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The Tiger Gap: Culture, Contradiction, and Clausewitz in German Armored Warfare in World War II

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**The Tiger Gap: Culture, Contradiction, and Clausewitz in German Armored Warfare in
World War II**

A Thesis Presented for the
Master of Arts
Degree
The University of Tennessee, Knoxville

Eric Vahan Muirhead
May 2019

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Dedication

To my parents, Mom and Dad, for giving me my love of learning and
to my wife, Annie, for always being my partner in every adventure.

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This work would have been impossible without the years of help and support I received from countless individuals. To Brigadier General Sean C. Bernabe, Colonel Paul T. Krattiger, and Lieutenant Colonel Stephen Fairless for their patience, leadership, and mentorship. To Lieutenant Colonel David Escobar and Lieutenant Colonel Christian Durham for inspiring me to pursue an assignment to the United States Military Academy. To Lieutenant Colonel Tom Smith for his insight, intellect, and “white-board” discussions where he finally asked me, “Why would Germany build the Tiger tank?” To Professors Vejas G. Liulevicius, Monica Black, Denise Phillips, and Shellen Wu of the University of Tennessee Department of History for their lessons and guidance as I trained as a historian. To Doctor JoBeth Bradley of the University of Tennessee German Department for teaching me the language I never thought I could learn. To the staff of the National Archives Microfilm Department for helping me navigate the Captured German Records Collection in Washington D.C. To Len Dyer and his staff at the National Armor and Cavalry Museum Restoration Yard at Fort Benning, Georgia for letting me experience the only Tigers on this side of the world. To Doctor Robert S. Cameron, historian of the U.S. Army Armor Branch, for helping me crystalize my ideas into actual research goals. To Rebekka M. Bernotat and her research staff at the Donovan Maneuver Research Library at Fort Benning, Georgia for their exemplary work in helping me discover a new treasure-trove of American documents I never knew existed. Finally, to my in-laws, Sue and Robert, for opening their home to me.

Abstract

Why would the German military in World War II pay more resources for fewer tanks? When the Soviet Union and United States were out-producing Germany three to one in vehicles, the German Military High Command instead chose to develop the Tiger: a sixty-ton beast that could defeat any enemy on the battlefield, but could only be produced in extraordinarily limited numbers. Though there are thousands of publications on the history of the Tiger tank, they only fall into one of two categories: detailed technical specifications or oblique references to the Tiger as it was used by operators in the field.

This historical study will introduce a novel perspective on the history of the Tiger. The tank was a pivotal cultural symbol that gained enough positive reception over its short three years of service with the German military that it acquired an agency of its own and influenced the events of World War II. When viewed in this new context, the Tiger becomes an important link in the continuity of a much-discussed German military culture founded in the 19th century philosophy of Carl Von Clausewitz that grew and developed through German reunification, and remained virtually unchanged despite the defeat of World War I.

Using in-depth analysis of government documents captured by the Allies after World War II, soldier testimonials, and battle reports, this study proves that the Tiger was far more than merely another machine of war. It is an important cultural artifact and symbol of German military supremacy that still has impact to this day.

Table of Contents

Introduction	1
Chapter 1. A Cultural Foundation in Clausewitz	16
Chapter 2. An Armored Revolution	31
Chapter 3. Project Tiger	47
Chapter 4. A Changing Symbol of Hope	60
Chapter 5. Till the Bitter End	70
Conclusion	81
Bibliography	87
Vita	96

Abbreviations

Ausf: model type (*Ausführung*)

BAMA: *Bundesarchiv Militärarchiv*, Freiburg, Germany.

CGRC: Captured German Records Collection, United States National Archives

DMRL: Donovan Maneuver Research Library, Fort Benning, Georgia, United States.

FLAK: *Flugabwehrkanone* (anti-aircraft gun)

NACPM: United States National Archives, College Park, Maryland.

OKW: *Oberkommando der Wehrmacht* (German Military High Command)

Pz: *Panzer* (armored or tank)

Pzkw: *Panzerkampfwagen* (tank)

StuG: *Sturmgeschütz* (self-propelled assault gun)

VK: *Versuchs Kampffahrzeug* (prototype vehicle)

Introduction

For Christ's sake get a move on! There's a Tiger running alongside us 50 yards away.

-Sergeant O'Conner, British 7th Armoured Division
Morning of June 13, 1944 at Point 213¹

In the summer of 1944, Villers-Bocage was a tiny, unremarkable hamlet tucked away in the farm fields of northern France. The name, literally translated as “Hedgerow Village,” aptly described the surrounding countryside of cattle pastures, small woodlands, and natural walls of dense brush and shrubs. It was doubtful that any military planner would consider the two-square mile cluster of houses significant save for one detail: French National Route 175 ran straight through the middle of downtown.

RN 175 was an important two-lane highway that linked the ancient city of Avranches on the English Channel with the Northern French transportation hub of Caen. On the morning of 6th June 1944, British and Canadian troops stormed Nazi-held “Fortress Europe” on three landing beaches code named Gold, Juno, and Sword. These landing sites were located almost directly north of Villers-Bocage.

The initial objective of the combined Commonwealth Forces was to seize Caen within the first twenty-four hours of landing. However, greater than expected German resistance meant that the British fell well short of their goal. This was of great concern to the Supreme Allied Commander, American General Dwight D. Eisenhower, and much to the chagrin of the Ground Forces Commander, British Field Marshal Bernard Montgomery. The British leader was fully

¹ Quoted in David Porter, *7th Armoured Division at Villers-Bocage 13 June 1944* (London: Amber Books Ltd, 2012), 136.

aware that Eisenhower considered him far too timid in executing his operations.² Almost immediately, Montgomery and his staff began planning for a new offensive to seize Caen in order to prove both to the British people and their American allies that he was up to the task of leading the push towards Paris.

Within a week, Montgomery signed off on a plan to send the British 7th Armoured Division forward in a bold strike. First, they would push south before turning northeast to drive along RN 175. Then, Commonwealth forces would punch straight through the defensive lines of the German *Panzer Lehr* Division to Caen. On the evening of June 12, 1944, Montgomery confidently wrote in a letter to his chief of staff, “Will move on Villers-Bocage and Noyers tomorrow. All this very good and *Pz Lehr* may be in grave danger tomorrow.”³ Ironically, trying to challenge his reputation for timidity would prove to be disastrous.

Just after 8:30 in the morning on June 13, the 4th County of London Yeomanry (4th CLY), a British armored reconnaissance regiment, entered Villers-Bocage from the west. For three hours they had slowly advanced from assembly areas near Livry. However, they had encountered almost no German resistance along their route. As soon as advance elements entered the village, they were treated to the sight of two German soldiers hopping into a *Kübelwagen*, an amphibious military car, and fleeing at high speed.⁴ French villagers then emerged from their homes and businesses to jubilantly welcome the advancing British army.

No doubt, the British must have felt extraordinarily confident. The 4th CLY arrived that morning with what they considered to be overwhelming force to meet the planned German

² Richard Overy, *Why the Allies Won* (New York: W.W. Norton & Company, 1996), 165- 166.

³ Quoted in Michael Reynolds, *Steel Inferno: I SS Panzer Corps in Normandy* (South Yorkshire: Pen and Sword Books Ltd. 1997), 99.

⁴ Porter, *7th Armoured Division at Villers-Bocage 13 June 1944*, 132.

resistance. Led by British Viscount Lieutenant Colonel Arthur Cranley, the 4th CLY consisted of 37 officers leading 655 enlisted soldiers.⁵ At full strength, they possessed an arsenal of 117 separate vehicles and anti-tank guns, including 49 Cromwell IV/VI medium tanks, 11 American-made M3A3 Stuart light tanks, and 12 M4A4 Sherman Firefly tanks.⁶ The Firefly was the primary Commonwealth anti-armor tank of 1944-1945.⁷ Though the vehicle itself was produced in the United States, British engineers replaced the smaller, American 75mm cannon with a British-made QF-17 anti-tank gun. The British QF-17 was one of the most powerful anti-armor weapons in the Allied arsenal. Commonwealth armies fielded Fireflies to match the heavier German tanks they expected to encounter in France such as the Tiger and the Panther.⁸ With such overwhelming firepower and so little resistance, the 4th CLY increased their rate of march and charged headlong through the village at a full clip.

As RN 175 exited Villers-Bocage to the east, it gently sloped upwards towards the top of a hill labeled as “Point 213” on British maps. Point 213 would provide the British an excellent location not only to observe Villers-Bocage, but also establish defensive positions to protect against an expected German counter-attack from the east. 4th CLY’s A Squadron sped for a kilometer straight up the hill and quickly seized the heights. Again, the only resistance encountered was a German staff car just west of the hilltop which was easily destroyed. However, in the triumphant rush, A Squadron’s scouts failed to conduct a proper reconnaissance of the wooded areas between the hill and Villers-Bocage proper.⁹ Other units from 4th CLY moved forward to keep up with A Squadron’s sprint, but the abrupt halt at the top of Point 213

⁵ Ibid, 49.

⁶ Ibid, 52.

⁷ Ibid, 75.

⁸ Ibid, 73-74.

⁹ Ibid, 130-131, 135.

created a traffic jam. As A Squadron only posted sentries watching eastward, one hundred plus British vehicles found themselves strung out on RN 175 in a long, single-file column that stretched from Point 213 all the way to the westward edge of Villers-Bocage nearly two kilometers away.

Lieutenant Colonel Cranley moved forward to try to bring some order to A Squadron's deployment while the rest of his regiment sat in static frustration. As officers and non-commissioned argued among themselves how to alleviate the congestion, many soldiers decided it was a good time to step out of their vehicles and stretch their legs. Some even took the opportunity to set up stoves on the roadside and brew a morning cup of tea.¹⁰ Completely unbeknownst to the British, catastrophic danger lurked in an apple orchard directly south of Point 213. The 2nd Company, 101st SS Heavy Tank Battalion, 1st SS *Panzer* Division: *Leibstandarte Adolf Hitler* (Adolf Hitler Lifeguards) had arrived at Point 213 the night before after a five day road march north from Beavais.¹¹ The *Waffen SS*, short for *Schutzstaffel* (Armed Protection Squadron) was the military wing of Germany's Nazi party. They swore no allegiance to the nation, only to their leader, Adolf Hitler. The *Leibstandarte* was the oldest and most experienced division of the *Waffen SS* with over two years of combat experience in Southeast Europe and the Soviet Union. 2nd Company's commander, *Obersturmführer* Michael Wittmann, was already recognized as one of Germany's top tank commanders. On January 14, 1944, he was awarded the Knight's Cross of the Iron Cross, one of Germany's top awards for valor and leadership, when his confirmed number of armored vehicle kills reached 88. Only two weeks later, his medal was upgraded to the next higher level, Knight's Cross of the Iron Cross with Oak

¹⁰ *Ibid*, 135.

¹¹ David Porter, *I SS Panzer Corps at Villers-Bocage 13 June 1944* (London: Amber Books, 2012), 127.

Leaves, when his confirmed kills reached 109.¹² He was personally presented his medal by Adolf Hitler. Before June 13, 1944, Wittmann was already well-known in Germany. He was portrayed in the press as a hero, and had already completed a tour of the Third Reich designed to boost civilian morale. After June 13, 1944, his legend would become immortal.

Besides its commander, 2nd Company also possessed another crucial asset. It was equipped with the most infamous German tank of the war: the Tiger *Ausführung E* (Tiger Model E) often shortened to simply Tiger I.¹³ By June of 1944, the Tiger I had seen combat on both the Eastern Front and in North Africa for almost two years. The vehicle built a formidable reputation for its heavy armor and deadly 88 millimeter high velocity main gun: the *Kampfwagenkanone 36* or *KwK 36*. Though the Tiger I was already in the process of being phased out in broader German service by the larger, more heavily armored Tiger II, the *Königtiger* or “King Tiger,” the Tiger I was still respected by Germany’s armored forces and feared by its enemies.

At 8:45 am, one of Wittmann’s soldiers ran into his improvised company command post among the dense clusters of apple trees. He frantically warned Wittmann that a massive column of British vehicles was assembled just a few hundred yards away.¹⁴ Wittmann didn’t hesitate. In a later after action review, Wittmann said, “I had no time to assemble my company; instead I had to act quickly, as I had to assume that the enemy had already spotted me and would destroy me

¹² *Ibid*, 132 and John R. Angolia, *On the Field of Honor: A History of the Knight’s Cross Bearers Vol. 2* (San Jose: R. James Bender, 1980), 319.

¹³ Prior to February 27, 1944, the Tiger tank was also known as the “*Panzerkampfwagen VI Tiger*” in keeping with Germany’s late 1930s convention of naming tanks in numeric sequence. By order of Adolf Hitler, this was dropped and subsequent official German documents refer to the vehicles only as “*Panzerkampfwagen Tiger*” and model number. Often the two terms are used interchangeably in secondary sources, however, for the purposes of this study, I will endeavor to use the specific nomenclature stated in the original referenced source. See Walter J. Spielberger and Hilary L. Doyle, *Tigers I and II and Their Variants*, trans. Edward Force (Atglen: Schiffer Military History, 2007), 103-104 and “Official Vehicle Designations,” 08 August 1944; *Records of the German Army High Command* (National Archives Microfilm Publication T78, serial 381, roll 413, item H 158, frame 6381933); CGRC; NACPM for the subsequent official vehicle designations approved by Hitler to include the Tiger II.

¹⁴ Porter, *I SS Panzer Corps at Villers-Bocage 13 June 1944*, 132.

where I stood.”¹⁵ Fifteen minutes later, as the soldiers of A Squadron still were laughing and joking about their uneventful morning, a roaring beast crashed out of the trees to their south and planted itself on the far shoulder of the road.¹⁶ This creature’s body was made of sixty tons of high-carbon steel from Germany’s Ruhr Valley. Its low growl echoed across the highway as the 700 horse power Maybach-Motorenbau HL 230 series engine from Friedrichshafen sucked high-octane gasoline and oil into its valves. The British were close enough to hear the grinding and wheezing of the turret motors as the *KwK 36* manufactured by *Kruppwerke* in the North-Rhine Westphalia traversed onto its first target.¹⁷ The vehicle, like the historical German Reich itself, was built from many individual components: powerless when separated, but invincible when combined.

The only recorded report of a British reaction from that first, terrifying moment came from Sergeant O’Conner of the 1st Rifle Brigade. He sat in his stationary half-track on RN 175, possibly enjoying a steaming mug of fresh tea. When he saw the Tiger I emerge, he desperately reached for his radio and sent a panicked transmission directed at the stalled vehicles to his front: “For Christ’s sake get a move on! There’s a Tiger running alongside us 50 yards away.” It would be the only warning the rest of the 4th CLY would receive from its forward elements before the carnage began.¹⁸

Wittmann took aim at the last vehicle of the convoy, a Cromwell. It was immediately destroyed in a roar from his main gun. This prevented any vehicles at the rear of the convoy from retreating out of his cannon’s reach. Next, Wittmann turned to the lead British vehicle, a Firefly

¹⁵ Michael Wittmann, as quoted in Patrick Agte, *Michael Wittmann and the Waffen SS Tiger Commanders of the Leibstandarte in WWII: Volume Two* (Mechanicsburg: Stackpole Books, 1996), 20.

¹⁶ Porter, *I SS Panzer Corps at Villers-Bocage 13 June 1944*, 135.

¹⁷ Thomas L. Jentz and Hilary L. Doyle, *Germany’s Tiger Tanks: D.W. to Tiger I: Design, Production, and Modifications* (Atglen: Schiffer Publishing Ltd, 1997), 179-180.

¹⁸ Porter, *7th Armoured Division at Villers-Bocage 13 June 1944*, 136.

waiting to take its place on Point 213.¹⁹ The *KwK* 36 high-velocity cannon was designed to punch through the thickest Allied armor at ranges in excess of 2000 meters. When Wittmann opened fire, he was less than fifty meters away.²⁰ The 88 millimeter shell effortlessly punched straight through the Firefly. The tank was cut to shreds in a clap of man-made thunder and a brilliant flash of orange fire. The two British hulks immediately burst into flame and trapped the other helpless vehicles between them directly in Wittmann's field of fire.

The German tank commander ordered his driver to turn west and charge down RN 175 straight at Villers-Bocage. Wittmann commanded his gunner to fire as fast as the vehicle's loader could heave new shells into the cannon's breech. In less than five minutes, the entire road was nothing but a sea of twisted, burning metal. The air reeked of fuel, acrid smoke, and spent cordite. Most British soldiers saw the futility of trying to stop the advancing Tiger and simply dove out of their vehicles to huddle in a roadside ditch waiting for Wittmann to pass.²¹

Three Stuart light tanks of the 4th CLY's reconnaissance troop bravely attempted to stand against Wittmann when he reached the eastern edge of Villers-Bocage. They furiously fired their puny 37 millimeter main guns, but the small shells literally bounced off the nearly four-inch thick steel frontal armor of the Tiger. When Wittmann returned fire with his 88 millimeter, the two-inch thick armor of the Stuarts tore like tissue-paper.²² He left the three Stuarts consumed in flames before continuing forward to engage the 4th CLY's headquarters vehicles inside the town.

Over the next seven minutes, Wittman destroyed the tank of the Regimental Reconnaissance Troop Commander, the tank of A Squadron's commander, the Regimental

¹⁹ Porter, *7th Armoured Division at Villers-Bocage 13 June 1944*,136.

²⁰ Porter, *I SS Panzer Corps at Villers-Bocage 13 June 1944*, 135-136.

²¹ *Ibid*, 136.

²² Porter, *7th Armoured Division at Villers-Bocage 13 June 1944*,136-137.

Sergeant Major's tank, two artillery observation tanks, the Regimental Intelligence officer's armored car, and the Regimental Medical Officer's half-track.²³ A shot from another Firefly forced Wittmann to turn northward where, in an act of extraordinary bravery, the Regimental Adjutant, Captain Dyas, and his crew maneuvered their Cromwell tank to block Wittmann's path in the narrow streets. Even though they knew their weapons had virtually no chance of damaging the Tiger, they managed to fire twice before Wittmann obliterated them.²⁴ Their actions were not in vain. This action gave a dismounted anti-tank crew time to fire their small six-pounder gun and score a hit on the drive sprocket of Wittmann's vehicle. Effectively hobbled, the Tiger could no longer move.²⁵ However, the battle was still not over.

A little before 9:15 a.m., Wittmann and his crew opened fire on the anti-tank gun with their turret mounted machine guns and effectively suppressed the British long enough to bail out of their disabled tank. With sub-machine guns, pistols, and a few stick grenades, Wittmann and his four other crew members fought a running retreat from Villers-Bocage on foot armed with only hand weapons. The victorious Germans then made their way to their division headquarters over nine miles to the north.²⁶ Wittmann was quoted later as saying:

I then decided to abandon the tank. We took all the weapons we could carry, but I didn't destroy the tank as I believed that we could regain possession of it. Made my way to a division, about fifteen kilometers. Had to dodge enemy tanks several times; could have taken them out but had no close-range anti-tank weapons, so with a heavy heart had to leave them be. I reached the

²³ Porter, *7th Armoured Division at Villers-Bocage 13 June 1944*, 137-138.

