The Anatomy of The United States

Strategic Bombing Survey (Europe): Its Cause, Course, Controversy, and Consequence

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Preface

The stories of the past intrigue some to ask questions as to why things are the way they are. In my particular case I have always been fascinated with the era of the World War II, especially that of the air war and its campaign in Europe. From childhood, I sat in my room looking at posters of B-17 bombers, P-47 fighters among others, pretending that somehow I was in command of these legendary crafts at a critical moment in history. I would listen to the stories of people who lived through the era, telling tales of bomber formations being shot to pieces by enemy fighters and flak. It led me to question what was the point of all this chaos if the effort led to so much difficulty, and why was there an importance of airpower in the American military despite criticism of the past. With Professor John W. Chambers’ advice, I sought and found the report of the United States Strategic Bombing Survey that had become the authority of the American bombing campaign.

The Survey, which covered both the European and Pacific air campaigns, became the authoritative record of the air wars successes and failures. I have become enamored with the study, especially the European examination where much analysis into precision bombing takes place. I have become intrigued into what the report is and what it suggests of the bombing, which in turn has led me to look deeper into the impact of the Survey’s relevance. Therefore, it was decided upon with agreement from my advisor Professor Chambers, to focus on an analysis of the United States Strategic Bombing Survey in the European Theatre of Operations.

With this kind of challenge, it is important to thank and recognize those who have contributed to making this work possible. First and foremost, I have to thank my wife, Patti, for assisting me. She kept my head mentally and spiritually clear for the task that
lay ahead of me when I felt the weight of this project at times unbearable. Thank you to my mother and father who instilled passion and diligence in me to whatever task lay ahead. I wish to also show gratitude to important members of academia for their contributions. Professor John W. Chambers, my advisor, has been invaluable in this process and deserves my sincerest thanks. Without his guidance, I would never have known where to start, and where to research the material, as this is such a large subject. Thanks to Professor Norman Markowitz who took on the task of being the second reader and offering his insight on the subject. Thanks to Professor James Masschaele for pushing me in class to come up with answers to questions when they needed to be answered. It was not always pleasing, but it made me learn the value of organization.

Special thanks to James Niessen at the Rutgers Alexander Library for showing me all the important areas of the Library related to the USSBS. I also would like to thank random library staff that answered countless questions I had about inter-library loans and extended privileges. I am sure a few were being more than patient with me. I would also like to thank the Aresty Foundation for supplying me with important funding for the opportunity to visit the U.S. National Archives II in College Park, Maryland. I would also like to give a special thank you to the people at the National Archives. The help they gave me in finding the information needed was invaluable to my research and understanding of the topic. Finally, I wish to thank Professor Ellen Deil-Matto who told me years ago in a phone conversation that I had the ability to tackle projects such as these and succeed in them. The confidence of that conversation has never left me, and continues to remind me to push forward. I thank you all and am deeply indebted to you all for your assistance no matter how big or small.
Introduction

The United States Strategic Bombing Survey (Europe) was a complicated, heavily detailed series of surveys and reports published between a two-year period of 1945 to 1947. The Survey with sanction from President Roosevelt, “Secretary of War Henry L. Stimson officially established the USSBS in November 1944 to analyze the effects of strategic air power in the European Theater.”¹ It has been researched by historians such as David MacIsaac, critically sourced by the *NY Times* as a “treasure house of information so little known to the public”, and at times discarded by such people as Drew Pearson in the *Washington Posts* The Washington Merry Go Round calling it, “One of the armies best boondoggling projects”³. A major question of that survey is why is it so divisive to those who have questioned its analysis in the European Theatre of Operations? The debate that seems to stem forward is the one of accuracy of effect vs. embellishment of effectiveness, considering that it had a role in deciphering the modern method of bomber warfare. What is necessary for any study of the Survey is to evaluate the information by what it is trying to state as it does offer rather interesting results related to the effects of bombing.

There are obvious implications of the survey being biased or just plain inaccurate because of rumor and scrutiny of the USSBS intentions and practices by the staff.

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Accusations of the USSBS cameramen “photographing new German inventions at the request of American business executives” or USSBS aircraft “had so little to do that it was sent on a special trip from Frankfurt to Paris to bring back Cognac” are some of the negativities aimed at the value of the analysis. Evidence displayed by the reports does however counter this “Boondoggle” as will be displayed in the body of the work. The USSBS is also seen in some political, military, and historical circles as merely a tool used by such groups as the “Bomber Mafia” of the Army who sought for an independent Air Force. Though it is unquestionable that the analysis helps in that measure, there is considerable weight suggesting the reports offer more than just a maneuver to help establish the Air Force based on economic importance. The survey with its various divisions and reports are much too detailed and critical to simply accept this method of thought.

Looking at the survey, in particular within the European Theater of Operations, one can look at the detail of the reports and begin to see a pattern of information that does not lend to mere promotion in strategic bombing. Questions surface as to whether the criticisms are warranted or not. What is visible in the survey reports are more of an informative history in an economic format that take into account certain sectors of interest of the German war economy. This style of analysis provides an appraisal of what the bombing achieved, at what levels, in different areas of the air war while highlighting different aspects of the campaign. If one takes the opportunity to look at the survey in this light, there is much more available to an analyst than a mere advocating of the

4 Pearson, 5
strategic bombing. Interestingly enough it takes into account different areas of the campaign that does not always highlight merits of the Army Air Force, such as the loss rate of the bombers as well as its certain flaws in intelligence and need of escort to succeed.

All aforementioned elements counter initial theories on how strategic bombing would take part in a combat scenario. For example, in the first chapter of The Effects of Strategic Bombing on the German War Economy the survey outlines that three premises point to the eventual successes of the campaign. “The first was the phenomenal increase in the weight of attack that could be brought against the enemy. The second consideration is the equally impressive improvements in operational technique. The most important among these were the development of the P-51 (Mustang) long-range fighter early in 1944 and the introduction during the same year of radio direction devices like OBOE and H2X (The P51 was the first fighter aircraft to be able to escort the bomber formations to and from a target designation deep into Germany. OBOE and H2X were early types of Radar designed to assist in putting aircraft on target for bombing.). The Third consideration to bear in mind is that throughout most of the period of the air war the choice of targets was greatly influenced by the requirements of the immediate military situation.”

So it begs the question, what is the Survey trying to disclose? Officially its goal was to attain and analyze the effects of Strategic Bombing in the Theater as mentioned above. However, the most suitable answer based on the civilian leadership is a historical focus on economic value in bombing based on effects as the reports often suggest. But to

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6 USSBS Committee, *The Effects of Strategic Bombing on the German War Economy*, Washington D.C. (October 31,1945) 1. (parenthesis utilized by author)
understand that, one must look at areas that the survey focused upon, as well as take into account what protocol the survey was trying to measure. Looking at the various reports submitted, the Survey attempts to answer questions in an economic fashion of bombing that have yet to be answered prior to that time. By focusing and highlighting the areas that the Survey investigated, it is viable to see the report as informative and authoritative rather than just a report where, “a thousand officers, enlisted men and civilians have been browsing through Germany doing relatively little.”7 Illustrating the points of the reports as an economic evaluation rescinds the doubt of the analysis and places it in context with what it actually is, a report on the bombing effects in World War II.

One more note to the reader important to the context of the paper, and that is the focus of morality in bombing civilians that was evident with places like Dresden and Berlin. For the purposes of this paper no major emphasis will be placed on the civilian bombing effects. It must be acknowledged that it is a disturbing occurrence in warfare that the Army Air Corps admittedly tried to refrain from with precision attack8, as well as critics such as the Navy looked upon as “indiscriminate bombing”.9 In context however, the loss of life on the ground is no more of value than that of the air crews blown out of the sky or killed conscripts on the eastern front. It is of this opinion that it can cloud the results of what is important in an analysis such as the USSBS, which was the effect of bombing toward German capitulation. This does not excuse the fact that bombing

7 Pearson (4)
resulted in loss of civilian life, but in no instance is the act of killing moral. As is in war, morality is put aside now to attain answers outside the emotion of human ethics.
Chapter 1: Origins

The USSBS was the most extensive evaluation on effects of a strategic bombing campaign, since the Air Power theorists of the early twentieth century developed the doctrine of Strategic Air Power. To understand why the USSBS was important in evaluating the new dimension of aerial warfare, you must look at the origins dating back to the First World War. In a set of statistics from a PBS series, *The Great War* (Nov. 1996), there were an approximate 65,038,810 total mobilized forces of various combating nations who served from 1914 to 1918. Of that figure 37,466,904 were suffered as combined casualties. Of that amount 8,528,831 were directly killed in the three and a quarter year war. The figure approximates over fifty percent casualty rates in a modern war of attrition. That is staggering when trying to condone the use of force. Air Power was certainly in its infancy at this stage, and certainly played no overwhelming role in the outcome of the Great War. However, some who were involved in aerial combat saw potential in this new style of warfare to possibly end egregious trench combat and began to question what and how aircraft can contribute in future conflict.

Giulio Douhet an Italian General who preached the benefits of strategic bombing reflected on the Great War and promoted a doctrine of Air Power in his book *Command of the Air* (1921) stating, “Inevitably the two groups of nations had to enter the conflict directly, throwing themselves into the vortex with reckless abandon; and neither group

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11 World War I Table
12 World War I Table
could have resigned themselves to acknowledge defeat except as a consequence of complete collapse. And this collapse could not have happened except by a long and onerous process of disintegration, moral and material, of an essential nature-a process which came about almost independently of the purely military conduct of the war”.\(^\text{13}\) It is safe to say with all those concerned historically that these sentiments are shared almost universally. The deficits of static warfare were too high to provide solutions from other modern machines such as the machine gun, tank, and poison gas. There was a necessity for evolution where theory must be applied to counter attrition warfare that ceased to be efficient.

Strategic bombing offered this new dimension and men such as Douhet as well as Billy Mitchell, who was a General in the U.S Air Corps during World War I saw the opportunity in applying this new element. For the purposes of this paper it is not necessary to go into excessive detail of each of the theories, but to highlight some attributes. “Brigadier General Billy Mitchell and the hopes and dreams of a few aircraft manufacturers, began its long battle to achieve institutional parity with the Army and Navy.”\(^\text{14}\) “Billy Mitchell’s bombing of naval ships, culminating with the sinking of the ex German battleship, Ostfriesland on July 21, 1921 with six 2000 lb. bombs provided clear illustration of how airpower could accomplish the coastal defense mission at a fraction of the cost of a fortified defense network”.\(^\text{15}\) “Weapons placed accurately within a couple hundred feet of a ship’s water-line, caused a ship "thought to be relatively safe


\(^{14}\) MacIsaac, 5.

from aerial attack" to rapidly sink.”16 “Thus, Mitchell could arguably translate (from the battleship sinking demonstration), a doctrinal role for US airpower.”17 For all intensive purposes, Mitchell easily is demonstrating that the smaller, faster, more maneuverable aircraft are able to challenge the centuries old dimension of warfare and succeed with it. But this area is only one facet of the potentials of air power in which the USSBS had to consider when researching bombing effects in Europe.

Another area the survey had to collect upon is the fight to the enemies’ source of power, the home front. The point of strategic bombing as the theories began to evolve is how to bypass the front line and counter the enemies’ base of economic supply and morale. Giulio Douhet tackled this concept by making his proposals in *Command of the Air* by highlighting what potential air power can achieve. “The command of the air carries with it the following advantages:

1.) It shields one’s own territory and seas from enemy aerial offensives, because the enemy has been made powerless to carry out offensives. It protects, therefore, the material and moral resistance of the nation from direct and terrifying attacks by the enemy.

