ENIGMAS REVEALED: SELECTED CASE STUDIES

INVOLVING CRYPTOLOGY

BY THE ALLIES IN WORLD WAR II

THESIS

Presented to the Graduate Council of
Southwest Texas State University
in Partial Fulfillment of
the Requirements

For the Degree

Master of Arts

By

Francis M. O'Laughlin IV, B.A.

San Marcos, Texas
May 14, 1999

Dedication

To Mom and Dad

TABLE OF CONTENTS

Page

Chapter

CHAPTER ONE

INTRODUCTION

How secure are government secrets today? How crucial was the intelligence war during World War II? Did foreknowledge of German or Japanese aggression make differences in the war? Have lessons been learned from past intelligence successes and failures? This thesis will focus on three case studies covering the intelligence battles of World War II.

The first case study will show the influences of Polish cryptologists in breaking down the German enigma communication devices. The German Army and Navy required secure communications due to the vastness of the *Third Reich*. For example, German U-Boats and the *Afrika Corps* both depended on secure communications to accomplish their missions. This communication line became a focal point of Allied intelligence.

Poland reemerged as a nation following World War I. Learning their lesson from their previous partitions at the hands of Austria, Prussia, and Russia; Poland invested in intelligence operations. The most successful and direct method of action dealt with wireless radio communications. These transmissions could be easily intercepted. The Polish innovative mind developed with ways of theoretically breaking down the German machine sending the codes. If they could construct the device and determine how it operated, they could deduce ways of defeating it.

Poland invested in young mathematicians with a gift for languages and cryptology. These young men became the backbone of Polish intelligence during the interwar years. When the German Army stood at the border threatening invasion, Poland quickly sent their people and information to the British and French. The knowledge obtained from the Poles advanced the Allied war effort tremendously. The British were shocked at the successes and theoretical advancements made by the Poles. The British and American cryptologists were able to learn from the Poles and adapt to future German machines.

This ability to read German intercepts helped defeat the U-boats in the North Atlantic and enabled the Allies to attack Germany where it was weak or unsuspecting. As Germany was slowly pushed back to its borders, the amount of radio communications dropped and the Germans themselves became suspicious that their codes had been broken. This played a role in the failure of the Allies to predict the Battle of the Bulge.

The second area of this thesis deals with the critical Battle of Midway between the Japanese and American Navies. This battle ended with a decisive American victory and changed the tide of the war. Japan would lose four carriers and never again threaten the Hawaiian Islands or the West Coast of the United States.

The Battle of Midway was a classic ambush. The American fleet, though small and outnumbered, had foreknowledge of Japanese intentions regarding Midway. The Japanese fleet would help support a landing of troops and hope to engage U.S. fleet in a major fleet engagement that could decide the war in the Pacific. If the U.S. fleet was sunk, then Japan could negotiate a peace treaty from a position of power. Japan hoped to retain its recently acquired possessions and natural resources and avoid a war of attrition

with the United States. However, Japan lacked the vital resources required for a long sustained war. Japan began the war with a numerically and qualitatively superior navy. If the war dragged on long enough, the United States could easily outbuild the Japanese. The Japanese attacks on Pearl Harbor and Midway were designed to knock the United States out of the Pacific.

U.S. intelligence officers had been working for years trying to decode Japanese transmissions. Before the war, low level transmissions had been compromised, but the military channels had not yet been fully broken. After the war began, intelligence was expanded and energized against the Japanese. Gradually the Americans were able to read parts of Japanese military transmissions.

These transmissions helped the United States map out the Japanese fleets and probable courses of action. One major action occurred in the Coral Sea. The American fleet was sent to halt a potential invasion. This battle ended up being the first time the Japanese Navy had been stopped in six months of aggression. Although the Japanese technically won the battle, they were denied an opportunity to invade the Solomon Islands. The Americans won a strategic victory because they stopped a potential invasion and forced the Japanese to regroup.

The U.S. fleet launched a surprise attack on Japan with Army B-25 bombers led by Colonel Jimmy Doolittle. The Doolittle raid on Tokyo left little significant damage on Japan, but provoked an angry reaction from the Japanese military that required a major action against the United States. A plan to assault Midway had been sitting around for several months.