²⁴ *Ibid*, 139.

²⁵ *Ibid*, 139.

²⁶ *Ibid*, 139.

division and immediately reported to it and to corps. Subsequent counterattack destroyed the enemy. The bulk of the armored regiment and a rifle battalion were destroyed.²⁷

The rampage lasted less than fifteen minutes, but in that time, the British lost eleven tanks, nine half-tracks, four armored personnel carriers, and two six-pound anti-tank guns.²⁸ Wittmann's already great reputation grew even larger. He returned to the *Führer's* presence to be decorated with the Knight's Cross of the Iron Cross with Oak Leaves and Swords. Then, he was promoted to *SS Hauptsturmführer* and given command of his old battalion. He returned to the fight in Normandy six weeks later.²⁹ Villers-Bocage would not be liberated by Allied troops until August 4th, 1944.

Michael Wittmann's victory over the 4th CLY is often recounted as a true legend of World War II. However, a major participant in the engagement is often lost in describing the tank commander's tremendous skills and accomplishments. Though the battle has been meticulously studied by dozens of scholars over the past seven decades, no source indicates that any of the soldiers of the 4th CLY from Lieutenant Colonel Cranley down to his lowest private had any indication of "who" they were facing. Rather, they only knew "what" they were facing. The British did not know the commander of the attacking tank was already a legendary *Panzer Ace*, a holder of the Knight's Cross of the Iron Cross, or even an officer of Hitler's infamous *Waffen SS*.

²⁷Michael Wittmann, as quoted in Agte, 20.

²⁸Porter, *I SS Panzer Corps at Villers-Bocage 13 June 1944*, 139.

²⁹Wittmann was killed fighting with British Forces during the "Battle of the Falaise Pocket" on August 8, 1944. Several units claim credit for firing the lethal shot. However, most historians give credit to a Sherman Firefly of the 1st Northhamptonshire Yeomanry. He was listed as "Missing in Action" until 1983, when his body was discovered. Wittmann and his crew are now interred in the German Military Cemetery in La Cambe, France.

As Sergeant O'Conner's bleak quote conveys, all the men of the 4th CLY knew was that they were facing an infamous German Tiger: a tank whose reputation alone was fearsome enough to force the British infantry and tankers into action before even a single shot was fired. Once the actual fighting started around Point 213, many were so convinced that resistance was futile, they abandoned fully functional and undamaged vehicles to cower in a ditch rather than trust their lives to tanks, weapons, and equipment that they believed were abjectly inferior to the German *Panzerkampfwagen*.

No doubt, the abilities of Wittmann and his crew had a large impact on the outcome of the morning June 13, 1944. However, if Wittmann was not known to the British, skill alone cannot fully account for the 4th CLY's reactions prior to the actual engagement. Therefore, scholars can rightfully question if Michael Wittmann's personal agency alone was solely responsible for the destruction. Could the Tiger tank itself have become so renowned in the eyes of both Allied and Axis combatants that it had the ability to alter the course of events by its mere presence?

“The Tiger Gap”

Why did the German military invest so much of its limited wartime resources into a vehicle as complex and expensive as the Tiger? The first production vehicles did not see combat until August of 1942 around Leningrad. By this time, more combat tested designs such as the *Panzerkampfwagen III* and *Panzerkampfwagen IV* had already helped the German Military High Command (*OKW*) conquer Poland, the Low Countries, France, Southeast Europe, parts of North Africa, and brought German forces all the way to the outskirts of Moscow. The light and medium tanks already fielded to *Panzer* Divisions had proven to be effective in large numbers,

were much less costly and resource intensive to build, and could be produced at relatively high rates. A later model *Panzer III* required approximately twenty-three tons of steel to produce while a later model *Panzer IV* required approximately twenty-four tons. In comparison, a Tiger I required fifty-seven tons of steel.³⁰ The Tiger II which began replacing the Tiger I in 1944 required a whopping sixty-eight tons of steel.³¹ Even the Panther tank, the medium vehicle which was designed to fully replace the *Panzer IV* in wider German service only required forty-six tons.³² This was made even more significant by the fact that a contemporaneous American Sherman tank required only thirty-three tons of steel and a Soviet T-34/85 required a mere thirty tons.³³

Not even accounting for the increased mechanical complexity of the Tiger series of tanks and the resulting increase in man-hours required to assemble one, by raw materials alone it was possible to build over two *Panzer IVs* for one Tiger I and almost three *Panzer IVs* for one Tiger II. Despite these facts, the highest levels of German political and military leadership sacrificed tremendous amounts of currency, natural resources, and industrial might to design, produce, and field the Tigers. This came at the cost of reducing or, in the case of the *Panzer II*, *Panzer 38 (t)*, and *Panzer III*, completely eliminating the production of successful designs from the early years of *Blitzkrieg*.³⁴

³⁰ Thomas L. Jentz (Ed.), *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany's Tank Force, 1933-1942, Vol. 1* (Atglen: Schiffer Military History, 1996), 279-281.

³¹ Thomas L. Jentz and Hilary L. Doyle, *Germany's Tiger Tanks: VK 45.02 to Tiger II: Design, Production & Modifications* (Atglen: Schiffer Military History, 1997), 160.

³² The *Panther* was never able to fully phase out the *Panzer IV* due to technical and design issues. See Thomas L. Jentz (Ed.), *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany's Tank Force, 1943-1945, Vol.2* (Atglen: Schiffer Military History, 1996), 294.

³³ *Ibid*, 292, 295.

³⁴ Between September 1939 and December of 1942, before full wartime mobilization was achieved, German industry produced a total of 7,143 *Pzkw. IIs*, 38 (t)s, and *IIIs*. Conversely, during the entire course of World War II, only 1347 Tiger *Is* and 462 Tiger *IIs* were produced in total. Even when you count the 6,058 *Panther* tanks produced between May of 1943 and May of 1945, this only represents an eleven percent increase in production when, after

Why did the leadership of Germany choose to gamble on producing a larger, more expensive, more technically complicated vehicle at a time when the Third Reich was subjected to increasing levels of economic pressure, resource deprivation, and the ravaging effects of increased Allied strategic bombing? More simply, in a time of scarcity why did the German government choose to pay a higher cost for producing fewer vehicles? This discrepancy or “Tiger Gap” is the central question of this historical study.

The evidence points to a single answer: The Tiger series of tanks was a physical representation of the military and cultural values of National Socialist Germany. Its function in combat was consistent with the culture taught to the German Officer Corps at institutionalized *Kriegsschulen* (military academies). The industrial and engineering skill required to design, build, and operate a vehicle with the Tiger’s level of complexity showcased the Third Reich’s emphasis on science, technological development, and education. Finally, when combined with the audacity and fanaticism of men like Wittmann, the vehicle’s overwhelming level of firepower and armored protection made for ideal Nazi propaganda showcasing class and masculine gender ideals.

Finding Continuities and Situating the Tiger’s Place in German Military Culture

In his 2008 article, “When the *Sonderweg* Debate Left Us,” historian Helmut Walser Smith emphasized the importance of “continuities” that “situate the German past in a denser

full mobilization, *Panzer IV* production increased 367 percent from 1,743 produced between September 1939 and December 1942 to 6,402 produced between January 1943 and May 1945. Though it is debatable how many heavy Tigers and medium Panthers equal the much lighter *Pzkw II*s and *Pzkw 38 (t)*s, these numbers are meant to showcase how many more *Pzkw III*s, *Pzkw IV*s, and Panthers could have been produced once full mobilization was achieved in lieu of the heavier, more complicated, and much more expensive Tiger I and II. To view the official *OKW* production numbers reproduced by month, see Jentz, *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany’s Tank Force, 1933-1942, Vol. 1*, 256-269 and Jentz, *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany’s Tank Force, 1933-1942, Vol. 2*, 280-289.

weave of international and transnational history.”³⁵ Though Smith was referring to the explanation of the rise of National Socialism vis a vis the German “special path” or *Sonderweg* hypothesis, his framework is just as valid for the study of the Tiger tank.

To date, all scholarship on the Tiger has fallen into one of two general categories. The first, exemplified by scholars such as Thomas Jentz, Hilary Doyle, and Walter Spielberger, focused on the mechanical aspects of the vehicle and its technical development. These works provided detailed insights into the engineering of the Tiger, but failed to provide any greater cultural context of the complicated relationship between the Tiger and broader German military culture. In *Panzer Truppen: The Complete Guide to the Creation and Combat Employment of Germany's Tank Force, 1933-1942*, Jentz explained the emergence of vehicles like the Tiger as being endemic of the German military's shift from the “Offensive War” of 1939-1941 to the “Defensive War” of 1942-1945.³⁶ While the first combat experience of the Tiger I in August 1942 corresponded to this theory's time frame, Jentz's ex-post facto explanation failed to account for the fact that the Tiger's development began nearly a year earlier in 1941. This paradigm also did not address long-standing German military continuities stressing the importance of offensive tactics: a philosophy rooted in military thinkers such as Carl von Clausewitz and Moltke the Elder which decisively shaped professional German military education in the decades prior to World War II.³⁷ These teachings embodied what Isabel Hull

³⁵ Helmut Walser Smith, “When the *Sonderweg* Debate Left Us,” *German Studies Review*, Vol. 31, No. 2 (May, 2008), 236-237, Accessed August 29, 2017, <http://www.jstor.org/stable/2766851>.

³⁶ Thomas L. Jentz (Ed.), *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany's Tank Force, 1933-1942*, Vol. 1, 7.

³⁷ Jörg Muth, *Command Culture: Officer Education in the U.S. Army and the German Armed Forces, 1901-1940 and the Consequences for World War II* (Denton: University of North Texas Press, 2011), Chapter 5.

later dubbed “the cult of the offensive,” or the idea that attacking with tactical and technical superiority alone could win wars.³⁸

The second category of literature subordinated the Tiger as equipment used by exemplary individual actors. Patrick Agte’s two volume series, *Michael Wittmann and the Waffen SS Tiger Commanders of the Leibstandarte in WWII*, the collected works of Michael Reynolds and David Porter, and historical memoirs such *Panzer Ace Otto Carius’ Tigers in the Mud* granted limited agency to the vehicle in that it was portrayed as either enabling human accomplishment or even as a “partner” in fierce combat. However, the Tiger is not the primary focus of these works. These books lack the analysis of how human and vehicle interacted politically and socially.

In line with Peter Paret’s concept of “New Military History,” this study creates a third strategy by focusing on the interaction between the Tiger tanks and the political, military, economic, and cultural leaders of Germany during World War II.³⁹ In what Jeffrey Herf called the “Reactionary Modernist” period of Germany from the 1920s to 1930s, conservative writers like Ernst Jünger emphatically believed that new technology could bring about the triumph of the wartime *Gemeinschaft* first experienced by trench veterans during the First World War now on a new and national scale.⁴⁰ Using sources primarily gathered from the Captured German Records Collection at the United States National Archives in College Park Maryland, the Donovan Maneuver Research Library at Fort Benning, Georgia, and artifacts stored at the National Armor and Cavalry Museum, also at Fort Benning, this study’s research addressed the following objectives:

³⁸ Isabel V. Hull, *Absolute Destruction: Military Culture and the Practices of War in Imperial Germany* (Ithaca: Cornell University Press, 2005), 2, 13, 22.

³⁹ Peter Paret, *Understanding War: Essays on Clausewitz and the History of Military Power* (Princeton: Princeton University Press, 1992), 220.

⁴⁰ Jeffrey Herf, *Reactionary Modernism: Technology, Culture, and Politics in Weimar and the Third Reich* (Cambridge: Cambridge University Press, 1984), 24.

1. Place the design of the Tiger in conversation with the military and political culture that created it and address how the design of the Tiger tank reflected its contemporary place in German military history.
2. Address the role that the German military desired the Tiger to fill within its larger wartime strategy.
3. Address how that role changed as wartime and battlefield conditions evolved between 1942 and 1945.

Taken at their surface, the Tiger I and its larger sibling, the Tiger II appeared as wasteful and irrational contradictions for a nation with the combination of Germany's breadth of military experience and limited war-time budget. However, with deeper and broader analysis, the "Tiger Gap" illuminated new facets of German military culture and symbolic representation.

Chapter 1

A Cultural Foundation in Clausewitz

Everything is very simple in war, but the simplest thing is difficult.

-Carl von Clausewitz, *Vom Kriege (On War)*

In *Absolute Destruction*, Isabel Hull wrote that the German military of the 19th and early 20th centuries was dominated by a philosophy known as “the cult of the offensive.” This paradigm stated that it was better ruthlessly to attack enemy forces where they were weakest in the fewest number of bold engagements possible. These victories would then lead directly to a final victory over a depleted and exhausted adversary.¹ To many, this strategy seemed proven effective by Chief of the German General Staff, Helmuth von Moltke the Elder, at engagements such as Königsgrätz in 1866 and Sedan in 1870. Industrialization enabled the German military to rapidly move troops via railroad and produced new weapons, including repeating rifles and early automatic machine guns, which granted their infantry huge advantages over adversaries.

Moltke’s strategy shaped the doctrine taught to students at professional military academies for the next 70 years.² The most famous example of a bold strike enabled by technological mobility was the Schlieffen Plan, the German strategy designed to knock the British and French armies out of a conflict prior to the time period required for their eastern ally, Russia, to fully mobilize. Though ultimately a failure in 1914, the plan’s characteristics nested within the mold firmly established by Moltke during the Austro-Prussian War of 1866 and the Franco-Prussian War of 1870-71.

¹ Hull, 167.

² Ibid, 161.

This idea of rapid action combined with constant attrition did not originate with Moltke, however. The foundations were firmly established in the writings of his mentor, Carl von Clausewitz, a German general of the Napoleonic period. It is impossible to conduct a thorough examination of German military culture in the period of 1850-1945 without reference to Clausewitz's writings and philosophy. He was the director of the Prussian War College or *Kriegsakademie* from 1823 until 1836 where he instructed Moltke as a junior officer.³ Clausewitz's lessons formed the basis of Prussian and later German military education in the period of Moltke's tenure as Chief of Staff during the 1850s-1870s. Despite the crushing defeat of World War I, early 20th Century German leaders still believed Clausewitzian doctrine to be superior to the Jominian theories espoused by the French, British, and United States' militaries.⁴ The post-war Weimar military or *Reichswehr* led by General Hans von Seeckt also ardently adhered to Clausewitzian martial philosophy.

The prevailing belief among German military personnel was that their tactics had not "lost the war" in 1918. Instead, they were betrayed by anti-military leftists and politicians on the home front: a now discredited theory commonly referred to as the *Dolchstoß* or the "Stab in the Back." Belief in this "betrayal" prevented any serious post-war reevaluation of military education. The German military of the 1920s largely kept their professional schooling intact in direct defiance of the Treaty of Versailles.⁵ The primary instructors of the German *Kriegsakademie* at this time were veteran officers from World War I. Men such as Erwin Rommel and Heinz Guderian, later famous generals of Hitler's *Wehrmacht*, mentored the next

³ Muth, 20.

⁴ Britain, France, and the United States largely followed doctrine based on the methodology advocated by General Antoine Jomini, a Franco-Swiss officer serving in Napoleon's Army. His works were the basis of most Western European military curriculums and saw widespread use in both the Crimean and American Civil Wars. See Muth, Chapters 1 and 4.

⁵ Muth, 149, 150.

generation of officers using the same fundamental assumptions that Clausewitz emphasized a century earlier.⁶ This meant that the battles of World War II would be fought with largely the same underlying principles found in World War I strategy.

Carl von Clausewitz was born in 1780 in Burg bei Magdeburg, Prussia. The son of a lieutenant in Frederick the Great's army, Clausewitz entered military service at the age of twelve as a lance-corporal. He invaded France with the Prussian intervention during the French Revolution. However, it would be his experiences during the Napoleonic Wars that would most influence his philosophy. Captured at Jena in 1806, Clausewitz spent two years as a prisoner in Imperial France. After his return to Prussia, he was so disgusted with the peace treaty between his nation and Napoleon that he travelled east and joined the Imperial Russian Army. Clausewitz served the tsar from 1812 to 1813. He was present at the Battle of Borodino in 1812 and helped negotiate the Prussian/Russian/British coalition with the Convention of Tauroggen that would ultimately defeat Napoleon's army. By then a major general, Clausewitz assumed his tenure as chief of the Prussian *Kriegsakademie* in 1823 where he assembled the writings that would eventually become his most famous work.

Clausewitz's widow, the Countess Marie von Clausewitz (née von Brühl) published *Vom Kriege (On War)* in serial format between 1832 and 1835 after her husband's sudden death from cholera in 1831. Influenced by Hegel's dialectic method of philosophy, the book grappled with the true "essence" of war from a political, social, and philosophical perspective. Clausewitz chose to view war in its basic nature as "an act of force to compel our adversary to do our will."⁷ He emphasized the importance of unity of leadership. According to Clausewitz, war is "merely a

⁶ Ibid, 161, 191.

⁷ Carl von Clausewitz, *On War* (1832) translated by O.J. Matthijs Jolles (1943) re-published in *The Book of War: Sun-Tzu The Art of Warfare & Karl von Clausewitz On War* (New York: Modern Library, 2000), 264.

continuation of policy by other means” and “all wars may be regarded as political acts.”⁸ It was therefore critical that military officers must be subordinated to political leadership while politicians simultaneously provided realistic and concrete objectives. Otherwise, campaigns would end in unnecessary casualties and failure. Eschewing the mathematical and technical methodology favored by his Franco-Swiss contemporary Antoine-Henri Jomini, a general in Napoleon’s army, Clausewitz took a much more abstract approach to war. He called it “a veritable chameleon” composed of the “fascinating trinity” of violence, rational thought, and chance simultaneously interacting and influencing each other.⁹ To Clausewitz, military conflict could not be understood in the classroom or the laboratory, nor was it an academic subject to be taught.¹⁰ Rather, it was a phenomenon that had to be learned through realistic training and actual experience in combat.

During Clausewitz’s lifetime, Prussia was a relatively small European state surrounded by potentially hostile foreign powers. Russia, France, Great Britain, and Austria all possessed far greater reserves of manpower, materials, and currency. The wars of Frederick the Great (1740-1786), Clausewitz’s primary historical examples, showcased the ability of a smaller, rapidly-mobile army engaging numerically superior forces, inflicting relatively large amounts of casualties, and eventually earning victory by wearing down enemy reserves and an opponent’s political will to fight. This deeply instilled in Clausewitz the idea that it was not the size of a

⁸ Ibid, 280, 281.

⁹ Clausewitz used the term “*wunderliche Dreifaltigkeit*” in the original text which Jolles translated as “strange trinity” for his 1943 edition meant for United States Military Intelligence. I have chosen to use “fascinating trinity” in line with the 1976/1984 Howard and Paret edition as I believe it better encompasses Clausewitz’s original meaning of a three-way relationship that merits greater examination. See Clausewitz, trans. by Jolles, 282 and *On War (1832)* translated by Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976/1984), 89.