2.) It exposes the enemy’s territory to one’s own aerial offensives, which can be carried on with the utmost ease, because the enemy has been made powerless to act in the air. It therefore facilitates a direct and terrifying attack on the enemy’s resistance.


3.) It completely protects the bases and communication lines of one’s own army and navy, and threatens those of the enemy.

4.) It prevents the enemy from helping his army and navy from the air, and at the same time insures aerial help for one’s own army and navy.”

Douhet continues with his analysis stating, “Because of its direct action, the air arm pits populations directly against populations, nations directly against nations, and does away with the intervening armor which has kept them apart during past wars. Now it is actually populations and nations which come to blows and seize each other’s throats.”

Douhet implicitly dictates that the strategy of employing air power in a measure of independent tactics will unleash a faster more humane method of concluding war by, “crushing the resistance of the enemy; and this can be done more easily, faster, more economically, and with less bloodshed by directly attacking that resistance at its weakest point. The more rapid and terrifying the arms are, the faster they will reach vital centers and the more deeply they will affect moral resistance. Hence the more civilized war will become, because damages will be corresponding to the number of people involved. The better arms are able to attack citizens in general, the more private interests are directly hurt, the fewer wars will be for people will not be able to say any more: ‘Let us all arm for war but you go and do the fighting’ ”.

Douhet and others like him are making a tremendous assumption with the potentials of airpower in future conflict. Many militaries around the world that were planning to employ the new medium of air power looked to these philosophies and

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18 Douhet, 192
19 Douhet, 193
20 Douhet, 196
planned accordingly. The United States in the mean time was preparing itself to combat the Germans once again, this time with air power playing a potentially critical role in the demonstration of combat. The upcoming war for the United States would now demonstrate if and how aerial warfare could help the effort.

Military men like Carl Spaatz, and H.H. (“Hap”) Arnold following educational lessons and theories presented in the Air Corps Tactical School of the 1920’s developed theories that took in the ideas of Douhet, Mitchell and others. They believed “through careful, scientific study of a nation’s industry, to single out particular targets whose destruction would of itself bring a halt an entire industry or series of industries. If a number of such targets could be identified and destroyed, it might just be possible, with a relatively small force, to bring and enemy’s war production to a halt with almost surgical precision.”

In 1939 the strategists had developed an idea, which coincidentally was the foundations for what critics use to discredit the air war and the USSBS commission. “In brief it may be described as follows: The most efficient war to defeat an enemy is to destroy, by means of bombardment from the air, his war-making capacity; the means to this end is to identify by scientific analysis those particular elements of his war potential the elimination of which will cripple either his war machine or his will to continue the conflict; these elements having been identified, they should be attacked by large masses of bombardment aircraft flying in formation, at high altitude, in daylight, and equipped with precision bombsights that will make possible the positive identification and destruction of ‘pinpoint’ targets; finally, such bombing missions having been carried out, the enemy, regardless of his strength in armies and navies, will lack the means to support

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21 MacIsaac, 8
continued military action.” With this bold assessment the Air Corps went ahead to war with plans called Air War Plans Division-1 and 2 in 1941 calling for a huge commitment of “239 combat groups, and the provision of 63,467 aircraft and 2,164,916 men.” This measure of commitment asked for was tremendous since it certainly would entail a massive amount of material and funds from the government, which ultimately would take capital away from other branches such as the Navy. Nonetheless with the entry of the United States into World War II, the Army Air Corps was given the opportunity to demonstrate if and how it can contribute to the war effort based on the stratagem. In 1943 at the Casablanca conference, the Air Corps was directed by the Chiefs of Staff to engage in “the progressive destruction and dislocation of the German military, industrial, and economic system, and the undermining of the morale of the German people to a point where their capacity for armed resistance is fatally weakened. This is construed as meaning so weakened as to permit initiation of final combined operations on the Continent.’ The primary targets for the time being were listed in the following order of priority: (1) German submarine construction yards, (2) The German aircraft industry, (3) transportation, (4) oil plants, and (5) other targets in enemy war industry.” But with this new responsibility comes the burden of reconciling accounts, and men of the Air Corps were in need of documenting the attributes of the air campaign so when it the war came to its conclusion there would be a way to show aerial bombardment as a necessary tool in modern warfare. Thus began the work to acquire the necessary personnel to get a survey of the campaign.

22 MacIsaac, 7
23 MacIsaac, 12
24 MacIsaac, 14-15
Once there was an understanding that there would be a need for an official history to the bombing campaign in Europe to document findings, circles within the military and government started looking how to apply that accordingly. “The genesis of the United States Strategic Bombing Survey is to be found, form an historical standpoint, in proposed and actual organizations which were conceived, apparently, in March 1944.”

It is possible, even probable, however, that individuals and groups both within and outside of the Army Air Forces had ideas on the subject European Theater of Operations, a number of organizations, both American and British, which were doing economic and physical damage research on air targets.”

So from a historical standpoint as well as a military standpoint, the impression of what was to be looked for was underway by other organizations like for example the Office of Strategic Services that gathered intelligence or the Committee of Operations Analysts that had “various subcommittees called upon the services of economic and industrial experts throughout the United States.”

This committee consisted of members that studied economic figures, which were useful in deciphering the German situation for the Air Corps and directly gave information to Gen. Arnold. The COA with its methods helped establish the notion of the USSBS by a report which “on 8 March 1943, recommended continuing evaluation of the effectiveness of the air attack for the information of appropriate authorities, and it may be that this recommendation contained the germ of the idea which was later to burgeon into the proposal of an independent Survey. This report, copies of which are appended to the history, along with comments made on the report by the British Ministry of Economic

26 Beveridge, 1
27 MacIsaac, 25
Warfare, is a basic document used in the early planning of the Survey."\textsuperscript{28} Also important in this committee is that three of its members were Col. Edgar P. Sorensen, Col. Guido Perera, and Lt. Col. W. Barton Leach who would later serve on the USSBS staff.\textsuperscript{29} After this notable report to General Arnold “on several occasions during 1943 Colonels Perera and Leach, after consulting in England with General Eaker and representatives of the RAF, prepared interim reports purporting to represent such evaluations.”\textsuperscript{30} The individual evaluations that were being prepared were good enough to explain what was being done in the war to military commanders, but this was not sufficient to overall evaluate the campaign or nominally present effective material in an unbiased fashion that would help solidify the air branch as a definitive part of the total war effort. What was needed further was an independent unbiased analysis that included many facets of the war against Germany. “Such a survey, to be complete, would be sufficiently wide in scope to cover thoroughly the various factors of military, economic and political life, in addition to the technique of serial bombing (Serial bombing is also known as area bombing where the entire area is indiscriminately bombed to achieve desired bombing effect). Technical data desired should also be obtained at this time. In order to provide this broad basis a number of military and civilian experts in various categories would be required. Further, the necessity for impartiality in order to achieve a true picture would indicate the appointment of some prominent American with a wide reputation for intelligence and integrity to head this mission. It is obvious that the results of this survey may well determine our entire air policy over a number of years subsequent to the

\begin{thebibliography}{9}
\bibitem{28} Beveridge, 2-3
\bibitem{29} Beveridge, 3
\bibitem{30} MacIsaac, 25
\end{thebibliography}
termination of the present conflict”31 Some like Gen. Marshall and President Roosevelt agreed with this idea and with a letter signed from President Roosevelt in September 1944. Officially, “‘the United States Strategic Bombing Survey’, it began, ‘was established by the Secretary of War on 3 November 1944.”32

Once this procedure of official establishment was out of the way the task was now to find the necessary people who would head the survey and acquire the information that the theorists were hoping to come by. After attempting to enlist persons of interest who were of prominence, the Air Staff of the Air Corps approached by telephone and letter to Frank D’Olier who was the president of Prudential Insurance Company in Newark, NJ. This choice would prove fruitful since he was in fact a businessman who understood the economic factors since he was the head of a Corporation. Mr. D’Olier prior to his position at Prudential had a history that made him a good fit for this position. He served in World War I as a Lt. Col. in the Army first in the artillery then in the Salvage Service.33 “He was discharged in April 1919 and resumed his normal business activities.’ ‘Between the Wars he continued his distinguished business career, becoming a Director of the Howard Savings Institute of Newark, New Jersey; a Director of the National Biscuit Company; Director of the Pennsylvania Railroad Company; a Director of the General Refractories Company; a Director of the Morristown Trust Company; and a Trustee of Princeton University.”34 Mr. D’Oliers background with the preceding mentioned companies made his appointment a wise choice when looking for someone to

31 Beveridge, Memorandum for Deputy Chiefs of Air Staff by Maj. Gen. Barney Giles (parenthesis utilized by author)  
32 MacIsaac, ix-x  
33 Beveridge, 402  
34 Beveridge, 402-403
look over the survey from an economic and logistical standpoint. He appropriately accepted the job and began acquiring additional support to assist him in his task to document the air war. Mr. D’Olier soon received that assistance by like-minded individuals such as Henry C. Alexander, George Ball, and J. Kenneth Galbraith.

Mr. Alexander’s qualifications stem from “in 1935 he became a partner in J.P Morgan and Company and, upon the incorporation of the Morgan interests, became a Director and Vice-President of J.P Morgan and Company, Inc.”35 He became Mr. D’Olier’s right hand man as the Vice-Chairman on October 23, 1944.36 George Ball who became the Director of the Survey and immediately in charge of the Transportation Division as well as Area Studies37 from 1942 to 1944 served as “Associate Counsel in the Office of Lend Lease Administration and the Foreign Economic Administration. He joined the Survey in November 1944.”38 J. Kenneth Galbraith became Director of the Overall Economic Effects Division of the Survey in February 1945.39 “He specialized in Agricultural Economics and worked for several industrial firms as an Economic Consultant before becoming and Instructor in Economics at Harvard University in 1938. In 1939-40 he was Assistant Professor of Economics at Princeton University.’ ‘In 1944-45 he was Assistant Administrator of the Lend Lease Administration. During all this period her served as an Economic Consultant to various Government agencies.”40 Though this does not constitute all of the significant members of this commission such as military

35 Beveridge, 404
36 Beveridge, 405
37 Beveridge, 409
38 Beveridge, 409-410
39 Beveridge, 415
40 Beveridge, 415-416
personnel, the few that are mentioned here are significant in that they directly lend credence based on their pasts to the idea of a business like mindset toward the evaluation.

In total figures the Survey consisted of “300 civilians, 350 officers, and 500 enlisted men”\textsuperscript{41} meant to go across Europe and gather reports. The mix of persons suited to a report gathering structure divided into civilian staff working hand in hand with military personnel potentially made it able recognize various factors that would contribute to a full bodied report. The military personnel were able to direct the staff to significant sources as well as point out the pros and cons of each section militarily as well as decipher military jargon to civilian personnel. The civilian staffs were more than likely the more scrutinized group of the survey in theatre and were left to take in the info and make it legible to the people in Washington. This is not always made apparent by the view of some critics who saw the Survey as meaningless. The formidable Drew Pearson who did not favor the Survey citied that, “big-shot business executives have been commuting back and forth across the Atlantic by plane at top priorities while a thousand offers, enlisted men and civilians have been browsing through Germany doing relatively little.”\textsuperscript{42} However that was far from the case with respect to the actual break down of how the large USSBS mission operated.