The Doolittle raid caused the military to enact the Midway plan without proper planning. The Coral Sea action had forced two carriers to Japan for repairs and resupply. This meant that only four carriers would be able to assault Midway and attack the U.S. fleet. The Midway invasion plans also called for four separate fleets to engage differently. One fleet would invade the Aleutians Islands off Alaska as a diversionary raid. The invasion fleet would move independently. The carrier strike force was well out in front and away from the supporting battleship force. The resulting battle allowed the small American fleet to decimate the carrier strike force without threat from the other Japanese fleets.

The final case study takes place in Europe. The Normandy invasion allowed the Allies to finally start pushing the German back to their own borders. The successes of this campaign led the Allies to a mindset of "victory disease" or overconfidence. This overconfidence prevented the necessary intelligence reports from being received or believed. The potential for a German counteroffensive was thought to be ludicrous. The Battle of the Bulge would soon remove any doubt.

Hitler had hoped for a chance to strike back and split the Allied forces in the Low Countries and France. If the German Army could seize Antwerp and its valuable shipping docks, the war could be extended another several months to a year. Then the German Army could turn and focus on the oncoming Soviet threat. The massive buildup for the counteroffensive should have been the first of many clues for the Allied intelligence experts. This study will show how the necessary hints were ignored or disregarded. The lesson to be learned is that one should never underestimate your enemy.

The Allies figured the German Army was finished. The war would end soon. The war became a harsh reality again to those who fought in the Battle of the Bulge.

The lessons to be learned from the intelligence successes and failures of World War II are numerous. The general lessons learned revolve around secure communications and obtaining accurate intelligence on your enemy. Misunderstanding the intentions of your enemy could be costly. "Informed policymaking and decisionmaking require adequate information and analysis." [1]

Governments require proper intelligence from which to determine policy and action. If a government fails to heed to this, their security could be compromised. Intelligence sources and methods can vary from domestic information about activities of kids bringing guns to school or internationally with nuclear or biological weapons of mass destruction. Dangers exist in this world for every nation. Those countries that make a determined effort to avoid or deter danger will survive much longer than those who fail to heed to the simple idea of secrecy and intelligence.

What lessons do we learn from World War II dealing with cryptology? How can these lessons be applied to the present day? Currently, Russia and China are prime candidates for espionage. These large nations require secure communications and remain serious threats to the national security of the United States. The lessons from World War II can be easily applied to these countries. A difficult situation exists in the Balkans. Proper intelligence is extremely suspect in such a war torn ragged region. The United

---

[1] Jeffrey T. Richelson, The U.S. Intelligence Community. (Boulder, Westview Press, 1995) 1

States in actively attacking this region by airplanes. When and/or if ground troops are

placed within this area, proper intelligence will become even more valuable and necessary.

Vietnam showed us many lessons about guerilla warfare and the necessity for

information. The Balkans present another scenario where traditional methods of

intelligence do not apply. Former Secretary of State Henry Kissinger has stated,

"Anyone concerned with national policy must have a profound interest in making sure

that intelligence guides, and does not follow, national policy." [2]

---

[2] Ibid, 7

CHAPTER TWO

THE CONTRIBUTIONS OF POLISH CRYPTOLOGISTS

IN THE DOWNFALL OF THE *THIRD REICH*

In times of peace and even more so during times of war, intelligence has been the

most valuable commodity desired. Knowing what your opponent can do is the difference

between victory or defeat. Sun Tzu states, "If you know the enemy and know yourself,

you need not fear the result of a hundred battles."[1] The following case will show that a

country and people may be measured not so much in what it can produce physically, but

for how it performs mentally. The Polish people knew themselves and their enemy.

Knowledge could not stop the German Army though.

Intelligence has been coveted since the dawn of civilization. "If we only knew,"

still applies to many stories of lost battles. If the army could only find a weak spot in the

enemy lines? If the navy knew the disposition of the enemy fleet? What if the United

States had foreknowledge of the Japanese raid on Pearl Harbor? What if Napoleon or

Hitler knew where the Russians were weakest during their drive on Moscow? What if

Hitler knew where and when the Allies were going to land in France? What if the United

---

[1]James Clavell, The Art of War--Sun Tzu. (New York, Dell Publishing, 1983) 2

12

States (Vietnam 1967-1973) had taken advantage of the Tet Offensive through prior intelligence. The history of the world could have been changed dramatically if the accurate foreknowledge of such situations had been acquired.

