STRATEGY RESEARCH PROJECT

SCHWERPUNKT
THE LUFTWAFFE AND THE ALLIED AIR CAMPAIGN IN EUROPE (1943-1944)

BY

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USAWC CLASS OF 1999

U.S. ARMY WAR COLLEGE, CARLISLE BARRACKS, PA 17013-5050

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ABSTRACT

AUTHOR: John J. Jacobson, Lt Col, United States Air Force

TITLE: *SCHWERPUNKT*, THE LUFTWAFFE AND THE ALLIED AIR CAMPAIGN IN EUROPE (1943-1944)

FORMAT: Strategy Research Project

DATE: 7 January 1999 PAGES: 42 CLASSIFICATION: Unclassified

Attaining air superiority over the German Air Force in 1944 did not in and by itself win the war in Europe, but it did make possible those operations that did. Had the Luftwaffe been able to maintain air superiority over the Continent from 1943-1944, the successful ground invasion at Normandy never would have taken place. Consequently, with his air force in control of the skies over the battlefield, Hitler would have been in a much better position to consolidate his territorial gains and negotiate a favorable peace with the Allies.

The thesis of this paper is that the Luftwaffe was Germany's strategic center of gravity in 1944 and it was the recognition of this, combined with the Allied leadership's use of air power in accordance with the principles of war, that gave the U.S.-British alliance its war-winning strategic advantage. Defeating the Luftwaffe and winning air superiority over the skies of Europe stripped Germany of the ability to protect itself and was the key event that led to the eventual collapse of Germany's armaments industry and military.

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> *"Fortunately for us, neither Hitler nor the German High Command understood the strategic concept of air power, or the primary objective of a strategic air offensive. The Germans had air supremacy on the Continent. They also had air superiority in numbers over Britain: but they were unable to establish control of the air, and this was essential to carry out sustained operations. It was apparent to observers in 1940 that the German leadership was wedded to the old concept that air power was restricted to support of fast-moving ground troops and didn't have an independent mission . . . "*[2]
>
> — General Carl A. Spaatz, first Chief of Staff, USAF

Following Dunkirk, Hitler and the German military stood on the threshold of European domination. The German 38th Corps, led by General Erich von Manstein, stood poised for the planned invasion of the British Isles, code-named SEALION. Across the narrow channel lay Britain, now alone in its fight against Nazi rule of the continent. In June 1940, Manstein believed Germany enjoyed "the decisive advantage of not initially having to face any organized defense of the British coastline . . . from troops that were adequately armed, trained and led. It is a fact that as far as her land forces went in summer 1940, Britain was to a large extent defenseless."[3] The invasion never materialized. In Manstein's opinion, "the decisive reason is the fact that . . . the Luftwaffe had not attained the requisite air supremacy over British territory."[4] For Hitler, the failure of SEALION would

prove to be an historic lost opportunity that would never return.

In contrast, four years later on June 6, 1944, the skies above the Allied invasion force at Normandy were clear of German aircraft. To gain their foothold on the continent, the Allies put ashore 325,000 men in the first week. They faced a million and a half man German army in Northern France organized into 60 divisions, yet they prevailed and began the long victorious march toward the German heartland.[5] The difference between these two scenarios was air power, and in particular air superiority. The Allies were victorious because they correctly identified and defeated Germany's "center of gravity, the hub of all power and movement, on which everything depends."[6]

Air superiority on the modern battlefield is a prerequisite for successful operations, achieving it enables all other military missions. The architect of the U.S. air effort in the Gulf War has pointed out that, beginning with Germany's attack on Poland in 1939, "no country has won a war in the face of enemy air superiority, no major offensive has succeeded against an opponent who controlled the air, and no defense has sustained itself against an enemy who had air superiority. Conversely, no state has lost a war while it maintained air superiority . . . air superiority consistently has been a prelude to military victory."[7]

In the five months before the invasion, the Luftwaffe was emasculated in the air and on the ground by American fighters while the strategic bombing campaign attacked German aircraft manufacturing centers and assembly areas. The Luftwaffe's defeat enabled the invasion to proceed without threat from German air and prevented the movement of superior numbers of German ground forces from reinforcing the Normandy area.[8] General Von Rundstedt, the German commander in France during the invasion said, "The Allied Air Force paralyzed all movement by day, and made it very difficult even by night."[9]

The thesis of this paper is that the Luftwaffe was Germany's strategic center of gravity in 1944 and it was the instinctive recognition of this, combined with the Allied leadership's use of air power in accordance with the principles of war, that gave the U.S.-British alliance its war-winning strategic advantage. Defeating the Luftwaffe and winning air superiority over the skies of Europe stripped Germany of the ability to protect itself and was the key event that led to the eventual collapse of Germany's armaments industry and military. Finally, it was the defeat of the German Air Force in the air through attrition rather than the destruction of German industrial capacity by bombing that played the most significant role in the Luftwaffe's defeat.

This paper sets the stage with a description of the political policies, objectives, and military strategies that led to the conflict in Europe and an examination of the development of Axis and Allied air doctrine. The center of gravity concept and the principles of war will then provide a framework to evaluate the allied strategy used during the Anglo-American Combined Bomber Offensive (CBO) in Europe from mid 1943 through Operation OVERLORD in June 1944.