Their mission was divided into different divisions to encompass the effects of bombing in an almost corporate mindset. The committee broke up the research into three major areas of study, \textit{Military Studies, Economic Studies, and finally Civilian Studies}.\textsuperscript{43} These studies were broken further into twelve divisions as subsets of the three areas

\textsuperscript{41} USSBS Committee, \textit{Over-All Report (European War)}, Washington D.C. (September 30,1945) ix.
\textsuperscript{42} Pearson, 4
\textsuperscript{43} USSBS Over-All, III
aforementioned to fully appreciate the aspects of the campaign. Military Studies were responsible for two divisions, the *Military Analysis* and *Physical Damage*.\(^{44}\) The Civilian Studies encompassed three divisions with the Area Studies, *Morale*, and *Civilian Defense*.\(^{45}\) Finally, Economic Studies held the responsibility of the remaining several divisions: *Oil, Aircraft, Munitions, Equipment, Utilities, Transportation, and finally Overall Economic Effects*.\(^{46}\) If one looks how these different areas were broken down, once again one can see something that is far more encompassing than a simple study for the efficacy of air power. Especially with major emphasis placed on the Economic Studies with several specific divisions looking how the air campaign affected important areas of the German war economy. To the idea of the group doing little, evidence above shows that the Survey was a serious operation with major divisions documenting the bombing campaign. This will be exhibited as well in the breakdown reports in the next few chapters. There is also no simple coincidence that economic factors are largely discussed within the bulk of the analysis. With looking at who was in charge and how the USSBS structured itself for analysis, it is feasible to argue that the major factor determining the Survey was economic viability as preached by Douhet in Strategic Bombing Doctrine.

\(^{44}\) USSBS Over-All, III  
\(^{45}\) USSBS Over-All, III  
\(^{46}\) USSBS Over-All, III
Chapter Two: 1945 Over-All Report

In the 1945 reports, released to the public on September 30th of that year, were devised partially in a hope to assist in a possible continuation of war efforts against Japan. The general reports of the European campaign were to allow some type of answer immediately of what was working and what was not in the aerial campaign against Germany. The majority focus of the work was placed on various studies of economic factors within the German war machine. This is important to take into account since World War II was very much an economic war emphasizing mass production capabilities of the various belligerent nations. Since Germany was in a mass production footing before major aerial operations took effect, Air Corps staff as well as members of Washington were interested to see what if anything the strategic bombing accomplished against the German production effort to supply the military in the field.

The first report released by the USSBS did not complete in time to give assistance for the Japanese war effort, but it did open results to the first major aerial campaign. The Over-All Report was the opening chapter on significant consequences of aerial bombardment. Unlike theory or preliminary studies like the Smuts Memorandum of August 1917 to evaluate air efforts in World War I, which was a study of the RAF and the necessity for an independent unified air force,\textsuperscript{47} the survey optioned to focus on various aspects of the bombing effects of Germany. Looking through the pages of statistics and graphs, the economic factors are always present as to how the bombing effort affected the German economic system to offset any efforts to support the military expeditions of the German military. After the introductory essay in the report titled Role

\textsuperscript{47} MacIsaac, 4
of Air Power\textsuperscript{48} that describes what in general caused the success of the air campaign, the evaluation of sectors in German industry are discussed. In Attack on German Air Power\textsuperscript{49} the committee begins by recognizing statistical numbers of economic value. It begins with, “The story of the German aircraft industry is inseparable from that of the German Air Force.”\textsuperscript{50} An opening line such as this indicates plainly that industry and military branches are interlinked lending to economic factors intertwining with the war. It continues, “During the war years, aircraft, together with air force equipment, represented approximately 40 percent of total German war production and their manufacture, in all its phases, involved the employment of 2,000,000 men. The total number of aircraft accepted by the German Air Force in 1939 was 8,295 planes, of which less than 4,700 were fighter types. In 1944, the corresponding figures were 39,807 total, of which about 30,000 were fighter types.”\textsuperscript{51} This opening paragraph noticeably demonstrates that there is an emphasis of economic figures that are important to the analysis of the air war. This is supported by twenty-nine visual graphs and tables that offer comparison explanations to what the Survey was paying attention to such as tonnage dropped by bombers\textsuperscript{52} and amounts of tonnage dropped on principle targets.\textsuperscript{53} What one must grasp in taking this perception along with figures, is there is more here than a simple bomb to target analysis. To state that this is relevant one need to look no further than the Chairman and Vice-Chairman, Frank D’Olier and Henry Alexander who come from the corporate field and understand figures of an economic nature.

\textsuperscript{48} USSBS Over-All, 1
\textsuperscript{49} USSBS Over-All, 11
\textsuperscript{50} USSBS Over-All, 11
\textsuperscript{51} USSBS Over-All, 11
\textsuperscript{52} USSBS Over-All, 6
\textsuperscript{53} USSBS Over-All, 8
The Survey continues however, and does not focus solely in the aircraft industry in the analysis. It understands that it is one part of the whole machine. For example, it also focuses on the industries that supported the air force such as the ball bearing industry as it was “Complimentary to the attack on German air power.”\(^{54}\) It starts by recognizing the focus of the bearing industry stating, “The segment selected was the anti-friction bearings industry, and the specific target was Schweinfurt.”\(^{55}\) This specific site is significant since it was bombarded on two occasions of August 17, 1943 and October 14, 1943.\(^{56}\) The survey continues as to why it is important because, “Within that single city there was concentrated at that time approximately one-half of all the workers and one-half of all the production of this critical industry.”\(^{57}\) From that point the survey begins to document the actions against the site stating on the August 17 raid 400 tons of bombs with 80 direct hits at a loss of 36 planes out of 200 aircraft that equates to an eighteen percent loss rate.\(^{58}\) That amount is certainly high and is sighted with critics as a major drawback to bombing calling unescorted heavy bombers as a “sturdy myth”\(^{59}\). The accounting continues stating tonnage amounts recognizing that in August to December 1943, a total 11,000 tons were dropped on the bearing industry with approximately two-thirds on Schweinfurt alone.\(^{60}\) From there it continues on with the raid in October highlighting similar statistics emphasizing gains to expenditures. What can be taken from this accounting is that the committee is attempting to be accurate in their

\(^{54}\) USSBS Over-All, 26  
\(^{55}\) USSBS Over-All, 26  
\(^{56}\) USSBS Over-All, 26  
\(^{57}\) USSBS Over-All, 26  
\(^{58}\) USSBS Over-All, 26  
\(^{60}\) USSBS Over-All, 26
investigation of the bombing whether it is good or bad. The numbers that are being portrayed here are similar to a cost and effect analysis of a corporate undertaking but in this case it is looking specifically at the bombing sight of Schweinfurt, Germany. The reality is that with the losses of the Schweinfurt raid based on minimal effect on bearing production with ten percent machine loss and twenty percent finished stock loss, along with associated manufacturing that countered within weeks of the raids, the Survey looked at the situation as “severe” and “could not be sustained”.\textsuperscript{61} It is important to notice that the Survey focused on what was attributably lost by the Germans, as certainly there were effects to what bombing did on that site. The Survey also recognizes that this was a disappointment in the history of the campaign that led to temporary suspension of deep raids until escort fighters arrived.\textsuperscript{62} Again there must be recognition that a segment is being factored in the entirety as opposed to a simple cause and effect report.

From the immediate analysis of the air industry and ball bearings, the committee looks at the other areas of interest in strategic bombing. Another phase of the report analyzed the overall economic effects because, “Prior to the summer of 1943, the effect of the air raids cannot be measured in any appreciable degree on munitions production or on national output in general.”\textsuperscript{63} This is because prior to that time the United States had not played a significant role in bombing making it understandably irrelevant to the Survey. The report highlights certain results of the bombing claiming, “total loss of German armament output from air raids in 1943 cannot be put higher than about 3 to 5

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\textsuperscript{61} USSBS Over-All, 26  \\
\textsuperscript{62} USSBS Over-All, 26  \\
\textsuperscript{63} USSBS Over-All, 36
\end{flushright}
percent.”  It continues to analyze looking into 1944 “which carried the promise of
decisive results.”  The offensives that started against oil and nitrogen plants in May and
June, against the German transportation system in September, and against the Ruhr steel
industry in October all achieved results fully up to expectations and in many cases above
them.”  To support this analysis the report looks at an armament index for production,
“which had risen until the third quarter of 1944, fell by 10 percent in the fourth quarter.
Half of this fall was attributable to territorial losses. (Which did not involve bombing)
The air raids can also be credited with preventing planned expansion.” With this claim
the Survey also states, “The index of armaments production fails to reflect the serious
damage done in 1944 to specific segments of the German economy - oil, steel, and
transportation. This illustrates that the Allies did not attempt to destroy the German
economy as a whole. The bombing offensive sought to rather stop it from operating by
damaging key points.”  The analysis here describes the intentions of the initial
parameters of the air war minding that the war was not entirely seen through the eyes of
the Allied cause. The report exhibits that they sought to look at the different areas to
configure proper analysis of the campaign in its entirety.

The report continues on to the certain segments mentioned above as it feels that
the Allies concentrated upon these areas during the war to lend corroboration of what was
accomplished. The report starts on oil since it was crucial on the ability for the German
military to be mechanized. “From the beginning of the war oil had been a weak point in

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64 USSBS Over-All, 37
65 USSBS Over-All, 37
66 USSBS Over-All, 37
67 USSBS Over-All, 37
68 USSBS Over-All, 37
the German supply system. As early as 1942, shortages of aviation fuel had compelled the Germans to cut down the training of pilots, and it has been seen that this circumstance, as much as any other, eventually cost Germany control of the air over her own territory. Thus, in attacking Germany’s synthetic oil plants, the Allies selected an existing bottleneck and sought to draw it tighter. It continues on with consumption figures such as the 7,500,000 tons of oil consumed by Germany in 1938 prior to the war as a backdrop to how the war affected progress. By 1939 at the invasion of Poland, there was only a six-month supply of fuel that did not measure up to the German plans. Figures were compiled further by looking into the civilian economy of oil consumption allowing 300,000 tons of motor gasoline in 1943 where before the war in was ten times that amount. From there it looks at the synthetic plants that produced synthetic oil at hydrogenation plants. Locations with their approximate production figures are shown in this study such as Politz with 558,000 tons of synthetic oil to be taken into account, as it is a viable piece of information in the analysis. Studies into the oil industry looked in various locations such as occupied territories such as Ploesti in Romania, but focusing on the significant bombed sites that applied. This is important in the discussion of the war economically and as been displayed before, sectors of each area play its role in the bigger effort to subdue the enemy.

The measures of analysis similar to what is described above are in general terms discussed similarly concerning three areas of interest in the German economy. Rubber,

69 USSBS Over-All, 39
70 USSBS Over-All, 39
71 USSBS Over-All, 39
72 USSBS Over-All, 40
73 USSBS Over-All, 40
Chemicals, and Powder and Explosives, all which were important in the greater context of the German war machine, is examined to a certain degree. The report continues on looking at other factors that encompassed the German economy. The Report looks into transportation as well as the motorized vehicle industry since they also played a role in contributing to the German war effort. “26 plants in Germany, constituting an integral portion of the prewar automobile industry produced trucks, other vehicles, aircraft components, ordnance and V-1 items. Attack was concentrated on that portion of the industry producing trucks. Six of the 10 medium- and heavy truck producers were subjected to 12 precision raids during which 6,530 tons of bombs were dropped. Of the other plants, six were attacked as part of a systematic campaign against motor vehicles in 18 raids during which 3,592 tons of bombs were dropped. Thirteen additional precision raids were directed against this group of plants in their capacity as producers of aircraft components, ordnance and V-1 items.”