¹⁰ Clausewitz, trans. by Jolles 324.

force but rather the combination of its “physical and moral” strength that ensured victory.¹¹

Clausewitz distilled this “conception of war” into the following statements:

1. The destruction of the enemy’s military force is the leading principle of war, and for all positive action the main way to the object.
2. This destruction of the enemy’s force is principally effected only by means of the engagement.
3. Only great and general engagements produce great results.
4. The results will be greatest when the engagements are united in one great battle.
5. It is only in a great battle that the general-in-chief commands in person, and he naturally prefers to entrust the direction of it to himself.¹²

Clausewitz’s original philosophy was amplified to the extreme by elements of German military leadership over the next century. This eventually resulted in many of the more drastic tactical weapons of World War II including the Tiger program.

Offense and Defense: The Positive and Negatives of Warfare

One of the most difficult concepts for readers to grasp in *Vom Kriege* was the relationship of offense (which Clausewitz often refers to as “the attack”) and defense. Clausewitz did not consider them to be related or even equal in stature.¹³ He considered defense to be the “stronger” form of war, but still inferior to offense.¹⁴

¹¹ Ibid, 461.

¹² Ibid, 493.

¹³ Ibid, 275

¹⁴ Ibid, 619.

Clausewitz believed that the only purpose of defensive operations was to “preserve” friendly forces in preparation for the attack.¹⁵ A weaker opponent who could not yet strike a stronger or better prepared opponent, or conversely, an attacking force that had exhausted its resources and could no longer advance, would transition to defensive operations to build or rebuild their combat power. Armies in the defensive had the advantage of shorter supply lines, prepared positions, and fortresses as well as familiarity with the terrain they occupied.¹⁶ However, defense also had a strong “negative” object. An army on the defense could not dictate where or when an enemy was destroyed and therefore could not dictate the terms of an enemy’s surrender.¹⁷ Defense meant only survival.

Conversely, the purpose of the offense was to bring about the destruction of the enemy’s forces and therefore was “a means to the end” and the most direct path to a final victory.¹⁸ This meant that it was the “positive” to the defense’s “negative.” However, it was also the weaker form of warfare because all the advantages of terrain and preparation belonged to the enemy.¹⁹ Defense could not win wars. It was merely maintaining the “status quo” long enough to transition to a “swift and vigorous attack-the flashing sword of vengeance-[which] is the most brilliant point of the defensive.”²⁰ Of great importance to subsequent German military culture, Clausewitz also believed that victory in an overall defensive war could be achieved by engaging in offensive operations that supported defense across a broader area.²¹ Though a stronger opponent was conducting an overall attack, a weaker opponent could still win by attacking the opponent at the weakest points.

¹⁵ Ibid, 619.

¹⁶ Ibid, 626.

¹⁷ Ibid, 619.

¹⁸ Ibid, 840.

¹⁹ Ibid, 626.

²⁰ Ibid, 635.

²¹ Ibid, 660-661.

Peter Paret stated that it was a fundamental misunderstanding of this concept by several generations of German soldiers from the 19th into the 20th century which contributed to the defeats of both World Wars.²² To Clausewitz, offense in a defensive war had to be balanced with the need to preserve forces. He clearly argued that an army unable to logistically support itself should transition to the defense to rebuild and strengthen its forces. However, many German military leaders took Clausewitz's assertion at face value that a broader defense could be fought with "tactical" offensive engagements. This meant they often chose to attack stronger opponents as a shorter means to victory rather than gathering resources in their weakened state. When applied to global, industrial war, this fundamental misunderstanding meant that the German economy could not keep up with losses, and actually perpetuated the hardships that destroyed the country's ability to continue fighting.

A powerful example of this concept can be found in the *Kaiserschlacht* Offensive of 1918. A weakened German Army chose to attack fortified British and French positions along the Western Front prior to full American mobilization. Though some initial gains were made, the German military did not have the logistical or man-power reserves to continue their advance or even hold the newly acquired ground. The sheer cost in lives and equipment eventually contributed to the final German surrender eight months later. However, if anything, the near-German breakthrough of Allied lines during the *Kaiserschlacht* actually reinforced the false idea that the broader offensive could have defeated the Allies. During the Second World War, German strategists looked for ways to enhance their army's ability to break through enemy lines more efficiently. One result of this research was development of the *Panzer* warfare.

²² Paret, 115.

Tactics and Strategy: The Art of the Engagement

The relationship between individual engagements and the collective impact of all battles was revealed in Clausewitz's discussion of strategy versus tactics. Strategy was "the use of engagements to attain the object of the war" while tactics was defined as "the use of armed forces in engagements."²³ For Clausewitz, an army's tactical superiority, or the ability to win individual battles, directly translated to a force's ability to win an entire conflict. He boldly asserted "in strategy...there is no victory."²⁴ This is not meant to imply that a conflict must not have an overall objective. Rather, political and military leaders must engage in useful, well-planned, and well-executed tactical level fights that culminate in final victory "as a chain, composed of nothing but engagements."²⁵ In *Vom Kriege*, the simplest path to absolute victory is the destruction of enemy forces. For Clausewitz, this was only possible by direct action in the form of battles.²⁶ He dedicated an entire section of his book to this concept called "The Engagement." In Book 4, Chapter 4, Clausewitz unequivocally stated that "every engagement is, therefore, the bloody and destructive measuring of the strength of forces, physical and moral; whoever has the greatest sum total of both left at the end is the conqueror."²⁷ Clausewitz believed that each tactical engagement was the meeting of two diametrically opposed elements that attempted to annihilate each other by means of fire and maneuver. The element which possessed greater "physical" strength in the form of both numbers and quality of equipment and greater "spiritual" strength in the form of indoctrination, training, and morale would always emerge "victorious." Clausewitz described his criteria for "victory" as the force which suffers the

²³ Clausewitz, trans. by Jolles, 330.

²⁴ Ibid, 626.

²⁵ Ibid, 396.

²⁶ Clausewitz uses the term *das Gefecht* or "the engagement" to mean the use of direct force between two opposing military forces in either "Defensive" or "Offensive" posture.

²⁷ Ibid, 461.

least damage in both the “physical” (casualties and lost equipment) and “spiritual” (broken morale, loss of faith in victory, loss of confidence in leadership) will win the engagement. Of important note is that “physical” losses could be significantly offset by preventing “spiritual” defeats to the point that defeat could actually be transformed into a victory. Even if friendly forces suffered greater physical losses than the enemy, they could still be considered “victorious” if they inflicted greater “spiritual” losses on the enemy and therefore robbed the enemy of the will to continue fighting.²⁸ The more of these engagements a force linked together in a strategic chain, the closer it would be to winning the war.

How the German military applied these principles to their culture and conduct of war in the 19th and early 20th centuries is essential to understanding their choice of battlefields, logistics, and equipment which eventually resulted in the “Tiger Gap” of World War II. Hull’s detailed study of German military culture clearly demonstrated how military leaders, regardless of their geographic or logistical constraints would always default toward planning quick, direct engagements rather than waiting for conditions to develop more to their favor or augmenting their strategy with diplomacy.²⁹ German officers from 1900-1945 were repeatedly and viciously indoctrinated during their training that the most desirable course of action was always to take initiative, develop a plan, and violently attack. They believed that even if it was “strategically” not expedient, a tactical victory would always further degrade enemy forces and contribute to final victory.³⁰ Despite the crushing defeats of 1918, initiative and tactical superiority were still the most prized virtues of German military culture. Prior to and during World War II, this led to

²⁸ The most common term for this nature of victory in contemporary military vocabulary is the “Pyrrhic Victory” referring to the Pyrrhic Wars of the 3rd century B.C. when Greek forces defeated several Roman legions but suffered eventual defeat when their forces suffered irreplaceable losses to accomplish it. Clausewitz never actually uses this term in his text. See Clausewitz, trans. by Jolles, 400-401.

²⁹ Hull, 168.

³⁰ Muth, 165-167.

a huge focus on developing better rifles, faster firing machine guns, and heavier and heavier tanks no matter how many resources these programs consumed.

The Culminating Point of Victory: The *Schwerpunkt*

In *Vom Kriege*, an effective commander identified where the enemy was weakest, wore down their forces through powerful and bold action, and then escaped with a sufficient number of friendly forces to fight another day.³¹ This location is what Clausewitz called the *Schwerpunkt* or “culminating point.”³² Identifying and exploiting this location (which could be either physical or metaphorical) was essential to all victories, whether it be a skirmish between two platoons or an entire war between two nations. Even if the overall strength of two opponents was significantly different, a smaller, weaker force could still defeat a larger opponent if leaders were able to skillfully maneuver greater amounts of forces and resources to the *Schwerpunkt*.³³ However, this was made exponentially more difficult by the fact that the *Schwerpunkt* could change over the course of an engagement, based on evolving battlefield conditions. These could include new intelligence, the commitment of reserves, loss of logistical supply lines, or drops in enemy “spiritual” strength.³⁴ To minimize the chance of misidentifying the *Schwerpunkt* and enhance the relative strength of their forces, an effective commander must accomplish two things:

1. Maximize the “physical” and “spiritual” strength of their forces at all times through training, tactical superiority, and logistical management.

³¹ Clausewitz, trans. by Jolles, 462-463.

³² Ibid, 416.

³³ Ibid, 417.

³⁴ Ibid, 886-888.

2. Preserve the “economy” of their forces by efficiently fighting as few tactical engagements as possible to achieve strategic victory conditions.³⁵

The *Tiger* tank was meant to address both these concerns. The vehicle was designed as a *Schwerpunktwaaffe* or “culminating point weapon.” The purpose of this vehicle would be to provide overwhelming firepower against enemy forces and act as “spiritual” reinforcement for German troops at points where *Wehrmacht* commanders felt that they could best influence the outcome of engagements.³⁶ It was designed as much for the morale it could inspire as its firepower or armored protection.

The Importance of the Individual

One of *Vom Kriege*'s most important prescriptions was that victory required competent and engaged leaders. For Clausewitz, battles were fluid events where new variables, changing information, and fluctuating factors such as enemy reinforcements, weather conditions, and logistics could turn the tide of momentum at a moment's notice. These difficulties compounded themselves into a force that Clausewitz called “friction” or intangible factors that collectively degrade a military force's performance and cannot be fully accounted for with prior planning.³⁷ According to Clausewitz, “friction” is “that which distinguishes real war from war on paper.”³⁸ The only thing that could overcome “friction” on a battlefield was strong, unified leadership with “powerful, iron will” and “strong spirit.”³⁹

³⁵ Ibid, 416-417, 524.

³⁶ Office of the General Inspector of Panzer Troops, “Response to After-Action Reports of the Infantry Division *Grossdeutschland*,” 27 April, 1943, reproduced in Jentz, *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany's Tank Force, 1943-1945, Vol.2*, 38.

³⁷ Ibid, 321.

³⁸ Ibid, 322

³⁹ Ibid, 321-322.

As exemplified by his conception of ideal warfare, Clausewitz believed “great” leaders possessed the ability to determine which engagements were the most significant to the destruction of the enemy and positioned themselves to directly take charge of them. The most influential example for Clausewitz was Frederick the Great.⁴⁰ During the Seven Year’s War, the Prussian king was always present at the most significant battles, constantly analyzing and synthesizing all available information to determine when and where to commit additional forces and direct assaults against the most vulnerable points in enemy formations. This included the 1757 “Battle of Leuthen” when Frederick used a feint attack on one end of the battlefield to then outmaneuver and route an Austrian force twice his size. Clausewitz stated that this concentration of authority in one individual, a leader who could immediately decide on bold responses, was absolutely essential: not only because this reduced the time and effort necessary to react to changing conditions, but also because it caused the maximum amount of damage to the enemy with the minimum amount of friendly effort.⁴¹ Final victory was not achieved by the ability of an army to field larger forces or more weapons, but rather the ability of a force to use its resources more efficiently in well-planned and executed battles under competent direction.⁴² Efficiency and unity of command were everything.

This focus on “one leader” taking overall responsibility for action would later become a common theme taken to extremes in both the German military and political culture. It was an idea that often also yielded disastrous results. Two critical assumptions for Clausewitz were that

1. Leaders would understand that wars must be subordinated to political goals.

⁴⁰ Ibid, 288.

⁴¹ Ibid, 292-293.

⁴² Ibid, 524.

2. Leaders would be able to grasp the entire political and social dimensions of a battlefield, not merely the military ones.

However, over the course of the next century, the focus on the unity of military leadership had the opposite effect. Rather than becoming further integrated into political and diplomatic organizations, the military actually became further isolated from other German state institutions.⁴³ During the 1904 campaign against the Herero people in German Southwest Africa, Kaiser Wilhelm II placed the entire campaign under the responsibility of German Chief of Staff Alfred von Schlieffen. The military completely ignored the advice and consent of the colony's civilian leadership, constantly searched for a single and bold victory, and ignored the dire warnings of the colonial authorities experienced with the area.⁴⁴ The armed forces went on a campaign of increasing violence, death, and destruction that left thousands of innocent civilians dead or displaced.⁴⁵ From 1916-1918, the German Army under the command of Marshals Paul von Hindenburg and Erich Ludendorff created a military dictatorship in the name of streamlining administration of the First World War. Their administration alienated huge swaths of the German civilian population, the *Reichstag*, and eventually even the German Kaiser Wilhelm II himself. The result was the 1918 Revolution that toppled the government and resulted in the November Armistice.⁴⁶ Finally, and most dramatically, the *Fronterlebnis* or "front experience" during the First World War was extolled by many on the German far-right and contributed to the rise of Adolf Hitler and his NSDAP.⁴⁷ The Nazis consolidated total control of the German state in the form of one individual encapsulated in the slogan *Ein Volk, Ein Reich, Ein Führer* or "One

⁴³ See Gordon Craig, *The Politics of the Prussian Army 1640-1945* (Oxford: Oxford University Press, 1956) and Karl Demeter, *The German Officer Corps in Society and State: 1650-1945* (New York: Praeger, 1965).

⁴⁴ Hull 12-13.

⁴⁵ *Ibid*, 96.

⁴⁶ Gunter Mai, *Das Ende des Kaiserreichs: Politik und Kriegführung im Ersten Weltkrieg* (Munich: Deutscher Taschenbuch Verlag, 1987), 151-152.

⁴⁷ Herf, 225.

People, One Nation, One Leader.” The military ideals of “unity of command” had become corrupted into an absolute dictatorship which would cost millions of lives.

Carl von Clausewitz’s *Vom Kriege* is a long and detailed treatise by design. As a dialectic argument, his martial philosophy was meant to be understood as a whole unit, and not by its individual prescriptions. However, in the constant desire for the quickest route to victory, the German military picked and chose pieces of it to construct their culture while simultaneously ignoring key caveats or updating Clausewitz’s principles to reflect the changing nature of industrialized warfare in the 19th and 20th centuries. Between 1871 and 1945, the only lessons the German military gleaned from Clausewitz were the search for a “major victory” and overcoming the friction of warfare with decisive tactics.⁴⁸ However, these ideals completely neglected Clausewitz’s key assertions that defense was an absolutely necessary component of building strength as well as the caution that forces must be only used in the most decisive of engagements.

Over the course of roughly a century, the Prussian and German militaries, driven by an abridged, simplistic understanding of Clausewitz’s principles, gained increasing amounts of political control and influence over the nation. Clausewitz’s teachings were misconstrued, misinterpreted, or completely misapplied to non-military matters even to the point of negating Clausewitz’s most important, underlying principle: war was “a continuation of policy by other means” and cannot be won without subordination to political authority.

The German military became blinded by its own lust for power and search for easy victories which created a “cult of violence.” This fanaticism sought utter tactical superiority and worshipped the ability to annihilate an enemy even to the point of extreme irrational behavior

⁴⁸ Paret, 121.

and consumption of resources.⁴⁹ It would reach its ultimate incarnation in the creation of weapons like the *Panzerkampfwagen* Tiger: powerful, expensive, but ultimately unsustainable.

⁴⁹ Hull, 333.

Chapter 2

An Armored Revolution

On the other hand, there is no doubt that German armored units have suffered severe losses in Russia and Libya. It remains to be seen how far the Germans will be able to maintain these high standards of training in replacing losses. Even standards of training, however, are not absolute, and much will depend on the standards of the Germans as compared with those of their opponents.

- United States Army Intelligence Bulletin
July 30, 1942¹

In *Machines as the Measure of Men*, historian Michael Adas wrote that by the early 20th century, European powers were convinced that advanced technology was the symbol of their political and racial superiority.² Richard A. Preston and Sydney F. Wise echoed that point in *Men in Arms* when they proposed that the political, economic, and military spheres of a nation are inherently interrelated. In other words, the social priorities of a civilization are reflected in the technology it produces.³ To European imperialists, machines designed to dominate others both empowered and justified their conquest, occupation, and exploitation of “lesser civilizations.”

British, French, and American spheres of imperialism were mostly confined to Africa, South America, and Asia. However, Germany lost all of its overseas territory after the Treaty of Versailles. Without a significant navy, Germany would be unable to challenge the Western European and North American powers for dominance of overseas colonies. The only direction for possible colonial expansion would be eastward towards the Soviet Union. Adolf Hitler

¹ Military Intelligence Service, “Training of Tank Crews in German Armored Divisions” in *Tactical and Technical Trends*, No. 4 (30 July, 1942), United States War Department; DMRL.

² Michael Adas, *Machines as the Measure of Men: Science, Technology, and Ideologies of Western Dominance* (Ithaca: Cornell University Press, 1989), 204.

³ Richard A. Preston and Sydney F. Wise, *Men in Arms: A History of Warfare and Its Interrelationships with Western Society, Second Revised Edition* (New York: Praeger Publishers, 1970), 305.

himself extolled the necessity of the conquest of “the East” as early as 1923 in his autobiography, *Mein Kampf*. He ardently reiterated that the idea of “peaceful economic conquest of the world” was impossible and that only military force could secure resources for a new, more powerful German Empire.⁴ Hitler dedicated many pages to his negative assessment of Russian and Soviet civilization. He also believed that the fertile lands east of Prussia towards the Ural Mountains were ripe for forceful German colonization. To Hitler, the German Volk deserved dominion over these lands because Britain and France had already set the imperialist tone with their own expansionism both before and after World War I.⁵ German rearmament became the means to regain “lost national honor” in the wake of the Treaty of Versailles’ strict military limitations. The creation of new, land-based weapon systems was a prerequisite to new German domination of Europe and Western Asia.

While German military and political thinkers looked ahead to the next conflict, the allied nations focused on their experiences in the last war. Because their armored tactics had “won,” the victorious powers firmly believed that their tanks would always follow World War I tactics: the direct support of dismounted forces. Great Britain and France felt that any subsequent wars on the continent would largely follow the same format as 1914-1918: an initial collision of infantry followed by lengthy, defensive stalemate. British and French tanks remained large, slow behemoths designed to support infantry breakthroughs during trench warfare. U.S. tank forces were actually disbanded and the few remaining armored vehicles left in America were placed under direct control of the Infantry School at Fort Benning, Georgia. This formula directly followed the French model of heavy vehicles attacking enemy infantry to provide freedom of

⁴ Adolf Hitler, *Mein Kampf* (1925 and 1927) translated by Ralph Manheim (New York: Houghton Mifflin, 1999), 143-144.