GERMAN GRAND STRATEGEY

Adolf Hitler became chancellor of Germany in 1933 and initiated events that changed the face of Europe for the next half century. Hitler propagated an ideology based on two principles, race and space. With regard to race, Hitler felt that Germany was not defeated in World War I, but "stabbed in the back by Jews and those inspired by Jews."[10] Hitler's ideology taught that this same racially inferior class of individuals still controlled events in Germany and maintained their positions of influence through the help of foreigners who had been victorious in World War I only because of this treachery. Hitler would correct this perceived injustice through revolution, a revolution in which he would attempt to eliminate entire segments of the European population in the name of racial purity.[11]

The concept of *lebensraum* (living space) was Hitler's second ideological theme. In *Mein Kampf*, Hitler wrote that maintaining racial quality was dependent on acquiring sufficient land and resources for the population to thrive.[12] This ideology resulted in a policy where war became one of the primary means to gain the territory necessary for "racial survival."[13]

These two inexorably intertwined ideologies, race and space, had a fundamental impact on Germany's foreign policy. The struggle for space was to become a vital element of that policy and led Hitler to look eastward for expansion. Force and the threat of force became the means to attain his foreign policy objectives. It is a tribute to his political genius that he was able to remilitarize Germany, annex Austria and defeat Czechoslovakia without firing a shot.[14]

The key to Hitler and Germany's grand strategy was the ability to build German military strength faster than any of its potential adversaries. Hitler counted on a series of quick, short wars and negotiated settlements to quickly build German strength and power in Europe.[15] If his strategic concepts were to be successful, it was essential to have a well-trained military that was ready to go on the offensive while its opponents were still mobilizing for war.[16] German military strategy called for a combined arms campaign that would overwhelm an enemy without the need for protracted campaigns

against the enemy's army or industrial war materiel complexes. This strategy met with uninterrupted success until the Battle of Britain.[17]

GERMAN AIR DOCTRINE

> *"Anyone who has to fight, even with the most modern weapons, against an enemy in complete control of the air, fights like a savage against a modern European army."*
>
> — Field Marshal Erwin Rommel, Northwest Africa, 1943.[18]

The airman who provided the long-range strategic vision for the Luftwaffe during the early 1930s, General Walther Wever, Chief of Staff, was killed in an aircraft accident in 1936. The death of General Wever would prove a tragic blow to German air doctrine and strategic thought because his followers would lack his strategic vision. Consequently, Hitler's "doctrine of the short war" would eventually play a role in Germany's ultimate defeat. Since Hitler only planned for short, tactical wars, the German air force was ill equipped to conduct strategic air campaigns against Britain and Russia.[19] This was reflected in Germany's attempt to conduct these campaigns without the benefit of a heavy, long-range, four-engine bomber.[20] The Luftwaffe attempted to develop and build an aircraft capable of reaching Russian industry located beyond the Ural Mountains. Two prototypes were developed, but neither made it past this stage due to poor performance.[21] The ultimate result was a situation

in which the doctrine and forces available were inadequate to achieve Germany's strategic objectives. Germany had a relatively short-range, tactical air force when it declared war on Britain and Russia, two countries whose industrial heartland could only be reached with long-range aircraft. Consequently, Germany entered the war with doctrine and equipment that were not up to the tasks that lay ahead.[22]

On 1 September 1939, German troops entered Poland. Germany destroyed the Polish Air Force during the opening days of the war, gaining air superiority almost from the outset. Consequently, Polish ground forces came under constant attack from accompanying German air power. Poland fell in 17 days.[23]

On May 10, 1940, 134 German infantry divisions, 10 armored divisions, and 3700 combat aircraft launched an invasion of Holland, Belgium and France.[24] The outcome of the air war in the Low Countries was much the same as it had been in Poland nine months earlier. The Luftwaffe won air superiority in two days and by the 14th of June German troops occupied Paris.[25] Three days later, the French government requested an armistice. Britain now faced the expanding German juggernaut alone.[26]

The Luftwaffe's failed effort to gain air superiority over England during the Battle of Britain has become a classic example of what can result when flawed doctrine is combined with limited strategic planning. Over a two-month period the

Luftwaffe continually changed their objectives, failed to correctly identify the British center of gravity, and generally lacked the persistence and patience necessary to achieve their objectives against the British fighter forces. The tactical concept that had been successfully implemented against Poland and France would prove ineffective in the strategic campaign against England.[27]

ALLIED GRAND STRATEGY

Great Britain's survival during the war and its continuation as a world power after the war's conclusion was an American objective before the U.S. entered the conflict and was the foundation of American strategy once the war began.[28] The overarching objective of the Allied coalition was the complete and unconditional defeat of the Axis powers. This was the Allies' ultimate objective as stated during the ARCADIA Conference in December 1941 when the U.S. and British first met to discuss their war objectives. It remained the primary political aim until Germany's unconditional surrender three and one half years later.[29] Additionally, American and British grand strategy called for placing emphasis on the war in Europe until victory was achieved while maintaining the strategic defensive in the Pacific.[30] The primary means for accomplishing the Allied

political objective and defeating the Axis forces was "an invasion of the continent by land forces."[31]

