an impartial and expert study of the effects of the aerial attack on Germany which was authorized in enlarged scale as the Combined Bomber Offensive at the Casablanca Conference. Its value obviously depends on the quality and impartiality of the group selected to make the study as well as on the scope of the study itself.*
>
> Letter from President Roosevelt to the Secretary of War, September 1944.

Introduction

In the effort to defeat Hitler, Allied air power dropped nearly 2,700,000 tons of bombs while flying more than 1,440,000 bomber sorties. Over 158,000 Allied airmen were killed in conjunction with this effort.[1] The effects on the German homeland were many. The following excerpt from the United States Strategic Bombing Survey (USSBS) helps to highlight the extent of the damage.

> In the wake of these attacks there are great paths of destruction. In Germany, 3,600,000 dwelling units, approximately 20% of the total, were destroyed or heavily damaged. Survey estimates show some 300,000 civilians killed and 780,000 wounded. The number made homeless aggregates 7,500,000. The principal German cities have been largely reduced to hollow walls and piles of rubble. German industry is bruised and temporarily paralyzed. These are the scars across the face of the enemy, the preface to the victory that followed.[2]

Hidden within these strategic bombing missions and the resulting damage lie many lessons for the air power strategist. The formal mission of the USSBS was to determine the effects or lessons to be drawn from the Allied air effort against Germany; eventually

[1] USSBS, Office of the Chairman, *Overall Report, European War* (Washington: GPO, September, 1945), X.

Japan was added to the survey. Not simply the physical effects, but the economic, physiological and moral effects the bombing had on the German war machine as well as the German civilian population. The effort encompassed some 300 civilians and 850 military personnel, whom often followed closely behind the front to uncover the answers surrounding the effects of the bombing effort.[3] The survey team scoured Germany uncovering and studying statistical data and records from German industry, records from government agencies and officials, and interviewing thousands of Germans including military and political leaders.[4] In the end, over 200 reports from the European campaign alone were submitted and eventually included in the official USSBS collection.

The questions surrounding the USSBS are many. Was the survey team impartial? Were the results valid? What effect would the survey have on the Army Air Forces (AAF)? These questions will all be answered to some extent during the course of this paper, but the emphasis lies elsewhere. The driving force behind this paper is to determine whether and how the reports of the USSBS influenced AAF doctrine. More precisely, this paper evaluates the doctrine as it pertained to strategic bombing. Did the strategic bombing campaign during World War II validate AAF doctrine in its entirety or was there need for change based on the results of the USSBS? If so were changes made based on these results? The answers to these questions are of great importance to the producer of Air Force doctrine today. The relevance though lies not in the validation of any portion of the AAF doctrine entering World War II, but in the process for updating doctrine. The process of accepting substantiated criticism that is often aimed at the inner core of the foundation upon which doctrine is based. For it is the basic assumptions, which over time often gravitate toward fact in the mind of the strategist, that must be tested and evaluated against the realities of war.

The following strategy is used to uncover the answers to the above questions. Chapter two analyzes AAF doctrinal beliefs entering World War II. The teachings at the Air Corps Tactical School (ACTS) were heavily relied upon in the analysis of the AAF

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[2] USSBS, Office of the Chairman, *Summary Report, European War* (Washington: GPO, September, 1945), 6.
[3] USSBS, Office of the Chairman, *Overall Report, European War* (Washington: GPO, September, 1945), IX.
[4] USSBS, Office of the Chairman, *Overall Report, European War* (Washington: GPO, September, 1945), IX.

doctrine. Additionally, Air War Plan Division-1 (AWPD-1), the AAF's first air campaign plan for World War II, is assessed to provide congruence with doctrinal beliefs as codified by the ACTS.

Chapter three begins the study of the USSBS. But prior to evaluating the data as published in the USSBS, a determination must be made toward the partiality or impartiality of the survey process and results. The AAF had much to gain by ensuring positive results from this survey, complete independence at the top of the list. The Navy, particularly in the Pacific Theater, had ulterior motives for inputting data into the USSBS process. Roles and missions as well as post-war budget allocations were all potentially up in the air based on the results of the survey. Beginning with the formation of the survey team and ending with the writing of the report, this chapter attempts to answer the question, was the survey impartial?

Chapter four is dedicated to assessing the results and recommendations of the survey. As the USSBS would probably double the volume of most home libraries, it is not analyzed in its entirety. The survey team was divided into twenty-four divisions, each compiling reports on a finite number of sub-areas followed by a final report that summarized the findings in the more specific sub-reports. The data presented in this chapter is comprised of information found primarily in the final reports, referring to the more specific reports only as required for clarification.

Chapter five builds a picture of Air Force doctrine after World War II. Published official Air Force doctrine is evaluated, but is not the sole source as it was tardy entering the equation. It was not even published until the 1953-1954 time frame. Therefore, the Air Force's involvement in joint war planning is analyzed to hopefully provide a clearer picture of Air Force doctrine during this era. In addition to analyzing post-war doctrine, this chapter attempts to link the findings of the USSBS to changes in doctrine or potential areas that called for changes, yet were ignored. In completing this chapter an unavoidable limitation to this paper must be highlighted. While logic may provide the bridge from the USSBS to changes in Air Force doctrine, few historical footnotes are provided to allow this author to conclude as fact that the USSBS was the driver for this change. The clues uncovered may point toward that fact, but it is impossible to conclude definitively that action A directly influenced action B.

The final chapter not only brings closure to the findings of this paper, but also sheds light on the implications for current and future doctrine. Should lessons learned be the mission of the military, or do our preconceived assumptions sway the data such that conclusions do not penetrate deep enough into doctrinal beliefs? Can the study of past events truly keep history from repeating itself?

Before beginning the mission at hand, a few definitions are required to minimize confusion for the reader. The first definition is that of strategic bombing. This term has meant many different things to different people conjuring up ideas such as massed civilian terror bombing ala Giulio Douhet. While these differing images are a subset of strategic bombing, they do not adequately describe the concept in its entirety. David MacIsaac, who is probably the leading expert on the USSBS, borrows a working definition for strategic bombing from Neville Jones that will also be employed in this paper.

> Strategic bombing may be defined as the direct attack against the most important elements of an enemy's war-making capacity, for example, his industries, communications, and the morale of his civilian population, as opposed to the units and equipment of his armed forces. The object of such bombing, which is the product of an age in which the distinction between soldier and civilian has disappeared, is to undermine the enemy's war effort.[5]

One additional emphasis must be given with this definition; the strategic bombing mission is executed independent of the ground or naval campaign. In fact, many writings of this time frame actually use the term strategic and independent interchangeably.[6] As this paper explores AAF and then Air Force strategic bombing doctrine, it refers to this phenomenon as strategic doctrine.

One final working definition is required for this paper: that of doctrine. The following definition is paraphrased from the current Air Force Basic Doctrine Manual AFDD-1 and will suffice for the contents of this paper.

> Military doctrine is a statement of officially sanctioned beliefs and principles that describe and guide the proper use of forces in military operations. It is what we have come to understand, based on our experience to date. Doctrine is an accumulation of knowledge gained

[5] Neville Jones, *The Origins of Strategic Bombing* (London: William Kimber, 1973), 13.
[6] Colin S. Gray, *Modern Strategy* (Oxford: Oxford University Press, 1999), 228-231.

> primarily from the study and analysis of experience, which may include actual combat or contingency operations.[7]

This definition leads to another potential shortfall, at least by definition, in this paper. It is probably more accurate to term the ACTS doctrine as theory. But as chapter two unfolds, the link between ACTS theory and AWPD-1 should hopefully prove that the AAF accepted ACTS theory as doctrine. While this theory did not have much wartime experience to rely upon, it was nonetheless "a statement of officially sanctioned beliefs and principles that describe and guide the proper use of forces in military operations." Whether the AAF concept of strategic bombing prior to World War II is labeled theory or doctrine is unimportant for the analysis within this paper as the process attempts to link changes in beliefs based on lessons learned in war. The results should remain unchanged regardless of whether the starting point was based more on theory than experience.

[7] Department of the Air Force, *Air Force Basic Doctrine, AFDD-1* (Maxwell AFB, Ala.: Air Force Doctrine Center, 1997), 1.

Chapter 2

ARMY AIR FORCE DOCTRINE ENTERING WORLD WAR II

Has the advent of air power brought into existence a method for the prosecution of war which has revolutionized that art and given to air forces a strategic objective of their own independent of either land or naval forces, the attainment of which might, in itself, accomplish the purpose of war; or has air power merely added another weapon to the waging of war which makes it in fact only an auxiliary of the traditional military forces?

Extract from an introductory lecture at ACTS, 1935.

Introduction

This chapter attempts to codify the AAF doctrine entering World War II. The mission is not to retrace AAF doctrine in its entirety, rather doctrine that supports the independent strategic mission of the AAF. In doing this Army regulations governing the AAF are of little value as they rarely mention the idea of a strategic mission for the AAF. Therefore other sources are used to build the ideas, beliefs and assumptions surrounding AAF strategic doctrine entering WWII. The roots of this strategic doctrine can be found in the writings of such men as Giulio Douhet, Billy Mitchell, Jan Smuts and Hugh Trenchard. Their ideas are interwoven throughout AAF doctrine entering WWII. But attaching the ideas to the theorist is unimportant for the purpose of this paper and is left to the historian. The emphases of the following pages are threefold. First, the basic principles of AAF strategic doctrine are described. Second, the important assumptions surrounding these principles are developed. Finally, AWPD-1, the AAF's initial air strategy for WWII, is analyzed to illustrate the AAF's first attempt to apply strategic doctrine to a real world scenario.

Doctrine Development in the Air Corps Tactical School (ACTS)

Then Major Haywood Hansell was an instructor at the Air Corps Tactical School, 1935-1938, during much of the development of AAF strategic doctrine. In reflecting on these events in his book, *The Strategic Air War Against Germany and Japan*, he pens the foundation of the ACTS strategic theory on five aphorisms:

> 1. Modern great powers rely on major industrial and economic systems for production of weapons and supplies for their armed forces, and for manufacture of products and provision of services to sustain life in a highly industrialized society. Disruption or paralysis of these systems undermines both the enemy's *capability* and *will* to fight. (Emphasis in original).
>
> 2. Such major systems contain critical points whose destruction will break down these systems, and bombs can be delivered with adequate accuracy to do this.
>
> 3. Massed air strike forces can penetrate air defenses without unacceptable losses and destroy selected targets.
>
> 4. Proper selection of vital targets in the industrial/economic/social structure of a modern industrialized nation, and their subsequent destruction by air attack, can lead to fatally weakening of an industrialized enemy nation and to victory through air power.
>
> 5. If enemy resistance still persists after successful paralysis of selected target systems, it may be necessary, as a last resort to apply direct force upon the sources of enemy national will by attacking cities. In this event, it is preferable to render the cities untenable rather than indiscriminately to destroy structures and people.[8]

These five aphorisms are important to the understanding of AAF strategic doctrine, but further analysis is required to yield the true basis upon which this framework was built. It is the underlying assumptions that must be uncovered to establish the efficacy of AAF doctrine.

The fundamental argument surrounding these beliefs is contained within the ACTS idea of the ultimate aim in war. Is it the destruction of the enemy military or is there some other ultimate aim that could bring victory quicker and with less blood? The ACTS preached that indeed the destruction of the enemy military was sufficient to gain

[8] Maj. Gen. Haywood S. Hansell, Jr., *The Strategic Air War Against Germany and Japan* (Washington D.C.: Office of Air Force History, 1986), 7-10.

victory but that it was not necessary. The ACTS argued that it was the will of the people that must ultimately be defeated to ensure victory. "The ultimate object of all military operations, then, is to destroy the will of the people at home, for that is the real source of the enemy's national policy."[9] The military, however, had mistakenly identified the enemy military as the ultimate aim in war because they typically had to be defeated prior to applying pressure to the true source of the enemy's national policy, the will of the people.[10] But Germany, in WWI, sued for peace while their military was still intact and on foreign soil. It was not a military defeat that forced Germany to sue for peace, but a civilian population that had lost their will to fight. This German example resulted in large part from the blockade of materials and food necessary for the general population and the war effort. This leads to the question, how can air power be used to break the will of the people?

The answer to this question yields the theory of the industrial web. A nation's industry was believed to be a series of interconnected activities in which one relied upon the other, like the links of a chain. Additionally, modern warfare put a huge strain on the industrial chain further exposing the vulnerabilities of the system to air attack.[11] The key to the theory was to determine the most vital links that if targeted would bring the system to a halt. Furthermore, if chosen correctly those bottlenecks would influence both an enemy's capability to wage war and the means of sustaining a normal life to the civil population in a single blow.[12] A further testament to this belief is shown in the following:

> The destruction of the capacity for war of a nation can be combined with the direct application of pressure to the civil population without loss of efficiency to either purpose. The industrial mechanisms, which provide the means of war to the armed forces, and those that provide the means of sustaining a normal life to the civil population, are not separate disconnected entities. They are joined at many vital points. If not electric power, then the destruction of some other <u>common</u> element, will render them <u>both</u> inoperative at a single blow.[13] (Emphasis in original).