⁵ Ibid, 326, 475, 524, 613-615, 642-645.

maneuver for friendly infantry. After America retreated into a policy of isolationism, very few resources were placed into American armored development in the 1920s and 1930s. The single word to describe how the Western powers viewed tank warfare before 1940 was stagnation.

Germany took a very different approach to armored warfare. After the Second World War, General Heinz Guderian, the officer foremost responsible for German tank development between 1925 and 1940, wrote a testament for United States Army Intelligence detailing his personal experiences of the early *Panzer* Corps. It serves as a critical document revealing not only the history of German tank doctrine, but also the decision-making process and motivation behind the initial incarnations of the force. The Treaty of Versailles forbade any official German armor research after 1919. However, the post-war German military (*the Reichswehr*) understood from their experiences in 1918 that tanks could provide the breakthrough necessary to prevent the paralyzing stalemate of trenches. To hide the development of new tanks from the Allied Powers, the *Reichswehr* established a 100,000 soldier “Motor Transport Service” with Guderian at its head. It combined the remains of Imperial German Army’s *Panzer* and Air Force’s together as Germany was allowed to maintain a limited number of armored cars and other wheeled vehicles for self-defense per the stipulations of the Versailles Treaty.⁶ On the surface, it pretended to limit itself to a few field maneuvers per year as not to arouse suspicion. Their true efforts, however, were far eastward of the Prussian frontier.

The 1918 Treaty of Brest-Litovsk brokered a separate peace between the Soviet Union and Germany. Before the rise of Hitler and his goals of eastward expansion, many in the German military thought that future wars would again be fought against Britain and France for control of international territory and prestige. The fledgling Soviet Union, also wary of Britain and France,

⁶ Heinz Guderian, “OKH Project #7: Representation of Armored Interests, 1938-1945 (1948);” DMRL, 1.

shared the German belief that the west was the primary threat to their existence. Absence of the constraints of the Versailles Treaty between the new communist government of Russia and the Weimar Republic during the 1920s allowed the two aspiring powers to embark on a secret, joint armored development project unbeknownst to the Western Allies.⁷ In exchange for allowing Germany to test secret armored prototypes east of the Urals, the Bolshevik government received detailed information about any German technological developments.⁸ According to Guderian, the small, crude tank designs that his organization tested in Russia bore little resemblance to the vehicles that would dominate the battlefields of Europe fifteen years later.⁹ However, these joint tests stimulated important tactical and strategic discussions on the effective use of armored vehicles in future conflicts and gave both Germany and the Soviet Union a tremendous head start developing new tank doctrine.

The most important issue facing German tank designers in the 1920s and early 1930s was also one of the most basic: how to defeat the technologically superior British and French tanks. The victorious nations were able to maintain and improve upon their existing designs from World War I while Germany had to start over again from scratch. Guderian's answer proved to be very simple: numbers. In 1930, the *Reichswehr* formed its first separate *Panzer* companies.¹⁰ Unlike the British, French, and Americans who subordinated their larger, stronger tanks to infantry units, independent German armored formations would allow their smaller tanks to travel together in fast moving packs with independent objectives. When these units encountered enemy vehicles, they would be able to overwhelm them with local numerical superiority and rapid, aggressive maneuvers. Guderian, a signal officer during the First World War, also added another

⁷ Ibid, 1.

⁸ Ibid, 1.

⁹ Ibid, 1.

¹⁰ Ibid, 3.

key improvement: voice radios mounted in the vehicles.¹¹ These relatively new and expensive devices facilitated instant communication and allowed multiple German tanks to coordinate their actions against enemy targets. Though Britain and France actually possessed more total tanks than Germany in the early 1930s, the new synchronized attack doctrine of Germany would allow the *Reichswehr* to separate, isolate, and destroy larger forces piecemeal. In line with the teachings of Clausewitz, the German military chose to gain victory by assembling superior forces at a *Schwerpunkt* to demoralize and obliterate their enemies. By the summer of 1934, the first *Panzer* divisions were formed.¹² These independent, armored divisions would become the spearhead of the German Army and set the stage for future “Lightning War” or *Blitzkrieg*.

Though degrading relations between the Soviet Union and the new Nazi government of 1933 forced the joint tank programs of the USSR and Germany apart, Hitler was an early and enthusiastic supporter of armored warfare.¹³ Already familiar with the German far-right’s fascination of blending warrior tradition with advanced technology, Germany’s new dictator was intrigued by the possibilities provided by Guderian’s new tank doctrine. In 1935, Hitler reorganized the Weimar era *Reichswehr* into the *Wehrmacht*, a consolidated military headquarters that included the Army (*Heer*), Navy (*Kriegsmarine*), and Air Force (*Luftwaffe*) within a unified command structure. It was also in 1935 that Hitler openly disavowed the Treaty of Versailles and began the full rearmament of Germany. With restrictions on weapons development no longer a constraint, the military joined forces with established, civilian industry to begin the mass-production of new tank designs including the *Panzer II* scout tank, *Panzer III*

¹¹ Ibid, 3.

¹² Ibid, 3-4.

¹³ Ibid, 7.

anti-armor tank, and *Panzer IV* anti-infantry tank.¹⁴ Though these vehicles were heavier than the early designs from the 1920s, they still were much less-armored and more lightly armed than their counterparts in Western Europe including the British Matilda infantry support tank and the heavy French Char B1 and Somua. Anxiety over the threat of these enemy vehicles spurred even greater reorganization of the German military in line with Clausewitz's prescriptions for efficiency and unity of command. On November 1, 1938, Hitler ordered the *Wehrmacht* to merge the old horse cavalry of both the German and Austrian armies with his new *Panzer* divisions under a unified command, The Chief of Mobile Troops.¹⁵ This office would complete the final preparations for the war unleashed upon the world less than a year later.

The success of the initial German armored thrust into Poland in 1939 surprised even the *OKW*. Though the Polish Army possessed very few tanks of its own, it did have large numbers of anti-armor guns that posed significant dangers to the relatively lightly armored German tanks. In addition, the rough terrain and unimproved roads of Eastern Europe were significant obstacles to the mobility of the new *Panzer* divisions. However, the *Panzer* IIs, IIIs, and IVs operating in independent formations proved deadly to Polish light infantry and were able to overcome anti-tank defenses by means of coordinated fire and maneuvers. However, the Polish anti-tank gunners, firing from prepared positions, still managed to inflict significant casualties. The first German unit to reach Warsaw, *Panzer-Regiment 35*, recorded the following event on September 9, 1939:

At first, the *II. Abteilung* ran into strong enemy forces near Adamowa and inflicted heavy losses. But, hidden in small wood-lots, enemy anti-tank guns almost completely wiped

¹⁴ Jentz, *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany's Tank Force, 1933-1942, Vol. 1*, 14.

¹⁵ Guderian, 7.

out the *6. Kompanie*. Leutnant von Cossel was severely wounded when hit in the throat as he looked out of his *Panzer* to orient himself. The *II. Abteilung* didn't reach their objective until 1400 hours.¹⁶

Despite the brave resistance from determined defenders, the independent German armored thrusts combined with overwhelming infantry support conquered Poland in a little over a month. The new *Panzer* Divisions proved their viability and the *OKW* readied for their next challenge: direct action against the British and French armies in Western Europe.

The German army implemented several changes as a result of lessons learned in Poland. They consolidated all outstanding tanks together and added more *Panzer* divisions to their formations.¹⁷ The “Battle of France” began on May 10, 1940 when 2,200 German tanks organized into ten divisions plowed through the Low Countries toward the French frontier.¹⁸ This fight revealed the new value of tanks when combined with the joint efforts of motorized infantry, artillery, and aircraft. The concentrated groups of lighter German tanks quickly surrounded and overwhelmed the dispersed, heavier, and less mobile Allied tanks detailed to slow-moving, dismounted infantry battalions. The *Panzer* divisions, supported by fast moving self-propelled guns and close support *Luftwaffe* aircraft such as the Ju-87 Stuka, tore huge holes in Allied defensive lines. Motorized German infantry units riding on trucks and half-tracks were able to drive straight through the gaps faster than French forces could fill them.¹⁹ Despite their numerical superiority, the Anglo-French coalition could not stop the relentless German advance. Huge formations of the French Army were isolated and bypassed while the British were hurled

¹⁶ “35 *Panzer-Regiment* War Diary,” 9 September 1939, reproduced in Jentz, *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany's Tank Force, 1933-1942, Vol. 1*, 98.

¹⁷ Guderian, 8.

¹⁸ *Ibid*, 9.

¹⁹ *Ibid*, 10.

backward to Dunkirk on the Channel Coast. The British Expeditionary Force abandoned their French allies by evacuating the mauled remains of their army to England between May 26 and June 4. With the French military in utter chaos, the German army marched into Paris unopposed on June 14, 1940. The French agreed to an armistice on June 22, which toppled the Third Republic and ceded the northern half of the *Metropole* to German occupation. In less than one year, the German army, reorganized around the new *Panzer* formations, had conquered Poland, the Netherlands, Belgium, Denmark, Norway, and France. By the spring of 1941, southeast Europe would also be under Nazi control. With the Molotov-Ribbentrop Pact securing neutrality between the Soviet Union and Nazi Germany, Britain stood alone against the might of the *Wehrmacht*. Britain and France had believed that the next war with Germany would be a repeat of the last conflict. As a result, they failed to modernize their doctrine and it cost them control of Continental Europe. Conversely, the German military had successfully demonstrated their invention of modern, combined arms operations: fast-moving armor, infantry, artillery, and aircraft linked by a robust wireless communication network fighting with synchronized objectives.

An analysis of the after-action reports from the “Battle of France” shows an important divergence of opinion on the reasons for the overwhelming German success. Intelligence reports from the Western powers, including a newly mobilizing United States, granted agency to the people and organization of the German military. On June 7, 1941, Major General Adna R. Chaffee, commander of the United States Army’s nascent tank force, published his analysis of the success of Germany’s *Panzer* Divisions. He stated unequivocally that, “the great German victories in France were won by offensive operations of armored armies supported by combat aviation...I believe that [Germany’s successes] were primarily due to close coordination and

cooperation.”²⁰ In other words, by reorganizing their forces into concentrated units trained to operate and interact together, Germany’s soldiers created high levels of proficiency and performance. Captain Carl T. Schmidt, a German-speaking officer in the United States Army, published a professional development article on December 1, 1941 with his own analysis of the recent events in France. He flatly rejected the idea that the Germans succeeded because of their level of technological development.²¹ To Schmidt, German tanks were average at best. German *Panzer* Divisions owed their successes to their concentrated numbers and strategic flexibility.²² In his analysis, any army could match the success of the *Wehrmacht* if it trained and organized its soldiers along the lines of the German model.²³ The Military Intelligence Service of the United States War Department published a detailed, thirty page pamphlet nine months after the U.S. entrance into the war on the history, strengths, and weaknesses of German *Panzer* Divisions. It asserted, “the German doctrine of the motorized arm is in keeping with the classical conception of the aim of war as defined by Clausewitz a century ago, and reaffirmed by the masters of German strategical concepts- von Moltke, Bernhardt, and von Schlieffen-namely, the destruction of the enemy’s armies.”²⁴ The pamphlet continued its analysis of German armored effectiveness by repeating assertions that the success of *Panzer* formations was not the result of their new weapons, but of an “aggressive spirit” and the “determination of the combatant to push forward at all costs.”²⁵ This echoed Clausewitz’s doctrine that “spiritual” strength could often overcome the limitations of “physical” strength. Finally, another Military Intelligence Service

²⁰ Adna R. Chaffee, “The Defense Program” in *Army Navy Journal*, (7 June, 1941) United States War Department; DMRL, 1145.

²¹ Carl T. Schmidt, “The German Armored Force” in *Coast Artillery Journal*, November-December 1941, (1 December, 1941) United States War Department; DMRL, 562.

²² *Ibid*, 566.

²³ *Ibid*, 572.

²⁴ Military Intelligence Service, *The German Armored Army* (August 10, 1942), United States War Department; DMRL, 6.

²⁵ *Ibid*, 21.

report squarely attributed the success of Germany's tank forces to the training and *esprit-de-corps* of its members which it dubbed, "the *Panzer Spirit*."²⁶ This frame of mind, cultivated with difficult and exacting standards, physical fitness, and constant repetition of exercises, resulted in a force that could work together and overcome any obstacles placed in its path. The common thread woven through all these analyses was that it was less the capabilities of the German equipment and more the personnel and structure of *Panzer* divisions that made them effective. This was an important baseline for the development of later victory strategies. The Allies did not have to produce significant new technology to overcome the *Wehrmacht*. Instead, they only had to increase their levels of training while also producing sufficient quantities of vehicles and equipment to overpower the German Army.

German analyses of "the Battle of France" and subsequent engagements across Europe assigned agency quite differently. Rather than focusing on their overall, "strategic" successes as their British and American counterparts did, German military reports overwhelmingly focus at the "tactical" level of engagement. This interesting variance falls squarely in line with Hull's assertions that once fully engaged in conflict, German military culture tends to default to performance in individual actions as a metric for evaluating success or failure. When looking at battles, German planners and strategists tended to focus on the ability of their forces to inflict casualties and damage on enemy forces. A great deal more agency was placed on the equipment and weapon systems than the abilities of individual troops. This was likely due to the assumption that German soldiers were always proficient due to the *Wehrmacht's* rigorous training program. As pressure mounted on the German military to continue their positive momentum, the

²⁶ Military Intelligence Service, "Training of Tank Crews in German Armored Division."

traditional “cult of the offensive” began to overwhelm the newer paradigm of “strategic” tank warfare.

Panzer-Regiment 35’s reports from France in 1940 reinforced the idea that German tanks had to be made more tactically lethal to continue to achieve success in the future. “Impressed by the effect of our weapons, some of the French crews abandoned their tanks,” Colonel Eberbach, the regimental commander stated, “the enemy tanks behave leaderless, aimless, badly commanded, tactically inferior, and try to get away too soon.”²⁷ However, the crux of Eberbach’s testimony soon shifted to the fact that the German tanks sometimes struggled against the heavier armor and more powerful weapons of their French and British opponents. He recounted precise details of weapon systems rather than general effectiveness. “The French Somua tank is superior to our *Pz. Kpfw.III* in both its armor and armament (4.7 cm gun)...The French 2.5 cm anti-tank gun can penetrate the armor at any location on the *Pz.Kpfw.III* at ranges up to 500 meters. The French 4.7 cm anti-tank gun is an exceptional weapon that is effective and can penetrate the *Pz.Kpfw.III* even at 1500 meters.”²⁸ Eberbach ended his testimony with a dire warning for the *OKW*. Regardless of the exceptional performance of his tank crews, if the French changed their tactics, his forces would be rendered helpless if more powerful German vehicles were not developed: “[t]he decisive cause for the German success in battle against French tanks was the fact that the French always fought against the regiment only with a small number of tanks...It could lead to a very difficult situation if the French employed a large number of Somua tanks against us.”²⁹ Despite the fact that Germans were already decisively succeeding strategically in

²⁷ “35 *Panzer-Regiment* War Diary,” 12 May, 1940, reproduced in Jentz, *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany’s Tank Force, 1933-1942, Vol. 1*, 118.

²⁸ “35 *Panzer-Regiment* War Diary,” 14 May, 1940, reproduced in Jentz, *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany’s Tank Force, 1933-1942, Vol. 1*, 123.

²⁹ *Ibid*, 123.

the fight for France, the traditional appeal of tactical superiority (and the crushing fear of losing it) remained firmly entrenched in the German officer corps. According to Guderian, Hitler's initial reaction when faced with the reports of stronger enemy tanks was to order an immediate increase in tank production in the late summer of 1940 to 1,200 tanks a month. However, when the Army Ordnance Department estimated that such an increase would cost two billion *Reichsmarks* and require an additional 100,000 skilled factory workers, Hitler abandoned the plan.³⁰ With France defeated and Continental Europe secured, the skill and training of German *Panzer* crews would have to remain the deciding factor of victory for the *OKW*. However, the invasion of the Soviet Union one year later would reinforce the persistent belief in German leadership that the individual fighting ability of their tanks would have to be significantly and rapidly increased.

On June 22, 1941, the invasion of the Soviet Union began. Adolf Hitler, desperate for the vast agricultural and petroleum-producing regions of the USSR, broke the non-aggression pact with Stalin and ordered the alliance of Nazi Germany and its Axis puppet states to charge across Soviet frontiers. Spearheaded by 3,200 *Panzers* and 3.6 million soldiers, German Army Groups sliced through ill-prepared Soviet defenders on three main axes of advance: Leningrad in the north, Moscow in the center, and Ukraine and the Caucasus to the south.³¹ The same tactics that crushed Poland, Britain, and France, initially overwhelmed the Red Army as well. By July 9, Army Group North was on the outskirts of Leningrad. On July 16, Army Group Center captured Smolensk on the border between Belorussia and Russia. Simultaneously, Army Group South reached the outskirts of Kiev in the Ukraine. On the surface, it seemed that the superiority of

³⁰ Guderian, 11.

³¹ *Ibid*, 12.

German armored crews would again conquer another major European power. However, by August, new Soviet defensive techniques began having drastic and shocking effects.

The German military continued its advance, but degrading weather conditions combined with the near-suicidal bravery of Soviet troops severely slowed Axis progress. More importantly, the effectiveness of Soviet tanks stunned the German attackers.³² As previously discussed, the Soviet Union modernized its armored forces jointly with the Weimar Republic from the 1920s into the 1930s. However, as the German *Wehrmacht* transitioned to full rearmament in 1935, the Soviet military began its own independent development of new tank prototypes. Two of them, the lighter T-34 and the heavier KV-1, would prove to be tactically superior to even the best German tanks in the autumn of 1941. German intelligence failed to identify the threats of these excellent vehicles in the months leading up to the invasion. A pamphlet distributed to Axis invasion forces on June 1, 1941 entitled “Most Important Tanks of the Soviet Union” failed to mention either model at all.³³ However, both vehicles possessed advanced features specifically designed to fight in the Soviet Union. The T-34 especially, with its sloped armor and wider tracks that distributed its weight more effectively on the rugged Russian terrain, was exceptionally combat-effective and caused heavy casualties among German invasion forces. Between June of 1941 and December of 1941, the German military lost 957 *Panzer* IIIs and 426 *Panzer* IVs, a stunning forty-three percent of its initial invasion strength.³⁴ When those numbers are reflected against the 1,320 *Panzer* IIIs and 374 *Panzer* IVs built and factory rebuilt in the

³² Ibid, 12.

³³ “Most Important Tanks of the Union of Soviet Socialist Republics” 1 June, 1941; *Records of the German Army High Command* (National Archives Microfilm Publication T78, serial 460 roll 492, item H3/991); CGRC; NACPM.

³⁴ “*Panzerkampfwagen* III and IV Production and Losses,” reproduced in Appendixes A6 and A7 of Jentz, *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany’s Tank Force, 1933-1942, Vol. 1*, 266-268. The probable explanation for the large difference in numbers of vehicles destroyed is that in early-war German doctrine, the *Pzkw* III was specifically designed for tank to tank combat while the *Pzkw* IV was designated as primarily an infantry support tank. This meant that the *Pzkw* III was more likely to directly encounter enemy tanks in battle.

same period, this meant that the Soviets were destroying almost as many tanks as German industry could produce, even before the USSR fully mobilized for a counter-attack.³⁵ Eventually, Soviet industry would out-produce and overwhelm the German army.