The role air power was to play in gaining the objective of Allied military strategy was described during the Casablanca Conference in January 1943. The Allied goal was to first achieve air superiority in the theater by means of a massive strategic air offensive prior to an invasion.[32] This offensive became a combined air campaign against the German heartland, which its advocates believed might offer the possibility of making an invasion unnecessary. While this particular dream did not come to pass, it was the combined air campaign that would make the invasion possible and thus assure Allied victory.[33]

ALLIED AIR DOCTRINE

The first air doctrine was born out of the frustration, stalemate, and trenches of W.W.I. The air power theorists argued that wars in the future could be fought and won more quickly and humanely, with less expenditure of lives and treasure through direct attack of the enemy's vital centers from the air. Air power would become an essential element of national security.[34]

The first of the great air power theorists, Giulio Douhet, in his timeless work, *The Command of the Air*, envisioned fleets of "battle planes" destroying enemy air forces on the ground.

These battle planes would then be free to bypass conventional land forces and destroy vital enemy strategic targets deep within the interior of the opposing force at the time and place of the air commander's choosing. Air power could bypass ground defenses, thereby putting every area of the enemy nation at risk. [35]

Another early air power theorist, Billy Mitchell, advocated the development of a wide range of aircraft types, including bombers, fighters, attack and pursuit aircraft, which could strike and destroy the vital production complexes that enabled the enemy to wage war. Mitchell advocated the development of new air doctrine and a military strategy based on these beliefs. To accomplish this, he proposed that the nation build an independent air force.[36]

American air doctrine in World War II was formed during the late 1920s and throughout the 1930s by bomber advocates like Arnold, Eaker, Spaatz, and LeMay. However, unlike the Germans, the Americans would develop the doctrine, aircraft and training required for the war in Europe.[37] The main tenet of U.S. air doctrine became strategic daylight precision bombing. This theory was grounded on three principles. The first was that a modern nation could be crippled economically if vital components within its economic system were destroyed.[38] Further, this doctrine taught that the necessary precision needed to destroy a

nation's industrial web could only be achieved with daylight bombing from high altitude.[39] Finally, these airmen believed that heavily-armed, well-flown formations of bombers could get through enemy defenses without unacceptable losses, fighting their way through if necessary, and destroying vital preselected targets.[40]

The early theorists from the Air Corps Tactical School (ACTS) would lead the American bomber forces during WW II. However, they would begin this epic campaign with a doctrine that placed little emphasis on fighter aircraft. The role of pursuit and fighter aircraft was primarily to support ground forces. AWPD-42, the requirements plan for war materiel production in 1943, failed to mention the need for escort fighters to accompany the bomber formations.[41] This would prove to be a fundamental flaw in American air doctrine as it existed in early 1943.

ALLIED MILITARY STRATEGY AND PLANNING

In January 1943, President Roosevelt, Prime Minister Churchill, and the Combined Chiefs of Staff met at the Casablanca Conference.[42] The product of this conference was the "Casablanca Directive" which stated the air offensive's purpose as: "To bring about 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."[43]

With these objectives in mind, the Combined Bomber Planning Team, led by General Haywood S. Hansell from the First Bombardment Wing and Air Commodore Sidney O. Bufton, RAF, Director of Bomber Operations at the Air Ministry, began preparing the operational strategy for the campaign. Its first priority was the German aircraft industry, with top priority given to fighter aircraft assembly plants and engine factories. Before an invasion could take place, air superiority over the battlefield was a necessity. The proposed method for accomplishing the destruction of the German fighter force and gaining air superiority would be sustained heavy bombardment, with Allied bombers destroying German fighters in the air while bombing production facilities deep within the German heartland.[44] Unfortunately, American air doctrine and the belief that modern, heavy bomber formations could penetrate enemy defenses unescorted to destroy the German industrial base would not be proven during the war.[45] John Kenneth Galbraith, a member of the Strategic Bombing Survey stated, "Strategic bombing was designed to destroy the industrial base of the enemy and the morale of the people. It did neither."[46]

If the concept of daylight precision bombing single-handedly winning wars remained unproven, then the question

becomes what if any significant contributions did air power make to the victorious Allied war effort? The answer lies in the battle for air superiority over the skies of Germany. Attaining air superiority over the German Air Force in 1944 did not in and of itself win the war, but it did permit those operations that did. Concentrating ground forces before major offensives such as the planned Allied landings in France during the spring of 1944 demanded control of the skies over the battlefield. The 1944 invasion would not be a viable option until the Luftwaffe's destruction as a fighting force over France was accomplished.[47]

CENTER OF GRAVITY CONCEPT, THE LUFTWAFFE AND AIR SUPERIORITY

> *"One must keep the dominant characteristics of both belligerents in mind. Out of these characteristics a certain center of gravity develops, the hub of all power and movement, on which everything depends. That is the point against which all our energies should be directed."*[48]

> *"The first task, then, in planning for a war is to identify the enemy's centers of gravity, and if possible trace them back to a single one. The second task is to ensure that the forces to be used against that point are concentrated for a main offensive."*[49]
>
> — Carl von Clausewitz, *On War*

The most important responsibility of the commander when planning any campaign is to correctly identify the foundation of the enemy's capability, the enemy's center of gravity. This is

the primary source of his power and resistance that enables him to achieve his objectives and deny you yours. It is the enemy's strategic center of gravity that must be defeated to achieve the strategic objective in the theater. Consequently, correctly determining the enemy center of gravity is the crucial element in maintaining the campaign's focus and is the key to its success.