The United States broke some of the Japanese codes during World War II. One of these codes led to the annihilation of the Japanese Navy at Midway in 1942. Less than seven months after Pearl Harbor, the Japanese were put on the defensive due to accurate intelligence. They lost four of their carriers and their high morale earned at Pearl Harbor.

Nations can be deceived or won over by such key moments. The United States had an agent in the Soviet Defense Ministry in 1961. This Russian, a Soviet Army Colonel, Oleg Penkiovsky, gave President John F. Kennedy vital information regarding the state of readiness of the nuclear missiles and the Soviet leadership. Kennedy knew to call the Soviet bluff. The closest the world has come at that time to World War III was averted due to proper intelligence.

One of the most momentous developments in "intelligence" history was the Polish governments' ability to read the German enigma (a name given to the German code machine) codes before and at the beginning of World War II. It will be useful to begin by summarizing the key contributions made by this incredible intelligence coup.

Poland has existed since the Middle Ages. Indeed it had been a major military power until the late eighteenth century. However, the more powerful nations of Prussia, Russia and Austria made three partitions of Polish land. "The Third Partition, involving

the Austrians, in 1795 marked 'the end of Poland as a political entity, as a state.'"[2]

After 123 years, Poland reemerged as a country only after World War I in 1918. Proximity to hegemonic powers has decided the fate of the Poles for the past century. Geographically, Poland lies in northeastern Europe. Central and northern Poland are relatively flat. Southern Poland is hilly to mountainous as it borders the Czech Republic and Slovakia. Germany borders Poland to the west and Russia lies along the eastern border. The Baltic Sea comprises Poland's northern border.

Germany and Russia have been continental powers in Europe for over a century. Germany emerged as a dominant military and political power in the late nineteenth century and Russia derived its power from its territorial size and population.

Poland regained its independence in 1918 and decided to invest time and energy into intelligence-gathering activities. The Poles lived in a danger zone between a revisionist Germany and Soviet Russia, and intelligence was a primary concern of the fledgling Polish state.

According to Polish historian Wladyslaw Kozaczuk, prior to the rise of the Nazi regime, a decision was made by the German government to increase the number of army divisions. "The armored and motorized rapid armies and air force, which were to become the key instruments of 'lighting war,' required new systems of radio communication, and

[2] Thomas Magstadt, Nations & Governments. (New York; St. Martin's Press, 1998) 190

that, in turn, entailed secure ciphers."[3]

The breaking of the secure cipher is the focal point of this chapter.

From Poland's point of view, both Germany and Soviet Russia were threats. Of the two powers, though, Germany was the more menacing, particularly after Hitler came to power even though Hitler had signed a nonaggression pact with Poland in 1934. Accordingly, Polish intelligence research focused on Germany.

Cryptography is the art of secret writing. Cryptology is the study of breaking codes. Messages have been sent by many different methods over time. The most secure method of secret communication is the "one-time" pad. The "one-time" pad requires a set of identical codes drawn randomly. Since the same code is never used twice, it is almost impossible to decipher. However, the "one-time" pad is costly and unwieldly. The volume and security of these pads forced a more practical means of secure communication.

The Poles believed that Germany would not use the one-time pad, but would in the words of author F.W. Winterbotham, "turn to a mechanical system which could be quick and easy to operate, a system of so changing the letters of the words in the signal by progressive proliferation that only the receiver who knew the key to the system could set his own machine to unscramble the letters back to their original meaning."[4]

The most widely used mechanical system involved a cipher machine. A cipher

---

[3]Wladyslaw Kozaczuk, *Engima - How the German Machine Cipher Was Broken, and How It Was Read by the Allies in World War Two.* (Warsaw; University Publications of America, 1984) xiii.

[4] F.W. Winterbotham, *The Ultra Secret.* (New York; Harper & Row, 1974) 9

machine resembles a typewriter. Certain keys resemble the text to be sent. When typing a message, the machine shifts or transposes the original letters to substitute symbols. The only way this text may be deciphered and read is by a similar machine with the same key setting(s).