Reports coming back from the front spoke plainly of the Russian vehicles' dominance. On October 22, 1941, the official battle report of the *4. Panzer-Division* stated: "The absolute superiority of the Russian 26 ton [T-34] and 52 ton [KV-1] tanks over our *Pz. Kpfw.* III and IV was felt...In addition to the superior weapons effectiveness and stronger armor, the [T-34] is faster, more maneuverable, and the turret traverse mechanism clearly superior."³⁶ Guderian's analysis concurred with that of his subordinate commanders. He wrote that "the T-34 proved to be far superior" and that, more importantly, the future numbers available to the Russians were only expected to rise.³⁷ By December of 1941, Army Group Center was on the outskirts of Moscow, but bitter winter weather combined with an imminent Soviet counter-offensive made it clear to German soldiers that the war was far from over. Some *Panzer* Divisions had lost over eighty percent of their vehicles in six months of unbroken action.³⁸ It was obvious to German military and political leadership that drastic action was necessary.

The simplest solution was to produce larger numbers of tanks. However, German industry was already feeling the hard constraints of labor and materiel shortages by the winter of 1941-1942. An *OKW* memorandum entitled "The Demand for Armaments Accounting for the Situation in December 1941," dated two days before Christmas, laid out the bleak situation for 1942. The losses of ground forces in Russia, combined with the British naval blockade of

³⁵ Ibid, 266-268.

³⁶ "Battle Report of the *4. Panzer Division* ," 22 October, 1941, reproduced in Jentz, *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany's Tank Force, 1933-1942, Vol. 1*, 205.

³⁷ Guderian, 12-13.

³⁸ Jentz, *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany's Tank Force, 1933-1942, Vol. 1*, 209.

German ports and the entrance of the United States into the war meant that the army, navy, and air force all had suffered extreme losses over the course of last year. The bottom line for German industry according to military planners was that they would have to find a way to produce more high quality equipment with fewer available workers and less materials.³⁹ This task seemed impossible with the numbers of older vehicle designs required to replenish the depleted *Panzer* formations.

The decision on how to solve the problem of re-fitting and re-equipping Germany's tank force was so important to the overall war-effort that Adolf Hitler became personally involved. On November 29, 1941, he assembled a conference on tank production at his headquarters. The meeting gathered together representatives from the military including Field Marshals Keitel and Jodl, representatives from the Reich Ministry for Armaments, and German industrial leaders including Dr. Ferdinand Porsche. At the end of the conference, Hitler made his pronouncements for the future of the German *Panzer* Corps.⁴⁰ He ardently believed that German tank designs were "showing their age" and that the *Panzer* III was no longer able to defeat the more effective Russian designs. The future of the German war effort hinged on mass production and he decreed that, effectively immediately, only three German tank designs would be produced to increase efficiency. The *Panzer* IV's design would be modernized, and the *Panzer* III would continue in production only until a superior replacement could be fielded. That replacement would be a new, heavy tank design capable of firing a much more powerful anti-armor round. The firms of Porsche and Henschel were both contracted to produce prototypes of this new, heavier *Panzer*

³⁹ *Die Forderung an die Rüstung unter Berücksichtigung der Lage im Dezember 1941*, 23 December 1941; *Records of the German Armed Forces High Command* (National Archives Microfilm Publication T77, serial 17 roll 17, item Wi/IF 5.122); CGRC; NACPM.

⁴⁰ "Hitler Conference on Tanks," 29 November 1941; *Records of the German Armed Forces High Command* (National Archives Microfilm Publication T77, serial 17 roll 17, item Wi/IF 5.122); CGRC; NACPM.

that would be tactically superior, more technically advanced, and more heavily armed than any Russian, British, or French vehicle had ever been before.⁴¹ By decree of the *Führer*, Project Tiger was born.

The analysis of German armored development in the years between 1919 and 1941 provides a compelling link between the military culture of Imperial Germany and that of the Third Reich. During the 1920s and 1930s, Germany illegally freed its best military minds from the restrictions of the Treaty of Versailles to develop new weapons, strategies, and doctrine that resulted in the birth of the *Panzer* Division: a unit designed to fully embrace true Clausewitzian doctrine. These divisions were highly trained, highly motivated, and concentrated at key points on the battlefield to overwhelm even numerically superior enemies. However, when finally placed into action in the autumn of 1939, *Panzer* divisions became victims of their own success. The victories of 1939-1940 caused the “cult of the offensive,” a perverted misunderstanding of Clausewitz’s philosophy, to once again become the driving motivation of German military and political leadership. This desire for quick victories led to the disastrous Russian invasion of 1941 which cost the lives of thousands of German armored crewmen. While the Allies attributed German success to the high quality of these irreplaceable young men, the Germans themselves believed that better, stronger technology could overcome their strategic losses by refocusing the broader war into smaller, tactical engagements. In the winter of 1941, the *OKW* could have chosen to stay the new course developed in the inter-war years and focused on maintaining a net numerical advantage. However, at the mercy of a World War I corporal turned absolute dictator, the *OKW* returned to the same path that led to disaster in 1918. They surrendered their agency to an old idea in the guise of a new machine.

⁴¹ Ibid.

Chapter 3

Project Tiger

The Tiger, constructed by the firm of Henschel at Kassel, could be produced immediately, which was a rare occurrence.

-Heinz Guderian, 1948¹

From its inception, the goal of the Tiger tank program was invincibility. The *Wehrmacht's* leadership envisioned a vehicle that could destroy any enemy vehicle that stood in the way of an attack. Adolf Hitler dreamed of a behemoth that would showcase the engineering and military supremacy of his new, thousand-year Reich. The German government diverted millions of *Reichsmarks* into the development program.² Some of the nation's most preeminent industrial firms, including Daimler-Benz, Krupp, Maybach, and Porsche, designed and produced components and submitted proposals for the *Panzerkampfwagen VI*.³ After a period of testing and evaluation, the firm that won the final contract would earn the right to call their vehicle by that coveted name: Tiger.

However, the most scant resource dedicated to the development of the new tank was time. The war was rapidly turning against Germany as 1942 began. The military leadership wanted the new vehicle immediately to assist in operations. The *Führer* issued final approval to begin the program in November of 1941 and he expected the first functional prototypes physically in front of him by his 53rd birthday on April 20, 1942. This gave engineers a mere six

¹ Guderian, 13.

² Spielberger and Doyle ,8.

³ Thomas L. Jentz and Hilary L. Doyle, *Germany's Tiger Tanks: D.W. to Tiger I: Design, Production, and Modifications*, 31-32.

months to meet all the design requirements and make a working prototype.⁴ On the surface, this short timeline reflected a real sense of arrogance on the part of the *OKW*. However, it also hinted at a growing feeling of desperation. Every day the Tiger wasn't at the front to turn the tide was another day of ground lost to advancing Allied forces in Eastern Europe and North Africa. The Tiger would not only be a symbol of the German military's resolve to defeat its enemies, but also a present from the German people to their leader. The tank would be a physical reassurance that the nation was still fanatically dedicated to Hitler and his cause.

Industrial engineers, on the other hand, did not have the luxury of idealism. They would be the ones to transform the grandiose ideas of their political and military leaders into working machines. Meeting the deadline would only be possible by modifying and combining existing technology. Of the two firms designated as primary contractors, Porsche was the favorite choice from the beginning. Dr. Ferdinand Porsche, a high-performance vehicle designer and an early proponent of the *Volkswagen*, was a close friend of Adolf Hitler and was present at the initial "Tank Conference" in November of 1941.⁵ Porsche's firm had been working with ideas for heavier tank designs since 1939 under the designations *Typ 100* and *Typ 101*.⁶ The other firm, Henschel & Son of Kassel, was more of a dark horse. Though the company was well-known for producing high-quality railroad locomotives, they had also been working with the German Army Ordnance Department on developing heavy tracked vehicle chassis since 1937.⁷ In early 1941, they had created a successful thirty-ton prototype hull with a Maybach gasoline engine called the

⁴ "Tiger Competition Results," 22 April 1942; *Records of the German Armed Forces High Command* (National Archives Microfilm Publication T77, roll 194, item Wi/IF 5.900); CGRC; NACPM.

⁵ "Hitler Conference on Tanks," 29 November 1941; *Records of the German Armed Forces High Command* (National Archives Microfilm Publication T77, serial 17 roll 17, item Wi/IF 5.122); CGRC; NACPM.

⁶ Thomas L. Jentz and Hilary L. Doyle, *Germany's Tiger Tanks: D.W. to Tiger I: Design, Production, and Modifications*, 23-25.

⁷ Spielberger and Doyle, 11.

VK (*Versuchs Kampffahrzeug* or Prototype Fighting Vehicle) 3001(H). Their goal was to eventually turn the device into a piece of heavy self-propelled artillery.⁸ After the decision to expedite the development of the Tiger, the army deemed Henschel a viable competitor and allowed them to advance the development of their existing design alongside Porsche whose own prototype had been re-christened the VK 4501 (P).⁹ The venerable German artillery firms of Krupp and Rheinmetall were assigned with developing two new cannons for the prototypes. Krupp would develop the turret and modify their venerable 88 mm heavy anti-aircraft cannon, the *FLAK* 36, for the Porsche design.¹⁰ Simultaneously, Rheinmetall would develop a newer, lighter 75mm high velocity anti-tank gun and turret for Henschel.¹¹ The initial hope of the Army Ordnance Department was that competition between these firms would produce faster and more successful options for the final version of the Tiger. Hitler took great interest in every step of development for these new weapon systems. He eagerly attended weekly progress reports, even demanding photographs of the vehicles for his own personal examination.¹² These tanks would be his birthday presents, and he anticipated their deliveries with the zeal of an excited child.

However, as the April 1942 deadline approached, it became obvious that even with the tremendous amount of resources dedicated to the *Tiger's* development some competitors would still fail to achieve results. The *Führer* personally cancelled the Rheinmetall 75mm gun and turret for Henschel and grudgingly allowed the Krupp turret and weapon to be installed on the

⁸ Ibid, 14-18.

⁹ Ibid, 28.

¹⁰ Thomas L. Jentz and Hilary L. Doyle, *Germany's Tiger Tanks: D.W. to Tiger I: Design, Production, and Modifications*, 33.

¹¹ Ibid, 33.

¹² Albert Speer; "Führer Conference Notes," 16 March 1942, trans. SAC on 05 July 1945; *Records of the Reich Ministry for Armaments and War Production* (National Archives Microfilm Publication T73, serial 192, roll 192, item RmfRuk 2096); CGRC; NACPM.

Henschel prototype.¹³ The new weapon required too many specialized materials, specifically the rare and expensive metal tungsten, to be viable for mass-production. The dreams of a super-weapon started to give way to hard reality. The National Socialist economy lacked flexibility and was ill-prepared for an extended war which required new and advanced technologies. Hitler mandated weekly briefings from his economic ministers, especially the new head of the Reich Ministry for Armaments and War Production, Albert Speer, to see the levels of all essential war resources. The *Führer* wanted to know the levels of coal, iron, and especially copper required to produce tanks and other vehicles in minute detail.¹⁴ In the first half of 1942, the German leader issued orders and proclamations micro-managing the use of every industrial resource still available to Germany. His ardent standing order was that more and better tanks roll off the production lines as quickly as possible.¹⁵ No matter the costs, he demanded that the first vehicles would be ready to send to the front lines no later than the summer of 1942.¹⁶ His ministers, generals, and engineers all feared the consequences if they failed.

On Hitler's 53rd birthday, April 20, 1942, the *Führer* and his entourage drove out to a field near his headquarters in the East-Prussian town of Rastenberg to view his long awaited presents. Working examples of the Porsche and Henschel vehicles, along with Dr. Ferdinand Porsche, Dr. Erwin Aders, chief designer for Henschel, and representatives for Krupp were all

¹³“Discontinuation of 7,5 for Henschel Tiger” 29 June 1942, trans. by HCK on 02 July 1945; *Records of the Reich Ministry for Armaments and War Production* (National Archives Microfilm Publication T73, serial 192, roll 192, item RmfRuk 2096); CGRC; NACPM.

¹⁴“Resource Projections for *Panzerkampfwagens*” 9 January 1942; *Records of the German Armed Forces High Command* (National Archives Microfilm Publication T77, serial 194 roll 194, item Wi/IF 5.900); CGRC; NACPM.

¹⁵“Adolf Hitler Material Guidance” 21 March 1942; *Records of the German Armed Forces High Command* (National Archives Microfilm Publication T77, serial 194 roll 194, item Wi/IF 5.900); CGRC; NACPM.

¹⁶ Albert Speer; “*Führer* Conference Notes,” 5-6 March 1942, trans. FGC on 06 July 1945; *Records of the Reich Ministry for Armaments and War Production* (National Archives Microfilm Publication T73, serial 192, roll 192, item RmfRuk 2096); CGRC; NACPM.

present to answer Hitler's questions and demonstrate the two prototypes.¹⁷ On the surface, it appeared to be a fun and exciting birthday outing for Hitler. It is impossible to know if the *Führer* had any concept of how difficult it was to execute.

Dr. Aders recorded the extensive preparations in his diary. Just getting the two fifty-seven ton behemoths from Central Germany to East Prussia was a monumental undertaking. Forty-eight hours before the showcase, workers for Henschel loaded their Tiger prototype onto a railway car in Kassel for its eastward journey. The vehicle was so wide that the tracks hung over the side of the flat-bed railcar by two inches in both directions. This meant for the safety of other trains, the *Reichsbahn* (German Railway) had to shut down the entire East Prussian line for two days.¹⁸ When the tank arrived in Rastenberg on April 19, it took a specially requisitioned 70-ton railway crane to lift the steel beast onto the ground.¹⁹ The Porsche prototype arrived on another train from their new *Nibelungenwerk* factory in Austria. The next morning, a detachment of German military police closed all the public streets in the city to allow the massive vehicles to drive the final stretch to the *Führer* headquarters.²⁰ Besides secrecy, there was also a fear that the prototypes could crush any civilian traffic they encountered.

Hitler arrived at the impromptu proving ground with much fanfare around 11:00 am. According to Dr. Aders' account, the industry representatives were lined up and formally introduced to Hitler one at a time. However, the representatives of Henschel were devastated when they saw Hitler's reaction to Dr. Ferdinand Porsche and his Tiger. Before the demonstration even began, the *Führer* pinned a War Merit Cross on Porsche's jacket for his

¹⁷ Spielberger and Doyle , 76.

¹⁸ *Diary of Dr. Ernst Aders*, reproduced in Spielberger and Doyle, 76.

¹⁹ Ibid

²⁰ Ibid

service to the Reich.²¹ At that moment, it seemed clear that Hitler had already made his choice: his old friend, Ferdinand Porsche. Dr. Aders and his team stood silently as Hitler and his entourage gushed over the Porsche prototype, asking question after question. Finally, the dignitaries made their way over to the Henschel vehicle and climbed aboard. Hitler examined the vehicle for only “two or three minutes” before asking a benign question about the radiator. Then, he climbed back down.²² However, Dr. Aders and his support team had to endure more humiliation.

Army officials told the civilians to wait in the field for several more hours. Reich Marshal Hermann Göring was delayed, but still wanted to see the demonstration vehicles. At 3:00 P.M., Göring and Hitler returned to the field together. The Reich Minister approached the engineers in an “operatta-like” manner carrying a dress-sword and his German Marshal’s baton. This time, neither man bothered with the Henschel prototype at all. Dr. Aders and his engineers watched as the two most powerful men in Germany climbed over every centimeter of their rival’s creation and then viewed a short driving demonstration.²³ It seemed that the future direction of the Tiger program was indeed decided. An *OKW* report written two days later summarizing the event only mentions the Henschel prototype in the subject heading to state that it was present.²⁴ The Henschel engineers returned to Kassel, completely downtrodden.

However, Porsche’s confidence in Hitler’s nepotism was his firm’s own downfall. His version of the Tiger was extremely over-complicated and possessed many new, unnecessary design features. This included the use of two, separate V-10 air-cooled engines working in

²¹ Ibid

²² Ibid

²³ Ibid

²⁴ “Tiger Competition Results,” 22 April 1942; *Records of the German Armed Forces High Command* (National Archives Microfilm Publication T77, roll 194, item Wi/IF 5.900); CGRC; NACPM.

parallel and connected to a single transmission.²⁵ Porsche believed this arrangement would generate far more torque and acceleration than Henschel's prototype. While theoretically true, in actual use the complication of making two engines drive one vehicle was a mechanical nightmare. The arrangement severely limited the vehicle's extended reliability and made it far more difficult to quickly mass-produce.

In extended testing at the German army's tank proving ground in Kummersdorf in the summer of 1942, the Henschel vehicle outperformed the Porsche prototype in every event.²⁶ The Porsche prototype's drive train broke down continually. The Henschel vehicle, though not perfect, performed well above the satisfaction of army observers. More importantly, since the Henschel Tiger was built largely from other company's components already tested and in production, it could be mass-produced with sub-contracts far more easily than its rival which required extensive factory construction. Henschel informed the Reich Ministry of Armaments and War Production that they could have their first series of tanks built, delivered, and deployed to Russia by late-summer.²⁷ Pragmatism again won out. The situation in the East and in North Africa was growing more desperate by the day as the Soviet Union continued to mobilize and British and American forces were now fighting together in the Mediterranean theater. Circumstances were, in fact, so dire that Hitler stated he was not averse to the Tiger's final shakedown being conducted "in combat."²⁸ On July 8, 1942, Hitler decreed that production on the Henschel prototype would go forward with the first combat-ready models in action no later

²⁵ Spielberger and Doyle, 28.

²⁶ Ibid, 92.

²⁷ Albert Speer; "Führer Conference Notes," 23 June 1942, trans. HWH on 29 June 1945; *Records of the Reich Ministry for Armaments and War Production* (National Archives Microfilm Publication T73, serial 192, roll 192, item RmfRuk 2096); CGRC; NACPM.

²⁸ Albert Speer; "Führer Conference Notes," 5-6 March 1942, trans. FGC on 06 July 1945; *Records of the Reich Ministry for Armaments and War Production* (National Archives Microfilm Publication T73, serial 192, roll 192, item RmfRuk 2096); CGRC; NACPM.

than September.²⁹ However, all was not lost for Ferdinand Porsche. Hitler, still enamored of his friend, gave Porsche another three months to refine his design and prepare it for mass-production.³⁰ Nevertheless, when the new October deadline passed, Porsche still failed to deliver a viable tank. On October 20, 1942, the *OKW* officially named the Henschel prototype as the final winner and granted it the permanent title of Tiger I.³¹ Yet Porsche's Tiger hull would still see action in a different configuration. Porsche's vehicles, without their Krupp turrets, would be fitted with a new, *KwK* 43 long-barreled 88mm gun and be converted into tank-destroyers. These heavy self-propelled guns would be dubbed "Ferdinands" in honor of their original designer and would see limited action.³² It seemed that Hitler's devotion to Dr. Porsche still had the ability to win military contracts.