In examining and analyzing the German center of gravity in the European Theater in 1944, the Clauswitzian meaning of center of gravity as moral and physical sources of strength, power and resistance will be used. In using this definition, it is understood that the strategic center of gravity is the source of power and strength of a force and although it may be vulnerable to a stronger adversary, it should never be identified as a vulnerability or a source of weakness.[50] Further, if we use the Clausewitzian model, "The first task, then, in planning for a war is to identify the enemy's centers of gravity, and if possible trace them back to a single one."[51]

In the context of events and military capabilities in the European Theater in 1943-1944, the Luftwaffe was Germany's strategic center of gravity and its defeat was the Allied military forces' primary objective. The Luftwaffe would have to be defeated if the Allies were to accomplish their strategic objective and achieve unconditional surrender. A strong German

Air Force in control of the skies over Europe would preclude an invasion in 1944 and leave Hitler in a favorable position to consolidate his territorial acquisitions in Europe and negotiate a favorable peace settlement.[52] The Casablanca Conference in January 1943 produced the Committee of Operations Analysis report, which established the objectives and priorities for Eighth Air Force for the next year. Although the Luftwaffe was not specifically designated as a center of gravity, the report was approved by the Combined Chiefs of Staff and listed the German air force as the intermediate objective, "second to none in priority."[53] Clearly, the Allied leadership recognized air power as the single most significant enemy capability that stood in the path of a successful Allied ground invasion and eventual German surrender.

U.S. Army Air Forces and the British began their 1943 air offensive with an air doctrine that placed emphasis on the bomber force. However, as the Germans began to better organize their day fighter defenses and shift their emphasis from the Eastern and Mediterranean fronts, unescorted bomber losses began to mount. During the summer of 1943, bomber losses were seven times greater without fighter escort than when accompanied. These losses resulted, in part, from flawed doctrine that saw the offensive open with only the "self-defending bomber" and short-range P-47 fighter escorts.[54] Because the requirements

listed in AWPD-1 reflected the doctrine developed by the ACTS theorists, fighter development hadn't kept pace with bomber development. Consequently, long-range escort fighters were not available in the numbers needed during the summer and fall of 1943.

By the fall of 1943, a crisis was emerging. The Luftwaffe's defense had grown from a single fighter wing in January 1943 to eleven fighter wings by the end of the year.[55] When Eighth Air Force attacked the German ball-bearing plants at Schweinfurt and the Messerschmitt complex at Regensburg in August 1943, American losses were over 19 percent. The deep, penetrating attacks on Germany's industrial heartland represented the essence of early Air Corps doctrine. However, without the protection of escort fighters, the bombers could not get through without unacceptable losses. German fighters would time their attacks to begin after the escorting American fighters ran low on fuel and returned home. The worst was to come on 14 October during a return to Schweinfurt when 60 bombers went down, a 26 percent loss rate.[56]

The official American history of the war states, "the fact was that Eighth Air Force had for the time being lost air superiority over Germany . . . Eighth Air Force made no more deep penetrations in clear weather into Germany for the rest of the year. That failure was, prior to December, the result of a

command decision based on the lack of escort and the need for recuperating the bomber force."[57]

With the new year came new doctrine and a change in leadership. General Spaatz headed U.S. Strategic Air Forces in Europe, and Brigadier General Jimmy Doolittle took over as commander of Eighth Air Force. The first thing Doolittle did as commander was to unleash American fighters to begin offensive operations against the Luftwaffe. He said, "The first duty of Eighth Air Force fighters is to destroy German fighters." He considered this his most important decision of the war. His reasoning was that by January 1944, "German fighter production, which had long been one of our first priority targets, no longer really mattered . . . since the customer could no longer use the product for lack of fuel and trained replacement pilots."[58] Luftwaffe ace, General der Flieger Adolf Galland agreed, pointing out that "when Doolittle freed the fighters, the Luftwaffe lost the air war."[59]

The Allies launched their first major offensive incorporating the new doctrine during "Big Week," from the 20th to the 25th of February 1944. During this six-day period, American losses were high, but the Luftwaffe lost over one-third of its authorized strength. This included irreplaceable fighter aces and squadron commanders and created a tremendous problem for the German Air Force. During May 1944, a month before the

Normandy invasion, German pilot attrition peaked at 25 percent. Therefore, although fighter production actually increased during the spring, this achievement was hollow because Luftwaffe fighter units underwent a complete turnover of single-engine pilots during the first five months of 1944. As new pilots joined fighter squadrons in rapid succession, their flying careers, on average lasted only 30 days.[60] A trained pilot force able to conduct combat operations may take years to build and lies at the heart of any successful air plan. Britain's Air Chief Marshal Sir Hugh Dowding, Air Officer Commanding-in-Chief, Fighter Command agreed, labeling a trained pilot force the real "center of gravity" of the RAF.[61]