[9] Maj. Muir S. Fairchild, *The Aim of War*, ACTS Lecture, 1940, HRA248.2021A-3, 10.
[10] Maj. Muir S. Fairchild, *The Aim of War*, ACTS Lecture, 1940, HRA248.2021A-3, 11.
[11] Maj. Muir S. Fairchild, *The Economic Structure*, ACTS Lecture, 1938, HRA248.2019A-10, 8.
[12] Maj. Muir S. Fairchild, *Primary Strategic Objectives of Air Forces*, ACTS Lecture, 1939, HRA248.2021A-11, 3.
[13] Maj. Muir S. Fairchild, *Primary Strategic Objectives of Air Forces*, ACTS Lecture, 1939, HRA 248.2021A-11, 3.

Two examples are rife throughout the ACTS writings and are worth recounting here. While these examples do not expose the common link between the military and the civilian economic structure, they illustrate the effects on the industrial chain of attacking the vital link. The first example applies to the automobile industry. A strike by the makers of a door latch brought automaking throughout the United States to a standstill until the strike could be settled.[14] Could a similar result be attained through bombing the latch manufacturer? The ACTS believed that indeed this would have the same result. A similar case in the aircraft industry bore the same basic result when a flood stopped production of springs that were used in the installation process of aircraft propellers.[15] These examples illustrate the potential results of an air attack, but say little of how to determine the vital links in the system.

As an intellectual tool, ACTS used New York City as a model to further develop their ideas concerning the vital links in an industrial chain. Transportation, electrical power, raw materials and water were all among the vital links that, if targeted, would bring down the New York industrial and economic systems.[16] The information for the analysis of New York City was readily available, but would intelligence be able to provide the required information against a potential enemy? ACTS believed that it would as cited in the following quote from an ACTS lecture:

> I hope [that it] is apparent to you, that all the necessary information to make the required analysis is available in time of peace—available to all the world. Proper analysis of that information will give us a very definite answer as to the degree of vulnerability and the effect to be anticipated from the various degrees of destruction.[17]

The next pillar in the development of AAF strategic doctrine concerns the means for effectively targeting the vital links. The concept espoused by the ACTS was that of precision bombing. The improved Norden Mark XV bombsight became operational in 1933, giving the bombardier the ability to aim, although somewhat crudely, at a given pinpoint target.[18] But even with the new bombsight, technological limitations still forced a visual identification of the target, which in turn required that the bombing mission be

[14] ACTS, *National Economic Structure*, ACTS Lecture, 1940, HRA248.2021A-7, 3.
[15] ACTS, *National Economic Structure*, ACTS Lecture, 1940, HRA248.2021A-7, 3.
[16] Maj. Muir S. Fairchild, *New York Industrial Area*, ACTS Lecture, 1939, HRA248.2019A-12, 5-21.
[17] ACTS, *National Economic Structure*, 8.

flown in daylight. With this concept how many bombs would be required to take out a given target?

The ACTS took a very systematic and mathematical approach to determine the requirements to take out a particular target which was based almost entirely on probabilities. Their lecture on practical bombing probabilities illustrates this scientific approach to targeteering.[19] The first step was to input the required probability of destruction, as an example 90%. Then, based on the flying altitude and the size of the target, a look-up table was used to determine the tonnage of bombs required to assure a 90% probability of destruction. These look-up tables were based on actual bombing data in a peacetime environment. Once the tonnage was determined, the number of aircraft required could easily be determined. An analogy prepared for the electrical power grid of New York City portrays the confidence the ACTS had in their ability to accurately hit and destroy a given target.

> We see then that 17 bombs, if dropped on the right spots, will not only take out practically all of the electric power of the entire metropolitan area but will prevent the distribution of outside power! Let us add one bomb for the small Brooklyn-Manhattan Transit plant and make it 18. Three squadrons of bombers, therefore, would certainly do the trick if they could bomb with 100% accuracy. You may add on your own factor for bombing probability. Whatever that factor may be, *it is quite apparent that it would take no very large force to practically assure depriving this whole great metropolitan area of all sources of electric power for a period of many months*.[20] (Emphasis added).

The AAF believed not only that they could readily knock out power, but that the initial attacks would keep the power off for "many months."

The final piece to the strategic doctrine was the development of unescorted massed air strikes penetrating enemy air defenses. The often-studied argument between pursuit and bombing aviation in the ACTS is worth mentioning, though only in passing. The believers in unescorted daylight bombing eventually won the argument, but this was one area that was not a unified front. Current technology helped push this decision in favor of the Bomber Mafia.[21] The B-17 could fly faster, higher and farther than any

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[18] David MacIsaac, *Strategic Bombing in World War II* (New York: Garland Publishing Inc., 1976), 9.
[19] ACTS, *Practical Bombing Probabilities*, ACTS Lecture, 1939, HRA248.2208A-7.
[20] ACTS, *National Economic Structure*, ACTS Lecture, 1940, 18.
[21] David MacIsaac, *Strategic Bombing in World War Two* (New York: Garland Publishing Inc., 1976), 9.

American pursuit aircraft, which would make it hard for the pursuit to even provide adequate escort.[22]

ACTS believed that the initiative was gained through the offense, which provided a great benefit over the defense. In their lecture on air defense they emphasized the difficulties associated with stopping an enemy air offensive.[23] Due to the great dispersion of important targets the ACTS believed that a defensive network would have limited success in detecting and intercepting a bomber force prior to them hitting their target.[24] This line of reasoning further questioned the need for pursuit escort of the bombers. Unescorted bombers would avoid interception by "employing high speed, seeking natural cover and bombing from high altitudes."[25] If intercepted, bombers would defend themselves with their defensive formation and firepower.

The fifth aphorism requires an expansion to shed light on the actual intention of the concept. At first glance this idea has the smell of a Douhetian city busting strategy of raining bombs atop a hysterical civilian population, but this is far from the intention that the ACTS had in mind. The bombing of Madrid, Barcelona and the Japanese attacks on Chinese cities illustrated to the ACTS that this bombing strategy yielded only temporary psychological effects and in the latter case seemed to strengthen the will of the Chinese people against the Japanese.[26] The objective of a city campaign was to destroy vital civic systems, render the cities untenable, and force their evacuation thereby indirectly affecting the industrial system.[27]

Before moving onto the development of AWPD-1, it is important to cover a few ACTS doctrinal beliefs that have yet to be covered. From the many writings on this subject to include this one up to this point, a picture is often painted that portrays ACTS theory as being only concerned with the bombing of the industrial web. While ACTS did believe this to be the AAF raison d'être, they by no means disregarded the other intermediate objectives for air power. These objectives were intermediate in that they did

[22] Robert Finney, *History of the Air Corps Tactical School 1920-1940* (Maxwell AFB, Ala: Air University, March 1955), 33.
[23] ACTS, *Problems of Hemisphere Defense*, ACTS Lecture, 1939, HRA248.2021A-35.
[24] ACTS, *National Economic Structure*, ACTS Lecture, 1940, 16.
[25] Ralph A. Snavely, *Bombardment Aviation*, ACTS Lecture, 1939, HRA248.2208A, 14.
[26] ACTS, National Economic Structure, ACTS Lecture, 1940, 2.
[27] Maj. Gen. Haywood S. Hansell, Jr., *The Strategic Air War Against Germany and Japan* (Washington D.C.: Office of Air Force History, 1986), 14.

not strike directly at the source of national power, but were required as a prerequisite to meeting that ultimate aim.

The ACTS categorized air objectives into four primary groups: hostile army, hostile navy, hostile air force, and hostile nation.[28] The determination of which objective or objectives to attack with the strategic forces was based on the strategic situation. If the nation was on the strategic defensive then strategic forces should be used to guard against the "greatest threat."[29] Examples are then given to illustrate situations where the strategic air force is required to attack enemy forces, be it army, navy or air force, rather than the nation itself. This idea is further illustrated in this excerpt from a bombardment aviation lecture:

> While counter-air force operations are commonly considered a task performed only by attack aviation . . . bombardment must contemplate counter-air force operations because the enemy may establish bases on the North American continent out of range of attack aviation from which they could strike vital objectives within our nation. In this situation it is not improbable that counter-air force operations against such an established air force might be our only operation.[30]

AIR WAR PLAN DIVISION-I

With this basic knowledge of AAF strategic doctrine, AWPD-1 is analyzed to hopefully tie the initial air campaign plan entering WWII to that of ACTS strategic theory. Since the documentation covering the plan itself was the size of a "New York City phone book," this analysis will only scratch the surface attempting to uncover the strategic implications for the employment of air power.[31] Before meeting this goal a brief history of the formation of the plan is needed.

In July of 1941, President Roosevelt requested the Secretaries of War and Navy to prepare an estimate of "the overall production requirements to defeat our potential enemies [Germany, Italy and Japan]."[32] The mission of developing the Army air

[28] Maj. Muir S. Fairchild, *Primary Strategic Objectives of Air Forces*, ACTS Lecture, 1939, 2.
[29] Maj. Muir S. Fairchild, *Primary Strategic Objectives of Air Forces*, ACTS Lecture, 1939, 2.
[30] ACTS, *Bombardment Aviation*, ACTS Lecture, 1939, HRA248.2208A, 14.
[31] Richard D. Hughes, personal notes while member of Air Planning Staff, 1941, HRA520.056-234, 8.
[32] Franklin D. Roosevelt, President of the United States, memorandum to Secretary of the Army and Navy, subject: production requirement to defeat potential enemies, 9 July 1941, HRA145.96-154.

requirement portion of this plan was delegated to the Air War Plans Division.[33] The core of the Air War Plans Division was made up of former instructors at the ACTS: Col. Harold George, Lt. Col. Kenneth Walker, Maj. Haywood Hansell and Lt. Col. Laurence Kuter. The results of their mission were much more than a simple list of air requirements; they essentially developed an air campaign to defeat the "potential enemies" of the United States.

The first step in developing this air campaign was to codify strategic objectives based on the general guidance given to the planning staff. They had President Roosevelt's guidance to "defeat potential enemies," as well as guidance from Brig. Gen. Leonard T. Gerow, Chief of the War Pans Division, stipulating that the joint British-American conversations (ABC-1) and the current US war plan (Rainbow No. 5) should be followed.[34] The guidance set forth in these plans was:

1. To wage sustained air offensive against Germany in order to:
    a. Reduce Axis surface and sub-surface operations.
    b. Restrict Axis air operations.
    c. Undermine German combat effectiveness by deprivation of essential supplies, production and communication facilities.
    d. Permit and support a final invasion of Germany.
2. To conduct air operations in strategic defensive in the Orient.
3. To provide air action essential to the security of the continental United States, our possessions and the Western Hemisphere.[35]

From these general tasks the AWPD developed a set of objectives or actions necessary to meet these requirements. For the strategic offensive portion of the plan, the primary objectives included destroying and disrupting portions of Germany's electrical power grid, transportation network, and petroleum and synthetic oil industries. These target systems would allow for the simultaneous degradation of the industrial war making

[33]Maj. Gen. Haywood S. Hansell, Jr., *The Strategic Air War Against Germany and Japan* (Washington D.C.: Office of Air Force History, 1986), 30.
[34]Maj. Gen. Haywood S. Hansell, Jr., *The Strategic Air War Against Germany and Japan* (Washington D.C.: Office of Air Force History, 1986), 31-32.
[35] Air War Plans Division, *Graphic Presentation and a Brief: AWPD/: Munitions Requirements of the Army Air Forces to Defeat Our Potential Enemies,* Part 1, August 1941, HRA145.82, Maxwell AFB, Ala., 1.

capability as well as the German civilian economic structure.[36] Additionally, they were vulnerable because "German war operations have placed a considerable strain upon the economic structure of the Reich."[37] It should also be noted that these objectives bear a close resemblance to the systems that would be targeted under the ACTS intellectual analysis of New York City.

Due to the German air threat, the *Luftwaffe* became an intermediate objective of overriding importance. Because of the difficulties in finding and attacking the enemy aircraft and personnel on the ground, it was decided that they must be targeted at the source.[38] This intermediate objective would take precedence over the primary objectives because the *Luftwaffe* would have to be defeated to allow a land invasion as well as to allow allied bombers the ability to hit the primary objectives.[39] These four basic objectives were further divided into 154 individual targets:

1. Electric Power (50 power plants and switching stations).
2. Transportation (47 marshalling yards, bridges, and locks).
3. Synthetic petroleum production (27 plants).
4. The *Luftwaffe*, especially its fighter arm (18 airplane assembly plants, 6 aluminum plants, and 6 magnesium plants). [40]

Once the objectives and their corresponding vital links had been developed, the next step was to determine the number and types of aircraft to execute the campaign. The AWPD relied heavily on their ACTS experience to develop these numbers. Using a probability of hit of 90% they determined tonnage per target, which yielded the number of aircraft per target, required to meet the overall strategic objective. The assumption was made that the bombing campaign should take 6 months to complete once American

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[36] Air War Plans Division, *Graphic Presentation and a Brief: AWPD/1, Munitions Requirements of the Army Air Forces to Defeat Our Potential Enemies,* Tab 1, August 1941, HRA145.82, Maxwell AFB, Ala., 6.