This method, however, leaves an opportunity for others to copy the message and attempt to decipher it. Nonetheless, the number of permutations and combinations possible makes it extremely time-consuming for even experienced mathematicians to comprehend, and then they can only decipher the simplest message. The first step in breaking another cipher system is knowing the type of system being used. This is where the Poles made the difference.

The Germans had emerged weakened from World War I, but their infrastructure was left intact. The French, Poles and Russians were not so fortunate. The Germans were beginning to rebuild and reinstitute themselves into a position of power on the continent. The Poles, British and French all had cause for concern.

This was the beginning of the Polish cryptology program. The Poles began penetration operations against the Germans in 1928. The Polish government set out to test and train their brightest students at Poznan University Mathematics Institute. Only the best would be recruited into the new business of breaking foreign codes. The director of the Institute, Professor Zdzislaw Krygowski, was not satisfied with rote memorization.[5]

---

[5]Kozaczuk, 1

At the beginning of January 1929 Professor Krygowski drew up a list of potential students. His emphasis was toward students who had the mathematical knowledge, and the ability to think independently. These students were in their third or fourth year of college and had fluent knowledge of the German language.

The Polish army intelligence invited them to participate in a cryptology course. They were sworn to secrecy. The classes were held twice weekly, in the evenings, and conducted by Cipher Bureau cryptologists commuting from Warsaw.[6]

Poznan was the logical place for training. The students at the Mathematics Institute came from western Poland or the Baltic Sea area. These students had attended German language schools, since the Polish language had been banned from schools in those parts of Poland that, from the late eighteenth century until 1918, had been occupied first by Prussia and later by Germany. Knowledge of one or more foreign languages, in addition to mathematics, was indispensable for a cryptologist.[7]

In the late twenties and early thirties there were very few trained and qualified cryptologists at the time in Poland. At the General Staff's Cipher Bureau in Warsaw, trained specialists, as distinguished from clerks who enciphered and deciphered messages, could be counted on the fingers of one hand.[8] The lack of sufficient staff and the military buildup secretly being assembled across the border in Germany increased the tensions.

The Polish cryptology course organized at Poznan was focused at radio

---

[6]Ibid, 1
[7]Ibid, 2
[8]Ibid, 2

intelligence. The course began with students given a set of actual German ciphergrams to solve. This system had already been broken, although the professors considered the codes to be insolvable by the new students. The professors gave the hint that these intercepts were circular letters from the Berlin *Reichswehr* Ministry concerning winter quarters and bivouacs on *Reichswehr* training grounds.[9]

A couple hours later, some of the students, Marian Rejewski, Henryk Zygalski and Jerzy Rozycki, presented their solutions. Most of the rest of the students failed this test. Even harder tests followed. Students began to drop out of the course and others simply could not keep up with the pace of the class. Rejewski, Zygalski and Rozycki, however, managed to keep up with the extra cryptology classwork, in addition to their normal class load. The most promising talent appeared to be Rejewski. After his graduation, he went to the university in Goettingen, Germany. He spent one-year period of advanced study in actuarial mathematics. Upon his return, he taught at the Mathematical Institute in Poznan.[10]

Many other great mathematical minds were at work also at work in Goettingen. Six Americans, including J. Robert Oppenheimer, who played major roles in the atomic bomb project, also attended Goettingen. The University was a magnet for the world's mathematical scholars.

Back at Poznan in 1931, Rejewski and his colleagues continued their graduate studies. They also worked on German codes in the underground vaults of the Command

---

[9] Ibid, 4
[10] http://gl.umbc.edu/~lmazial/Enigma/enigma.html

Post on St. Martin's Street.[11] This laboratory allowed the young cryptologists an

opportunity for experimentation. These young men began to decipher routine messages

from careless German cipher clerks. These mistakes were exploited until one day they

ended. The Germans began to use a new cipher machine. It could not be penetrated with

previous methods. This new device was impervious to standard methods of deciphering.

On September 1, 1932, Rejewski and his younger colleagues, Rozycki and

Zygalski began work as regular employees at the Cipher Bureau in Warsaw. Captain

Maksymilian Ciezki, an instructor in cryptology, brought these young students to his

department. Ciezki, now head of the bureau's fourth, (BS-4) had progressed no further in

the solution of the new Enigma version than he had when Pokorny first presented the

problem to him.[12] Ciezki decided to give these new men a simple code. They began with

work on German Naval Codes. The German Navy had revised their system immediately

following the Treaty of Versailles.