The first platoon of Henschel Tiger Is arrived on the Eastern front near Leningrad on August 29, 1942.³³ Everyone involved in the vehicles' development, testing, and fielding was eager to see what the German military's new heavy tank could accomplish in the face of real opposition. Two weeks later, on September 16, the Tiger tank saw its first combat.³⁴ The results of the engagement shocked everyone: the vehicle performed horrifically. The German Army ordered the tanks into action in the marshes surrounding Lake Ladoga on the outskirts of the city. According to the report of the Tiger platoon leader, transmission problems immediately caused the four vehicles to maneuver far more slowly than normal. The swampy terrain caused the

²⁹ Albert Speer; "Führer Conference Notes," 08 July 1942, trans. HJC on 14 June 1945; *Records of the Reich Ministry for Armaments and War Production* (National Archives Microfilm Publication T73, serial 192, roll 192, item RmfRuk 2096); CGRC; NACPM.

³⁰ Spielberg and Doyle, 92.

³¹ *Ibid*, 98.

³² Albert Speer; "Führer Conference Notes," 22 September 1942, trans by AA on 10 July 1945; *Records of the Reich Ministry for Armaments and War Production* (National Archives Microfilm Publication T73, serial 192, roll 192, item RmfRuk 2096); CGRC; NACPM.

³³ Jentz, *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany's Tank Force, 1933-1942, Vol. 1*, 245.

³⁴ "Report of Tiger I Action Near Lake Ladoga," 7 October 1942, reproduced in Jentz, *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany's Tank Force, 1933-1942, Vol. 1*, 246.

nearly sixty-ton tanks to sink into the muck, clogging their tracks and further hampering their mobility.³⁵ “The terrain was impossible for us,” the officer later wrote crestfallen while recounting the events. When the vehicles finally encountered a Soviet anti-tank gun, real disaster occurred. The platoon leader’s tank took two direct hits. The first round destroyed the barrel of his cannon rendering it unable to fire. The second hit the driver’s hatch making it difficult to control the vehicle. Two other Tigers fared even worse. One was damaged so badly it had to be towed back to the company headquarters. The other’s engine caught fire, burning the vehicle to the ground. The hulk had to be abandoned in place to the Soviet defenders.³⁶ However, the young lieutenant did end his report with an optimistic observation: “The most important thing we have noted is that no shot had penetrated the armor. I hope that the next attack can be carried out under different conditions.”³⁷ In their very first battle, half of all operational vehicles had been crippled and another was completely destroyed. It seemed that the Tiger program failed before it had truly begun.

However, over the next few months, more of the new tanks arrived from Henschel ready for action. Front-line mechanics became more experienced working on the Tiger’s demanding engine and the intricate transmission necessary to drive such a heavy war machine. Military commanders began to grasp what battlefield conditions would be optimal for the new machine and which ones led to catastrophe. In the closing months of 1942, the Tiger’s reception among its operators and opponents rapidly improved.

From October 1942 to March 1943, stunning reports filtered back to the *OKW* about the performance of Tiger Is against Russian, British, and American vehicles. Due to the huge

³⁵ Ibid

³⁶ Ibid

³⁷ Ibid, 246-247.

demands and resources required to make a single tank, Henschel could only produce the vehicles at an average rate of thirty-four per month.³⁸ As a result, even the most well-equipped German tank units could only initially field a few tanks at a time. However, even in groups of less than five, Tigers began achieving marvelous results. Enemy tank and anti-armor crews were unprepared for the new German *Panzerkampfwagen*'s massive size and tremendous firepower. Even with their near fanatical desire to reclaim lost territory, Soviet soldiers in T-34 and KV-1 tanks were hurled backward whenever German commanders sent the new Tigers into the *Schwerpunkt*. In one battle in February of 1943, a single Tiger withstood "227 hits from anti-tank rifle rounds, 14 hits from 5.7 cm and 4.5 cm anti-tank guns, and 11 hits from 7.62 cm guns...but these didn't especially hinder the Tiger's mobility."³⁹ In March of 1943, a dispatch from the *13. (Tiger) Kompanie/Panzer Regiment Grossdeutschland* described another remarkable encounter in great detail: "During a scouting patrol two Tigers encountered about 20 Russian tanks to their front, while additional Russian tanks attacked from behind...Both Tigers were hit 10 or more times at ranges from 500 to 1000 meters. The armor held up all round. Not a single round penetrated."⁴⁰ The report continued to describe the raging battle and concluded with a single, victorious phrase: "The end result was 10 enemy tanks knocked out by two Tigers within 15 minutes."⁴¹ Dozens more reports like this began to change the German outlook on the war. Hitler was ecstatic that his Tiger program was beginning to have measurable effects against enemy tanks and morale. By April of 1943, only one year since he had first laid eyes on the prototype, Hitler declared that production of the Tiger must be increased to the maximum level possible to

³⁸ Jentz, *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany's Tank Force, 1933-1942*, Vol. 2, 268.

³⁹ "Testament of Leutnant Zabel," 10-11 February 1943, reproduced in Jentz, *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany's Tank Force, 1933-1942*, Vol. 2, 34.

⁴⁰ "Battle Dispatch from the *13. Kompanie Grossdeutschland*," 7-9 March 1943, reproduced in Jentz, *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany's Tank Force, 1933-1942*, Vol. 2, 38.

⁴¹ *Ibid*, 38.

ensure German victory.⁴² Despite mounting pressures from Anglo-American strategic bombing and the ever increasing numbers of Russian soldiers, weapons, and equipment arriving from new factories east of the Ural Mountains, the *Führer* became more and more convinced that super-heavy armor could be the decisive factor that Germany needed to regain the offensive.

During these months, Albert Speer's weekly meetings with Hitler became brain-storming sessions. The *Führer* was obsessed with creating heavy weapons that would dwarf even the Tiger's huge mass. The most famous example of Hitler's newfound obsession with size was the *Maus*: a 100-ton monster with 128mm battleship guns grafted to its metal-frame. Again, the *Führer* reached out to his good-friend, Dr. Ferdinand Porsche, to produce this impractical creation.⁴³ General Heinz Guderian, by this time Chief Inspector of all *Panzer* Forces, grew concerned that Hitler's ever increasing devotion to size would interfere with Germany's ability to produce suitable amounts of more realistic vehicles.⁴⁴ Still, the German General Staff was in no position to disagree that the Tiger program was seeing significant results in combat. They concurred with Hitler's decision to move forward with the Tiger II, an even larger, upgraded version of the Tiger I slated for deployment by mid-1944.⁴⁵ Probably the most damaging result of German leaders' newly acquired positive reception of the Tiger I was a selective myopia in seeing any flaws of the vehicle. The combat reports of successful frontline units often stated that

⁴² Albert Speer; "Führer Conference Notes," 11 April 1943, trans by HJC in 1945; *Records of the Reich Ministry for Armaments and War Production* (National Archives Microfilm Publication T73, serial 192, roll 192, item RmfRuk 2096); CGRC; NACPM.

⁴³ Two prototypes were commissioned, but only one complete example was ever built. Today, it is on display at the "Kubinka Tank Museum" outside of Moscow, Russia. See Albert Speer; "Führer Conference Notes," 03-05 January 1943, trans by PMN on 02 July 1945; *Records of the Reich Ministry for Armaments and War Production* (National Archives Microfilm Publication T73, serial 192, roll 192, item RmfRuk 2096); CGRC; NACPM.

⁴⁴ Guderian, 14-15.

⁴⁵ *Ibid*, 14 and Albert Speer; "Führer Conference Notes," 03-05 January 1943, trans by PMN on 02 July 1945; *Records of the Reich Ministry for Armaments and War Production* (National Archives Microfilm Publication T73, serial 192, roll 192, item RmfRuk 2096); CGRC; NACPM.

maintenance and supply shortages were already causing issues. In the same dispatch that reported the victory over 20 Russian T-34s, the *13. Kompanie* stated unequivocally, “the highly complicated Tiger must be as carefully maintained as combat aircraft in the *Luftwaffe*.”⁴⁶

Another memorandum from April 1943 produced by Guderian’s own office sternly warned “the Tiger is a *Schwerpunktwaaffe*...Dispersing them [into other units] is an idiotic squandering of this valuable equipment. The maintenance needs-especially for a Tiger-are not guaranteed in a normal tank battalion.”⁴⁷ These exchanges are blatantly indicative of a return to the “cult of the offensive.” As Tiger tanks began to gain numerous victories, more and more commanders became convinced that the new vehicles could win anywhere and do anything, even without being supported with necessary numbers, maintenance, or logistics.

Still, the phenomenal combat effectiveness and brute strength of the early Tigers made serious impressions on all the Allied tank crews that faced them. Seventy years after first encountering the German leviathans, Dr. Ken Tout, a veteran tank gunner of the 1st Northhamptonshire Yeomanry (the unit that later killed Michael Wittmann in 1944), said, “The Tiger tanks were terrifying. They were so much more powerful and bigger than anything else on the battlefield.”⁴⁸ A fellow British armored veteran, Ernest Slarks, of the 23rd Hussars added, “When you heard the name ‘Tiger’ it filled you with fear. They could fire at you and take you out from a mile and a half away.”⁴⁹ Despite their limited numbers of Tigers, the German military

⁴⁶ “Battle Dispatch from the *13. Kompanie Grossdeutschland*,” 7 to 9 March 1943, reproduced in Jentz, *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany’s Tank Force, 1933-1942*, Vol. 2, 38.

⁴⁷ “Response from *Generalinspekteur der Panzer Truppen HQ to Infanterie Division Grossdeutschland*,” 27 April 1943, reproduced in Jentz, *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany’s Tank Force, 1933-1942*, Vol. 2, 38.

⁴⁸ Adam Aspinall, “British Tank Heroes Meet German Tiger Rivals 72 Years After Their WWII Clashes and Hug It Out,” 06 April 2017. *The Mirror Online*. Accessed 15 December 2018 at <https://www.mirror.co.uk/news/uk-news/british-tank-heroes-meet-german-10172869>.

⁴⁹ *Ibid.*

had crafted a weapon even more psychologically devastating than its impressive physical characteristics. Fear and reception alone began to change the behavior patterns of enemy soldiers during a critical period of the war.

The development and fielding of the Tiger tank was a remarkable feat of German engineering. The goal was to create a new type of tank that the world had never seen before: an armored vehicle that could destroy any enemy, anytime, anywhere. Despite initial shortcomings, the Tiger I quickly became a “success” in that it inspired Germany’s forces with new victories while instilling new fear in enemy soldiers across the battlefield. However, with a new offensively-focused machine, German military culture once again defaulted to its most familiar, and dangerous, assumptions. Planners and senior officials quickly allowed themselves to become fixated on the vehicle’s tactical prowess and forgot that equally robust maintenance, logistical, and industrial networks were required to keep the heavy tanks fighting. These officers believed that the Tiger could accomplish all tasks, no matter how fool-hardy. They began making increasingly difficult and impossible demands upon the Tiger crews. This short-sightedness and arrogance would culminate in July of 1943, when the Tiger’s initial success influenced the decision to execute what would become the most significant turning point of World War II: Operation Citadel, the “Battle of Kursk.”

Chapter 4

A Changing Symbol of Hope

III Panzer-Korps reported the loss of 13 Tigers in one company that had started out with 14 Tigers on the morning of 5 July 1943. Nine Tigers fell out due to mine damage.

-Captain Graf Kageneck, July 6, 1943¹

The “Battle of Kursk” or Operation Citadel, as it was called by German planners, began on July 5, 1943. The offensive involved almost 1,000,000 soldiers with almost 3000 tanks attacking against hardened Soviet defensive lines on the steppes of Eastern Ukraine. Hitler and his generals believed a powerful attack could turn the momentum of the Eastern Front back towards the oil fields of the Caucasus. Securing a source of petroleum at the expense of the Red Army was the only real chance left for a German victory. Though many historians, such as Ian Kershaw, point to the catastrophic defeat of the German Sixth Army at Stalingrad in February of 1943 as the turning point of World War II for Nazi Germany, a much stronger case exists for Kursk to be considered the real “beginning of the end” for the Third Reich. Though Stalingrad proved to be a crushing blow to the morale of the German Army and the home front populace, it was only after the failure of Operation Citadel that Nazi leaders actually began to alter their overall plans for war with the Soviet Union.

Beginning with the German withdrawal from Stalingrad in the opening months of 1943, the Soviet Red Army under Russian Field Marshal Georgy Zhukov began rapidly advancing against the depleted and exhausted German *Wehrmacht*. By the end of spring, the Soviet advance

¹ “Battle Report of *schwere Panzer-Abteilung 503*,” 06 July 1943, reproduced in Jentz, *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany’s Tank Force, 1933-1942*, Vol. 2, 92.

had reached eastern Ukraine, but German resistance had been reinvigorated by the introduction of more advanced weapon systems such as the Tiger tank. The Soviet counter-attack ground to a halt around the city of Kursk. When the lines stabilized in late spring, a 90 mile wide “salient,” or western-facing bulge, existed between German Army Group Center and German Army Group South with Kursk in the center. The Soviets now found themselves surrounded to the north, west, and south by the German army. The communists immediately began to prepare defensive works against a potential German counter-offensive. The Red Army pressed over 300,000 civilians into military service and turned the Kursk salient into a giant fortress. Soviet forces dug over 3,000 miles of anti-tank ditches and laid almost 1,000,000 anti-tank and anti-personnel mines. Despite Soviet resolve and an imminent Anglo-American invasion of Italy, Hitler and the *OKW* refused to abandon the chance to regain the offensive in the east. Army Group South and Army Group Center formed two armored spearheads that would attempt to envelop the salient from the east and isolate the communist defenders from resupply. It was a mirror of the Soviet operations that had captured Stalingrad five months before. If Operation Citadel was successful it would mean avenging the loss of the Sixth Army, and the Tiger tank would be Germany’s primary instrument of justice. Heavy *Panzer* units would lead the charge on both ends.

The result was a complete disaster for the German military. Despite their tremendous armored protection, the Tiger tanks were unable to withstand the combination of withering anti-tank fire and anti-armor mines.² The combination of Soviet aircraft, artillery, and T-34s brought the German offensive to a grinding halt after only eleven days. The Red Army, fully anticipating the German course of action, immediately counter-attacked and pushed the Germans back out of

² Jentz, *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany's Tank Force, 1933-1942*, Vol. 2, 84-88.

the salient. Once again, German military culture had ignored previous warnings about the limitations of their own forces and placed too much stock in their own tactical and technological superiority. Without sufficient logistical support, even the mighty Tiger tank could not overcome the prepared Soviet defenses backed by seemingly endless reserves of materiel and soldiers. After another five weeks of bitter fighting, over 50,000 German soldiers were dead. Over 130,000 more were wounded. Hundreds of precious tanks and *Luftwaffe* aircraft were lost. The bulk of the *Wehrmacht* in the east was shattered and a slow, merciless retreat out of Soviet territory began. The tide of the war in the East would never again be in Germany's favor. The defeat at Kursk also bolstered the morale of Allied populations. Newspapers in the United States, Britain, and the Soviet Union ran headlines triumphantly announcing that Germany's armored forces would no longer pose a threat. On July 9, 1943, the front page of the *Springfield Daily News* in Springfield, Massachusetts boasted, "Reds Appear to be Winning War's Biggest Tank Battle," and, "Terrible Nazi Tiger Tamed."³ The obvious implication to all readers was that if the Tiger tank, the most powerful symbol of German military supremacy, was now defeated, all of Germany would soon be conquered as well.

Beside the tremendous physical losses, The "Battle of Kursk" also caused severe psychological damage to the *OKW* and its leadership. In the subsequent weeks after the defeat, the content and tone of meetings between Hitler and his generals changed significantly. Field Marshal Heinz Guderian emphasized the impact of the defeat at Kursk in his post-war testament to US Army Intelligence. "The bitter failure of the battle at Kursk," he wrote, "costing strong *Panzer* losses, damaged the German Army to an irreparable degree, and the loss of the war dates

³ *Springfield Daily News*. 1943. "Reds Appear to Be Winning War's Biggest Tank Battle." 9 July.

from this defeat even more than from that at Stalingrad.”⁴ By the second half of 1943, the discussion was less about how to “defeat” the Soviet Union, but rather how to “stop” its further advance into German territory. A chart produced by German military planners based on the losses sustained during Citadel showed that conservatively, the German army could expect to face Soviet armor and infantry forces in every sector outnumbering them at least three-to-one.⁵ As German attrition continued to mount in both the Eastern and Mediterranean fronts, that gap was only expected to widen. When faced with these facts, even Hitler’s delusional optimism had to give way to more austere, pragmatic changes.

Before Kursk, Hitler’s orders to his military and economic planners always revolved around producing greater numbers of heavier tanks. After Kursk, it seemed that Hitler’s faith in the unquestioned supremacy of heavy *Panzers* had been severely shaken. The *Führer* began extolling the value of self-propelled artillery pieces over newer tank designs. In a series of meetings with Speer from August 19-22 1943, Hitler lectured that under most of Germany’s “current circumstances” self-propelled assault guns (*Sturmgeschütz* in German, and often abbreviated as *StuG*) frequently outperformed the *Panzer IV* in combat engagements. He also frequently reminded Speer that German industry must now place greater emphasis on *StuG* production.⁶ It is important to note at this juncture that not all of Hitler’s change of heart may have been due to his assessment of combat performance. Self-propelled assault guns were essentially a large tank cannon mounted on a set of motorized tracks. Since they possessed no turret and significantly thinner side and rear armor, *StuGs*, were much cheaper and less resource

⁴ Guderian, 22.

⁵ “German-Soviet Army Comparisons” 14 October 1943; *Records of the German Army High Command* (National Archives Microfilm Publication T78, serial 431 roll 463, item H3 119); CGRC; NACPM.

⁶ Albert Speer; “*Führer* Conference Notes,” 19-22 August 1943, trans by HWH in 1945; *Records of the Reich Ministry for Armaments and War Production* (National Archives Microfilm Publication T73, serial 192, roll 192, item RmfRuk 2096); CGRC; NACPM.

intensive to build. Albert Speer was fully aware that newer, more austere measures were required to keep Germany's forces fighting.⁷ Rather than admit that the German economy no longer possessed sufficient resources to continue building larger and larger numbers of *Panzers*, Hitler instead chose to frame his sudden change of perspective as a matter of "efficiency" with "guidance" from the economically-minded Speer.

The *Maus* and other "super-heavy" designs quickly lost their appeal in favor of *StuG* designs after Kursk. However, one new tank development program still remained a top priority.⁸ As the winter of 1943 began, Hitler's interest in directly managing German armored development continued to increase. He felt that only with his personal intervention would the German military find the correct balance of weapons systems and tactics to change the fortunes of war back to his favor. On November 15, 1943, he pontificated to Albert Speer at length about the benefits that *StuGs* had over most tanks. "Their superiority is assured by their considerably thicker front armor, by their armament, and the supply of ammunition available," Hitler lectured. Speer and the other attendees at the weekly armaments meetings had no choice but to sit back and take copious notes on the subject.⁹ Still, at the same scheduled meeting two weeks later, Hitler didn't hide his excitement as engineers from *Henschel* briefed him on the planned

⁷ Ibid.