[37] Air War Plans Division, *Graphic Presentation and a Brief: AWPD/1, Munitions Requirements of the Army Air Forces to Defeat Our Potential Enemies,* Tab 1, August 1941, HRA145.82, Maxwell AFB, Ala., 6.

[38] Air War Plans Division, *Graphic Presentation and a Brief: AWPD/1, Munitions Requirements of the Army Air Forces to Defeat Our Potential Enemies,* Tab 1, August 1941, HRA145.82, Maxwell AFB, Ala., 8.

[39] Haywood S. Hansell, Jr., *The Air Plan that Defeated Hitler* (Atlanta, Georgia: Higgins Mcarthur/Longino and Porter, 1972), 108.

[40] Air War Plans Division, *Graphic Presentation and a Brief: AWPD/1, Munitions Requirements of the Army Air Forces to Defeat Our Potential Enemies,* Part 1, August 1941, HRA145.82, Maxwell AFB, Ala., 1.

industry had produced the full strength of aircraft.[41] This time frame was based loosely on the fact that Allied Forces would not be capable of a ground invasion of the continent for three years.[42]

Finally, the Air War Plans Division visited the concept of unescorted bombing missions. They concluded that speed, altitude, defensive firepower, armor and simultaneous penetration of defenses "made it feasible to make deep penetrations into Germany in daylight."[43] They also cast a shadow of doubt by concluding, "the degree of reliability of conducting sustained offensive air operations would be greatly enhanced by development of an escort fighter."[44]

This quick sketch of AWPD-1 was meant to bring out the strategic implications of the plan. Implications that can be traced directly back to theory from the teachings of the ACTS. As a final note it is important to understand that the members of the AWPD did evaluate needs for support of a land invasion as well as the defensive needs for the United States and the Far East. In the end, AWPD-1 called for 11,775 aircraft, which were composed of a ratio of almost two to one bombers to fighters, for the strategic campaign against the German heartland. The fighters would be used to defend bases for the strategic bombers. To support the requirements for a land invasion and defensive needs, the Air War Plans Division determined that 11,909 tactical and air defense aircraft were needed.

CONCLUSION

In closing this chapter it is important to review the basic assumptions that composed the foundation of AAF doctrine entering World War II. The purpose here is to

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[41] Air War Plans Division, *Graphic Presentation and a Brief: AWPD/1, Munitions Requirements of the Army Air Forces to Defeat Our Potential Enemies,* Part 2, August 1941, HRA145.82, Maxwell AFB, Ala, 1.

[42] Air War Plans Division, *Graphic Presentation and a Brief: AWPD/1, Munitions Requirements of the Army Air Forces to Defeat Our Potential Enemies,* Tab 1, August 1941, HRA145.82, Maxwell AFB, Ala.

[43] Air War Plans Division, *Graphic Presentation and a Brief: AWPD/1, Munitions Requirements of the Army Air Forces to Defeat Our Potential Enemies,* Tab 1, August 1941, HRA145.82, Maxwell AFB, Ala, 11.

[44] Air War Plans Division, *Graphic Presentation and a Brief: AWPD/1, Munitions Requirements of the Army Air Forces to Defeat Our Potential Enemies,* Tab 1, August 1941, HRA145.82, Maxwell AFB, Ala, 11.

simply lay out the data. Therefore a most powerful tool of the critic, hindsight, will not be employed.

At the heart of AAF doctrine was the idea that the ultimate aim in war was to destroy the will of the people. This objective could best be met by targeting the vital links in the industrial economic structure of the enemy; a structure that was further strained by the requirements of war. Additionally, adequate intelligence would be available as to the location of these vital links and once attacked they would remain paralyzed for many months. Finally, unescorted mass bomber formations could penetrate enemy defenses and destroy the given targets.

Chapter 3

THE USSBS: TRUTH OR BIAS?

Let me state definitely the objective of the Survey. Our objective is to evaluate the importance and potentialities of air power as an instrument of military strategy . . . We shall proceed in an open-minded manner, without prejudice, without any pre-conceived theories, to gather the facts. We are simply to seek the truth. And when all the facts are gathered, then the Directors will draw up the report as impartially as it is humanly possible for us to do. We have no intention, nor should we at this stage, of commending or criticizing any individual, group, or organization in any way except as final facts and the real truth might so require.

Franklin D'Olier, USSBS Chairman to the Survey Team.

We have the facts and there just can't be much argument about that. It is when we get to the conclusions that the trouble arises.

Paul H. Nitze, April 1946.

Introduction

This chapter strives to assess whether or not the USSBS was in fact an impartial survey based on the effects of air power in both the European and Pacific Theaters of operation. While this chapter has no direct impact on the evaluation of a doctrinal shift resulting from lessons learned as penned in the USSBS, it is nonetheless important to the validity of this project in its entirety. If the USSBS was partial to the point of issuing conclusions based on inputs exterior to the collected data or in some way slanting the data to meet predetermined conclusions, then the evaluation of a doctrinal shift based on those tainted conclusions is of little value toward meeting the objective of this paper. It would, however, open the door to a completely different study focusing on these biases and their potentially negative effects on doctrine after World War II.

To begin, the formation of the USSBS survey team is reconstructed to hopefully lend credit to the idea of an impartial board. Next, a directed telescope is placed on the Pacific Theater of operation as that seems to be the focal point of authors that purport that

the survey was in fact partial. Finally, conclusions are drawn based on that data. In producing this chapter a large amount of gratitude must be given to David MacIssac. For it is his thorough research on the topic of the Army and Navy debate in the Pacific that allowed the facts to be retraced here.[45] While this statement may lead the reader to question the personal biases of MacIssac, as the facts unfold it should become clear that the survey was in fact unbiased.

The Formation of the USSBS

It should come as no surprise that the members of the AAF believed that one of the key foundations to a nation's strategic air power was its ability to act independently of other forces. They believed that it was inevitable that if these forces were under the command of the Army, they would be forced to change priorities to meet some intermediate objective of the ground commander. There are numerous examples from WWII that illustrate this case and point. As an example, Gen. Carl Spaatz, acting Deputy Commander-in-chief for Air during the Africa Campaign, had numerous battles with ground commanders over a spectrum of issues ranging from the proper employment of air power to selecting target priorities.[46] Airmen believed that the maximum contribution of a strategic air force came from an independent entity commanded by individuals with airmindedness. This belief was undoubtedly in the minds of the individuals of the AAF that spawned the idea of a survey to determine the effects of strategic bombing. This in itself does not incriminate the Army Air Forces. The facts as they unfolded during World War II suggested the capability of air power to be a decisive military arm. For advocates of Air Force independence, the next step was to formalize these facts by an impartial survey to educate the American people on the potential of air power.

While the survey itself states that it was mandated by the President of the United States, a closer look at the data uncovers the fact that it was not President Roosevelt's idea. The concept originated in both the offices of Intelligence and Plans in the AAF at roughly the same time, 23-24 March 1944.[47] But the ideas emanating from the AAF did

[45] See Maj. David MacIsaac, *Strategic Bombing in World War II* (New York: Garland, 1976), 119-151.
[46] David R. Mets, *A Master of Airpower, General Carl A. Spaatz* (Novada, Cal.: Presidio Press, 1988), 145-159.
[47] Maj. Ralph A. Colbert, Intelligence Division, memorandum to Brig. Gen. T. D. White, Assistant Chief of Staff, Intelligence, subject: Post-Armistice Damage Evaluation Commission, 27 March 1944, HRA

not highlight ways to bias a survey, rather the need for a civilian dominated survey committee to give both the weight and appearance of impartiality. General Arnold stated this fact in a letter to Major General Jacob E. Fickel, Commander of the AAF Evaluation Board.[48]

> In selecting Mr. D'Olier as well as the prominent civilians on his staff we are creating an impartial authority which will carry weight beyond the sphere of the Army Air Forces.[49]

This is but one of many items of correspondence that emphasized the need for impartiality in the survey team. Additionally, prominent civilians were needed to carry weight in the civilian world; men of high profile in the public eye. While many rejected the offer to participate in the survey, the final cut produced many prominent men: Franklin D'Olier, Chairman of the survey and President of the Prudential Insurance Company of America; Henry C. Alexander, Vice-Chairman of the survey and later the President of the Morgan Guaranty Trust Company; Paul H. Nitze, later Secretary of the Navy and Deputy Secretary of Defense; George W. Ball, later Secretary of State and Ambassador to the United Nations; J. Kenneth Galbraith, internationally known economic philosopher and sometime Ambassador to India.[50]

These men were given complete control of the organization and execution of the survey.[51] They reported not to any senior AAF member, but directly to the Secretary of War. Military members were part of the team, some used to help gather data and others employed as military advisors. The military advisors came from each branch of the service, including the AAF. Their expertise was required to explain the logic behind the military operations as well as how operational factors, such as weather, effected the campaign. Furthermore, care was taken to ensure that each service had representation at the appropriate level. This is illustrated in an excerpt of a letter from General George

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MICFILM A1123, frames 1356-1357 and (Author not legible), memorandum to Maj. Gen. F. L. Anderson, Deputy Commander, Operations, subject: Proposed Committee to Survey Results of Combined Bomber Offensive, 23 March 1944, HRA MICFILM A1123, frames 1360-1361.

[48] This board was formed to analyze the effects of the tactical bombing in the European Theater of Operations.

[49] Henry H. Arnold, Commanding General Army Air Forces, to Jacob E. Fickel, Chairman, Army Air Force Evaluation Board, letter, subject: Formation of USSBS Team, 3 November 1944, HRA519.55A.

[50] Maj. David MacIsaac, "A New Look at Old Lessons," *Air Force Magazine* 53, no. 9 (September 1970): 122.

[51] James Beveridge, *History of the United States Strategic Bombing Survey* (unpublished), HRA MICFILM A1123 frames 840-841.

Marshall, Chief of Staff of the Army, to Admiral Ernest J. King, Chief of Naval Operations:

> I believe it most essential that the Navy Department be represented by an officer of similar grade to those furnished by the Ground and Service Forces.[52]

By placing military members of equal rank from each service, a system of checks and balances was in place to hopefully keep one branch from negatively influencing the civilian control of the survey. But even this system did not keep the services from bickering and arguing over the exact effect each service had toward the ultimate objective of the war, unconditional surrender. This was especially evident between the AAF and the Navy in the Pacific Theater.

The AAF and Navy Battle

The most publicized incident involving the perception of biases in the USSBS occurred in the Pacific Theater of operations. While this incident is often referred to as the great AAF and Navy debate, it is more accurate to title it the great Anderson/Ofstie debate. Franklin D'Olier empowered Maj. Gen. Orville Anderson to head the Military Analysis Division because he felt it was important to have an AAF officer present to help fill in the details of the actual course of operations. Admiral Ralph Ofstie secured appointment to a similar role, as chief of the Navy Analysis Division, for the Pacific Theater of operations. While both men were groomed in their separate services, they were by no means the voice of the Army Air Force or of the Navy. But they did, as would any military officer, work to ensure that their respective service gained the recognition that it deserved.

This fact coupled with three overarching circumstances helped to push these two men into a debate that seemed unsolvable. First, was the fact that the survey's "findings will establish a basis for evaluating the importance and potentialities of air power as an instrument of military strategy, for planning the future development of the U.S. Air Forces."[53] In other words, the results of the survey may influence service funding. The

[52] Gen. George Marshall, Chief of Staff of the Army, to Admiral Ernest J. King, Chief of Naval Operations, letter, subject: United States Strategic Bombing Survey, 3 November 1944, HRA137.1-2

[53] Henry Stimson, Secretary of War, to Franklin D'Olier, President, Prudential Insurance company of America, letter, subject: Purpose of the USSBS, 3 November 1944, HRA519.55A.

European summary report had been completed and seemed to only add to the questions of post-war organization and budgets:

> The outstanding significance of the air in modern warfare is recognized by all who participated in the war in Europe or who have had an opportunity to evaluate the results of the aerial offensive. These are *facts which must govern the place accorded air power in plans for coordination and organization of our resources and skills for national defense*.[54] (Emphasis added).

Second, the geographical features of the Pacific Theater dictated a much larger role for the Navy, even if that role was not the direct strategic bombing of Japan. Finally, when President Truman expanded the role of the USSBS to the Pacific Theater he asked the team to assess not only the effects of strategic bombing, but also "the effects of all types of air attack."[55] This simple statement by President Truman opened the door for an analysis of every Naval Operation from Midway through the blockade of Japan proper. Retracing the events to include the eventual reports catalogued by the USSBS will hopefully uncover the truth as to how the inter-service lines were drawn and whether or not it tainted the overall results of the survey.

In preparing reports for the Chairman, it was policy to first allow the other divisions to read and critique a given report. This decision would prove instrumental in bringing the differences between these two men into the open. Ofstie in response to the Military Analysis Division's report, *The Fifth Air Force in the War Against Japan*, prepared a three-page memorandum dissecting the report page by page. An extract from that memorandum should suffice in setting the overall tone.