When it comes to the idea of precision raids, they did fall short of the hitting inside of a pickle barrel with the Norden bombsight that was the American sighting tool of the bombers in a raid. Instead, “the average circular error in 1943 was 1,200 feet, meaning that only 16 percent of the bombs fell within 1,000 feet of the aiming point.” Similar general analyses were formalized in the Over-All report concerning other mechanized manufacturing concerning the Tank industry and Submarine industry. What is important to take into account of this series of inquiry is that there is a continuous flow of information being delivered to establish economic

74 USSBS Over-All, 65
correspondence to the German capitulation in World War II. Following a step-by-step approach of what the German economy consisted of and how it was at times curtailed is brought out for analysis.

The Survey also takes a look at other industries that the bombing campaign sought to limit. Among these mentioned in their own sections were extremely important areas to the German industrial machine. They were: Steel, Ordnance, Electric Utilities, Machine Tool Industry and finally since they posed the first missile warfare threat of modern warfare the V-Weapons. Important to keep in mind in this series is to recognize that the USSBS is compiling different factors that promote discussion of contribution rather than producing infallible answers to the importance of air power.

From the area of direct economic study, there is a section of the examination that takes into account the Attack on German Cities, Physical Damage from Bombing, German Civilian Morale and German Civilian Defense. Though these do not directly take into account economic factors such as bombing industrial targets like Schweinfurt, it does take into account what the German reactions at what level were accountable during the air campaign. The Physical damage assessment is important especially on the grounds that the Survey had some ability to account for bomb to impact statistics that may have effectively assisted in German capitulation. It reported that “49 of the larger cities, those of industrial importance, had 39 percent of the dwelling units destroyed or seriously damaged (2,164,800 our of 5,554,500), and many of these cities had lost their central and business districts and remained as suburban rings surrounding destroyed

77 USSBS Over-All, V
cores.” The Survey here is establishing how the bombing affected more than just precision attacks on industrial factories. This is more of an admission to the limits of precision attack. It is also an acknowledgement that the approach of bombing executed was far from precise.

To continue the Survey teams looked at the Morale questions by looking at “A cross section of the German population in the post-war American, French, and British zones of occupation.” The teams surveyed 34 towns with different representations to the war of zero damage to 40,000 tons dropped upon them. They also analyzed captured documents from governmental resources as well as German civilian mail, along with questioning foreign workers and community leaders. The information presented in this portion of the analysis produces the same type of investigation as the economic studies except in this occasion there is emphasis on questioning what did the bombing do to the civilian populations ability to live their lives. The question in this section was to see if the war came the German populations front door step and how they reacted to it.

In the area of German Civilian Defense the team recognized that the study of this sector was to calculate the civilian ability to lessen “the effects of aerial bombing on the civilian population.” The study encompassed “The critical period of action for civilian defense immediately after a raid, “The capabilities of civilian defense forces are measured and evaluated by the extent to which they are able to save lives to extinguish and confine fires, and to restore a community to a state of operation as near normal as possible.”

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78 USSBS Over-All, 91
79 USSBS Over-All, 95
80 USSBS Over-All, 95
81 USSBS Over-All, 95
82 USSBS Over-All, 101
possible." The analysis recognized that there was a need to comprehend how the civilians were able to react in an emergency mode, which again lends to the idea of the rebuilding phase and sustainability of the civilian exposed to warfare behind enemy fronts.

Finally in the analysis came the conclusions that offered suggestions on what was learned from the campaign. The purpose of this section is to present their analysis of what if anything could be learned from different aspects of the war. “It remains to look at the results as a whole and seek such signposts as may be of guidance to the future.”

The conclusion utilizes nine “signposts” which encompass all of the study such as mental conditions of the people, dominance of the air over enemy territory, and the increase in the offensive firepower cause a decrease in German capacity. Some of the signposts point out that Germany, “cannot live long under full scale and free exploitation of air weapons over the heart of its territory.” “The significance of Full domination of the air over the enemy- both over its armed forces and over its sustaining economy-must be emphasized.” “As the air offensive gained in tempo, the Germans were unable to prevent the decline and eventual collapse of their economy.” “The mental reaction of the German people is significant. Under ruthless Nazi control they showed surprising resistance to the terror.” “The German experience showed that, whatever the target system, no indispensable industry was permanently put out of commission by a single

83 USSBS Over-All, 101
84 USSBS Over-All, 107
85 USSBS Over-All, 107-108
86 USSBS Over-All, 107
87 USSBS Over-All, 107
88 USSBS Over-All, 107
89 USSBS Over-All, 108
attack. Persistent re-attack was necessary.”

Finally, “the achievements of Allied air power were attained only with difficulty and great cost in men, material, and effort.”

What this serves as is a reminder of the whole report and putting into context what is to be learned from the entire campaign. It is further complemented with commenting what the future will bring as the commission suggests the lessons to be drawn from the bombing campaign in Europe in World War II and what might be the possibilities of aerial warfare in the future. These will be discussed later in the Legacy section of the paper.

90 USSBS Over-All, 108
91 USSBS Over-All, 108
Chapter Three: Economic Analytical Reports

To complement the Over-All report of September 1945, the USSBS committee presented *The Effects of Strategic Bombing on the German War Economy*. J. Kenneth Galbraith as Director headed that report because this particular area was his specialty. The purpose of this report is to concentrate further on the economic study relating to the bombing campaign against Germany. The most intelligible motive for such a study is to reasonably assess with more definition what was discussed briefly in the Over-All Report. It must be remembered that the Over-All report covered all aspects of the air war relative to strategic bombing over Europe as was shown previously. This included bombing statistics and figures that focused on the progression of the allied bombing effort.

Galbraith’s particular area of study looks to attempt to define economic factors that contributed to the apparent air war success. The importance of economic factors are not lost on the committee that came from the business world, therefore it is only fitting that a dedicated report highlights this area. The opening commentary of the report reminds the reader of three considerations that were highlighted in the Over-All Report: the phenomenal increase of attack on the German war effort by air raids, the development of important technologies such as the P51 Mustang and early radar, and the choice of targets that was dictated by the military situation at hand. It begins its examination breaking the air war into four phases: “(1) the early period (until the end of 1942); (2) the period of limited capabilities (January 1943-February 1944); (3) the aircraft period (February 1944-June 1944); and (4) the period of full-scale offensive (July 1944-April 1945).”

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92 USSBS Effects on the German War Economy, 1
The significance to the reader is to understand the breakdown of varying degrees of bombing contribution to the Allied war effort. Looking at the bombing from this perspective will assist those that read the report to see why varying periods of the campaign resulted in mixed success. When looking at the bombing war from an economic standpoint, it can symbolically be compared to a quarterly report dictated by a corporation measuring different intervals of a fiscal cycle. This can be by chance since it is defined in the era of how the air war progressed, but it is difficult to be coincidental because the mindset of the chairman and his associates were focused on an economic mentality. Also important to note is this seemed rather cold and impassionate to the sufferings of human beings. A reader must understand that this is to be treated as an analytical report on warfare, which by its nature is cold-hearted and cruel. It therefore is necessary to put emotion aside when dealing with the subject as the Survey portray in the reports.

Furthermore, the committee presents a tremendous amount of visual graphs that support the findings presented in the report. In total, the arrangement gives 92 tables that span segments of interest such as; Strength and Losses of the Armed Forces 1939-44, Planned and Actual Production of Powder and Explosives 1938-44, Changes in Output of Total Munitions and Main Munitions Categories, December 1943-July 1944, and Indices of Motor Vehicle and Half-Track Production compared with Total Munitions Production, 1943-45. In addition to the tables presented in the report there are a group of thirteen exhibits offering supporting evidence such as; Total Labor Force, Including the Armed Forces, as of May 31, 1939-44, Number of German Aircraft Produced by Principal USSBS Effects on the German War Economy, 1

93 USSBS Effects on the German War Economy, 1
94 USSBS Effects on the German War Economy, v
Types, Monthly, 1941-44, German Production, Consumption and Stocks of Aviation Gasoline, 1940-45, and Indices of the Production of Army and Aircraft Weapons and Ammunition, 1939-45. The report even offers additional 115 tables in the Appendix concerning Labor, Capital Equipment, Construction, Basic Materials, Civilian Supply, and Armament. As shown by these various amounts of statistical information presented in the many pages of the report, there is no simple analysis being presented by the committee. Rather it is offering tremendous supporting evidence in a matter of style similar to a trade and industry measure to focus on economic factors related to the air war.

The study as mentioned earlier presents the air war in four distinct phases, but important to this analysis is the substance that makes up the four phases. This economic report sites seven specific criteria plus a summary and conclusion that are important for examination in an economic mindset and they are; German War Economy in Perspective, the Supply and Use of Labor, The Supply and Use of Capital Equipment, The Construction Industry, Basic Materials, Civilian Supply, and finally German Armament Production. The areas studied in this analysis supply information crucial to an economic format since materials, construction, equipment, and production all have a pertinent place in the economy of the Reich.

The section on the War Economy in Perspective starts by addressing that “to assess the impact of strategic bombing on Germany’s ability to wage war, an understanding of the structure and vulnerability of the economic target is indispensable.

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95 USSBS Effects on the German War Economy, vi
96 USSBS Effects on the German War Economy, vii-ix
97 USSBS Effects on the German War Economy, iii
Equally necessary is full knowledge of German strategy which in considerable measure
determined economic plans.” Immediately it is to be understood just as has been
evident in the name of this report as well as the majority emphasis of the Over-All report
the importance of economic primacy. The section continues by explaining the structure
of analysis with “The Survey has conducted extensive investigations of the relevant
documents on Germany’s war economy, and has interrogated nearly all of the key
survivors of the group that planned, or were associated with planning, Germany’s war
Strategy.” Some of the information listed in this section included documents from the
Reichsminister for Armament and War Production Albert Speer. This section also
included information from postwar interrogations by important figures, who were under
indictment for war crimes, such as Speer, Otto Sauer who was Albert Speers’ practical
right hand in the armaments program and Reichsmarshal Herman Goering who served as
head of the Luftwaffe and deputy fuehrer to Adolf Hitler. In this particular segment each section has its own
criteria. It starts with

Germany’s War Plan And Its Development that focused on Germany’s initial strategy of
blitzkrieg warfare that assumed a short and decisive war. The subsequent development of
a war plan toward protracted war and how the economy adjusted to this war is
discussed. This area is important to the context of bombing because for the Survey to
establish results of the campaign in a credible way it must understand what was the
German war plan to be able to affect it.

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98 USSBS Effects on the German War Economy, 15
99 USSBS Effects on the German War Economy, 15
100 USSBS Effects on the German War Economy, 15
101 USSBS Effects on the German War Economy, 15
The section included, *German Economic Planning*, which focuses specific to the planning of the German economy in a wartime footing. The section starts by realizing that “Hitler’s economic aim was directed to the dual purpose of increasing employment and developing the military striking power indispensable to his policy of territorial aggrandizement.” Importance of this section is to be able to analyze the economic strategy of Germany in the course of the war, so it would be easier to distinguish if and how bombing affected the economy by alteration in planning.