Rejewski and his coworkers picked a simple naval code to decipher. The German

naval codes were sent in four letter groups, for example, "YOPY." These German ciphers

had two distinguishing marks. They consisted of only six groups, each of four letters.

The second part was the regular use of the certain letters to start their messages. The

Polish cryptologists noticed that the letter Y began many of the intercepts. Rejewski and

his cohorts thought these might have been question words.

The German language uses many words like *Wer?*, *Was?*, *Wo?*, *Wohin?*, *Wann?*

---

[11] Kozaczuk, 5

[12] David Kahn, *Seizing the Enigma.* (Boston; Houghton Miflin, 1991) 54

and *Welcher?* to begin sentences. These Poles reasoned that cipher clerks would follow

the line of least resistance.[13] Then the question in hand was sounded out. What could be

asked with six words that could be answered with a date? Rejewski and his fellow

cryptologists figured out the possible question of, *Wann wurde Friedrich der Grosse*

geboren? (When was Frederick the Great born?).[14]

This led to the entire deciphering of the German naval code. With a template text

to follow, the entire code was broken down in real time. Actual messages could be read

simultaneously. The Germans would change the codes every several months, but the

Polish cipher team would only need a short time to adjust.

These activities were occurring in 1932. This was a full seven years before the

German invasion of Poland. The British would not have the ability to decipher German

messages until these Polish workers could smuggle their advanced ideas and machines to

England in 1938 & 1939.

The German enigma machine proved to be the most difficult machine to master.

The Enigma resembles a typewriter. When one types a message, it is encrypted within

the system and sent. The receiving system types the encrypted message just as it is seen

and the internal mechanics turn out the normal message. The only machine requirements

are the same setting for various knobs and levers.

---

[13] Kozaczuk, 11

[14] Ibid, 11

The Poles had a commercial Enigma machine to work and test. This machine only gave them the basic outline for the military unit. The Polish cipher team was sure the military enigma would have more intricate parts and different wiring. This is where the mathematical genius of Rejewski and his fellow students blossomed. The idea of "group theory" or the "properties of permutations" was put to the test.

This enigma machine had multiple revolving wheels, which randomly designate the letters or symbols for the message being sent. These mathematicians, studied the properties of this machine and attempted to design a way to decipher it. Captain Ciezki gave Rejewski a private room and copies of some obsolete key lists. Rejewski was assigned to break the new system. Using these old lists and a commercial enigma machine, Rejewski set out to unveil the new secrets of the system.[15]

Why had the British and French not solved this dilemma? They had the same means and documents. They intercepted radio reports. The British and French both had incredible mathematical minds. The part they both lacked was mathematical cryptoanalysts. Their cipher establishment, like generals still fighting the last war, saw no need to change the linguistic orientation that had brought them their successes of 1914-1918 and that was continuing to solve many diplomatic codes in the 1920s.[16]

Arthur Scherbius, a German engineer who worked on the enigma project had increased the possible number of keys by proposing a machine with seven or even ten

---

[15] Kahn, 62

[16] Kahn, 67

rotors. The German army disagreed and decided to make the rotors changeable, to add alphabet rings, and to attach a plugboard. This increased the number of permutations to the number of keys available to the astronomical figure of 10.5 quadrillion. "If 1,000 cryptoanalysts, each with a captured or copied Enigma, each tested four keys a minute, all day, every day, the team would take 1.8 billion years to try them all. Since on average the codebreakers would reach plaintext halfway through, the typical solution would take them only 900 million years. For the Germans, this sufficed. [17]

While working with old intercepts, Rejewski and his colleagues made some victories. By adjusting the old Enigma they possessed and working a few old codes, they were able to break a few older messages. These were painstakingly long exercises. Over time the men built up a catalogue of German text. This enabled them to reduce the exercises to a few minutes..[18]

The next portion dealt with the alphabet rings set on the rotors. They were able to narrow down the logical settings from millions to 676 positions. One out of five messages were broken when a particular German code letter grouping initiated the message. Now the cryptoanalysts had three of the four keying elements: rotor order, rotor setting, ring setting, and the plugboard connection.