American fighters continued this war of attrition through the spring of 1944. However, what was unique about the battle for air superiority over Germany was the fighter force's dependency on the bomber. The battle for air superiority required massed bomber formations striking at Germany's heartland to entice the Luftwaffe into the air. Without bomber formations over these high value targets in the German heartland, the battle wasn't worth fighting for an air force short on pilots and fuel. German fighters literally had to be "baited into the air" so they could be destroyed.[62]

By the war's end, Allied air doctrine proved itself up to the task. Though air doctrine changed continuously throughout

the campaign to incorporate the need for escort fighters with heavy bombers, the overall result of allied doctrine was victory in the air over Europe. What were the essential elements in the Allied victory in the air? The first was the identification of the Luftwaffe as the campaign's primary objective, the German center of gravity in current campaign planning terms, and its subsequent destruction. The second essential element was the Allied air planners' sound application of the principles of war.

THE CBO & THE PRINCIPLES OF WAR

World War II might have ended differently had the Luftwaffe understood and made correct use of the principles of war and the potential of air power. The speed and range that air forces possess offer commanders significant advantages in combat that center around the principles of objective, mass, and maneuver. These three principles, as described in Air Force Doctrine Document 1, will be used as a framework to evaluate and demonstrate how adherence to these principles during the Combined Bomber Offensive (CBO) contributed to the Allies successful campaign to gain air superiority.

There is no principle in war more important or crucial than the principle of the objective. In war, campaigns are fought to achieve theater strategic objectives. The object or objective is what determines or should determine decisions at each level of war. It is the strategic objective that must be accomplished

to achieve victory. Therefore, every effort must be directed toward a defined and achievable end, an objective.

It is critically important for the objectives at each level of war, strategic, operational, and tactical to be linked and support each other. Perhaps air power's greatest attribute is its ability to attack multiple targets simultaneously at different levels of war. Unlike surface forces, Allied air forces were not required to achieve tactical objectives first before seeking targets that would achieve their strategic objectives.[63]

At the grand strategic level, the objective was clearly identified as the unconditional surrender of the Axis Powers in Europe while remaining on the defensive in the Pacific.[64] The objective at the strategic level of war was spelled out clearly during the Casablanca Conference. The objective of the air campaign was "the progressive destruction and dislocation of the German military, industrial and economic system. This is construed as meaning so weakened as to permit initiation of final combined operations on the Continent."[65] The primary objective listed in the CBO target priority list was the German Air Force and in particular German fighter aircraft.[66]

The CBO maintained its focus on the campaign objective through its capacity to select for destruction the most vital elements of the German war machine. The successful conclusion

of the air campaign was dependent on sapping German fighter strength while attacking strategic targets in Germany. Because their objectives at the operational and strategic level were clearly defined, the Allied air forces were able to achieve the necessary unity of effort in the months preceding D-Day to achieve local air supremacy over the French Coast on June 6, 1944.[67] General Eisenhower, in recognizing the contributions of air power to the success of the Normandy landing cabled General Hap Arnold on 3 September 1944: "The basic conception underlying this campaign was that possession of an overpowering air force made feasible an invasion that would otherwise be completely impossible. The air has done everything we asked." In further summarizing the Army Air Forces' accomplishments he went on to say, "It has practically destroyed the German Air Force . . . it disrupted communications . . . it neutralized beach defenses . . . it has been vitally helpful in accomplishing certain breakthroughs by ground forces." Finally, "while all this was being done, the strategic forces have . . . succeeded in preventing substantial rehabilitation of German industry and oil production."[68]

The principle of mass requires that an air commander concentrate his forces at the decisive time and place to achieve the greatest results. By maintaining the offensive and utilizing airpower's unique ability to mass and maneuver while

operating at the operational and strategic levels of war, air planners maintained a continuous, stifling pressure on the Luftwaffe.[69] When the allies attacked strategic targets in Germany, they were able to concentrate overwhelming firepower quickly in the air and overwhelm opposition fighter forces.[70] For example, during Big Week in February 1944, the allies launched as many as 730 heavy bombers along with 332 escorting fighters during single raids against the German aircraft industries around Leipzig, Gotha, and Brunswick. It was during this week that the massed forces of the allied bombing campaign finally began to gain noticeable air superiority.[71] Throughout the CBO, the allies concentrated bomber and escorting fighter forces in armadas as large as 1000 aircraft packages to maximize the shock and effectiveness of each attack. This was in contrast to earlier operations in North Africa when air forces were used in a piecemeal fashion and met with disastrous results.[72]

The third principle, maneuver, places the enemy in a " . . . position of disadvantage through the flexible application of combat power. The ability to integrate a force quickly and to strike directly at an adversary's strategic or operational center of gravity is a key theme of air power's maneuver advantage.[73] By using mass and maneuver simultaneously, CBO planners gained a tremendous advantage over German defenses when

attacking targets at each level of war. Air power is unique in that commanders don't have to sacrifice maneuver when mass is achieved. Throughout the war, the allies used the principle of maneuver to keep the Germans off balance as to what target would be hit next. If the primary targets were obscured by weather, entire massed bomber formations were able to remain together and use the principle of maneuver to hit secondary targets often hundreds of miles away, resulting in a successful mission. Although this principle was used throughout the CBO, a particularly successful example of maneuver occurred during February 1944, when the Americans generated 3,823 bomber sorties and the British 2,351. This massive force was used to destroy targets in Regensburg, Leipzig, Wiener-Neustadt, Gotha and Schweinfurt.[74] By using the principles of mass and maneuver, allied commanders proved they could "hit any target, anywhere in Germany, without excessive losses."[75]