⁸ Hitler would not officially cancel the *Maus* and other super-heavy program in writing until after the Normandy invasion in July of 1944. However, these programs had already fallen out of favor by the autumn of 1943. See Albert Speer, "Führer Conference Notes," 08 July 1944, trans by HCK in 1945; *Records of the Reich Ministry for Armaments and War Production* (National Archives Microfilm Publication T73, serial 192, roll 192, item RmfRuk 2096); CGRC; NACPM.

⁹ Albert Speer; "Führer Conference Notes," 15 November 1943, trans by HWH on 03 July 1945; *Records of the Reich Ministry for Armaments and War Production* (National Archives Microfilm Publication T73, serial 192, roll 192, item RmfRuk 2096); CGRC; NACPM.

unveiling of their Tiger II prototype.¹⁰ The *Führer* obsessed over blueprints and questioned the engineers on every improved facet of the design. He demanded in-depth specifications of the upgraded Maybach engines, discussed whether Dr. Ferdinand Porsche's proposal to use an air-cooled diesel engine would be more efficient, and then randomly asked whether it would also be feasible to develop a camouflaged "flame-thrower mine" that could "shoot flames in all directions."¹¹ The engineers did their best did answer Hitler's bizarre inquiries with patience. Finally, Hitler began lecturing them on the inefficiency of their own internal turret mechanisms. He demanded that Henschel weld an additional piece of metal into the Tiger II's rear turret wall to better protect the crews from ejected shell-casings. The engineering team acquiesced and complied with Hitler's demands to change the blueprints on the spot.¹² When the *Führer* first laid eyes on the prototype sixty-eight ton monster tank two weeks later, he was quite pleased. However, he was also quick to remind everyone of his new passion for *StuGs* and that their production must not suffer as full production of the Tiger II commenced.¹³ Though Hitler's fanaticism for big tanks was not as enthusiastic as it was in the months before the catastrophe at Kursk, the Tiger II appeared to have survived the *Führer's* change of heart.

Albert Speer did not make any attempts to stymie the production of the Tiger II as he did with other weapon systems he did not believe in.¹⁴ However, behind the scenes, it seems that

¹⁰ Albert Speer, "Führer Conference Notes," 07 December 1943, trans by AA on 05 July 1945; *Records of the Reich Ministry for Armaments and War Production* (National Archives Microfilm Publication T73, serial 192, roll 192, item RmfRuk 2096); CGRC; NACPM.

¹¹ Ibid.

¹² Ibid.

¹³ Albert Speer, "Führer Conference Notes," 17 December 1943, trans by MBH on 09 July 1945; *Records of the Reich Ministry for Armaments and War Production* (National Archives Microfilm Publication T73, serial 192, roll 192, item RmfRuk 2096); CGRC; NACPM.

¹⁴ In early stages of development, the Tiger II was often referred to as the Tiger B or sometimes by the nickname *Königtiger* or "*King Tiger*." Though the nickname was more often used by Allied tankers, it was rarely used by the Germans and Tiger II became the official designation of the vehicle by Hitler's decree on August 08, 1944.

Speer did attempt to guide the Tiger II's design in more efficient directions. Most notably, Speer directed that the Tiger II would be fitted with the same engine and transmission as the Panther tank to simplify production and logistics.¹⁵ These covert tweaks of the design indicate at least one of two possibilities. It is more likely that Speer believed in the concept of the Tiger II, if not in its unrestricted execution. The second was that the Speer knew that Hitler fervently believed in the Tiger program and that there was no way to stop it despite its heavy costs in materials and labor.

As the year 1944 began, The Reich Ministry for Economics and War Production finally consolidated all German industry under its direct control. As the Anglo-American invasion of France became imminent, Hitler demanded that production of all weapons systems be further increased to the maximum possible numbers to supply major operations on three fronts: Russia, Italy, and Northern Europe. Despite the fact that German factories could produce double the *Panzer IVs* for the cost of a single Tiger I, and three *Panzer IVs* for the cost of a Tiger II, Hitler demanded that Tiger production be increased as well even at the expense of large numbers of other vehicles.¹⁶ The *Führer* ordered Henschel to continue Tiger I production until August 1944 while Tiger II production slowly scaled up to full capacity by June 1944.¹⁷ He wanted the two production lines to overlap to ensure there was no interruption in the numbers of heavy *Panzers* available for the front. This was a huge task for a single company which simultaneously faced

However, the names are sometimes used interchangeable in sources. See "Official Vehicle Designations" 08 August 1944; *Records of the German Army High Command* (National Archives Microfilm Publication T78, serial 381, roll 413, item H 158); CGRC; NACPM.

¹⁵ Thomas L. Jentz and Hilary L. Doyle, *Germany's Tiger Tanks: VK 45.02 to Tiger II: Design, Production & Modifications* (Atglen: Schiffer Military History, 1997), 19.

¹⁶ "OKH Planned *Panzer* Replacement Allocations," 18 December 1943; *Records of the German Army High Command* (National Archives Microfilm Publication T78, serial 381, roll 413, item H 159); CGRC; NACPM.

¹⁷ Jentz, *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany's Tank Force, 1933-1942*, Vol. 2, 286, 288.

the pressures of Allied strategic bombing, labor shortages, and severe restrictions on available materials. Still, Hitler would entertain no excuses. It was up to Speer and the Henschel engineers to figure out a workable solution.

It is at the beginning of 1944 that the “Tiger Gap” manifests itself with the most power. Even after the failure at Kursk, the Third Reich still controlled most of Continental Europe and still had at least some ability to change its war plans for greater efficiency and effectiveness. With Hitler’s loss of faith in “super-heavy” tanks and new support for *StuG* designs, economic logic should have dictated that the Tiger program be phased out in favor of much larger numbers of the more efficient, reliable *Panzer IV* while also shifting focus to heavier assault guns. It was also at this time the Panther tanks, a much simpler and cheaper design, were starting to become available. However, the opposite of the logical course of action occurred. Hitler doubled down on the Tiger program, actually ordering the combat-proven Tiger I phased out in favor of the heavier, more expensive, and completely unproven Tiger II.

When taken as a whole, the available evidence indicates several significant aspects about the Tiger tank and its reception in the highest levels of the German political and military leadership. By the end of 1943, the Tiger was not just another tank. It had evolved into a symbol of Germany’s military “culture of offense.” To give up the Tiger was to admit that the German Army was no longer strong enough to attack its enemies. The Tiger II was then a natural, if not rational, evolution of the Tiger I. It was a blunt signal to both Germany and the Allies that the Reich was not growing weaker, but still growing stronger. Germany continued to possess the technological and physical superiority that had led to its successes between 1939 and 1942. Hitler’s personal agency in the program’s development from the beginning showed that he considered the Tiger tank to be his personal property. The vehicle and its performance was a

grand symbol of his leadership ability. As long as the Tiger continued to grow and be successful, he would continue to grow and be successful.

Hitler's emotional attachment put huge pressure on Tiger crews to succeed against all odds. The tank was no longer a specialized *Schwerpunktwaaffe*: only meant to attack at the most critical points on the battlefield. By 1944, the Tiger instead would be called to fight in every location it was ordered to, even when the necessary resources were not there to support it. Any subsequent victory for the Tiger in these circumstances meant that it legitimized its own misuse, causing greater casualties and more sacrifices in the name of Hitler's pride.

Further complicating debate on the utility of the design, German propaganda had also indelibly linked the Tiger with final victory. *OKW* photographers and movie cameramen filled German media with triumphant images showcasing the superiority of the Tiger over Allied vehicles in every theater. German *Panzer* aces, including Michael Wittmann, often appeared alongside their ferocious Tigers in heroic poses like medieval knights with their steeds. This bluntly asserted the message that the war was nothing less than a battle of "good versus evil" and when German soldiers joined with their Tigers, the enemy would be inevitably destroyed. In the weeks before the Normandy Invasion, *Wehrmacht* photographers released a series of images showing Wittmann sitting triumphantly on the turret of his Tiger I. The officer stared off towards the horizon in a saintly gaze: his confident expression almost daring the Allies to attack.¹⁸ Three months later in August of 1944, *Die Deutsche Wochenschau*, the German government's official weekly newsreel, boldly portrayed Wittmann fighting with his Tiger I in the hedgerows of

¹⁸ Scheck, 15 May 1944. "Frankreich-Nord.- Porträt Obersturmführer Michael Wittmann mit Eichenlaub zum Ritterkreuz auf Panzer VI Tiger I (Bild 1011-299-1802-08)." BAMA, Freiburg. Accessed 29 September, 2018, Bundesarchiv.de.

northern France against advancing British and American forces.¹⁹ The narrator boldly stated that Wittmann “in his Tiger” was one of the “most successful and feared” tank commanders of the war.²⁰ A few moments later, the burned-out hulks of British and American tanks filled the screen as the narrator also claims that the Allies lost over 500 vehicles in less than a week.²¹ These claims helped convince the German populace that the war could still be won as long as soldiers like Wittmann had vehicles like the Tiger. However, this positive reception also made it impossible to cancel the costly Tiger program. Just as German political and military leaders could not abandon a vehicle that embodied their ideals, the German people could not abandon a vehicle that embodied their hopes.

By the summer of 1944, the German military could not change course towards a more efficient use of its limited resources. Rather, it had been forced into a romantic, self-inflicted austerity due to a combination of its own “offensive” culture and its leaders’ arrogance in their own assumed invincibility. Albert Speer and other civilian ministers recognized this, but still were unable completely to stop it.²² By June 6, 1944, the Tiger had indeed become renowned among both Allied and Axis soldiers, but at a huge price. The German government could not cancel the program because it had become the symbol for their nation’s military strength. Instead of being a symbol of victory, the Tiger was now a symbol of dogged determination and faith in a set of fanatic ideals.

¹⁹ *Die Deutsche Wochenschau 1944 No. 726*. 03 August 1944; *Net.ru Newsreel Collection* (Film Document Number No55104); Russian Archive of Documentary Films and Newsreels. Accessed 03 September 2018, *Net-film.ru*.

²⁰ “*in seinem Tiger*,” see *Ibid*.

²¹ *Ibid*.

²² Albert Speer, “Shift from Romantic to Technocratic Ideals,” 09 June 1944; *Records of the Reich Ministry for Armaments and War Production* (National Archives Microfilm Publication T73, serial 179, roll 179, item RmfRuk 1689); CGRC; NACPM.

Chapter 5

Till the Bitter End

Your task will not be an easy one. Your enemy is well-trained, well-equipped and battle-hardened. He will fight savagely. But this is the Year 1944! Much has happened since the Nazi triumphs of 1940-41.

-General Dwight D. Eisenhower
Order of the Day, June 6, 1944¹

The eleven months between the Normandy landings in early June of 1944 and the final German defeat in May of 1945 are some of the most eventful, but also most perplexing, of the entirety of World War II. Though this period would see the epic destruction of both the German military and the German homeland that would result in unconditional surrender to the Allies, it also contained some of Nazi Germany's most legendary victories under the most difficult conditions. These still capture the attention and imagination of contemporary military strategists: Michael Wittmann's victory over the 4th CLY at Villers-Bocage, *Panzergruppe West's* two-month defense of Caen, the "Battle of Narva" where Germans brought the Soviet offensive into the Baltic to a standstill for seven months, and Operation Watch on the Rhine (known by the Allies as "The Ardennes Offensive" or "The Battle of the Bulge") that pushed American lines back 50 miles and delayed Allied advance into Northwestern Europe. Besides the fanatical levels of morale General Eisenhower alluded to in his message to the Allied Expeditionary Force before D-Day, the other common factor that knits all these events together is the use of tanks, especially the Tiger I and Tiger II. In each case, the Germans did not hesitate in the "tactical" employment of their heavy armor, but utterly failed in their "strategic" imperative to logistically

¹ "Order of the Day," 6 June 1944 (Museum Manuscripts transferred to the Library FY69, Box 1; NAID #12000995); *Dwight D. Eisenhower Presidential Library Archives Online*. Accessed 22 December 2018 at https://www.eisenhower.archives.gov/research/online_documents/d_day/Order_of_the_Day.pdf

resupply, repair, and refit the over-taxed vehicles and their crews to allow for subsequent successes. With every spectacular short-term German victory, each blow to Allied forces, the numbers of combat-effective German troops, vehicles, and supply reserves slowly dwindled to nothing. Meanwhile, American and Soviet reinforcements continued to arrive in unprecedented numbers to their respective theaters of operation.

By the late summer of 1944, the Allies were threatening the German frontier from all sides. The Anglo-American offensive up the Italian peninsula secured Rome and was moving towards the Alps. The Soviet Union advanced through Ukraine, Romania, the Baltic States, and Poland. Finally, the “Battle of Falaise Pocket” in northern France surrounded and destroyed both the German 5th and 7th *Panzer* Armies. These circumstances forced the *OKW* to completely reevaluate and overhaul their defensive plans for the German heartland. The country’s territory had spanned from the Atlantic Ocean to the Volga River in the autumn of 1942. Two years later, it was quickly approaching the original size of the Weimar Republic. Worse yet for Hitler and his government, the Allies were fully mobilized, aggressively motivated, and wanted nothing less than absolute and unconditional surrender. More than ever before, the war became a numbers game for German military planners. Every soldier trained, every vehicle produced, and every weapon built had to be effective and efficient in order to have any hope of slowing the enemy armies approaching the Rhine, Danube, and Oder Rivers: Germany’s last natural lines of defense. Hitler demanded that German industry match the sacrifice of soldiers at the front. Despite the tremendous stress of labor and material shortages, he ordered a minimum production increase of 200 more tanks and assault guns per month above their already crushing quotas.² The

² Albert Speer, “*Führer* Conference Notes,” 20 August 1944, trans by WMS on 10 July 1945; *Records of the Reich Ministry for Armaments and War Production* (National Archives Microfilm Publication T73, serial 192, roll 192, item RmfRuk 2096); Captured German Records Collection; CGRC; NACPM.

OKW began in-depth quantitative analysis to determine the effectiveness of remaining German weapon systems versus their Allied equivalents. A series of detailed charts and graphs released in October of 1944 shows the one-on-one effectiveness of German tanks versus their American, British, and Soviet counterparts using numeric scores across a number of dimensions including frontal armor strength, side armor strength, and main-gun penetration ability.³ Of course, all of the German *Panzers* were equal to or greater than the performance specifications of their opponents. The Tiger II was rated as the best German tank with armor protection and fire-power that could best even the Josef Stalin 2 (JS-2), a specialized Soviet heavy tank built as a more-powerful successor to the KV series.⁴ What the German charts did not express was that by 1944, Allied tank plants in Detroit, Bedfordshire, and the Ural Mountains were still out-producing the over-stretched German factories at a cumulative rate of almost 3 to 1.⁵ The Reich Ministry for Armaments and War Production noted this fact time and time again in their internal memoranda. A report for Speer in the final quarter of 1944 bluntly asserted, “In 1944 there was no single tank producing plant which did not suffer directly and above all indirectly to a considerable extent. Insufficient supply of supplied [sic] parts...must be counted as an additional difficulty for all firms during the whole year.”⁶ Albert Speer’s insistence on greater efficiency by making many of the Tiger II’s components interchangeable with the Panther tank was also having a profoundly negative effect on the larger vehicle’s reliability. The engine and transmission, designed for the much lighter Panther chassis, would often become overworked and overheated when moving the

³ “Official Tank Comparison Charts,” 05 October 1944; *Records of the German Army High Command* (National Archives Microfilm Publication T78, roll 615, item H5/135); CGRC; NACPM.

⁴ *Ibid.* The Soviet “Josef Stalin” series of tanks are the only Soviet armored vehicles of the war to be “named” rather than numbered. This could be seen as a direct challenge to the fact that the Tiger was Hitler’s “personal” tank.

⁵ Appendix 1: Weapons Production of the Major Powers in Overy, 332.

⁶ “Report from Main Committee for Armored Fighting Vehicles” 31 December 1944, reproduced in Jentz and Doyle, *Germany’s Tiger Tanks: VK 45.02 to Tiger II: Design, Production & Modifications*, 59.

Tiger II's nearly seventy tons of steel bulk. Dr. Aders, still in charge of the Henschel design team, recorded in his notes:

The [Tiger II] had to take over from the Panther II the engine cooling system, engine compartment, transmission ventilation, fuel system, ventilation for the engine exhaust pipes, engine compartment deck, engine exhaust system, and turret hydraulic drive...the inherited components taken over in this way turned out to be disastrous.⁷

However, Speer still refused to directly challenge Hitler's demands for increased production. Besides Hitler's narcissistic belief in his own invincibility, another reason was that *OKW* and the German Army still clung to their deeply held cultural belief that victory came as a result of battlefield performance rather than industrial capacity. Speer knew that without the support of the military, Hitler would never agree to any change in production levels based on the input of industrialists and engineers.

In the autumn of 1944, the *Reichminister* began a personal tour to gather direct testimonies from those fighting with the Tiger at the front. It is obvious from his notes that Speer respected the opinion of "fighting men" more than any other, and desired to consider their perspective before making any further recommendations to the *Führer*. In early autumn, positive reception of both the remaining Tiger Is in service and the newly fielded Tiger IIs remained very high among front-line troops on both sides of the conflict. The officers of a German Army heavy tank battalion reported to Speer that despite its "teething troubles" (most likely a reference to the reliability issues discussed by Dr. Aders), that the Tiger II was "the [sic] heavy tank."⁸ During

⁷ *Anmerkungen zu Tiger B*, February, 1945, reproduced in Jentz and Doyle, *Germany's Tiger Tanks: VK 45.02 to Tiger II: Design, Production & Modifications*, 59.

⁸ „Die bis jetzt aufgetretenen Schäden sind „Kinderkrankheiten,“ nach ihrer Beseitigung ist der Tiger B der schwere Panzer“ with *der* underlined for emphasis in original text. See "Meeting Points for Visit with *Reichminister* Speer," October/November 1944; *Records of the Reich Ministry for Armaments and War Production* (National Archives Microfilm Publication T73, serial 182, roll 182, item RmfRuk 1801); CGRC; NACPM.

this period, Soviet tank crews as well still viewed both versions of the Tiger as formidable weapons. For over a year, Soviet Military Intelligence published propaganda pamphlets informing anti-tank and armored crews of the weakest points in the Tiger's armor based on analysis of captured examples.⁹ The blunt message was that the new German vehicle was not invulnerable and could be defeated with courage and training. However, the September 1944 issue of *Nachrichtenblatt der Panzertruppen*, the official newspaper of the German Armored Corps, published gleeful accounts from Tiger companies whose very appearance on the battlefield still caused Red Army units equipped with the latest JS-2 heavy tanks to turn away and run.¹⁰ The JS-2s which did remain were frightened to engage at any distance closer than 2000 meters and evacuated their vehicles as soon as a Tiger II fired upon them.¹¹ Though these accounts were published in an official piece of propaganda and therefore cannot be taken at face value, an internal memorandum of the General Inspector of Armored Troops did confirm at least some of the claims in the article stating, "these experiences are in accordance with those of other Tiger units and are correct."¹² At the very least, this means that Soviet heavy tank crews to some extent did modify their tactics when facing German units equipped with the Tigers and this gave many German heavy tank crews a great boost in confidence of their equipment.