The next area is *The Supply And Use Of Labor*, which is important because, “The labor supply of Germany during the period of air attack presents two sets of problems. In the first place the combined bomber offensive directly affected the size and efficiency of the labor force. Air raids and air raid warnings interrupt the flow of work, prevent workers from reaching their places of work and cause disorganization of various kinds, and destroyed workers housing and killed many workers. The effective labor force is thus reduced- and this reduction and its consequences are one of the results of bombing to be assessed.” The explanation discussed above is somewhat self-explanatory, but in an economic sense a labor force is necessary to produce. The lack of personnel on the account of bombing raids is a relevant form of analysis to effects of an economic nature. One particular section in the chapter is *The Effects of Strategic Bombing on The Labor Force*. This section highlights the phases mentioned early in the report claiming, “During the early months of strategic bombing no appreciable effects are noticeable. By the third quarter of 1944, however, there was a substantial weakening of the enemy’s

102 USSBS Effects on the German War Economy, 19
103 USSBS Effects on the German War Economy, 29
104 USSBS Effects on the German War Economy, 39
labor power, and it is estimated that at this critical stage of the war about 5.0 million workers were pinned down (which means that they were unable to move freely to be effective) by strategic bombing.”\textsuperscript{105} What is to be understood by the analysis in this area is that the Survey team is continuing to scrutinize the results in an economic fashion by highlighting the progression of economic downturn sought by the Allied war effort. The idea is to recognize the labor situation as part of the war machine and by discerning the figures related to labor one could see one facet of the effort to limit Germany economically by air bombardment.

The next area of the report is focused on The Supply and Use of Capital Equipment.\textsuperscript{106} The significance of this area is that in an economy the way a large piece of equipment is used in production is essential to producing finished product, such as ammunition, trucks, and locomotives. If bombing affects this equipment, it therefore affects the economy. According to the analysis of the Survey, “Among the basic factors of production, labor can be attacked but indirectly and natural resources in situation or in stocks are relatively invulnerable. The enemy’s capital equipment was, therefore, the general target of the American strategic forces.”\textsuperscript{107} Again the focus is on a particular affect bombing had on a part of the economic puzzle lending to the concept of bombings strategic importance to affecting a war effort. This area looks at Excess Capacity of Industrial Equipment, Damage to and Destruction of Machine Tools by Air Attack, Productive Capacity of the Capital Industries, Functions of Equipment Industry in War Economy, Analysis of Machine Tool Industry, Dispersal and Other Passive Defense, and

\textsuperscript{105} USSBS Effects on the German War Economy, 39 (parenthesis utilized by author)
\textsuperscript{106} USSBS Effects on the German War Economy, 43
\textsuperscript{107} USSBS Effects on the German War Economy, 43
Decline in Output Towards End of War. Each of these areas focus on capital equipment and their progression in respect to the bombing war and by looking into each area the evidence is compiled to suggest further the notion of targeting the economy.

The Construction Industry was the next on the list of analysis since a country “depends on its construction industry to restore its industrial and transportation plant”. One of the questions posed in this portion of the report among others is, “to what extent strategic bombing forced the Germans to maintain their construction industry?” To answer some of those inquisitions they focused on; Construction Before the War, Construction Volume and Employment During the War, Construction Resulting From Allied Bombing, Changing Administrative Organization, Maintenance of Factory Space For War Production, and finally Ultimate Collapse. Each area once again focus economically on the progression of this area and its contribution to understanding the complex warfare the Air Corps was trying to subdue in Germany.

Basic Materials economically is strategically important to any nation in peace and war. Without them no economy can function. The Report begins with a look at the German materials available to them. Their importance to a war effort was they serve as the staples of war product since they are the metals, lubricants, and fuels that help galvanize a war economy. Key sectors that are investigated are; Oil, Rubber, Nitrogen, Coal, Iron and Steel, Light Metals, Nonferrous Metals and Ferroalloys, and Electric

108 USSBS Effects on the German War Economy, 43-52
109 USSBS Effects on the German War Economy, 53
110 USSBS Effects on the German War Economy, 53
111 USSBS Effects on the German War Economy, iii
112 USSBS Effects on the German War Economy, 111
Power. The Report looks into each of these specific areas and how bombing had affected each key sector of the material portion in the economy. This again is designed to make bombing participation understood whether the effects were felt uniformly or not.

Next in line for analysis by the Report was the area of Civilian Supply. The focus of this portion of study was to understand the role of bombing upon the economy that affected the average German household. The key areas studied in this section were; Nature of Attack on the Civilian Economy, Civilian Consumption During the War, Food Supply, Clothing and Textiles, Leather and Shoes, Housing, Coal, Durable Consumer Goods, and finally Tobacco and Printing. Each area played their particular role in offering a comfort to the civilities that came with society. Each area being subject to some kind of hindrance by bombing may have on some level inhibited the economy, which in turn would possibly affect civilian morale.

Finally, the report takes a look at the most important aspect directly affecting the front line and that is German Armament Production. The simple reality in any war effort is the material that is built on the factory floor is the material that allows a military to impose their will upon an adversary. These areas of interest in this chapter are; Position of the Armament Industry in the Economy, Expansion of German Munitions Output, Effects of Strategic Bombing, Aircraft, Armored Fighting Vehicles (Panzer), Motor Vehicles and Half-Tracks, and finally Weapons and Ammunition. Each perspective area played their significant role in contributing to the German war effort.

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113 USSBS Effects on the German War Economy, iii
114 USSBS Effects on the German War Economy, 129
115 USSBS Effects on the German War Economy, iii
116 USSBS Effects on the German War Economy, iii
117 USSBS Effects on the German War Economy, iii
The Survey having the ability to evaluate the effects of bombing on those areas make sense, since economically restricting material essential to fighting in a modern full scale mechanized war. This area is consistently scrutinized, as it should because it played such a crucial role in the capabilities of the Wehrmacht and Luftwaffe.

In addition to the general economic examination by the USSBS in 1945, there were individual investigations by the Survey that were submitted in variously from 1945 to 1947 to help establish consequence of bombing on individual sites. Though they will not be discussed in great detail in this paper, it is important to recognize these reports as they support the idea of analysis concerning economic warfare by strategic bombing. The reports submitted for observation span various areas of German manufacturing as well as logistical findings concerning the flow of operations that were “written primarily for the U.S. Strategic Bombing Survey in preparation for further reports of a more comprehensive nature”.\footnote{USSBS Commitee, \textit{Friedrich Krupp Germaniawerft Kiel, Germany}, Washington D.C. (January 1947) ii.} It all plays its part in presenting individual parts in the larger scheme that was the campaign.

Representative areas included specific manufacturing facilities like Krupp steelworks ship and submarine building facility in Kiel Harbor of Germany, which was attacked twenty-four times during the course of the war.\footnote{USSBS, Friedrich Krupp, 2} Fock Wulf Aircraft Plant in Bremen, Germany, which was attacked thirty-four times.\footnote{USSBS Commitee, \textit{Fock Wulf Aircraft Plant, Bremen, Germany}, Washington D.C. (January 1947) 1.} Plus cumulative reports specific to general industry such as \textit{The German Anti-Friction Bearings Industry Report}. It also made individual reports concerning logistical operations important to the economy.
such as transportation as it has been argued earlier that it is essential to moving the economy forward. The purpose is not only to reinforce what has been described in the two major reports, but also to supplement any inquisition there may be on the mechanics of the operational productivity that led to these specific sights to be attacked. Also of importance is the need to break down with more specificity these particular sections according to production and logistical data that warrants a figure to allow judgment of failure or success. This information that is not allowed to be presented in great detail in the Over-All and Economic reports is crucial in that it presents supplementary evidence and therefore essential to the overall economic analysis.

The program of the committee is simply to acquire the data that was in the cross hairs of the bombing campaign and assess it. It does this efficiently by covering the different aspects of the entire machine, but in that examination there must be results that establish what are the achievements for the expenditures. It is simply offering a cost and effect analysis with which the answers are presented in the next chapter.
Chapter Four: Findings

The preceding chapters should have made clear that the majority of the analyses related to the total survey of the USSBS are based on an economic structure. Information the reports were trying to encompass are interrelated with many components since an economy include individuals who work industrial machinery, to the finished products that they produce. As to the Survey, its predominant mission, based on the areas of interest, is to understand if and how attacking bomber formations supported a war effort by disrupting the economy in its entirety. It should be evident by now that it is not a simple analysis promoting the Air Corps based on assumptions of what was worth bombing or a simple “boondoggle” as mentioned before.

This is not to say that there was no controversy in the findings. One of the things pointed out was by John Galbraith himself in the process of making conclusions for the Survey. In Stewart Halsey Ross’ book *Strategic Bombing by the United States in World War II* it is noted, “the editing job, he (Galbraith) later commented, became a regular war of attrition, with sentence by sentence review by colleagues ‘who chose to interpret data differently.’”¹²¹ Disagreements such as this happened for obvious reasons with a bureaucracy of people studying the same topic. MacIsaac notes in *Strategic Bombing in World War II*, “they (Survey Divisions) soon found themselves arguing-to take one example- not about the effects of bombing on aircraft factories, but about whether attacks on aircraft factories were more significant than those of aviation gasoline production.”¹²²” MacIsaac found the remedy with, “such debates, when significant, were resolved at the

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¹²¹ Halsey Ross, 202 (parenthesis utilized by author)
¹²² MacIsaac, 161 (parenthesis utilized by author)
levels of the directors”. But it is also relevant to know that the directors were of their own mind so there will always be a source of bias as MacIsaac points out.

There are particular categories that serve the interest of analysis based on the targeting decisions made by allied commanders. Most important of all there is a need to make sense of it all and come to some conclusions of how the aerial war had faired in context to World War II. The survey in its totality attempts to establish this but not in the manner that provides a definitive conclusion. For the purposes of this paper, all findings in the reports cannot be discussed here, as it would require volumes to go over all the details accumulated. It is rather more important to focus on the major findings that contributed in the analysis as they serve most relevant to the successes and failures of the air campaign.

The conclusion of USSBS analysis highlights that, “Allied air power was decisive in the war in western Europe. Hindsight inevitably suggests that it might have been employed differently or better in some respects. Nevertheless, it was decisive. In the air, its victory was complete; at sea, its contribution, combined with naval power, brought an end to the enemy’s greatest naval threat- the U-boat; on land, it helped turn the tide overwhelmingly in favor of Allied ground forces. Its power and superiority made possible the success of the invasion. It brought the economy, which sustained the enemy’s armed forces to virtual collapse, although the full effects of this collapse had not reached the enemy’s front lines when they were overrun by Allied forces. It brought home to the German people the full impact of modern war with all its horror and

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123 MacIsaac, 161
124 MacIsaac, 161
suffering. Its imprint on the German nation will be lasting.”

That seems to be a very bold statement on the grounds that many failures and statistics seem to counter the premise of decisiveness when it comes to the air war, but the statement must be looked upon with more scrutiny. As the details of the reports show, there is no absolute war winning capability of the strategic bomber.