PRELUDE TO VICTORY

> *"I shall never forget the date May 12, 1944. . . on that date the technological war was decided. Until then we had managed to produce approximately as many weapons as the armed forces needed . . . but with the attack of nine hundred and thirty five daylight bombers . . . upon several fuel plants in central and eastern Germany, a new era in the air war began. It meant the end of German armaments production."*

— Albert Speer, German Minister of Armaments and Munitions[76]

Germany's eventual collapse and unconditional surrender was assured when it lost the ability to protect its ground forces and military industrial complex from aerial attack. When the Allied air forces emasculated the Luftwaffe during the first five months of 1944, Germany lost the ability to prevent the Normandy invasion and retain its strategic status as European hegemon.[77] When the German air force lost the strength to adequately protect German war production and logistical supply lines, German combat power began a continuous decline that eventually ended in surrender. Without the Luftwaffe's protection, the CBO was able to wreak havoc on the German military machine by crippling the German petroleum industry and transportation system. By January of 1945, the *Wehrmacht* had ground to a halt.[78]

While all military forces have an almost insatiable appetite for oil, Hitler began the war with a severe shortage of rubber and petroleum. To compensate for Germany's lack of natural wells, Hitler invested heavily in synthetic processes and plants to produce aviation and motor fuel to propel his military forces. The Allies struck Germany's major oil-manufacturing plants in May 1944 with over 800 bombers.[79] By September 1944 Germany's ability to produce aviation grade fuel had fallen by 95 percent.[80] This had a catastrophic effect on German pilot training and meant that German fighter pilots

entered the war with an average of 100 hours compared to entry level American pilots with 400 hours of experience. The shortage also affected mission duration when Goering forbade the use of drop tanks on fighters because they could not afford to jettison half-full tanks.[81] In addition to further constraining the Luftwaffe, the destruction of the oil industry slowed German ground forces, depriving them of mobility as well as air cover. In a report to Hitler during the fall of 1944, Speer noted that the army had become "virtually immobile because of the fuel shortage." While visiting the Tenth Army, he encountered "a column of a hundred and fifty trucks, each of which had four oxen hitched to it."[82]

Simultaneously with its attack on the German oil industry, Allied air power put unrelenting pressure on the transportation system, virtually ending the supply of Ruhr coal to the railroads and the Rhine-Westphalian industrial area. This shut down the most important armaments plants and "precluded the successful conduct of the war."[83] Signs of total anarchy began to loom.

By December 1944, the German army was so constrained from a lack of fuel caused by Allied air interdiction of supply lines and the destruction of fuel refineries, that it had to depend on the seizure of Allied fuel dumps in order to execute the Ardennes offensive. Hitler's desperate armor offensive began

with minimum fuel supplies and no reserves during foggy weather to hamper Allied air activity. When the weather improved Allied fighters and bombers filled the sky and supplies to support the advance ceased entirely. By December 23, 1944, Field Marshal Model, commander of army Group B, concluded, "the offensive had definitely failed."[84]

> The failure of the Ardennes offensive meant that the war was over. What followed was only the occupation of Germany delayed somewhat by a confused and impotent resistance. Whatever was happening made no impression, since everything was overshadowed by awareness of the inexorable end.
>
> —— Albert Speer, January 1945[85]

CONCLUSION

Attaining air superiority over the German Air Force in 1944 did not in and by itself win the war in Europe, but it did make possible those operations that did. Had the Luftwaffe been able to maintain air superiority over the Continent in 1943-1944, the successful ground invasion at Normandy never would have taken place. With his air force in control of the skies over the battlefield, Hitler would have been in a much better position to consolidate his territorial gains and negotiate a favorable peace with the Allies.

The American experience in the 20th century indicates it is not possible to win a modern war if the enemy has air superiority. Naturally, it follows that air power must be the

key force when ground forces aren't capable of successfully engaging the enemy because of their inability to reach the enemy center of gravity. The Luftwaffe was Germany's strategic center of gravity in 1944 and it was the recognition of this combined with Allied leadership's use of air power in accordance with the principles of war that gave the U.S.-British alliance the war-winning strategic advantage. Defeating the Luftwaffe in the air through attrition and winning air superiority over the skies of Europe stripped Germany's ability to protect its vital interests. The Luftwaffe's defeat was the key event leading to the collapse of the German economy, armaments industry, and military and played a significant role in the Allies achieving their strategic objective, Germany's unconditional surrender. 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. . . .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."
>
> —— US Strategic Bombing Surveys[86]

WORD COUNT = 5966.

ENDNOTES

[1] W. Scholze-Stubenrecht and J. B. Sykes, Chief Editors, The Oxford-Duden German Dictionary (New York, New York: Oxford University Press Inc., 1994), 651.