> pp4-5: criticism not based on fact. p5: Is this an objective report on the 5th Air Force or primarily a medium of propaganda? If the latter, as it appears to me, it has no place in an USSBS publication. p7: continuing propaganda. pp60-61: Not factual. p64: should insert "Army and Navy" before "Air Forces." CVE's furnished the ground support for Lingayen landings. Fact is they were mostly naval. p68: Childish. p73: "Air transport alone can support large intra-theater operations . . .." Utter Nonsense.[56]

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[54] *USSBS Report no. 2, Overall Report European War* (Washington D.C.: GPO, September 1945), 109.
[55] Harry S. Truman, President of the United States, to Franklin D'Olier, Chairman, USSBS, letter, subject: Expansion of the USSBS, 15 August 1945, HRA137.3181-65.
[56] National Archives, 243, 1, 33, 300.6. in David MacIsaac, *Strategic Bombing in World War II* (New York, Garland Publishing, Inc., 1976), 125-126.

Anderson's Military Analysis Division had a similar response to the Naval Analysis Division's report, *The Philippines Campaign*. Samples of their response are shown below.

> *Comment No. 2.* This sentence concluded that the defeat in the Philippines campaign would constitute the final battle. We now know that this was not true . . .. Recommend that the sentence be deleted or modified to show recognition of campaigns that followed that of the Philippines.
>
> *Comment No. 12.* Recommend deletion of the entire paragraph. It is neither realistic nor factual.
>
> *Comment No.* 32. Following "repeated strikes" add, " . . . by FEAF and the fast carriers of the Third Fleet . . .." Both these forces operated in this area and the text should so state.[57]

This punch and counter-punch exchange between Anderson and Ofstie continued throughout the time spent in the Japanese Theater and even after returning to the United States. Paul Nitze, acting Vice Chairman for the Pacific portion of the survey, tried to put an end to the debate by declaring that neither the Military Division Report nor the Naval Division Report would be published as part of the USSBS.[58]

In the end both these reports, in slightly modified form, were approved for submission into the USSBS collection. Both were of limited value as they followed parochial lines. As an illustration an excerpt is taken from both final reports: Anderson's and then Ofstie's.

> Air power dominated its own element.
> Air power dominated naval warfare.
> Air power dominated ground warfare . . .
> Air power was capable of forcing the capitulation of an enemy nation without surface invasion.[59]

> By January 1945, Japan was in fact a defeated nation . . .. All hope of future resistance had depended upon oil and now the tankers were sunk and the oil cut off . . .. At home the bad news began to be known and mutterings of negotiated conditional peace arose even in the armed forces. Japan was defeated: it remained only necessary to persuade her of the fact.[60]

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[57] Maj. Gen Orville Anderson, Chief, Military Analysis Division, memorandum to Franklin D'Olier, Chairman, subject: Report by the Navy Analysis Division. HRA 168.7006-13.
[58] Maj. David MacIsaac, *Strategic Bombing in World War II*, 128.
[59] USSBS, Military Analysis Division, *Air Campaigns of the Pacific War* (Washington: GPO, July 1947), 68-69.
[60] USSBS, Naval Analysis Division, *Campaigns of the Pacific War* (Washington: GPO, 1946), 290.

While both of these excerpts show parochialism, Anderson's is by far the most dramatic. According to Gian P. Gentile in his article *Shaping the Past Battlefield, "For the Future": The United States Strategic Bombing Survey's Evaluation of the American Air War Against Japan,* this provided the evidence that "reflected accurately the overall partiality—not impartiality—of the Strategic Bombing Survey toward air power and an independent air force."[61] His accusations are true, at least to some extent. He puts the blame for this incident squarely on the shoulder of the AAF. But the Navy, as portrayed above, was not an innocent bystander to events. Does this incident constitute proof that the survey was biased to the point of being partial? The answer to that question is no; at least not in the overall objective of the survey. It is the opinion of this author that General Anderson failed at his duty to be an unbiased military advisor and portrayed the Army Air Forces in a poor light. The data existed to illustrate the prominent role that the AAF played in both theaters. His work attempted to undermine that data based on a personal mission to overstate the role of the AAF in World War II.

Two basic reasons exist to support the claim that the Anderson/Ofstie debates did not taint the overall conclusions of the survey. First, only six of the hundreds of reports of the USSBS carry the official seal of the chairman. These six documents were the conclusions of the chairman's office along with his directors, based in part on the supporting documentation from the individual divisions. That is, the conclusions drawn in any division report were exactly that, a division's conclusion. An individual division report should be thought of as a form of technical or background support used by the Chairman's office to develop their overarching conclusions.[62] Unfortunately, authors often reference these division conclusions, stating that they are the official conclusions of the USSBS, when they may not even concur with the accepted conclusions of the chairman's office.

Second, the final reports by the chairman's office were completed in 1946. The infamous report 71a, written by Anderson's Military Analysis Division, *Air Campaigns of the Pacific Theater*, was not even published until 1947. In fact, even its acceptance

[61] Gian P. Gentile, "Shaping the Past Battlefield, "For the Future": The United States Strategic Bombing Survey's Evaluation of the American Air War Against Japan," The Journal of Military History 64, no. 4 (October 2000): 1107.

into the USSBS fold was more of a play by D'Olier to hopefully end the bickering between the two military men.[63] A watered down version of the Naval Analysis Division's report was accepted in 1946, which opened the door for Maj. General Anderson to readdress the issue of the acceptance of the report written by his division. As stated above, D'Olier succumbed to Anderson's pressure and allowed inclusion of his report.

Conclusion

The leaders of the AAF undoubtedly had an ulterior motive for the execution of the USSBS: educate the public and hopefully gain an independent Air Force. But this revelation does not provide evidence for a guilty verdict on the subject of driving the conclusions of the USSBS. It would take no expert to uncover the fact that air power played a large role toward the military successes in both the European and Pacific Theaters of Operation. The leaders of the AAF saw firsthand the role air power played in World War II and needed only a credible entity to hopefully reveal this same result independent of any perceived service biases. This would not be true of every war subsequent to World War II.

Why was there no officially sanctioned study of the effects of air power after Vietnam or Korea? Could it have been because the results did not carry the same air of decisiveness as they had in World War II? To answer this question is beyond the scope of this paper, but human nature would lead one to accept this answer. Especially in light of the fact that OPERATION DESERT STORM and OPERATION ALLIED FORCE, two events that highlighted air power, were re-examined in the form of official surveys to help illuminate the findings as to the efficacy of air power. While this argument is admittedly underdeveloped, it should lend credibility to the belief that the AAF felt comfortable with the "facts" surrounding the use of air power in World War II and needed an independent team to announce these facts to the American public.

This does not imply that military members of the survey team did not attempt to over-emphasize the role played by their respective service. Admiral Ofstie stating that

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[62] Maj. David MacIssac, *The United States Strategic Bombing Survey* (New York: Garland Publishing Inc., 1976), XXXII.

the Japanese were defeated prior to the outset of the Strategic Bombing Campaign against Japan proper and Maj. General Anderson's zealotry toward air power are two main examples. Unfortunately, statements such as these were included in the USSBS. It was a failure of duty of not only the high ranking military officials, but also the civilian leadership of the survey. The reports have no disclaimer stating that the views expressed are those of the Military/Naval Analysis Division and do not reflect the official policy or position of the Survey team as a whole. They can therefore be quoted by any source footnoting that these were the official findings and conclusions of the United States Strategic Bombing Survey.

[63] Maj. David MacIsaac, *Strategic Bombing in World War II*, 130.

Chapter 4

CONCLUSIONS OF THE USSBS

On that day the technological war was decided. Until then we had managed to produce approximately as many weapons as the armed forces needed, in spite of their considerable losses. But with the attack of nine hundred and thirty-five daylight bombers of the American Eight Air Force upon several fuel plants in central and eastern Germany, a new era in the air war began. It meant the end of German armaments production.

Albert Speer, commenting on 12 May 1944 air attack.

Introduction

In the end, the USSBS uttered the words that the AAF leaders so coveted. Within a department of common defense, which provides unity of command and is itself oriented toward air and new weapons, the Survey believes that, in addition to the Army and the Navy, there should be an equal and coordinate position for a third establishment [the Air Force].[64]

But there were other lessons, as the USSBS also stated that "hindsight inevitably suggests that in some respects air power might have been differently or better employed."[65] This hindsight is the focus of this chapter. More specifically, the pre-war AAF strategic doctrine, as codified by the ACTS, is evaluated in relation to these lessons to unveil any shortfalls in the doctrine as a result of the test of war. While this exercise will highlight shortfalls in the written AAF doctrine, it is not sufficient to end on this note. There are additional important lessons from World War II that do not align with the ideas codified in AAF doctrine. Therefore, other lessons stemming from the USSBS must be investigated, as they provide information toward additions to the AAF strategic doctrine.

[64] USSBS, Office of the Chairman, *Summary Report, Pacific War* (Washington: GPO, July, 1946), 32.
[65] USSBS, Office of the Chairman, *Summary Report, Pacific War* (Washington: GPO, July, 1946), 29.

The Ultimate Aim of War: The Will of the People

Some have argued that the AAF doctrine of targeting the will of the people was not adequately tested in World War II. While allied airpower did drop over 3,000,000 tons of bombs on Germany and Japan, the economic structure, so vital to providing "the means of sustaining a normal life to the civil population," was not specifically targeted. From an academic standpoint this is probably true, but in evaluating the actual devastation of both countries, the almost universal pain and suffering of the civilian population, one would be hard pressed to argue that some other systematic targeting approach could have appreciably increased the pressure felt by the civilian population of either country. Highlighting a few statistical numbers from the European Theater of Operations will hopefully bring into focus the pressure applied to the civilian population: 305,000 killed, 780,000 injured, 5,000,000 evacuated, 18,000,000-20,000,000 deprived of essential services (gas, water and electricity).[66] If agreement can be reached on this point, then the logical question is, what effect did the strategic bombing campaign have on the will of the civilian population in both Germany and Japan? The answer to this question begins in Germany.

The Allied airpower effort undoubtedly had a huge impact on the morale of the German civilian population. The statistics stated above should make that point clear. But the decline in civilian morale did not lead to an overt movement by the civilian population to end the war. While absenteeism did at times reach high levels, the people by and large continued contributing to the war effort. The USSBS makes this point absolutely clear.

> As has been seen, armaments production continued to mount till mid-1944, in spite of declining morale, but from that point on, arms production began to decline and dropped every month thereafter at an increasing rate. *A minor, but not negligible, portion of this drop was the result of the cumulative effects of lowered morale*. (Emphasis added).
>
> *Bombing thus succeeded in lowering psychological morale but its effect upon behavior was less decisive*. The German controls remained relatively untouched, and thus repression and coercion kept an increasingly defeatist population from overt acts of opposition to the

[66] USSBS, Office of the Chairman, *Overall Report, European War* (Washington: GPO, September, 1945), 72.

conduct of the war.[67] (Emphasis added).

So the decline in morale did play "a minor, but not negligible role" toward the ultimate defeat of Germany, but not the role that had been envisioned by the instructors at ACTS. The form of government, to include their control mechanisms, was resistant to this type of strategy. These facts do not disprove the doctrine of attacking the will of the people, but do point to the fact that there are variables that may reduce the effectiveness of this strategy. The results in the Pacific Theater of Operations yielded this same basic conclusion. But in addition to this conclusion, the authors of the USSBS added a very convincing framework surrounding Japan's decision to end the war, to include the effects of decreased morale of the civilian population.

The USSBS states that the ultimate defeat of Japan was primarily due to two events: the blockade, which starved the country of vital raw materials, and the destruction of her Air Force and Navy. The strategic bombing of Japan acted as an accelerator to the decision by the Japanese leadership to surrender.[68] While these points continue to be argued today, it is clear that the pressure placed directly on the civilian population did not in and of itself end the war. "Rigid police controls allowed ideas of leaders to be formed separately from the people."[69] This fact again leads to the conclusion that affecting the will of the people may not lead directly to victory in war.

The authors of the USSBS offer a very Clausewitzian view as to the ultimate decision to end the war.

> While the impact of Allied air operations in the entire Pacific war bore directly upon the enemy's military and economic capabilities for resisting, only by translating these military and economic effects into political events could our announced war aim of unconditional surrender be realized.[70]
>
> The military and morale effects of our operations were significant chiefly as they bore directly upon the top political decision already made and the struggle between those political leaders who had already determined to find a way out of the war and the militarists who were determined to

[67] USSBS, Office of the Chairman, *Overall Report, European War* (Washington: GPO, September, 1945), 97-99.
[68] USSBS, Office of the Chairman, *Japan's Struggle to end the War* (Washington: GPO, July, 1946), 10-13.
[69] USSBS, Office of the Chairman, *Japan's Struggle to end the War* (Washington: GPO, July, 1946), 10.
[70] USSBS, Office of the Chairman, *Japan's Struggle to end the War* (Washington: GPO, July, 1946), 1.

continue it.[71]

These two passages bring into light valuable ideas toward gaining conclusion in war. Victory is not necessarily achieved by breaking the will of the civilian population or even by decisive victory on the ground. The ultimate aim in war is obtained by convincing a country's decision-makers that victory cannot be obtained or that the cost of continuing the conflict is clearly greater than any gain that may be achieved. In this framework the will of the people and even a decisive ground victory are but mechanisms to provide a cumulative effect toward swaying the decision-makers toward the decision to surrender.