Was it decisive? Yes it was, but where it was applicable such as the air war where in the end with support of fighter aircraft it roamed the skies at will to bomb German targets indiscriminately. It also chimes in the matter of a supporting role according to the Survey as it states in the submarine war as “contributing” in combination with the Navy. So, important to take from this passage is to understand that the report does not imply that it single handedly defeated Germany by bombing it to oblivion. It has its place in warfare to control and its place to assist as demonstrated by the findings in effect of bombing. The report presents a study that reveals bombing as an asset that contributes to an entire war effort by being used in various operations by destroying economic targets of value. This fails to achieve the preconceived assessments by air war enthusiasts like Mitchell and Douhet where it single handedly can cause submission with precise attack, but it does reveal the value that was not available in the previous World War.

For example of assisting in the war effort, it partially highlights curtailing production by harassing industry and persuade the German leaders to disperse its centrally located manufacturing such as aircraft into separate smaller segments. That may not have severely limited production, but it did potentially curtail further increases in

\[125\] USSBS Over-All, 107

\[126\] USSBS Over-All, 107
The information provided is necessary to consider not because the practice single handedly withheld Germany from producing war material decisively since the survey revealed that production numbers were increasing until late 1944, but the information accounts contributory factors that impeded potential capacity. A study by Richard Overy in *Why the Allies Won* states much the same with, “Bombing gradually dismembered the economic body.” Reichsmarshal Herman Goering who was interrogated by Henry Alexander promotes this part of the findings stating, “Basically, I can say that the widespread dispersal caused considerable delays due to the bad transportation, but generally speaking it functioned all right, although quality suffered considerably. It happened, for instance, that the fittings at the assembly were not accurate enough, and similar things.” The analysis presented exhibits this capability with relativity by pointing out the value of making the industry disperse. The point especially by Goering does not make it a defining factor, but as the Survey points out, it did make its presence known and frustrated the German economic machine.

The Survey also takes the timeline of bombing into account that cannot be ignored. The progress of bombing changed as the war progressed. Average tonnage of bombs dropped monthly in 1943 was about 26,000 tons in the combined effort. By 1944 the average increased to 131,000 tons, and finally in the few months of war in 1945 the average topped at a considerable 170,000 tons. By the end of the war that increase

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127 USSBS Effects on the German War Economy, 107
130 USSBS Effects on the German War Economy, 1
131 USSBS Effects on the German War Economy, 1
was over six times the average. The Survey again is displaying how the implementation of more attacks correlate to the decline of Germany. That amount of pressure from the air with the full force as planned for by commanders demonstrates its usefulness and latter success once the right combination of method and practice had been achieved. That strategy included the aforementioned dispersal, plus the attacking of various transportation networks such as rail systems, road/bridge networks as well as oil, material, and chemical industries. There is recognition of a patchwork of necessities that contributed to disrupt the economy rather than the single golden target.

This also goes back to the four phases of war broken down by the Survey’s conclusions, which show the fourth phase of July 1944 to April 1945 all out bombing. The tonnage statistics presented above represent three of the four phases presented by the USSBS. The 26,000-ton rate falls in the Survey’s timeline of “the period of limited capabilities”. The period limited of capabilities concerning the lower ton rate involves some of the darkest periods of the air campaign for the Allies, such as the Schweinfurt Ball Bearing raids of August and October 1943. Also important here is to understand that the Survey looked at the failures of the campaign by recognizing that important event whether it was major losses such as in Schweinfurt or inability to sustain itself without fighter coverage. It must be noted that this target area covers the entire industry not only one land designation with a total of 1,557 tons of bombs dropped where total bombing in 1943 constituted 206,188 tons. In contrast to the latter stages of bombing, the Survey in collective fashion considers this stage appropriately a small proportion of bombs were dispensed with at that time. This series of raids represent one of the major factors vocal

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132 USSBS Effects on the German War Economy, 1
133 USSBS Effects on the German War Economy, 4
detractors have on the air campaign and the USSBS analysis with the August raid resulting in thirty-six out of 183 unescorted bombers shot down.\textsuperscript{134} The October raid sent in 228 bombers with a loss of sixty-two from an approximate 291 encounters from the Luftwaffe as well as Flak.\textsuperscript{135} Unfortunately the results did not warrant the losses with an approximate ten percent of ball bearing machinery destroyed or damaged.\textsuperscript{136} The Survey admits that, “production on the whole received no more than a temporary setback.”\textsuperscript{137} It continues with the losses stating, “No air force can continue to absorb such losses. Accordingly, the Eighth AF had to confine its operations to the areas where fighter operations were available. This meant that until the arrival of sufficient numbers of long-range P-51’s, operations deep into Germany were impossible. In one raid, the Eighth Air Force had temporarily lost its air superiority over German targets.”\textsuperscript{138} This is a major admission of the inability for the bomber to do the job alone. This counters a major premise of air force doctrine that in strategic bombing the force of many bombers can fight into a heavily armed target, deliver their payloads successfully, and fight their way back home.

What is important in that assessment is that it certainly goes in terms of an economic analysis based on cost and effect. The Survey uninhibitedly cites the flaw of the unsupported bomber as not producing the intended outcome, which points to economic value of an operation. The establishment of a high loss rate with small results does not hide the failure of the bomber offensive; it rather acknowledges it in a formal

\begin{itemize}
\item \textsuperscript{134} USSBS Committee, \textit{The German Anti-Friction Bearing Industry}, Washington D.C. (January 1947) 28.
\item \textsuperscript{135} USSBS The German Anti-Friction, 28
\item \textsuperscript{136} USSBS The German Anti-Friction, 29
\item \textsuperscript{137} USSBS The German Anti-Friction, 29
\item \textsuperscript{138} USSBS The German Anti-Friction, 29-30
\end{itemize}
analysis of why the target preference was not fruitful enough in the war effort while highlighting it in the appropriate categorical timeline. It also pinpoints the flaw of the lone bomber theory expressing that without proper support, undertakings such as this were not sustainable (though this warning was not adhered to in later conflicts). This certainly counters the idea of preferential treatment toward the Air Corps, and presents the commanders as accountable to the consequence of its decisions.

The major increase of tonnage that historically indicates the turn for the allies in 1944 with the eventual commitment of D-Day landings occur in “the aircraft period” and later after the Air Corps’s release from Eisenhower’s control in “the period of full scale offensive”. The Survey attributes this increase in assisting with Germany’s downfall by preventing the aerial threat of the Luftwaffe through contributory bombing of aircraft industry as well as luring the Luftwaffe into the air to be destroyed by supporting tactical fighters such as the P-51 Mustang. In context though this was not a strategic win, but a tactical one as referenced in the Aircraft Division Summary Report. The report states, “Strategic bombing bears the same relationship to tactical bombing as does the cow to the pail of milk.” For example, the heavy attacks against the German airframe assembly in early 1944 failed as a strategic effort because it produced only a mild indisposition in the great industrial “cow” that fed the Luftwaffe. “But in a tactical sense the results were tremendously important. Hundreds of aircraft that might otherwise have opposed Allied landings in Normandy were left battered and twisted in smoking ruins of Marienberg, Augsberg, Weiner Neustadt and Dessau. They were not available at the time

139 USSBS Effects on the German War Economy, 1
141 USSBS Aircraft Division Industry Report, 5
when the enemy needed them most.”142 The admission of this failure counters the idea that the reports only highlight the Air Corps as strategically effective. However, what is important to take from this contributory conclusion is that the Survey once again points to the different methods that participate in the bigger concept of the war effort. The study also considers economic matters examining by, “Counting up the totals, however, and contrasting their potential capacity with actual accomplishment, it appears from this study that 18,000 aircraft of all types were denied the German Air Force in the period of intensive attack between July 1943 and December 1944. (Reported production for the same period totaled 53,000 aircraft.)”143 The conclusions of the Survey regarding the aircraft segment continue by assessing, “Of the estimated production loss, roughly 78 per cent or 14,000 aircraft were fighters.”144 By keeping such a number of defensive fighters out of the air at times when the air war was critical, the job of wrecking Germany’s manufacturing industries, her transportation system and her cities, was rendered that much easier and the war was probably shortened by some months.”145 So as described above the Survey does not just look at a target and analyze that by simply bombing it accomplished superiority. The consideration of how it impeded the German effort by supplying rates of production and potential material denied, again foster the economic principles that provide evidence of the air wars accomplishments.

Conclusions such as this are not simply analyzed by the Survey teams. Evidence that supports the conclusion above is based on testimony by USSBS interrogations and reports of key personnel like Dr. Kurt Tank who was the head of Focke–Wulf Aircraft

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142 USSBS Aircraft Division Industry Report, 5
143 USSBS Aircraft Division Industry Report, 6
144 USSBS Aircraft Division Industry Report, 6
145 USSBS Aircraft Division Industry Report, 6
Company. Conducted by a Colonel Perera of the USSBS staff, the interview notes reference that “In the winter and spring of 1944, the U.S. Air Forces hit all four of Focke-Wulf’s Eastern plants. The average production was 20 per cent of production for a period of two months.” It continues with, “The assembly plant in Marrienburg was heavily hit and more than 100 casualties resulted. Never-the less, production stopped for only three weeks, and the pre-raid figure was attained in six weeks.” Important in this perspective to the conclusion is that again there is a recognition of the contributory factors expressed economically that participated in the greater war effort while again recognizing that it did not possess the sole potential of defeating Germany as the effort was restored in a short order. This information clearly is taken into account in the findings. Though it is one small facet in the larger German economy it is a major one considering the aircraft industry represented the builder of direct aggression to allied air power and represented a considerable focus to allied command in 1943 and early 1944.

The emphasis on the air campaign in early 1944 suggests the eventual winning strategy of the air war is supported in reports. As a matter of fact as the war progressed, tonnage amounts increased tremendously in the final year and a half of the war supporting the idea that strategic warfare was viable as the reports convey. The first two quarters of 1944 saw a total of 447,916 tons of bombs dropped and the remainder of the war, which represented the final phase or “full scale offensive” of July 1944 to April 1945, produced a total of 1,234,767 tons of bombs dropped. That constitutes a total of

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147 USSBS Interview with Dr. Tank, 14
148 USSBS Effects on the German War Economy, 4-5
1,682,683 tons dropped in the time period where the Survey conveys that bombing became decisive in the war.

To look at the bombing and where the bombs were being dropped, the airfields were viewed with interest to the strategic commanders under direction of Gen. Dwight D. Eisenhower, commander of allied forces in Europe, because aircraft can impede any land invasion; therefore they were also of interest to the survey teams. The importance of this area is also that it directly had a role in impeding the bombing effort by allowing a staging area for the offending fighters. The facts point that in 1943 no significance was placed on airfields as a target according to survey information. This falls in line with the “period of limited capabilities” where many of the negative performances of the bombing campaign occurred with heavy losses due to defensive fighter sweeps by the Luftwaffe with for example “a swarm of three-hundred hovered over Frankfurt along the path of the bombers.”

This area was not considered top priority like oil and transportation in early to mid 1944, but the bombing totals suggest otherwise. The statistics offered by the Survey reports state that 53,342 tons of bombs were dropped in the first two quarters of 1944. Direct impingement of this German asset constitutes the lessening of relevancy in the total war effort. The findings are supported by the Goering interview when asked about bombing of hangers and such. Goering stated, “I could not say that they were a major factor, but they naturally did contribute.” It also lends to the increase of capabilities of the bombers that according to the Survey reached an estimated 1,600

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149 Overy, 121
150 USSBS Effects on the German War Economy, 4
151 USSBS Interrogation of Goering, 5
bombers at the start of 1944.152 This total increased for the remainder of the war with 71,312 tons of bombs dropped. The point here is that the survey illustrates direct points that impede German ability to carry on with a dimension of their war effort by demonstrating bombs to target in a timeline fashion. This again points to an economic analysis as it directs to cause and effect.