Schwerpunkt derives from the German word *schwer*, meaning heavy, and *punkt*, meaning point. The Oxford German Dictionary describes *schwerpunkt* as meaning "center of gravity" or "main focus." In the context of this paper, *schwerpunkt* is used to describe the Luftwaffe, in relation to the German strategic center of gravity in the European Theater in 1944. Additionally, we will depend on the Clauswitzian meaning of center of gravity as moral and physical sources of strength, power and resistance.

[2] General Carl A Spaatz, "Strategic Air Power in the European War," reprinted from "Strategic Air Power: Fulfillment of a Concept," Foreign Affairs, Chapter 37, April 1946, p. 226-236. Copyright 1946 by the Council on Foreign Relations, in Air War College Associate Programs, Vol. I, LSN 7, 6th Ed., pp. 119-125.

General Spaatz was a leading figure in the development of air power. During WW II he successively commanded the Eighth Air Force, the Twelfth Air Force, the North West African Air Forces, then The U.S. Strategic Air Forces in Europe, and finally those in the Pacific. He was the first Chief of Staff of the autonomous U.S. Air Force, 1947-1949.

[3] Field Marshal Erich von Manstein, Lost Victories, edited and translated by Anthony G. Powell, (Novato, CA: Presidio Press, 1982), 164-165.

[4] Ibid., 166.

[5] U.S. Military Academy, Summaries of Selected Military Campaigns, (West Point, N.Y., Department of Military Art and Engineering, nd, Special Printing for the Department of History, U.S. Air Force Academy, 1960), 142; quoted in John A Warden III, Col, USAF, The Air Campaign, (Washington: Published with the Aerospace Education Foundation, Air Force Association and Pergamon-Brassey's International Defense Publishers, 1989), 77-78.

[6] Carl Von Clausewitz, On War, edited and translated by Michael Howard and Peter Paret, Princeton, (Princeton University Press. 1989), 595-596.

[7] John A Warden III, Col, USAF, The Air Campaign, (Washington: Published with the Aerospace Education Foundation, Air Force Association and Pergamon-Brassey's International Defense Publishers, 1989), 10.

The one example Warden believes "on the surface could be seen to contradict these general principles" is Vietnam. However,

"the North Vietnamese were unable to conduct a successful conventional offensive as long as American air power was stationed in Indochina. Only after the Americans had left was the North able to mount a decisive ground offense into South Vietnam. In this case, South Vietnamese air attempted little and was easily repulsed by North Vietnamese mobile ground-based air defense systems. As air played no significant role in the invasion for either side, the ensuring action was essentially as it would have been before the era of the aircraft."

[8] Alfred C Mierzejewski, The Collapse of the German War Economy, 1944-1945, (Chapel Hill, The University of North Carolina Press, 1988), preface, xi-xiii.

[9] U.S. Air Force Assistant Chief of Staff, Studies and Analysis, The Impact of Allied Air Interdiction on German Strategy for Normandy, (Washington D.C.: 1969), 14; quoted in Warden, 12.

[10] Gerhard, L Weinberg, "The World Through Hitler's Eyes," reprinted from The Foreign Policy of Hitler's Germany, Diplomatic Revolution in Europe 1933-36. Chapter 1, 1970, pp.1-24, Chicago, The University of Chicago Press, in Air War College Associate Programs, Vol. I, LSN 7, 6th Ed., (Maxwell AFB, AL. 1995), 13.

[11] Ibid., 13-14.

[12] T. N. Dupuy, Col USA, Ret., A Genius For War, The German Army and General Staff, 1807-1945, (McLean, VA: The Dupuy Institute, 1993) 242-243.

[13] Weinberg, 14.

[14] Ibid., 9-18.

[15] Russell F. Weigley, The American Way of War, A History of United States Military Strategy and Policy, (Bloomington: Indiana University Press, 1977), 312.

[16] United States Strategic Bombing Surveys, (European War), (Pacific War), reprinted by Air University Press, (Maxwell AFB, AL: October 1987), 6.

[17] Ibid., 7.

[18] Ronald Lewin, Rommel: As Military Commander, (New York: Ballantine Books, 1972), 275.

[19] Williamson Murray, Strategy for Defeat: The Luftwaffe 1933-45, (Maxwell AFB, AL: Air University Press, 1983), 6-14.

[20] Stephen L McFarland, and Wesley Phillips Newton, To Command the Sky, The Battle for Air Superiority Over Germany, 1942-1944, (Washington, D.C.: Smithsonian Institution Press, 1991), 42-44.

[21] Richard Muller, The German Air War in Russia, (Baltimore: The Nautical & Aviation Publishing Company of America, 1992), 8-10.

[22] Spaatz, 120.

[23] J.F.C Fuller, A Military History of the Western World: From the American Civil War to the End of the World War II, (New York: Da Capo Press, Inc., 1957), 375-376).

[24] Ibid., 388-391.

[25] Murray, 36-37.

[26] Fuller, 407-408.

[27] Michael Howard, British Intelligence in the Second World War, (London: HMSO Publications, 1990), 14.

[28] Kent Roberts Greenfield, American Strategy in World War II, (Malabar, Florida: Krieger Publishing Company, 1982), 3.

[29] Ibid., 4.