Using a test run on the other setting, the Poles were able to reconstruct the message. The plugboard connection only affected twelve letters. By figuring out the missing setting, they were able to find the perfect match. The cryptologists took these

---

[17] Ibid, 68
[18] Ibid, 70

settings and were able to read the messages for that day. The horrible, long process had been beaten down from 900 million years to a single day.

This was the first opening to the new system. The process went smoothly for a couple years. From 1933 to 1935, the Poles were decoding most of the German radio broadcasts. Adolf Hitler had signed the Declaration of Nonaggression and Understanding with Poland in 1934. The Poles became more concerned when Hitler ordered a massive increase in the size of the army. This totally violated the Versailles Treaty.

The German military rejected the terms of the Versailles Treaty by 1935. The Germans increased the size of their navy, expanded the service time and number of conscripts into the army and began to conduct operations abroad. The *Reichswehr* had established numerous intelligence offices -- disguised as permissible *Abwehr* counterintelligence -- near the borders with Poland and Czechoslovakia.[19] The German *Reichswehr* had drawn up contingency plans for war with Poland, Czechoslovakia and France. The border areas were being enlarged and reinforced with highly trained troops.

During the mid 1920s German radio intelligence were themselves able to read about six thousand messages between the staffs and regiments of the Polish Air Force. This was a severe blow to the Poles. German intelligence gained accurate information about the locations of most of the Polish units, as well as about the plans of the air force command for the air force's development. Poland's Section II (military intelligence) learned of the lapse through painstaking analytical work: Section II headquarters noticed,

---

[19] Kozaczuk, 2

on the basis of reports from its field offices, that for some time the instructions for

German agents in Poland had carried hardly any assignments concerning air force units,

"whereas the Polish Air Force and air defenses had previously been objects of lively

interest to German intelligence."[20]

A frantic search for possible leaks led to the discovery that German intelligence

had intercepted and deciphered Polish radio reports concerning air force units. The Poles

then decided to dupe the Germans by selling them their own Polish code through

intermediaries. Afterward, the Poles exchanged the all-important information via a

courier. The German intelligence never caught on to this misinformation operation.

With the increased military activities, German radio transmissions rose

immensely. The increase in message traffic allowed easier manipulation of the new

settings. The German intelligence realized some changes were necessary. They reduced

by a third the number of messages sent using a particular order.[21] Another modification

changed the number of connections in the plugboard from a fixed six to a variable five to

eight. The last and hardest obstacle was the change in rotor order. The rotor order had

been changing every three months. Then with the increase in the military, the tempo was

changed to monthly. With the latest innovations, the new tempo was set daily.

The modifications had caused a massive reduction in solutions. The Germans

eventually changed their tempo to every eight hours. This quickly became a problem for

the Poles. They needed a shortcut against this machine.

---

[20] Ibid, 3
[21] Kahn, 72

Rejewski invented a device called the "cyclometer." This was a machine constructed from elements of two Enigmas and based on the principle of the "length of cycles." It was already known that the rotors had a maximum of 105,456 positions and the cyclometer allowed their arrangement to be rapidly calculated.[22] This new invention enabled the Poles to narrow down the sequence and position of the rotors within a few minutes.

Until 1938, the Polish Cipher Bureau was successful against most German military codes. The only code that consistently gave them difficulty was naval signals. This was due to the fact that the German Navy used five rotors in their machines. This was more work than the *Wehrmacht* and *Luftwaffe* enigma machines which only used three rotors.

The Poles had already made efforts to acquire the new German code machines. British intelligence also made inquiries into the new German code system. The Poles, however, were on the forefront of the effort to acquire German coding machines.