However, a sudden and drastic shift in reception among lower ranking tank crewmen and officers began to appear as the winter of 1944 approached. Critical shortages of supplies and reinforcements started to impact German troops on the frontline. Speer began to encounter

⁹ Soviet Military High Command, "Pamphlet for Commanders and Gunners of 76mm Guns Regarding Firing at Tanks." April 1943 reproduced in Thomas Anderson, *Tiger* (New York: Osprey Publishing, 2013), 234-236.

¹⁰ "Tiger Company Encounters *Josef Stalin* Tanks" *Nachrichtenblatt der Panzertruppen*," September 1944, reproduced in Thomas Jentz, *Germany's Tiger Tanks: Tiger I & II: Combat Tactics* (Atglen: Schiffer Military History, 1997), 148-150.

¹¹ *Ibid.*

¹² "Remarks on September Issue of *Nachrichtenblatt der Panzertruppen*," September/October 1944, reproduced in Jentz, *Germany's Tiger Tanks: Tiger I & II: Combat Tactics*, 151.

differing opinions on the value of the Tigers. In late October, Speer visited a group of German tankers facing advancing American forces in Italy. What they told him was startling. He recorded in his notes, “The troops were in this case clearly for a reduction in armor strength but ask for the largest possible number of tanks.”¹³ The combination of overwhelming firepower and heavy protection of the limited numbers of heavy *Panzers* was no longer effective in holding back the enemy. What German soldiers needed were greater numbers of tanks, even if it meant the ones they received were smaller and lighter than the Tiger. Without more vehicles, the actual men doing the fighting were unsure if they could stem the ever increasing Allied onslaught. Faced with huge numbers of fresh American Shermans and Soviet T-34s, “The Tiger Gap” was proving that it could not overcome the raw power of sheer numbers.

Even while enlisted soldiers and junior officers were growing concerned about the negative effects of the “Tiger Gap,” mid-grade and senior officers were still committed to their “cult of the offensive.” Convinced that Tigers could still provide overwhelming strength in every situation, senior commanders often ordered their dwindling numbers of heavy *Panzers* into dangerous and untenable situations in the hope that the crews could still miraculously prevail. Often, this was to bolster the dwindling morale of the infantry more than anything else. A battle report written by Captain Lange, commander of the 506th Heavy Tank Battalion laments this fact: “[o]ur understanding still remains the same as a year ago, that the Tiger is a battering ram and a bump stop to be used [at the] *Schwerpunkt*...It is not bearable that the Tigers must continuously stand as morale support behind the forward security line [i.e. within shooting

¹³ “Report on a Visit of Albert Speer, Minister of Armaments, to Army Group Southwest,” 19-25 October 1944; *Records of the German Army High Command* (National Archives Microfilm Publication T78, roll 623, item H 16/270); CGRC; NACPM.

distance of the enemy].”¹⁴ Captain Fromme of the 503rd Heavy Tank Battalion was equally frustrated in his reports to higher headquarters about what he considered to be the foolish use of his precious few tanks: “[d]uring this week, and continuing up to today, the battalion was not given time to perform maintenance in spite of urgent requests. This was partially due to the situation, but also partially due to the lack of understanding of the higher command.”¹⁵ A few sentences later, he bluntly complained, “The few operational Tigers that were left were shoved from division to division and, by inappropriate employment, given tasks that were not achievable and couldn’t be carried out.”¹⁶ While some of the poor senior planning could be attributed to senior officers’ unfamiliarity with tank tactics (many infantry and artillery commanders would lack tank-specific combat experience), a much more intriguing reasoning can be found when re-examining Clausewitz’s arguments for the “spiritual” strength of combatants. By the end of 1944, German officers were well aware of the Allies’ utter military supremacy in terms of “physical” strength. However, senior German military leaders were also cognizant of the value of the Tiger as a symbol of German military power. Their very presence reassured friendly forces and instilled fear in enemies, even if it meant forcing the vehicles into situations with limited military utility or chance of success. Ironically, the Tiger’s symbolic strength became its largest physical weakness as high operational tempo, poor planning, and desperation forced the vehicles and their crews into situations which began bleeding their remaining numbers to nothing.

¹⁴ “Battle Report of *schwere Panzer-Abteilung 506*,” 15 January 1944, reproduced in Jentz, *Germany’s Tiger Tanks: Tiger I & II: Combat Tactics*, 143-144.

¹⁵ “Battle Report of *schwere Panzer-Abteilung 503*,” 25 November 1944, reproduced in Jentz, *Germany’s Tiger Tanks: Tiger I & II: Combat Tactics*, 155.

¹⁶ *Ibid.*

Perhaps the most famous example of this phenomenon was December 1944's Operation Watch on the Rhine, also known as the "December Offensive" or the "Battle of the Bulge." Almost half a million German soldiers spearheaded by 600 tanks were ordered to attack the weakest point in the Anglo-American lines during the dead of the most brutal winter Europe had seen in a century. In temperatures well below freezing, the German Army charged forward with the objective of re-capturing the deep-water port of Antwerp in Belgium. Somehow, the *OKW* believed that with the loss of a main logistical hub, Allied operations would grind to a halt in the west, putting Germany in a far better position to negotiate peace terms before the Soviets reached the German heartland. With the mantra, "attack till we succeed," the last remains of Germany's precious fuel and materiel reserves were thrown into the fray. However, just as in the disastrous offensives in the Spring of 1918 and the Herrero Wars of 1904-1908, there was no real logistical plan in place to support such a bold strike. In fact, the German vehicles were given less than half the fuel they needed to reach their objectives and were instead ordered to capture gasoline and other petroleum products from surrendering Allied units.¹⁷ The result of this was both predictable and catastrophic. Despite the tremendous tactical advantages provided by German heavy armor, quickly German logistical reserves ran dry. Though the Germans were able to create a 50 mile deep "bulge" in Allied lines, they could never break through without additional support. In a little over a week, the offensive stalled and the Allies, though stunned, were able to resume their push eastward against an enemy that no longer possessed any kind of ordnance or petroleum reserves whatsoever. A British examination of the aftermath of the battle provides deep insight into the consequences of the German folly. Commonwealth forces captured 57 German *Panzers* in Belgium between December 17, 1944 and January 16, 1945. Of these, four were destroyed by

¹⁷ Hugh M. Cole. *The Ardennes: Battle of the Bulge* (Washington D.C.: Center for United States Military History, 1993), 74.

Allied aircraft and 21 were destroyed by Allied tank or anti-armor artillery fire. However, 24 were either demolished by their own crews or simply abandoned when the vehicles ran out of fuel or ammunition.¹⁸ Fifty percent of German armored losses were because of the *OKW's* inability to support their own troops rather than enemy action. For the third time in as many years, the lust to find Clausewitz and Moltke's single "bold strike" to victory had cost the *OKW* an entire German Army: Stalingrad, Kursk, and now the Ardennes. However, by the beginning of 1945, there was no hope of another chance. The defeat in the Belgium was so ruinous that Guderian does not even mention it in his post-war testament to the United States Army. The reason for this can be found in a series of letters he exchanged with Albert Speer in Germany in December of 1944. On December 9, Guderian as Chief of the Panzer Forces, wrote Speer begging him to ensure that supplies of new tanks and fuel from Germany would continue to flow uninterrupted to support the imminent offensive. Speer's response on December 15 must have been a crushing blow to Guderian. "Germany steel production has fallen by a third," Speer began.¹⁹ "At the moment, we no longer have the ability to exploit our coalfields which have either been lost or abandoned."²⁰ Finally, Speer summed up his grim assessment of the country's economic situation with the terse answer that the "fighting ability of the troops" may give the Reich a few more weeks of survival, but economically, Germany was already defeated.²¹ It is unknown whether Guderian had a chance to read Speer's response before the offensive began, but the attack commenced a day later as planned. Though Speer's assessment would prove to be

¹⁸ Jentz, *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany's Tank Force, 1943-1945, Vol.2*, 202.

¹⁹ Albert Speer to Heinz Guderian, 15 December 1944; *Records of the Reich Ministry for Armaments and War Production* (National Archives Microfilm Publication T73, serial 180, roll 180, item RmfRuk 1820); CGRC; NACPM.

²⁰ *Ibid.*

²¹ *Ibid.*

correct, he may have underestimated the “fighting ability” left to Germany. Spurred on by Hitler’s fanaticism and a high command which refused to accept a second major surrender in a single generation, the German military was not given the option to surrender and continued fighting on for six more months, until May of 1945.

The “Tiger Gap” was both a symptom and a reinforcement of the German military’s cultural construct: the “cult of the offensive.” Even when it was obvious that German forces were hopelessly outnumbered on the grand scale, military leaders supported building fewer vehicles because of their ability to win on the small scale. Even when any neutral assessment would seem to indicate that fast attack was the more foolish course of action than slow, deliberate defense, even the most experienced German officers defaulted to an offensive approach because that was their mental framework: the reality in which they had developed their world-view.

Though evidence suggests that Speer as a civilian may have been more dubious of the “Tiger Gap’s” effectiveness than his uniformed peers educated within formal German military networks, he was, at least, willing to publicly justify its effectiveness until the very end. On December 1, 1944, Speer made a visit to a group of Ruhr factories to bolster their crumbling morale. The content of his speech strongly indicates that even the people who built the Tiger II were also becoming skeptical that such a large, expensive vehicle was what Germany needed. Albert Speer bluntly indicated that the Tiger II and vehicles like it were exactly what Germany required for final victory, both in terms of effectiveness and the morale they inspired. “It is true that the Russian and now also the Englishman have adopted a name for the so-called Tiger II,

which you know from the use of earlier, calling it the King Tiger, because it is indeed a royal tank,” he began.²² Then, he laid out the “Tiger Gap” for the workers in the frankest of terms:

With 10 Tiger IIs, you can compete against 200 Shermans... The purpose of *Panzer IV* is to make it in the same number or double the number of pieces as the Tiger II, because the *Panzer IV* is only in the ratio of 1:1 to the Sherman. The *Panzer IV* has its advantages and disadvantages when compared to the Sherman, so that you have to compete with the same quantities in order to have success. You see, that in itself the Tiger II has threefold of the weight the *Panzer IV* but also has about twenty times the combat value.²³

The fact that Speer justified the “Tiger Gap” in terms of economic efficiency should come as no surprise. Economics had come to dominate his analysis of all problems by this point in the war. However, what is even more important is that even as he told Guderian that the economic battle with the Allies was already lost, Speer still felt that tactical superiority could at least buy time before the Germans were forced to surrender. At least passively, he had internalized the German military cultural ideas of tactical superiority that both created and explained the phenomenon of the “Tiger Gap.” Though the idea that fewer tanks of greater armor and firepower could win wars was a distinct phenomenon that developed in the German military between the years of 1941 and 1945, it is strongly indicative of a broader trend of military culture that had existed unbroken in centuries of German military culture through Moltke to Clausewitz which endured both victory and defeat.

²² Albert Speer. “Speech Comparing Industrial Production,” 01 December 1944; *Records of the Reich Ministry for Armaments and War Production* (National Archives Microfilm Publication T73, serial 180, roll 180, item RmfRuk 1701); CGRC; NACPM.

²³ Ibid.

Conclusion

Then came the collapse.

-Heinz Guderian, 1948¹

In his landmark 1973 book, *The Interpretation of Cultures*, anthropologist Clifford Geertz stated that his concept of “culture” was a “historically transmitted pattern of meanings embodied in symbols, a system of inherited conceptions expressed in symbolic forms by means of which men communicate, perpetuate, and develop their knowledge and attitudes about life.”² If, as Isabel Hull asserted, the continuity of German military culture from the 19th through the 20th centuries was embodied by the “cult of the offensive,” then the Tiger series of tanks was the ultimate symbol of that military culture. It was a machine deliberately designed from its outset to seek out the most critical portions of a battlefield, the *Schwerpunkte*, mercilessly attack, and crush both its enemy’s “physical” and “spiritual” strength to resist. All of this occurred within the German military’s traditional and misguided interpretation of Clausewitzian martial philosophy and doctrine. The Tiger was a weapons system that would also facilitate the gender and social norms of Germany’s new, National Socialist system of government. Ernst Jünger and other right-wing German political theorists in the 1920s and 30s envisioned a “reactionary modernism,” where industrial warfare would allow the “new German men” of all social backgrounds to merge with “new technology” to recapture ancient, romantic warrior ideals. This dream was realized on battlefields across Europe, Russia, and North Africa where the sons of Bavarian farmers like Michael Wittmann could suddenly defeat entire regiments commanded by viscounts of old British nobility. From its first taste of battle outside of Leningrad in the summer

¹ Guderian, 29.

² Clifford Geertz, *The Interpretation of Cultures* (New York: Basic Books, 1973), 89.

of 1942 till the final, hopeless defense of Berlin in the spring of 1945, the Tiger tank was much more than an inanimate collection of metal and parts. Instead, it became a representation of German unity and strength, built with the sweat and dedication of factory workers from every corner of the nation. They manufactured its components to support the resolve of young men from every social class and background composing the Tiger's crews. These symbolic acts of service and strength were so potent that they gave the vehicle its own agency with which it could influence actions and events by its mere presence. The silhouette of an approaching Tiger inspired tremendous feelings of hope and joy in German troops and equally tremendous levels of fear and dread in Allied forces. By the closing months of the war, the Tiger had become an avatar for Germany itself: as long as it could keep fighting, Germany could keep fighting.

Though the "Tiger Gap" initially manifested itself as an economic problem (and was sometimes framed in such terms by economically minded individuals such as Albert Speer) it cannot be logically analyzed as an economic problem. Instead, it must be examined and explained through the emotional and cultural considerations of the Third Reich's political and military leadership. The three objectives of this historical study were:

1. Place the design of the Tiger in conversation with the military and political culture that created it and address how the design of the Tiger tank reflected its contemporary place in German military history.
2. Address the role that the German military desired the Tiger to fill within its larger wartime strategy.
3. Address how that role changed as wartime and battlefield conditions evolved between 1942 and 1945.

The Tiger tank was not created out of thin air. It was a vehicle deeply rooted in a culture predicated on the idea that an active, attacking force would always triumph over a deliberate, cautioned defense. The tank was the physical representation of centuries of military tradition blending with the “reactionary modernism” of a German far-right political movement that wished to re-establish national honor and prestige after the total collapse of the German state in 1918. Only the specific, temporal intersection of these two intellectual and cultural networks could justify a tank like the Tiger.

Though initial German tank research in the 1920s and 1930s focused on the novel idea that larger numbers of smaller vehicles could overwhelm opponents, the limitations of that concept were realized when established German logistical and industrial networks could not support large-scale wartime operations for extended periods of time. The German economic framework was faced with new uncertainty after the tremendous losses in the Soviet Union in 1941. Rather than radically alter existing networks to support more flexible production methods like the Allied militaries did, German military planners and politicians reverted to the familiarity and comfort of their “cult of the offensive,” which had existed as an unchallenged continuity in martial culture for hundreds of years.

The original purpose of the Tiger tank and its subsequent variations was to bridge the gulf between what limited equipment and trained soldiers German society could produce and what was required to win an industrialized war on a global scale. In theory, a tank that was invulnerable, a tank that could always achieve victory despite the circumstances, did not have to be replaced in great numbers. Its crews would always survive to fight another day. This simultaneously solved three problems. Economic and industrial production would not have to be increased, the National Socialist societal and gender ideals of German supremacy would be

reinforced, and the German military could force other nations back to the defensive so that the offensive culture could be preserved. Jentz's claim that the German experience of World War II can be split between "Offensive War" and "Defensive War" is not enough of an explanation for what transpired between 1939 and 1945. Until the very end, German leaders never saw themselves as being in a "Defensive War." From Stalingrad, to Kursk, and into the Ardennes, every major German planned operation was about regaining and maintaining the ability to attack at will directly in the vein of Clausewitz's teachings.

However, from the outset of the Tiger's development in November 1941, German engineers and their military and political counterparts vastly overestimated their ability to support the Tiger's mechanically demanding platform, and underestimated Allied ability to produce vastly greater numbers of smaller, less-resource intensive vehicles to counter it. Over the course of the entire war, only 1,347 Tiger Is and 492 Tiger IIs were ever produced.³ In 1942 alone, the United States manufactured 24,997 tanks.⁴ Even while partially occupied and suffering the brutal campaign at Stalingrad, the Soviet Union was right behind with 24,446 vehicles produced.⁵ The stark difference between these figures alone is testament both to Allied industrial capacity as well as the Tiger tank's exceptional combat performance.

The German military placed their faith in the Tiger because it was a representation of their most ardent beliefs. By trusting it to accomplish the mission, leaders were, in fact, showcasing their confidence in their own superiority. Unfortunately for them, in the 1940s that

³ "Monthly Production Figures for Tiger I and Tiger II Tanks," reproduced in Jentz, *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany's Tank Force, 1943-1945, Vol.2*, 286, 288.

⁴ Overy, 332.

⁵ Ibid.

system proved as woefully inadequate in confronting the challenges of mechanized, industrial warfare as it had been between 1914 and 1918.

The Tiger empowered its nation with new confidence while shattering enemy morale with strings of tactical victories. It gained agency of its own to influence decision making processes and courses of action on the battlefield. However, this agency ultimately proved not only to be counter-productive, but also dangerous, as the Tiger's tactical effectiveness did not prove to be a real challenge to the Allies' strategic superiority. As the situation grew more desperate for German forces in 1943 and 1944, the Tiger and its crews were ordered to conduct increasingly dangerous missions that the vehicle was not properly suited to perform. This was partially due to the lack of available resources. However the major cause of this phenomenon was a false assumption that the Tiger was an invincible symbol of national strength rather than a piece of equipment designed for specific tasks at specific locations. Perhaps one of the reasons that a tank produced in such limited quantities has achieved such a "mythic" contemporary status among those who study the Second World War is also an indicator that the Tiger is still a salient symbol of the Nazi's military power today.

The "Tiger Gap" is not actually a contradiction and cannot be explained in purely economic or practical terms. Rather, it was a deliberately chosen paradigm which provides insight into the foundational cultural beliefs of the military and political leaders responsible for its creation. In hindsight, it is always easy to condemn past actors for behaviors later proven irrational. However, after detailed examination, it should come as no surprise that the Third Reich chose the "Tiger Gap" when confronted with the pressures of World War II. Human psychology has consistently shown that actors revert to their most comfortable and familiar assumptions when faced with uncertainty. The United States chose to build vast assembly lines

in plants run by automotive giants such as Ford, General Motors, and Chrysler where M4 Shermans rolled off the line in massive numbers. The Soviet Union harnessed the energy of tens of thousands of working class men and women to produce vast volumes of simple, rugged T-34s that, while individually weak, were collectively devastating. These nations' responses were just as consistent with their own cultural frameworks as the "Tiger Gap" was for Germany. In the future, scholars may find the most useful way of discovering what a society valued is to examine how it fought for survival.

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