[30] Haywood S Hansell, Maj Gen, USAF, The Air Plan That Defeated Hitler, (Atlanta: Higgins-McArthur/Longino & Porter Inc., 1972), 90-91.

[31] United States Strategic Bombing Surveys, (European War), (Pacific War), 9.

[32] Ibid., 9-10.

[33] Hansell, 91.

[34] William Mitchell, Winged Defense, The Development and Possibilities of Modern Air Power, Economic and Military, (New York: Dover Publications, Inc., 1988), 7-12.

[35] Giulio Douhet, The Command of the Air, translated by Dino Ferrari, edited by Richard Kohn and Joseph Harahan, (Washington D.C: Office of Air Force History, GPO, 1983), 117-119.

[36] Mitchell, 6.

[37] Hansell, 12-21.

[38] Ibid., 37.

[39] Ibid., 170.

[40] Ibid., 185.

[41] Ibid., 107.

[42] McFarland, 93-94.

[43] Hansell, 153.

[44] Ibid., 157-159

[45] Ibid., 96.

[46] Ibid., 4.

[47] Ibid., 2-5

[48] Clausewitz, 595-596.

[49] Ibid., 619.

[50] Joe Strange, Perspectives on Warfighting, Centers of Gravity and Critical Vulnerabilities: Building on the Clausewitzian Foundation So That We Can All Speak the Same Language, (Quantico, VA: Defense Automated Printing Service Center, 1996), 12.

[51] Clausewitz, 619.

[52] Albert Speer, Inside the Third Reich, translated by Richard and Clara Winston, (New York, Macmillan Publishing Company, 1970), 302-303, 346-347.

As the war progressed and defeats mounted for German forces on both fronts, German objectives changed between summer 1943 and fall 1944 from complete domination of all Europe to defending the German homeland and preventing the Russian and Allied offenses. Speer and other members of the German leadership "believed that Hitler would end the war at the right time." Thus, preserving through diplomacy what remained of the German Empire.

Had the Luftwaffe maintained air superiority over the Continent from 1943-1944, the successful ground invasion at Normandy never would have taken place. Consequently, with his air force in control of the skies over the battlefield and military industrial complex, Hitler would have been in a much better position to consolidate his territorial gains and dictate the peace terms more favorable to Germany.

[53] Hansell, 177-178.

[54] McFarland, 100-101.

[55] Ibid., 119.

[56] Ibid., 126-129.

[57] Ibid., 132.

[58] Ibid., 160-162.

The Lockheed P-38 was used as a long-range escort fighter beginning in October 1943, but the P-51 was introduced soon thereafter and was capable of longer ranges and was more effective against German fighters. Thus the P-51 became the premier long-range escort fighter.

Wesley Frank Craven and James Lea Cate, eds., The Army Air Forces in World War II, Vol. 3, Europe: Argument to V-E Day, January 1944 to May 1945, (Washington, D.C.: Office of Air Force History, 1983, reprint of University of Chicago Press 1951 edition), 9-11.

[59] Ibid., 162.

[60] Bernard Nalty, John Shiner, George Watson: Alfred Beck, editor, With Courage: The U.S. Army Air Force in World War II (Washington, D.C.: Air Force History & Museums Program, U.S. Government Printing Office, 1994), 226-228.

[61] James, A Mowbray, "The Battle of Britain: Air Strategy and Operations, 1940", Air War College Associate Programs, Vol. I, LSN 7, 6th Ed., (4 Feb 1989): 72-73.

[62] Col Clyde Bradley, USAF (ret), interview by Newton, 5 and 7 April 1988; quoted in Stephen L McFarland, and Wesley Phillips

Newton, To Command the Sky, The Battle for Air Superiority Over Germany, 1942-1944, (Washington, D.C.: Smithsonian Institution Press, 1991), 215.

[63] Department of the Air Force, Air Force Basic Doctrine, Air Force Doctrine Document 1, (Maxwell AFB, AL: HQ Air Force Doctrine Center, September 1997), 13.

[64] Hansell, 90.

[65] Ibid., 168.

[66] Ibid., 163.

[67] McFarland, 242.

[68] Extract from Cable No. FWD 13657, 3 September 1944, Eisenhower to Arnold, File 519.553-2, HRC: quoted in Stephen L McFarland, and Wesley Phillips Newton, To Command the Sky, The Battle for Air Superiority Over Germany, 1942-1944, (Washington, D.C.: Smithsonian Institution Press, 1991), 244-246.

[69] Department of the Air Force, Air Force Basic Doctrine, Air Force Doctrine Document 1, 14-15.

[70] Warden, 138-139.

[71] McFarland, 175-177.

[72] Warden, 138-139.

[73] Department of the Air Force, Air Force Basic Doctrine, Air Force Doctrine Document 1, 17-18.

[74] McFarland, 183-189.

[75] Ibid., 192.

[76] Speer, 346.

[77] Ibid., 176.

[78] Ibid., 588-589.

[79] Nalty, 216-234.

[80] Speer, 350

[81] Hansell, 219.

[82] Speer, 406.

[83] Ibid, 414.

[84] Ibid, 416-417.

[85] Ibid, 420.

[86] United States Strategic Bombing Surveys, (European War), (Pacific War), 37.

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