The USSBS further concluded that the Japanese will to resist [from the standpoint of the political decision-makers] was a function of the following:

1. Military potential.
2. Production potential.
3. Morale of the people.
4. Preservation of the *Tenno* system of government.

In this sense, all these factors played a role in the ultimate decision to end the war. The first three acted toward pressuring the Japanese leadership into submission, while the fourth actually added fire to continuing the war.

This conclusion provides no cookie cutter solution to war, rather a framework for the analysis of mechanisms that will lead to decision. Furthermore, within the contextual elements surrounding the war with Japan, the morale of the people played only an indirect role in achieving victory by influencing the Japanese leadership's decision making process.

It is evident that influencing the will of the people is not the all-powerful mechanism to assure victory. It played a role in both theaters of operation, yet the impact toward final decision was much less than anticipated. Similar attacks on a democratic nation may produce more decisive effects, but that is beyond the scope of this paper. With these conclusions drawn it is appropriate to move into the realm of the industrial web.

[71] USSBS, Office of the Chairman, *Japan's Struggle to end the War* (Washington: GPO, July, 1946), 4.

The Attack on the Industrial Web

The doctrine of attacking the industrial web has many pieces and parts that will all be covered in due course. In doing this, three common themes permeate the analysis of this doctrine, as critiqued by the USSBS, and therefore will be stated up front. First, war is fought against an opponent who thinks and reacts to the application of air power, not one that sits idly waiting for the next attack. Second, the industrial web doctrine is highly dependent on intelligence. Finally, technology plays an important role in executing this doctrine to meet the objective of coercing the enemy to surrender. With this being said it is time to jump into the intricacies of attacking the industrial web.

As a review, the ACTS characterized the industrial web as a series of links in a chain that if broken at a few vital points would render the system as a whole unusable. Furthermore, the economic strain on the system as a result of war made this chain even more vulnerable to attack. Finally, intelligence was available to easily find and therefore attack and destroy these links.

The AAF made many attempts at determining the vital links in the industrial web. It occurred not only at the strategic level, in such targets as oil and transportation, but also at the operational level in attempting to attack the vital link of the aircraft industry. At the Casablanca Conference in 1943 the Allied leadership gave a high priority to the destruction of the German fighter production. In developing a strategy to meet this objective, the aircraft industry was divided into two basic categories: engine and airframe.

Airframe production capability was roughly double that of engine production, but due to lack of intelligence on the engine industry the AAF concentrated on the airframe portion of the aircraft industry.[72] The airframe industry was further divided to look for key bottlenecks because the Allies in early 1943 simply did not have the available aircraft to target the airframe industry in its entirety.[73] As a testament to this fact, only 17% of the total bomb tonnage was dropped prior to 1944. During the process of dividing the

[72] USSBS, Office of the Chairman, *The Effects of Strategic Bombing on the German War Economy* (Washington: GPO, October, 1945), 158.
[73] Excerpt from "Plan for Combined Bomber Offensive From the United Kingdom (JCS277) in Barry D. Watts, *The Foundations of U.S. Air Force Doctrine (Maxwell AFB, Ala.: AU Press, 1984), 140.*

airframe industry, the planners determined that ball bearings were a bottleneck in the production process.

> The critical condition of the ball bearing industry in Germany is startling. The concentration of that industry renders it outstandingly vulnerable to air attack. Seventy-six percent (76%) of the ball bearing production can be eliminated by destruction of the targets selected. *This will have immediate and critical repercussions on the production of tanks, airplanes, artillery, diesel engines—in fact, upon nearly all the special weapons of modern war.*[74] (Emphasis added).

This passage from the Casablanca Conference should spark the memory of the door latch or the spring used in the propeller assembly from the ACTS lectures. This target became even more inviting because a large portion of the entire ball bearing industry was located in a single town, Schweinfurt.

The AAF's Eighth Air Force raided Schweinfurt on August 17th and again on October 10, 1943. While the plants took heavy damage, it did not slow the production of aircraft for the Luftwaffe. A much larger and expanded series of attacks took place during Big Week, February 20-25, 1944. During these heavy raids,

> About 90% of German fighter production was attacked and 75% of factory buildings were damaged or destroyed. Single engine fighter production was down 23% from January. Total production went down 18%. Fighter production quickly bounced back, jumping to 48% above what it had been in February by March. *This was due to: fixing previous inefficiencies, inability to destroy machine tools, unified front in terms of priorities (increase fighter production), choice of quantity over quality.*[75] (Emphasis added).

This excerpt along with the results of the Schwienfurt raids highlights shortfalls in the AAF pre-war strategic doctrine.

First, the strains of war had not pulled the German economic structure taut making it ever more vulnerable to attack. This was at least not the case in the aircraft industry. Fixing inefficiencies in the system, dispersing industry into other factories, replacing damaged items, and substituting were all examples of how the enemy could overcome attacks in the vital links. Second, even though the bombs damaged or destroyed the structure of the plants, the bombing often did not destroy the machine tools

[74] Excerpt from "Plan for Combined Bomber Offensive From the United Kingdom (JCS277) in Barry D. Watts, *The Foundations of U.S. Air Force Doctrine (Maxwell AFB, Ala.: AU Press, 1984), 137.*

used for manufacturing the parts of an aircraft. Finally, overall reactions by the enemy allowed them to quickly overcome the immediate effects of the bombing by making the production more efficient and dispersing the factories, which also made future attacks even more reliant on intelligence.

This phenomenon, which is often referred to as slack in the system, was not unique to this one industry. The USSBS reflected on a night raid carried out by the Royal Air Force (RAF) on April 27-28, 1944 with the objective of destroying panzer production capability.

> It was the most damaging single attack ever delivered on panzer production. It destroyed the ZF gearbox plant beyond reconstruction and at the Maybach plant it destroyed everything but the motor assembly building. Yet, although one of these factories was at the time the sole producer of the HL-230 engine used in heavy tanks, and the other the principle producer of gear boxes, the raids had comparatively little effect on output of finished tanks. *Large stocks of both these components were on hand, and preparations for supplementary production in several plants elsewhere had been made previously*.[76] (Emphasis added).

The above examples are not included as a tool to illustrate that these attacks had no impact on the war as a whole. But unforeseen circumstances, slack, would keep the attacks from having "immediate and critical repercussions." As a testament to the results these attack had on the aircraft industry, the USSBS surmised that fighter production from August 1943 through August 1944 was roughly 20% lower than what it could have been had the industry not been targeted.[77] This estimate was obtained by assessing proposed production versus manpower required as a result of bombing, clean up and dispersal as an example. Additionally, they do not tend to imply that there are not systems that contain less slack. The attack on oil is an important example.

In 1942, the German leadership contemplated increasing pilot training but already had a shortage of aviation fuel.[78] Furthermore in 1943, a fuel shortage was the main

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[75] USSBS, Office of the Chairman, *Effects of Strategic Bombing on the German War Economy* (Washington: GPO, September, 1945), 156.
[76] USSBS, Office of the Chairman, *Effects of Strategic Bombing on the German War Economy* (Washington: GPO, September, 1945), 170.
[77] USSBS, Office of the Chairman, *Effects of Strategic Bombing on the German War Economy* (Washington: GPO, September, 1945), 158.
[78] USSBS, Office of the Chairman, *Overall Report, European Theater* (Washington: GPO, September, 1945), 9.

reason for a reduction in pilot training.[79] Accordingly, it appears that oil may have been the critical link in the aircraft industrial web. Yet, heavy Allied air attacks on this link did not occur until May of 1944. Was this an oversight, or did intelligence not have the information to assess oil as a vital link in the aircraft chain? The documentation of the Casablanca Conference definitely proves that the Allies knew that oil was in short supply, but to what extent is unknown. The results of the attack on oil were decisive in terms of grounding enemy aircraft. By September of 1944, only 3 months after the attacks on oil began, the shortage was so great that large-scale operations were impossible.[80] In fact, the USSBS measured the attack on oil to be so decisive that it had "rendered superfluous any further attack on aircraft output."[81]

The inability to gain immediate and critical results by attacking the critical link of industry was not confined to the European Theater of Operations. Similar results occurred in the Pacific Theater, at least in the opinion of the USSBS, regarding the to effect on appropriate targets.

> In the final assault of Japan, *we were handicapped by a lack of prewar economic intelligence*. Greater economy of force could have been attained by accelerating the strangulation of the Japanese economy by earlier commencement of the aerial mining program, concentration of carrier plane attacks in the last months of the war on Japan's remaining merchant shipping rather than on her already immobilized warships, and a coordinated B-29 and carrier attack on Japan's vulnerable railroad system beginning in April 1945.[82] (Emphasis added).

The above analysis on the industrial web doctrine is not meant to downplay the effect it had on the war as a whole. Its focus was to illustrate that the industrial web doctrine had many variables that were not given proper account by pre-war planners. The result was a plan with an almost scientific action/reaction philosophy that underestimated the effects of a reacting enemy, lack of intelligence, and technological deficiencies.

Before moving on to the next portion of the ACTS theory it is necessary to

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[79] USSBS, Office of the Chairman, *Effects of Strategic Bombing on the German War Economy* (Washington: GPO, September, 1945), 159.
[80] USSBS, Office of the Chairman, *Effects of Strategic Bombing on the German War Economy* (Washington: GPO, September, 1945), 161.
[81] USSBS, Office of the Chairman, *Effects of Strategic Bombing on the German War Economy* (Washington: GPO, September, 1945), 162.
[82] USSBS, Office of the Chairman, *Summary Report, Pacific War* (Washington: GPO, July, 1946), 29.

investigate one more link in the industrial chain: rail transportation. As the smoke cleared from the European Theater of Operations, the USSBS concluded that the railroad network, along with river transportation, was indeed a vital link in the German war machine. The survey uncovered some very interesting information that will be discussed after a quick digression to build the case as to the importance of this system in the eyes of the Allied war planners.

The air war plan against Germany, as stated at the Casablanca Conference, entailed four distinct phases. The first three phases were designed to cripple Germany's economy, war-making capability and morale. The fourth phase had the objective of "paving the way for the Combined Operation on the Continent."[83] It was here, in phase four, that the rail network was first mentioned as a target. Additionally, rail was not believed to be a suitable link to undermine the industrial, economic network, but as an interdiction target to strangle the flow of supplies to the German Army.

> During the fourth phase these operations [that of phases 1-3] are continued and allowances made for concentration of attacks against military installations more directly associated with a cross-channel operation such as *rail transportation*, arsenals, military installations, etc.[84] (Emphasis added).

The planners at the Casablanca Conference evidently had no idea of the significance of this target system in debilitating the economic and war-making capability of Germany. The actual results of these attacks are recounted in the following excerpt from the USSBS.

> The attack on transportation beginning in September 1944 was the most important single cause of Germany's ultimate economic collapse. By March coal shipments were scarcely adequate even for the needs of the railroads. The operation of Germany's raw material industries, her manufacturing industries and her power supply were all dependent on coal. By January their stocks were becoming exhausted and collapse was inevitable.[85]

The effects of bombing the transportation network were so widespread that, once begun, it made it impossible for the USSBS team to measure the results of bombing of many of

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[83] Excerpt from "Plan for Combined Bomber Offensive From the United Kingdom (JCS277) in Barry D. Watts, *The Foundations of U.S. Air Force Doctrine (Maxwell AFB, Ala.: AU Press, 1984), 143.*

[84] Excerpt from "Plan for Combined Bomber Offensive From the United Kingdom (JCS277) in Barry D. Watts, *The Foundations of U.S. Air Force Doctrine (Maxwell AFB, Ala.: AU Press, 1984), 143.*

the other industries, aircraft and tank for example.[86] The USSBS also determined, through survey, that transportation was the "critical public utility" for the civilian morale.[87] The attack on the transportation network had one additional noteworthy effect on the German industry.

The bombing of the war-making industry forced the Germans to commit to an enormous dispersal campaign. As part of this plan industrial complexes were separated and relocated to different areas in Germany. In addition to hurting efficiency, it also made the industry much more dependent on smooth transportation.

> The attacks on transportation hurt raw material and components to reach their factories. It also made it impossible to carry out the dispersal program. Prior to mid-1944, dispersal had somewhat protected the industry from serious injury by air attacks; after that time it added to the difficulties encountered in airframe and engine assembly.[88]

This conclusion points to an idea that is not addressed in the AAF pre-war doctrine. That is the importance of second order effects. While the individual attacks on the aircraft industry and the transportation system had a substantial effect on the German war effort, the cumulative effects were much greater. In other words, the combined results of bombing both industry and transportation were greater than the sum of the individual attacks. This concept seems to have been overlooked by the ACTS, perhaps because of their over confidence in their ability to "knock out power for a period of many months." They did not account for the duality of war: breathing, thinking and reacting enemy.