Another area of importance that the Survey look toward are primary targets such as oil production that was the fuel of the economy through lubrication and energy of machinery and weapons which took 23,608 tons of bombs in the third phase and 192,714 tons in the fourth phase.153 The commanders recognized that the Germans never had a great supply of oil and fuel, which decidedly made it a focal point according to Survey findings. There was a need for utilizing synthetic stocks to supplement the great demand by the German military. This made the USSBS pay attention to the efforts to curtail it. It establishes that only in the latter stages of the war did the strategic bombing efforts capitalize upon the correct weak links of the German economic machine. It promotes that the bombing efforts adjusted to meet the need of the requirements necessary at the time, as well as establish that the bombing effort could produce relevant results of an economic value in contributory fashion.

For example the report states that synthetic production produced ninety percent of aircraft fuel and thirty percent motor fuel.154 The average production was “359,000 tons in the four months preceding attacks to 134,000 tons in June (1944) and 24,000 tons in

152 USSBS Effects on the German War Economy, 4
153 USSBS Effects on the German War Economy, 4-5
154 USSBS Effects on the German War Economy, 12
September (1944)." Corresponding to these numbers the tonnage of bombs dropped in 1944-45 at the height of the campaign reflected the decline with 216,322 tons fallen. There is a correlation of increase of targeted bombing of oil and a decrease in production. Dr. Karl Saur who was Albert Speer’s assistant recalls the effects of bombing in a summary report of his interrogation. He saw the bombing as “much more serious.”

“According to Saur there was no oil shortage in Germany up to June 1944, in the sense that neither production or military operations would have been effected thereby. The raids in June and July had, however, a strong effect and this industry could not recuperate so quickly due to technical reasons.” It continues, “The effects on refineries were much more serious than the effect of raids on hydrogenation plants. No more aircraft gasoline was produced in Germany after December 1944. Panzers were gradually grounded (immobile) after December, and fighters, when stocks were exhausted, a few months later.” This coincides with the known German tactical actions to acquire fuel later in the Ardennes offensive of December 1944. So there is pertinent relevance to what the report is suggesting focusing on key areas like oil.

The last and possibly most vital area of the physical economy, transportation was scrutinized in the reports. Transportation included marshalling yards, rail lines and bridges that proved essential to stopping the German war economy by limiting its transportation lines of supply. Transportation became a focus of bombing as it is implicated in moving military assets such as men and material. It also serves as an

155 USSBS Effects on the German War Economy, 12
156 USSBS Effects on the German War Economy, 4-5
158 USSBS Interrogation of Dr. Saur, 3
159 USSBS Interrogation of Dr. Saur, 3 (parenthesis utilized by author)
essential part of the economy since it allows the movement of product to maintain an economy. So in turn it becomes an important area of analysis for the Survey.

The Survey reports that in the height of bombing during the last two phases of the campaign, transportation received 508,093 tons of bombs against it.\(^{160}\) It stood for one fourth of each major targeting sector in bombing. Its closest category to follow was general area bombing that at its nearest was 23,000 tons off of the transportation sector. Prior to 1944 the total tonnage dropped was an anemic 22,335 tons, which if one looks at the timeline of the war, Germany at least in the Western front was still in a position of power.\(^{161}\) Though there were controversies as to its effectiveness by allied commanders with the German capability to rebuild damaged structures, the Survey notes that its importance was not the system but in what it transported and the delays that tallied up as time went on. That was coal, steel, rubber, oil, and other materials necessary to keep the German economy moving.

Sentiments are supported by interrogations like Speer noting, “The destruction of transportation resulted in stoppage of coal shipments. This in turn curtailed industrial production.”\(^{162}\) Evidence like this is supported by information of Speer informing Hitler in November 1944, “that the aerial attacks on Germany’s railroads were seriously affecting Germany’s war effort”.\(^{163}\) So with the admission from the head of German productivity admitting that there was significance to bombing, which in turn registers to the contributory factor played on the economy, once again reverberates to the findings of

\(^{160}\) USSBS Effects on the German War Economy, 4-5
\(^{161}\) USSBS Effects on the German War Economy, 2-3
\(^{163}\) Halsey Ross, 202
the Survey seeing the contributory efforts over a single decisive bombing run to cripple a war machine.

Important to the bombing campaign that without question has served as the most controversial of factors affecting the aerial effort has been the use of the indiscriminate bombing in cities (so-called “area bombing”) that the U.S. Air Corps (by then the USAAF) took part in. Though this did not physically limit the war effort by exhibiting losses of material, it did potentially inhibit the economy due to personnel lacking the will to go to work. The focus of that bombing was to affect the morale of the German people, which was not the original intention of the bombing strategy presented by U.S. commanders. The idea of precision attack was being questioned as a strategy, and attacking populations became part of the effort to curtail the German economy by American forces and therefore worth the examination of the Survey.

The accounts produce a drastic amount of armament that was dropped in a measure to affect the morale of the German population. This certainly goes against the doctrine of the U.S., which prided itself on the principle of precision strike to subdue an adversary. For example in 1943, 131,668 tons of bombs were dropped on designated area targets.164 In 1944 to April 1945, a total of 421,393 tons were dropped upon area targets that focused on population centers. To be fair this total included amounts that were dropped by the RAF, which made clear early in the war that area bombing was their method of choice. It is quite a controversial measure as it was considered barbaric to American standards. But what is important to take into account here that the tactic is being addressed. The matter is looked at with serious study on how it affected

164 USSBS Effects on the German War Economy, 3
production, as once again it was important to the maintenance of production. The findings state, “In the third quarter of 1944, beyond which period the data grow to scanty for use, the threat of strategic bombing reduced the labor force available for other purposes by at least 4.30 to 5.45 million persons.” This is supported by interrogations that decipher the difficulty in maintaining personnel during and after bombing sorties. In a report of Fritz Saukel who was an infamous Nazi leader in control of labor deployment during the war states that, “After the raid (Hamburg), however, there was a considerable flight of both German and foreign workers from the city.”165

There was a return of people (especially adult workers. Children were often left with relatives in the countryside) back after the raids, but what needs to be remembered here is that there was disruption in industry, most notable oil facilities in the area. The effects of the bombing were not definitive as it is admitted German people did not give in, but once again it must be kept in mind that the Survey interested itself in the matter of disrupting the war effort. That it did do if only in a contributory matter.

So what can be seen here is what the Survey saw as the effects of bombing in key sectors of the German war effort. Again these areas only scratch the surface of the total findings, but what must be acknowledged here is that the information provided focuses on the topic of how it affected the ability for Germany to carry on in an economic manner. Through bombing the survey points to different measures that curtailed the system, and through supported evidence by interrogations and captured documents, findings could be assessed into the reports with relevancy.

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Chapter 5: Legacy and Critique

The Survey was established as initially reported to develop what are the important factors that impacted the German war effort from aerial bombardment. Clearly by the points suggested earlier there was analysis based on the criteria of economic value to subduing the German war effort outside of direct front line conflict. The point of it all was to educate the public as well as government policy makers on the effects the Army Air Forces in World War II, as well as validate the Air Forces efforts. Once again it must be highlighted that not all avenues of legacy and criticism can be discussed here, as it would also contain volumes of information collected over the years.

First and foremost the Survey with the detailed analysis projected the efforts of the Air Corps and assisted in the establishment of the proposed Air Force. Second, it would help establish a framework that at the time was new in the realm of war. It must be remembered, that this conflict was the first contributable effort by aircraft in serious measure so there are questions to be answered to its value. It intentionally was also designed to produce concepts that can assist in the Japanese war that was thought would continue well into 1946. So in perspective to the anatomy of the USSBS, it serves as an important area of discussion.

To start there is a section where the analysis makes it suggestions on where to go forward to policy makers in government as well as the Army Air Force. The Over-All report points to “Of The Future” that offer these suggestions to be considered by those in Washington. It cites obvious things such as the need to keep the peace through avenues like the newly founded United Nations, but also to maintain diligence for the possibility
of a future war. Certainly the reports do not rank highly on reasons to keep war at bay from a moral standpoint. What the Survey does do is make clear the parameters of possibility in an aerial war. It also reminds us to not take everything noted in the review as dogma in future war, but to take the information supplied and apply it accordingly as a lesson of the past.

The most important effect the USSBS Report had was that it contributed to the establishment of an independent United States Air Force by the National Security Act of 1947. The role of the USSBS reports was to help establish efficacy based on its findings of effect. It as well nourished the hopes of people like Gen. Hap Arnold who at the outset sought for the information to contribute in making the Air Force become its own entity. Obvious to this analysis is that since the USSBS was the only significant analysis post World War II of the bombing campaign, the consequence of its information was invaluable since a majority of the reports came prior to the National Security Act in July 1947. Evidence to support this comes from Gian P. Gentiles paper *Investigating Oneself* referencing that Chairman D’Olier in a conversation with Paul Nitze points out that “Secretary of War Patterson told him of the great importance the Survey reports had proven to be with the unification of the armed services. ‘He (Patterson) said that repeatedly after many hearings our Report had been mentioned, with our particular

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166 USSBS Over-All, 109
167 USSBS Over-All, 109
169 MacIsaac 2-3
170 Stevenson, 130
insistence upon unification.”

With the Air Forces’ establishment in September 1947, the contribution by the report reveals this portion of its legacy with the acknowledgement of the independent Air Force.

Continuing with the Air Force, the USSBS also played a vital role in offering criteria for the Air Force to develop strategy based on the right and wrong practices of the campaign in WWII. “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. 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.”

The purpose of this section is to grasp the fact that the strategy was based on information by the evaluations, essential to the operations of the Air Force in future engagements. Though doctrine of a strategic nature was not always utilized as in Korea and Vietnam, it is essential to recognize that the information presented above follows an economic format of necessity based on principles of method scrutinized by the Survey teams across Europe. There is a clear link from the information presented by the reports to the doctrine formatted by USAF strategists. This is not to say atomic strategy was disregarded in action plans, but in this analysis of the European study, the

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171 Gentile, 12
conventional fare was far more relevant to typical strategy as atomic warfare would dominantly serve as a last resort.

To the idea of the Joint Chiefs executive role in the military, things must be recognized in progression. Though there was a figurehead in place prior to the actual position with Admiral William Leahy, who coincidentally preceded the USSBS, the role was only made official on an amendment of 1949 to the National Security Act. The job taken by famed Gen. Omar Bradley served as a waypoint that coordinated military branches with the government, as the office serves under the Secretary of Defense who in turn serves under the President. This provided efficiency and to some point further unification to the military bureaucracy that to some level plagued the war effort. As the role portrays, there is clear lineage to the recommendations set forth by the USSBS.

In the area of future civil government operations, the reports also assisted planning civil defense nation wide. For example in New York state the *New York Times* highlights a state bill that plans for any eventual war that would involve a need to protect the population. The committee headed by Frank Lynbrook made their reports in part from “results of the survey made in Britain, in continental Europe and Japan by the United States Strategic Survey Board.”