The Unescorted Bomber

This subject brings to light one of the greatest failures of the AAF pre-war doctrine: the assumption that a large formation of unescorted bombers would make it to the target with acceptable loses. But, remembering back to the arguments among ACTS

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[85] USSBS, Office of the Chairman, *Effects of Strategic Bombing on the German War Economy* (Washington: GPO, September, 1945), 13.
[86] USSBS, Office of the Chairman, *Effects of Strategic Bombing on the German War Economy* (Washington: GPO, September, 1945), 158, 170.
[87] USSBS, Office of the Chairman, *Effects of Strategic Bombing on the German War Economy* (Washington: GPO, September, 1945), 1.

[88] USSBS, Office of the Chairman, *Effects of Strategic Bombing on the German War Economy* (Washington: GPO, September, 1945), 161.

instructors over the subject as well as the recommendation for the manufacture of a long range escort fighters in AWPD-I highlights the fact that this tactic was a gamble that the AAF decided to accept. In reflecting on this decision, General Haywood Hansell states that this decision was based more on hope than fact. [89]

In scouring the USSBS for the results of the unescorted bomber tactic, one need look no further than the results of the Schweinfurt raids in 1943 to gauge the effectiveness of this tactic. Both raids were subject to heavy bomber loses, but the second raid resulted in bomber loses of nearly 30% of the entire package.[90] The tactic of unescorted mass bomber formations ended after this second raid on Schweinfurt. Another result of this catastrophe was an increased determination to gain control of the skies.[91]

This increased determination led to what the USSBS would call "the greatest single achievement of the air attack on Germany [the defeat of the German Air Force]."[92] On the opening page of the overall report for the European Theater of Operations, the USSBS established the importance of defeating the German Air Force. The following excerpt appears synonymous with the ideas of Giulio Douhet's basic framework of gaining command of the air and then exploiting that command to force your will upon the enemy.

> Of far more significance than statistics of strength and damage is the outstanding fact that the Allied Air Forces won the air war over Germany and obtained mastery of the skies in Europe. *The significance of this achievement and the results which followed from its exploitation are developed in these pages*.[93] (Emphasis added).

Results from the Pacific Theater of Operations only added data to the importance of this strategy.

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[89] "Notes for a Lecture on the Development of the U.S. Concept of Bombardment Operations," Feb. 51, in the Hansell Collection.

[90] USSBS, Office of the Chairman, *Effects of Strategic Bombing on the German War Economy* (Washington: GPO, September, 1945), 4.

[91] USSBS, Office of the Chairman, *Effects of Strategic Bombing on the German War Economy* (Washington: GPO, September, 1945), 4.

[92] USSBS, Office of the Chairman, *Overall Report, European Theater* (Washington: GPO, September, 1945), 9.

[93] USSBS, Office of the Chairman, *Overall Report, European Theater* (Washington: GPO, September, 1945), 1.

> It seems clear, however that air supremacy and its later exploitation over Japan proper was the major factor which determined the timing of Japan's surrender and obviated any need for invasion.[94]
>
> Control of the air was essential to the success of every major military operation.[95]

The requirements for fighter aircraft to escort bombers as well as a strategy to gain air supremacy over the enemy ring out in the assessment prepared by the USSBS. While not sufficient for victory, control of the air was "essential" for allowing exploitation by not only the air arm, but also the military as a whole. Before bringing this chapter to an end it is important to assess one more aspect of World War II: the introduction of the nuclear age.

The Atomic Bomb in Warfare

President Truman, in a letter to USSBS Chairman D'Olier, requested a study of the effects of the atomic bomb. While scholars continue to argue as to the motive of Truman's request, the importance here lies in the implications toward its military use in war. The power of the atomic bomb was devastating, especially when compared to that of a conventional bomb.

> When the atomic bomb exploded, an intense flash was observed first, as though a large amount of magnesium had been ignited, and the scene grew hazy with white smoke. At the same time at the center of the explosion and a short while later in other areas, a tremendous roaring sound was heard and a crushing blast wave and intense heat were felt. *The people of Nagasaki, even those who lived on the outer edge of the blast, all felt as though they had sustained a direct hit, and the whole city suffered damage such as would have resulted from direct hits everywhere by ordinary bombs*.[96] (Emphasis added).

The USSBS continually evaluated the atomic bomb in relation to the destructive power of a conventional bomb. "The atomic bomb raises the destructive power of a single bomber

[94] USSBS, Office of the Chairman, *Japan's Struggle to end the War* (Washington: GPO, July, 1946), 10-13.
[95] USSBS, Office of the Chairman, *Summary Report, Pacific War* (Washington: GPO, July, 1946), 27.
[96] USSBS, Office of the Chairman, *The Effects of Atomic Bombs on Hiroshima and Nagasaki* (Washington: GPO, June, 1946), 3.

by a factor of between 50 and 250 times."[97] The report on the effects of the atomic bombs on Hiroshima and Nagasaki devoted an entire section to this subject.

> An equivalent bomb load which would correspond to the destructive power of the Nagasaki bomb rather than the imperfect results achieved would approximate 2,200 tons of high explosives and incendiaries for physical damage plus 500 tons of fragmentation bombs for casualties, a total of 270 B-29 loads of 10 tons each.[98]

This statement points to the potential significance of the atomic bomb. The atomic bomb is able to overcome the "imperfect results" achieved from conventional bombs: inability to destroy machine equipment and limitations in the ability to accurately aim a conventional bomb. Additionally, one mission with the atomic bomb would do the job of 270 B-29's. In other words, the atomic bomb was not a revolution in weaponry that would change the nature of warfare, but simply a bigger bomb at the disposal of the air commander. A tool to allow greater destruction, in less time, with a smaller force.

It is hard to imagine these conclusions based on the current state of nuclear weapons. To help put things into proper perspective, the hydrogen bomb first tested in 1952 had an explosive power 1000 times greater than the Nagasaki bomb. It is this bomb that would open the door to a revolution in the nature of warfare.

Conclusion

This chapter did not provide the USSBS lessons in their entirety. That endeavor would require a book. It does however, provide a measuring device for assessing the efficacy of the AAF strategic doctrine entering World War II. Therefore, a few closing remarks are warranted in regard to the analysis of AAF strategic doctrine.

Attacking the will of the people played a role in both the European and Pacific Theater of Operations. It was not, however, a decisive factor in the ultimate outcome in either theater. It should be considered in the planning of any future air campaign, but must be evaluated in relation to the contextual elements of the proposed scenario. As an example, is the enemy system of government democratic or authoritarian?

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[97] USSBS, Office of the Chairman, *Japan's Struggle to end the War* (Washington: GPO, July, 1946), 28.
[98] USSBS, Office of the Chairman, *The Effects of Atomic Bombs on Hiroshima and Nagasaki* (Washington: GPO, June, 1946), 33.

The attack on the industrial web had a decisive impact on the war as a whole. However, the execution of this doctrine was more complicated than the pre-war AAF doctrine had suggested. Lack of intelligence, slack in the German economy, inability to destroy capital equipment, and a reacting enemy are all examples of difficulties that existed in World War II, but were not accounted for in pre-war doctrine.

The unescorted bomber was a failure. It would take the P-51 to help ease the sting of the German Air Force. Furthermore, the air superiority mission was regarded as the most important contribution of the air campaign. In Douhetian fashion, it opened the door for the exploitation of both Germany and Japan.

Finally, there was the introduction of the atomic bomb. Even though data was only available for a sample size of two, some important implications as to the effectiveness of this weapon were given. The USSBS provided the idea that the atomic bomb would help overcome many limitations, especially those attributed to technology, of AAF doctrine. Limitations in the bombsight, destruction power of conventional bombs could both be overcome with this new weapon.

Chapter 5

AIR FORCE DOCTRINE AFTER WORLD WAR II

An objective appraisal of the singular characteristics of air forces logically leads to an understanding of the dynamic impact of these forces in military operations. Evaluation of this impact in turn leads to the recognition that air forces are most likely to be the dominant force in war. (Emphasis added).

Air Force Manual 1-2, 1953.

The air power of a major nation, particularly that portion designed for strategic air operations, is the primary military instrumentality of national power. (Emphasis added).

Air Force Manual 1-8, 1954.

Introduction

This chapter assesses Air Force doctrine for the years immediately following World War II. As was the case in chapter two, the focus is on the ideas surrounding the efficacy of strategic bombing. Furthermore, this chapter attempts to illustrate the commonalties and differences between the pre-war and post-war doctrinal beliefs, and then link these findings to the USSBS. The search for data is encapsulated from two basic sources: official Air Force doctrine and Air Force involvement in the creation of joint war plans. Official Air Force doctrine serves as a starting point for Air Force doctrinal thought, but does not provide the detail required for this analysis. Additionally, numerous delays in the formulation and publication of these documents-- AFM 1-2 was not published until 1953-- invite other historical events to cloud its relevancy. Therefore, Air Force contributions to joint war plans are also investigated to help fill in the gaps not covered or otherwise biased by more recent events in official Air Force doctrine.

Official Air Force Doctrine, 1953-1954

It should be fairly obvious from the two doctrinal quotes above that the Air Force exited World War II with the continued belief that the strategic bombing mission was the decisive military instrument of war. Air Force doctrine expressed two broad concepts in terms of types of actions available to an air force: heartland and peripheral. Heartland actions involved attacks against the vital elements of a nation's war sustaining resources, while peripheral actions included tasks of reducing the enemy's fielded air and surface forces.[99] More precisely, heartland actions involved the independent strategic forces, while periphery actions involved theater (tactical) forces to support the Army and Navy. Even the term "peripheral" connotes an effort that is superficial or at best an effort that is not essential to the subject in question. In summation AFM 1-2 states:

> The conclusive effects obtained by attacks on the heartland targets, which represent the greatest threats, require the priority commitment of air forces to this task.[100]

But what was the ultimate aim of attacking these heartland targets? Would it remain the will of the people? The official doctrine states that a nation's war potential is the sum of its military and national resources to include raw materials, industrial capacity, manpower, scientific ingenuity, and national morale.[101] It further delineates this national structure into two categories. The first includes the products necessary to sustain the military forces, such as weapons, fuel, and ammunition. The second category "consists of the elements of a nation's strength necessary and common to the production of these end products such as utilities, transportation, systems of organization and control, and a nation's manpower."[102] But it does not go so far as to tie a link between the industrial complex and the "means of sustaining a normal life to the civil population," a concept that permeated throughout pre-World War II doctrine. Furthermore, the psychological effects on the civilian population are mentioned but official doctrine does not pronounce this the ultimate aim in war.

> Underlying the effect of attack on all target systems is a recognition that air forces *can produce emotional responses in the people of a nation*.

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[99] *Air Force Manual 1-2, Basic Doctrine* (Washington D.C.: Department of the Air Force, 1953), HRAK168.13001-2, 11.
[100] *Air Force Manual 1-2, Basic Doctrine*, HRAK168.13001-2, 12.
[101] *Air Force Manual 1-2, Basic Doctrine*, HRAK168.13001-2, 2.
[102] *Air Force Manual 1-2, Basic Doctrine*, HRAK168.13001-2, 15.

> These responses, depending upon how the air forces are employed, can be of a positive or negative nature. By careful consideration of the social structure of a nation, *it may be possible to apply air forces against those parts of the structure that will tend to develop cleavages favorable for exploitation*. It is, therefore, important in the selection of targets that consideration be given to the psychological effect of the attack on the enemy.[103] (Emphasis added).

This passage somewhat contradicts the most basic framework of the AAF doctrine entering World War II. In essence it expresses the uncertainty involved in how and to what effect a civilian population can be manipulated. Post-World War II strategic doctrinal thought had shifted toward emphasizing attacks on the war making and sustaining capability of a nation. Air power, to include strategic forces, "are designed primarily to immobilize the enemy's deployed military forces by the progressive destruction and neutralization of the means and facilities required to sustain combat."[104] While the will of the civilian population remained a piece to the puzzle, it was by no means the ultimate aim.

Delving back to the contents of chapter four, this shift is consistent with the findings of the USSBS. The will of the people had been relentlessly attacked in both the European and Pacific Theater of Operations, yet the effect played only a small role in the final outcome of the war. It was but one mechanism that was used to push the enemy toward submission. The above paragraphs are also synonymous with the framework developed by the USSBS, in their analysis of the Pacific Theater of Operations, for the ultimate defeat of a country. Military potential, production potential, and morale are all important mechanisms that can be affected by strategic air power.

The concept of attacking the production potential of a nation implies the continued belief in the industrial web theory, although the term itself cannot be found in the pages of official Air Force doctrine. As an example, attacking systems such as utilities and transportation, which are common to the production of militarily useful end products, is consistent with industrial web theory. One further example is given to illustrate the commonality of ideas with pre-war and post-war doctrine.

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[103] *Air Force Manual 1-2, Basic Doctrine*, HRAK168.13001-2, 16.
[104] *Air Force Manual 1-3, Theater Air Operations* (Washington D.C.: Department of the Air Force, 1953), HRA168.13001-3, 1.

> The fabric of modern nations is such a complete interweaving of major single elements that the elimination of one element can create widespread influence upon the whole. *Some of the elements are of such importance that the complete elimination of one of them would cause collapse of the national structure insofar as integrated effort is concerned*.[105] (Emphasis added).

It appears that Air Force doctrine continued to overemphasize the ability to determine, through intelligence, the existence of the "door latch," "propeller spring" or "ball bearings" that would cause the enemy system to fail. The analysis of joint war plans will provide more insight toward the continued belief in the industrial web theory. With this being said, it is appropriate to shift the focus to doctrinal beliefs on air superiority.

The USSBS made their point perfectly clear in relation to the importance of air superiority. In both Theaters of Operations, air superiority played a vital role in allowing the exploitation of air power. Would Air Force doctrine commit to this same level of importance? Many secondary sources claim that indeed the doctrine of 1953-1954 espoused that air superiority is the first priority of the Air Force. But in analyzing the doctrine, these claims become only partially true.

As stated earlier, Air Force doctrine delineated two basic types of actions available to an air Force: heartland and peripheral. The doctrine documents were developed along these same lines. Separate doctrinal manuals were written for the strategic and theater (tactical) missions of the Air Force. The manual supporting the theater mission makes clear the priority of their assets. Counter air is the first mission, followed by interdiction, CAS and then other supporting missions. In fact, the theater doctrine states that,

> Theater forces on the surface cannot adequately protect themselves from air attack, and extensive measures taken by them to do so may jeopardize their capability to cope with hostile surface forces; therefore, *the first great undertaking of theater air forces is to obtain dominance of the air*. . . . Extensive surface actions should be avoided, if possible, until control of the air has been secured.[106] (Emphasis added).

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[105] *Air Force Manual 1-8, Strategic Air Operations* (Washington D.C.: Department of the Air Force, 1953), HRAK168.13001-8, 4.
[106] *Air Force Manual 1-3, Theater Air Operations* (Washington D.C.: Department of the Air Force, 1953), HRA168.13001-3, 10.

So in the theater air manual, air superiority is not only the first air force mission, but also potentially the first military action that should take place in time of war. The same cannot be said of strategic air action.

The strategic air manual did give high priority to the counter air mission. But the emphasis was not placed on defeating the enemy's tactical aviation or an enemy's heartland air defense, rather counter air to defeat the enemy's strategic forces.[107] The forces that were capable of attacking our own heartland targets. In fact, attempts to apply strategic air directly against the fielded tactical air force was "diversionary in nature."[108]

The Air Force continued to believe that an air offensive would be impossible to stop.

> These capabilities [strategic bombing] are given added emphasis by the fact that the strategic air offensive can be launched immediately at the outset of hostilities and despite loses inflicted by defending enemy forces, *successful penetration is inevitable and devastating in effect* (emphasis added).[109]

These beliefs were backed to a degree by the addition of weapons of mass destruction (nuclear weapons). The use of weapons of mass destruction against the enemy industrial structure would "result in effects out of all proportion to the effort expended and the costs involved."[110]

The introduction of weapons of mass destruction had an even broader impact on Air Force doctrine. While precision attacks were still required for conventional weapons, nuclear weapons allowed a new targeting concept to enter the equation. One that is directly related to the USSBS analysis of the atomic bomb yielding more bang for the buck.

> It may be said that attacks themselves are horizontal since selectivity is frequently impossible when massed firepower is applied. A heterogeneous assortment of targets is wiped out and the effects spread laterally into the nation's life. A strike against a governmental control center surrounded by industry, communications facilities, transportation,

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[107] *Air Force Manual 1-2, Basic Doctrine*, HRAK168.13001-2, 11.
[108] *Air Force Manual 1-8, Strategic Air Operations* (Washington D.C.: Department of the Air Force, 1953), HRAK168.13001-8, 2.
[109] *Air Force Manual 1-8, Strategic Air Operations* (Washington D.C.: Department of the Air Force, 1953), HRAK168.13001-8, 1.
[110] *Air Force Manual 1-2, Basic Doctrine*, HRAK168.13001-2, 13.

> labor forces, and other likely targets is an example of this type of horizontal attack.

It appears that a sample size of two, Hiroshima and Nagasaki, along with the conclusions of the USSBS convinced the Air Force that an area bombing technique was acceptable in meeting the objectives of air power. Thus, nuclear weapons solved two problems associated with World War II. First, the accuracy requirement associated with precision bombing techniques would be greatly relaxed. Second, the explosive power of the bomb would give greater confidence that items, such as machine tools, would be effectively destroyed in a single bombing mission.

It is important to highlight one more doctrinal belief that stems from the pages of the USSBS: a contradiction of the ACTS belief that a few bombs could "put the lights out for a period of many months." The Air Force, at least on paper, took the conclusions of the USSBS to heart when they wrote:

> The total requirement for target analysis must encompass the *enemy capacity to replace, repair, and salvage the parts of his structure that have been weakened by air attack.*[111]

Official Air Force doctrine must be included in any study to uncover Air Force doctrinal beliefs about strategic air power, but after analyzing it many questions remain. In the end, it appears that official Air Force doctrine is as much an advertisement for air power as it is a manual to express doctrinal beliefs. A better understanding of doctrine can be gained from studying war plan development following World War II.

The Air Force and Joint War Plans

Even before the end of World War II, it was becoming apparent that the Soviet Union would be the greatest threat to the United States and her allies in Europe. The Soviet Union's actions after the war, to include the communist coup in Czechoslovakia and the Berlin Crisis, only reinforced American fears about the Soviet Union. The Marshall plan helped rebuild Europe from an economic standpoint and the Truman

[111] *Air Force Manual 1-8, Strategic Air Operations* (Washington D.C.: Department of the Air Force, 1953), HRAK168.13001-8, 1.

doctrine aided countries struggling against communism, but neither would stop an invasion by the Soviet Union of either Europe or the Middle East.[112]

In 1946, the military, and in particular the Joint Chiefs of Staff (JCS), began creating a series of contingency plans with the objective of curbing such an invasion.[113] President Truman's fiscal policy, emphasizing domestic issues over the strength of the military, helped to create a mismatch between the land forces of the United States and the Soviet Union. As a result, the Air Force would play a huge role in the opening phases of any contingency operation with the Soviet Union. In fact, the early contingency plans were nothing more than a strategic bombing campaign that would eventually open the door for a land invasion of Europe or the Middle East.[114] By 1948, a plan was in place that would highlight many of the doctrinal beliefs of the Air Force: TROJAN which was soon updated and renamed OFFTACKLE. The plan was not without controversy. Secretary of Defense James Forrestal was a skeptic of the strategic bombing campaign, arguing that air power alone could not win a war.[115] In a memorandum dated 23 October 1948 he tasked the JCS to make an "evaluation of the chances of success of delivering this effort [a powerful strategic air offensive against vital elements of Soviet war-making capacity]."[116] The JCS charged Gen. Hoyt S. Vandenberg with the task of completing this evaluation. The resulting report submitted on behalf of the JCS highlights some interesting doctrinal beliefs.

The overall objective of the strategic air offensive was to "destroy the capability and will of the enemy to resist."[117] This offensive "could well lead to Soviet capitulation and in any event should destroy their over-all capability for major offensive

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[112] Steven T. Ross, *American War Plans: 1945-1950* (New York: Garland, 1988), 5.
[113] Steven T. Ross, *American War Plans: 1945-1950* (New York: Garland, 1988), 25.
[114] Kenneth W. Condit, *The Joint Chiefs of Staff and National Policy, Volume II, 1947-1949* (Washington D.C.: Historical Division Joint Secretariat Joint Chiefs of Staff, 1976), 283-309.
[115] Kenneth W. Condit, *The Joint Chiefs of Staff and National Policy, Volume II, 1947-1949* (Washington D.C.: Historical Division Joint Secretariat Joint Chiefs of Staff, 1976), 311.
[116] Secretary of Defense James Forrestal, *JCS 1952*, in *America's War Plans for War Against the Soviet Union, 1945-1950, Vol. 9,* ed. Steven T. Ross and David Alan Rosenberg (New York: Garland Publishing Inc., 1989), 2.
[117] Gen. Hoyt S. Vandenburg, *JCS 1952/1*, in *America's War Plans for War Against the Soviet Union, 1945-1950, Vol. 9,* ed. Steven T. Ross and David Alan Rosenberg (New York: Garland Publishing Inc., 1989), 6.

operations."[118] The strategic air offensive would include a combination of nuclear and conventional attacks on the following target systems:

1. Urban Industrial Concentrations and Governmental Control Centers.
2. Petroleum Industry.
3. Inland Transportation.
4. Electric Power.

A closer analysis of the urban industrial targets illustrates that they were essentially attacks on the war-making capability of the Soviet Union. Targets within this category included components of the industrial system from raw materials to ball bearings to finished products. In all the targeting strategy was not much different from the strategy resulting from the Casablanca Conference during World War II. Increased emphasis was placed on the requirement to "police" targets after the initial attack to curtail the enemy's ability to repair damage.[119] In effect the targets in the industrial web did not change, which is consistent with the findings of the USSBS.

The means to carry out the strategic attacks were supported by some critical assumptions regarding the Soviet Union's defensive capabilities. It was postulated that, due to the vast size of the Soviet Union coupled with inadequate AA guns, fighters (especially those capable of night operations), and Ground Control Interceptor (GCI) radars, limited the ability of the Soviet Union to defend against a strategic bombing campaign. But even if these assumptions were underestimated the report concluded that:

> The problem of intercepting a B-29 flying at 30,000 feet at a speed of 330 knots (which is slower than the B-50) is still a formidable task.[120]

Radar bombing technology coupled with nuclear weapons allowed the bombers to hit their targets at night and also under the cover of adverse weather. Estimates were that under these conditions "no fighter passes are possible before the bomber releases its

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[118] Gen. Hoyt S. Vandenburg, *JCS 1952/1*, in *America's War Plans for War Against the Soviet Union, 1945-1950, Vol. 9,* ed. Steven T. Ross and David Alan Rosenberg (New York: Garland Publishing Inc., 1989), 6.

[119] Gen. Hoyt S. Vandenburg, *JCS 1952/1*, in *America's War Plans for War Against the Soviet Union, 1945-1950, Vol. 9,* ed. Steven T. Ross and David Alan Rosenberg (New York: Garland Publishing Inc., 1989), 9.

[120] Gen. Hoyt S. Vandenburg, *JCS 1952/1*, in *America's War Plans for War Against the Soviet Union, 1945-1950, Vol. 9,* ed. Steven T. Ross and David Alan Rosenberg (New York: Garland Publishing Inc., 1989), 14.

bombs."[121] So once again, Air Force strategic doctrine employed the use of unescorted bombers to reach their targets in sufficient numbers to effectively dismantle the enemy's war making capability. While estimates were that the early phases of a campaign could produce fairly high attrition rates to the bombers, Soviet defenses should "decrease appreciably within a relatively short time due to the cumulative effects of the strategic air offensive."[122] Though not specifically stated, this statement implies that the Soviet war economy would have difficulty adjusting to the effects of strategic bombing. This further paints a picture of a Soviet war economy stretched to the limit with little or no slack to ease the effects of an initial strategic air attack, an assumption that did not bear fruit in World War II.

It seems that the planners for this campaign must have dusted off the lectures from the ACTS to create this plan. The lessons of the USSBS, from fighter defenses to slack in the system, are no where to be found in this concept of operations!

In conclusion, JCS 1952/1 stated that the strategic air offensive could be delivered as planned.[123] Furthermore, by attacking only 70 of the 210 proposed targets the offensive would reduce the Soviet industrial output by more than 50%.[124] These conclusions did not sit well with the Chief of Naval Operations (CNO) Admiral Denfeld. He pointed out that the lack of reliable intelligence about Soviet military capabilities led Gen. Vandenberg to draw conclusions "predicated on assumptions not supported by known facts."[125]

He placed a formal dissention statement in the report JCS 1952/1, questioning the feasibility of the plan and requesting further analysis by a "Joint" committee. He believed that the Joint Strategic Plans Committee (JSPC) should evaluate the plan to

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[121] Gen. Hoyt S. Vandenburg, *JCS 1952/1*, in *America's War Plans for War Against the Soviet Union, 1945-1950, Vol. 9,* ed. Steven T. Ross and David Alan Rosenberg (New York: Garland Publishing Inc., 1989), 14.
[122] Gen. Hoyt S. Vandenburg, *JCS 1952/1*, in *America's War Plans for War Against the Soviet Union, 1945-1950, Vol. 9,* ed. Steven T. Ross and David Alan Rosenberg (New York: Garland Publishing Inc., 1989), 25.
[123] Gen. Hoyt S. Vandenburg, *JCS 1952/1*, in *America's War Plans for War Against the Soviet Union, 1945-1950, Vol. 9,* ed. Steven T. Ross and David Alan Rosenberg (New York: Garland Publishing Inc., 1989), 4.
[124] Gen. Hoyt S. Vandenburg, *JCS 1952/1*, in *America's War Plans for War Against the Soviet Union, 1945-1950, Vol. 9,* ed. Steven T. Ross and David Alan Rosenberg (New York: Garland Publishing Inc., 1989), 7.

include an analysis of the plan's assumptions conducted by the Joint Intelligence Committee (JIC). In March of 1949, the JIC submitted a report that stated:

> The Air Force study *oversimplified the intelligence presented and ignored some pertinent information*. Its overall assessment of Soviet air defenses was generally accurate, but available information was so scanty that it was entirely possible that Soviet capabilities had been underestimated. Moreover, *intelligence did not support the forecast in the study that destruction of the 70 primary targets would reduce Soviet industrial output by 50 percent or that an attack on a target would necessarily lead to its destruction*.[126] (Emphasis added).