Finally there must be some focus on the critics and praises of the USSBS. Important to any analysis is to note that not all who looked at the reports found it as a viable piece of information. Unfortunately but also necessary, there was questioning to

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the relevancy of the reports. Obvious suspicion was placed on the fact that there was a clear wish to create a separate Air Force. With the push by the information in the reports, there was a new branch in the military to fight for the post war spending dollars that were set aside by the leaders in Washington.

The Navy in particular looked at the reports with contempt, as it surely would contend the dominance of Naval superiority in post war operations. The threat of the USAF becoming the preeminent service in a counter offensive operation would deplete the funds that the Navy wanted to reserve for itself in ships, aircraft, and technology. It had proven itself decisive in the Pacific campaign and therefore did not find the aerial campaign in Europe in the same light, which makes it not worthy of the status the Survey presented of it. The Navy is summarized best suggesting “the fact that The United States Strategic Bombing Surveys found strategic bombing moderately effective at best in both major theaters of war.”

Though this does not accurately present the offerings of the analysis, it does not show the Navy looking at the USSBS in a positive light. Criticism of the Air Forces’ ability to fight decisively is a criticism of the analysis itself since the USSBS felt that it did play a decisive role in economically dismantling Germany. The “moderate” effects of bombing seem to be streamline in comparison to the detailed highs and lows demonstrated by the reports. Sentiments were further escalated with the cancellation of the USS United States, a planned super carrier by the Navy. “The 189 million-dollar price tag was high, but the Navy contended the price was worth the

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175 Andrew L. Lewis, LCDR, USN, The Revolt of The Admirals (paper presented to Air Command And Staff College, Air University, Maxwell Air Force Base, Al., April, 1998), 11.
contribution to national defense.” 176 The government decided to utilize the funds in a strategic bombing force that can project military power in the similar manner that the Air Corps projected in the latter stages of WWII with many bombers flying over strategic targets. Economically, the bomber in multitude was found to be more viable than the single aircraft carrier theoretically based on the economic analysis of the USSBS.

Also of the reports critics were in national media reports from outlets like the *New York Times*, *Washington Post*, ABC radio, and NBC radio. For example, a week after Mr. Alexander had a press conference on the European Overall Report on October 24, 1945 the *Chicago Daily News* stated, “we’ll still need armies and navies”. 177 An article from the *Times* quoting Marine Col. S. R. Shaw highlighting analysis from the USSBS “that bombing of German industry was ‘merely and incidental contribution’ to victory because ‘new all-time production highs were achieved as more bombs were dropped.’” 178 What is evident here is that despite the military position of the critic he is speaking from a standpoint positioned toward the Navy being part of that branch. He does not point to relevant stocks noted in the Survey that accumulated in the years before the heavy bombing in the summer of 1944 till the end of the war. It is relevant but difficult to accept blindly with bias toward only sections of interest rather than its entirety. However it must be acknowledged that in an editorial review some years later in the *Times* it notes, “The United States Strategic Bombing Survey, a remarkably objective study for the devastating nature of the Second World War in Europe and the Pacific. Even though it

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176 The Revolt of The Admirals, 15
177 MacIsaac 144
had a martial aim to begin with, in scope it went far beyond the effects of bombing.”

So there is a tremendous swing from various representations out there in regard to the reports validity.

By the representations of various people and outlets that look over the reports there are many judgments that are made based on what is viewed as important. In the case of the Marine colonel, the work sighted only favors success through accidental effect of bombing rather than intentional affect. It can only be assumed that the focus is on early periods sighted of the campaign. This can misconstrue a potential observation without looking at the various sections investigated in its entirety. The Survey is far more detailed as the *Times* editorial board member eludes too, and unless there is a deep inspection of the reports in an economic nature there can be little serious or legible conversation on the topic. Other sources that saw the Survey in positive manner included Lowell Thomas of NBC radio and Gram Swing of ABC radio just after the announcement of the Survey’s release by Henry Alexander believing the work was “objective and impartial”. MacIsaac notes in his book Strategic Bombing in World War II regarding the media and Survey findings, “‘Allied Power was decisive in the war in Western Europe;’ many, however felt free to translate: ‘Air Power Beat Reich, D’Olier Survey Finds’ (*Philadelphia Enquirer*); ‘Bombers Beat Germany Civilian Survey Finds’ (*Washington Times-Herald*); ‘Strategic Bombing of Germany is Termed Decisive in Victory’ (*New York Herald Tribune*); ‘They Missed the Pickle Barrel But They Smashed

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180 MacIsaac 143
It is evident that the Survey was not taken poorly by the majority of the press unlike Drew Pearson of the Washington Post. Not assisting in the authenticity of the Survey conclusions are debates from significant people noted for their knowledge. Probably one of the best critics of the report and bombing would come from the inside with John Kenneth Galbraith. His position was high as it is noted that he was an important member of the economic division of the USSBS. His statements in successive years counter some of what the reports find economically stating, “that the great strategic air attacks had not appreciably reduced German war production. Nor had they effectively shortened the war.”

It is also noted in some other writings about Galbraith by Richard Parker who was Galbraith’s biographer stating the USSBS said that bombing “hadn’t in fact succeeded in destroying- or even in seriously hindering- the Germans’ war production capabilities…Even the special targeting of oil and rail facilities after D-Day did little more than slow the German army and air force, rather than cripple them.’”

It is difficult to take an answer such as this from someone who worked on the project. As a matter of fact it to some degree it makes one reconsider the entire analysis since a member of the staff potentially presents reservations of the campaign. It is rather convincing, except that the nature of Mr. Galbraith is like some other voices of discontent that can be questioned. Stewart Ross Halsey writes in his book that Galbraith when speaking of the atomic bombs dropped on

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181 MacIsaac 143-144
Japan, he “stoutly insisted they were not decisive.”\textsuperscript{184} That is fair to say as suspect for anyone. Donald Miller adds to this in his book \textit{Masters of the Air} where Galbraith “considered bomber warfare ‘a hideous thing’ ”\textsuperscript{185} It continues with “he had mastered ‘the first principle of warfare: Naturally suspect what air generals tell you.’ ”\textsuperscript{186} It is true that the man was invited to assist in the survey committee for his economic prowess as being part of the Roosevelt administration.\textsuperscript{187} What is questionable here is as to how Galbraith would gauge success based on his own biases and how he applied that information in public after his term with the USSBS.

But with the knowledge of skepticism and somewhat confusing belief in the atom bombs effectiveness, there is a serious question to Galbraith’s statements and assessments. It must be also noted that no kind of admonishment on this level was present in the actual reports. It has been mentioned before that Galbraith stated discontent while performing his role of assessing the effects, but one must question as to why he continued on with the Survey and why was this not exposed during the process? Miller also notes that some of the criticism that is expressed above was not present at the time of the war but during the divisive air campaigns of Vietnam in the 1960’s.\textsuperscript{188} With the volatility noted, it is difficult to simply cast aside the reports value on the count of critics with potential motive. So even though criticism is an important factor to any analysis, especially an economic analysis, the grey area at least in the few examples

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184 Ross Halsey, 206  
185 Masters of the Air, 458  
186 Masters of the Air, 460  
187 Masters of the Air, 458  
188 Masters of the Air, 462
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shown is substantial enough to leave the analysis authoritative with its legacy fruitful rather than cynical.
Chapter 6: Conclusions

Finally with the evidence presented above it leads to an answer to the all-important question, “Did the USSBS (Europe) prove to be an authentic and valuable resource to the importance of Strategic Bombing?” With the path of this analysis the reader should be clear based on the origins and direction of the examination that it certainly was. The United States Strategic Bombing Survey started on the grounds of a substantial need for a critical look at the theory of independent strategic bombing put into practice. Based on the principles of air power advocates such as Guilio Douhet and Billy Mitchell, the United States sent its strategic bombers across European skies hoping to strike the decisive blow that would end German aggression. It was the first time a tremendous effort of this nature had materialized, admittedly an Anglo-American effort, and there needed to be a documented examination and evaluation of what the efforts had achieved.

The USSBS teams made that effort during their trek across Europe in 1944 and 45 as displayed in the various details indicated in the text of this paper. Through the USSBS analysis, which followed an economic structure examining key results, the effects of strategic bombing had been established, and in addition, the Reports provided lessons for future exhibitions of air power in a military setting. Following the principle of economic value focused in a manner of highlighting positives and negatives based on a timeline fashion, reputable assessments had been made which proved the value of strategic bombing in conventional modern warfare between modern industrial states.

The USSBS Reports also demolished some early theorists’ belief in the ability of a lone bomber winning the war by knocking out key sectors of the enemy economic
structure. The findings note rather that the ability of the bomber is to contribute to the total victory through a relentless attack under the guide of good intelligence. The reports found the strategic bombing campaign was decisive, but certainly in the case of Europe, it was not the war winner on its own. As the analysis states, the contributions through harassment helped wear down the German economy that by the fall of 1944 was no longer in a position effectively to sustain itself viably in a war setting.

This understanding is important in the case of determining bias, as critics may wish to suggest about the reports. It certainly is true that the bombing effort failed to contribute in the manner that Douhet or Mitchell had hoped through aerial dominance with precision attack. The Survey however, accounts for this and explains aerial tactics were not able to succeed in a measurable way with the methods initially used. That is important to take into account in the accusations lodged against the reports of being a “Boondoggle” that paid little attention to the effects of bombing raids. Rather than falling into line with the theories that would make bombing more easily accepted and at the same time “assist” in the Air Corps independence, the USSBS Report took the flaws into account, indicated where and how bombing failed and how it improved as the war progressed, such as the fighter escorts and better targeting information and decision-making.

From this viewpoint, the USSBS proves relevancy and reliability by how it presented the information in a broad scope encompassing as much as relevantly possible. The anatomy of the USSBS demonstrates the effects of bombing as efficiently as possible in a war time setting purely because it took the good with the bad and assessed it through an economic manner that allow people outside the military to appreciate what strategic
bombing had produced. The evidence aforementioned shows that the Survey followed the economic viability path with pros and cons that did not disguise the faults of bombing, but viewed the campaign with a keen eye and supplied valuable information that was supposed to help in the Pacific effort along with potentials of how to do things right for the future. The USSBS also was viable enough that its analysis helped establish an independent United States Air Force in 1947 and provide for a reformulation of both the doctrines for implementing strategic bombing and, in the Cold War, for defending against such bombing.

The reports in this opinion are further validated, based on detailed analysis by many groups sifting through rubble and documents in and around Germany as well as interviewing various important personnel in the German government. This sits far and away from a “boondoggle” that measured bombing as “moderately effective” with ulterior motives. The evidence displays that the Survey was taken seriously and had an effect on future military spending with the Air Force, along with public policy as shown with defense planning in New York. The problem is that because the Survey is a massive series of reports looking at the air war in its entirety, it is easy to for someone to look at moments where things went wrong such Schweinfurt and say that the Survey was embellishing the effects. It is far easier to accept the bad that stands out immediately than the good based on overall analysis. Based on economic principles set forth by the men who led the USSBS, the research provided information as accurately as possible in a chaotic setting. From failures such as unescorted bombing to successes such as the rail line bombardment, the Survey for the most part covered the sectors judiciously as the details within the reports convey. For that reason, it is safe in the opinion of this author to
take the results as accurate because the men behind it followed their task with business like decisiveness. Their conclusions followed the same suit; therefore it is of this opinion that the course of the USSBS was one of verity rather than invention. Looking at the report with apprehension is nothing more than picking and choosing parts of history one chooses to believe.
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