As a result of this report, the JCS assigned the newly formed Weapons Systems Evaluation Group (WSEG) to evaluate the weapons aspects of the air offensive plan.[127]

The WSEG study also reflected questions as to whether the Air Force could effectively carry out the strategic operation required in OFFTACKLE. Some of the highlights of the findings are stated below:

1. Logistical deficiencies and *expected bomber attrition rates preclude an offensive on the scale currently contemplated in OFFTACKLE*.
2. *Bomber attrition was estimated at 30% for night operations and between 40% and 50% for daylight missions* depending on assumptions in relation to the capabilities of the Soviet defensive network.
3. Grave deficiencies exist in intelligence on enemy capabilities. These deficiencies must be corrected in order to improve the basis for future planning and evaluation.
4. In view of the unfeasibility of carrying out the OFFTACKLE bombing program as a whole, *a re-examination of the entire target system is desirable*.[128] (Emphasis added).

The above reconstruction of events between 1948 and 1949 points to the lack of required intelligence to accurately determine the capabilities required to effectively prosecute a strategic offensive campaign. Furthermore, assumptions were made as to the ability to hit targets as well as the destruction, which would result from these attacks. In

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[125] Kenneth W. Condit, *The Joint Chiefs of Staff and National Policy, Volume II, 1947-1949* (Washington D.C.: Historical Division Joint Secretariat Joint Chiefs of Staff, 1976), 316.
[126] Kenneth W. Condit, *The Joint Chiefs of Staff and National Policy, Volume II, 1947-1949* (Washington D.C.: Historical Division Joint Secretariat Joint Chiefs of Staff, 1976), 318.
[127] Kenneth W. Condit, *The Joint Chiefs of Staff and National Policy, Volume II, 1947-1949* (Washington D.C.: Historical Division Joint Secretariat Joint Chiefs of Staff, 1976), 318.
[128] WSEG, *JCS 1952/11*, in *America's War Plans for War Against the Soviet Union, 1945-1950, Vol. 13,* ed. Steven T. Ross and David Alan Rosenberg (New York: Garland Publishing Inc., 1989), 158-162.

essence Air Force doctrine flowed down the same path of drawing conclusions based on data that was lacking or at best sketchy. These same conclusions had been made in World War II, resulting in the loss of thousands of airmen.

Conclusions

Air Force strategic doctrine had a large commonality with pre-WWII doctrine. But at the heart of the doctrine appeared an important difference. While the will of the people would be evaluated in applying doctrine to create a strategy, it was no longer regarded as the ultimate aim in war. Too many variables were involved as to the exact effect bombing would have on the civilian population to allow a definite action and reaction analysis. Instead post-WWII doctrine emphasized destroying and neutralizing enemy war making and sustaining capability. Even within this slightly altered paradigm, the targeting priorities did not shift significantly from those of pre-WWII doctrine. Industry, raw materials, transportation, and electricity remained at the core of the targeting doctrine.

The Air Force continued its almost scientific approach to calculating the number of bombs and aircraft required to destroy a target: an approach that seems at odds with the realities of World War II, as assessed in the USSBS, as well as the Clausewitzian fog and friction of war. This scientific approach even calculated effects attainable through the attack of certain targets, hitting 70 targets would reduce Soviet capability by 50%. New emphasis was placed on returning to targets that were hit to slow the enemy's capability to repair damage. This is a slight shift from the earlier belief that a few bombs could knock out power in New York for a time of "many months."

Probably the most remarkable similarity between doctrine of pre-WWII and post-WWII, at least as espoused in OFFTACKLE, was the Air Force's continued reliance upon the employment of unescorted bombers to deliver the strategic offensive. This would be possible due to the newly acquired night and weather capability, which would provide sufficient cover from the enemy air defense network. Even limited daylight missions were believed to have the capability to survive the enemy defenses in adequate numbers to allow success. The lack of much needed intelligence about true Soviet

capability, results from World War II and the assessments of other "joint" committees leads one to question the rationale of this decision.

Chapter 6

CONCLUSION

Victory smiles upon those who anticipate the changes in the character of war, not upon those who wait to adapt themselves after the changes occur.

Giulio Douhet, 1927.

Introduction

As promised, this chapter will tie up the loose ends and develop recommendations for the future. To begin, final remarks are made toward the development of doctrine after World War II. Then, an attempt is made to answer two questions: Did the USSBS successfully complete its mission and what are the implications for today?

Using chapter five as the point of reference, it seems safe to say that doctrinal development after World War II was only partially successful. Many appropriate lessons were on the pages of the USSBS, yet the Air Force chose to pick and chose which lessons they would take to heart. Haywood Hansell, in 1951, commented on the unescorted bomber doctrine entering World War II: an assessment that is applicable to the development of post World War II doctrine.

> . . . We unquestionably *magnified our expected capabilities and minimized our limitations* . . .. Our doctrine held that bombers in proper formation could conduct a running firefight and preserve themselves against fighter attacks. *Unquestionable this was based on hope and not on existing fact* . . .. In the period before the war our lack of experience led us to be far too optimistic in gauging the number of bombs and the number of trials it would take to destroy a target.[129] (Emphasis added).

These comments seem especially applicable to post war doctrine when reflecting on the concepts within OFFTACKLE. The biggest indictment of this doctrinal development is that they did have the facts, at least in terms of the results of World War

[129] "Notes for a Lecture on the Development of the U.S. Concept of Bombardment Operations," Feb. 51, in the Hansell Collection.

II. The atomic bomb became the centerpiece of their strategy, even though the numbers as well as its yield, especially in relation to a hydrogen bomb, were limited.

The written doctrinal manuals encompassed a more complete framework for executing an air campaign plan. But even they tended to underestimate the ability of an air defense to effectively counter a strategic attack of the heartland. Another interesting note about the 1953-1954 doctrinal manuals is that they seem to have neglected to account for the conflict in Korea. Perhaps the lessons simply could not be fleshed out in time to include in these manuals, or perhaps the lessons did not fit within the current doctrinal beliefs of the Air Force. In defense of the Air Force, doctrinal manuals in the second half of the 1950s definitely contained inputs from the Korean conflict. But could this have been done sooner?

Going back to World War II, the decision to even evaluate the strategic air campaign did not begin to surface until March of 1944. Once the decision was made, it became a frantic exercise to iron out the details of this mission. The questions were many: who should control the survey, what should they assess, and how should they carry out the mission. In retrospect, the ad hoc evolution of the USSBS seems acceptable, but would the Air Force put into place the framework to complete this important mission in the future? The answer to that question is no.

As stated earlier, there was not even a formal survey after either the Korean War or the War in Vietnam. Even the survey after OPERATION DESERT STORM was marred by a lack of coordination.

> Indeed, even in retrospect it has proven extremely difficult to decipher the air war's effects. Part of the reason for this comes from the unreadiness of the Department of Defense to conduct a comprehensive and immediate battlefield survey; part comes from the intemperate unwillingness of General Schwarzkopf to permit teams to enter the theater for that purpose. A few teams did eventually conduct surveys, but over limited and unrepresentative portions of the battlefield. The armed forces have easily spent hundreds of millions of dollars in recent years to simulate battle; *they made no comparable effort in this war to capture its reality.*[130]

This long quote was included because it brings to light the exact point that this author is attempting to make. The Air Force does an outstanding job of preparing its airmen for

the execution of war, yet little preparation is made toward developing a yardstick to measure their actions. In other words, evidence that is crucial to the proper analysis of wartime events may be lost due to not acting quickly to gain the appropriate information. With this conclusion, it is appropriate to turn once again to the USSBS.

Was the USSBS successful in completing its mission? The answer to that question is "yes." Based on requirements established by both of the American Presidents of the World War II timeframe, the survey did an outstanding job. But authors question even this conclusion. Richard J. Overy states that the survey "has a number of drawbacks as a historical source. It was put together in great haste in the few weeks after victory, with many of its general conclusions based on interviews and statements from senior German officials."[131] While it was put together with a sense of urgency, the term "haste" conjures other meanings such as unnecessarily quick action, thoughtlessness, rashness or undue speed. The since of urgency was important because lessons from the European Theater of Operations could be of importance to the Pacific Theater of Operations.

As to the use of interviews, they were included in the recommendations put forth by the USSBS. But conclusions were not based solely on these interviews. They were a piece to the puzzle, usually used to further evidence gained through other more concrete sources. Ironically, Overy includes no less than five such quotes from interviews of German officials to support his conclusions in his twenty-three-page article.

Overy did include an important point on the limitations of the USSBS; it did not make conclusions as to how the bombing affected the German strategy or military effort.[132] But even this statement is only partly correct. A few examples should suffice in supporting this contention. First, the USSBS highlighted the fact that the strategic bombing of Germany, especially the aircraft industry, forced the Germans to change their strategy and dramatically increase fighter output at the expense of bomber production. Furthermore, the USSBS analyzed the effects of the dispersal program to include its

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[130] Thomas A. Keaney and Eliot A. Cohen, *Revolution in Warfare? Air Power in the Persian Gulf War* (Annapolis, Maryland: Naval Institute Press, 1995), 219-220.
[131] Richard J. Overy, "World War II: The Bombing of Germany," in *The War in the Air 1914-1994*, ed. Alan Stephens (Maxwell AFB, Ala.: Air University Press, January 2001), 108.
[132] Richard J. Overy, "World War II: The Bombing of Germany," in *The War in the Air 1914-1994*, ed. Alan Stephens (Maxwell AFB, Ala.: Air University Press, January 2001), 108.

effects on the logistics strategy. As a final example, the USSBS concluded that the ill fated German rocket program cost the Luftwaffe an estimated "24,000 fighter aircraft."[133]

The USSBS did not delve into the tactical level of war. Their was no assessment of how the German military would have done had their been no strategic bombing. While this may have been a fruitful endeavor, it was not a part of the USSBS charter. Additionally, the primarily civilian caste of the USSBS was probably not qualified to make these determinations. They would have been accused of guessing – and rightly so. General Orville Anderson made this same point about the civilian composition of the USSBS team during an ACSC lecture in 1949.

> But to be free from military bias, they also suffered from a limited understanding of the nature of war and the result was that their conclusions, you will find, aren't focused to war thinking in terms of strategy, to any significant degree.[134]

This statement should not detract from the accomplishments of the USSBS. While a closer look at the ties between the strategic bombing and the ground war would have been beneficial, it also would have required much greater military involvement. This idea does not pose as big a problem in the present state of affairs with the Air Force, but greater military involvement in the USSBS survey could have overshadowed the creation of an impartial committee.

Orville Anderson makes one more indirect assessment toward the accomplishments of the USSBS. Anderson believed that a lot of the shortfalls in the air war were a product of poor tactics. During the Schweinfurt raids, explains Anderson, piecemeal application of forces as well as poorly chosen routes of flight contributed to the missions being so costly in American lives.[135] The point here is not to argue whether his assessment is right or wrong. The point is that the USSBS did not and, based on its composition, could not render this conclusion. They did not have the expertise to weigh the effect of tactics toward the outcome of the mission. This mission is the realm of military analyst.

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[133] USSBS, Military Analysis Division, *V-Weapons (Crossbow) Campaign* (Washington: GPO, January 1947), 35.
[134] Maj. Gen. Orville Anderson, "An Evaluation of Strategic Thinking of World War II", ACSC Lecture, September, 1949, 15, AU M-U38043A548.
[135] Maj. Gen. Orville Anderson, "Development of US Strategic Air Doctrine European Theater of Operations in World War II, ACSC Lecture, September, 1951, 40, AU M-U38043A548.

So how does this all come together with regard to the composition of a survey team? Civilian participation is the right answer. The AAF leadership wanted an unbiased group to convince the civilian population what they already believed. But more importantly, they got a team of civilian experts that were not biased by institutionalized assumptions. They were able to bring into questions basic assumptions about air power, that may be overlooked by airman. Civilians, though, cannot yield all the answers. They may have a limited working knowledge of executing an air war. Therefore, a large contingent of military members are required to flesh out some of the "military" aspects of the war.

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