The Poles convinced the British that they could steal a new version from a factory. The opportunity came in 1938, when a young Polish mechanic began working at a factory in Eastern Germany. This factory was making what the young man rightly judged to be some sort of secret signaling machine. As a Pole, he was not very fond of the Germans anyway. An intelligent observer and patriot, he took careful note of the various parts that he and his fellow workmen were making. The Gestapo made regular checks into the employees of all high security factories. At some point they discovered his

---

[22] Jozef Garlinski, *The Enigma War.* (New York; Charles Scribner's Sons, 1979) 40

nationality. He was removed and sent back to Poland. His keen observation had done him some good, and he got in touch with British Intelligence in Warsaw.[23]

Security on this project was kept at a premium. The Poles and the British decided that only the departmental heads were to be kept in the picture.[24] The young Pole was smuggled out of Warsaw and sent to Paris. With the aid of the *Deuxieme Bureau* (French Intelligence), he was given a shop and asked to replicate the machine. With the help of a carpenter, he was able to reconstruct the cipher.

There had been a number of ciphers made over the years. It did not take long to identify the mock-up as some sort of improved mechanical cipher machine called Enigma.[25] The name Enigma had been given to the machine by its German manufacturers. The Pole had been told not to make his model to scale. They figured he could detail some of features more easily this way. In fact, the bigger the better, because he could then more easily incorporate any details he could remember.[26]

While the Pole was working in Paris, the British Secret Intelligence Service (S.I.S.) and the Polish Secret Service made plans to steal an actual Enigma machine. There were still Poles working at the factory under German names. The Poles thought the job could be done more easily if they were given money and allowed to make the contact. "They knew the terrain and the people much better than we (British) did, so we (British) gladly agreed."[27]

---

[23] Winterbotham, 10
[24] Ibid, 10
[25] Ibid, 10
[26] Ibid, 10
[27] Ibid, 11

British history books (for example, *The Ultra Secret*) on this subject enjoy sidestepping the fact that the Poles acquired the machine and passed on the initial deciphers to the British. The British, though, did play an important role if not the only role. The British set to work on one of the first computers. This device would help break down the possible permutations. The Poles used partition boards which they would punch out to help narrow down the possible codes. The British invented a device called the "Bronze Goddes." With this device saving thousands of man-hours, they were able to read German Enigma ciphers more quickly.[28]

The Poles watched intently as Hitler began his moves in Eastern Europe. In 1938, Hitler forced his rule over Austria through a threat of invasion. Hitler won out over the Austrian Prime Minister Schuschnigg. Hitler made a speech from his birthplace of Braunau, Austria. Hermann Goring heard this speech over the radio and sent a message to Hitler. The Poles intercepted Goring message, "If the enthusiasm is so great, why don't we go the whole hog?"[29]

The Poles followed this process through radio intercepts. Hitler swallowed Austria without a shot being fired. This was but the first step in his planned campaign of aggression. Hitler had also avowed to conquer the breadbasket of Ukraine and Eastern Europe. This would allow his people (Germans) to expand and have *Lebensraum* (Living space). Hitler announced this theory in his book, *Mein Kampf*.

Part of Hitler's plan was to recapture the lost lands given to Poland and France.

---

[28] http://gl.umbc.edu/~lmazial/Enigma/enigma.html

[29] Michael Veranov, *The Mammoth Book of the Third Reich at War.* (New York; Carroll & Graf Publishers, 1995) 73

He hoped to seek his revenge for the guilt and loss of the First World War. Hitler

imagined conquering the French, Polish and Russians. He just needed to keep the British

on his side, or at least neutral. Britain's prime minister Neville Chamberlain and the

French premier Edouard Daladier met with Hitler in Munich in 1938 to solve the situation

of the Sudetenland. Hitler demanded that the Sudetenland of Czechoslovakia be

transferred to Germany. This area had German inhabitants. Not to mention, this is

where the Czechs had built their frontier fortifications against a possible invasion. Just

beyond this mountainous region was the industrial heartland of Czechoslovakia

Hitler demanded and received the Sudetenland from Czechoslovakia. Chamberlain

and Daladier did not know what a mistake they had made. An impassioned Winston

Churchill pronounced "Munich a disaster of the first magnitude and predicted that it was

only the beginning of the reckoning."[30] In France, Daladier himself "referred privately to

Munich as the terrible day." When his plane descended for a landing at Paris, he saw the

crowds below and thought at first they were there to attack him. When he realized that

he was wrong, Daladier snapped, "Idiots! They do not know what they are

applauding."[31]

Edward Benes was the President of Czechoslovakia before Hitler made his moves

into the Sudetenland and Czechoslovakia proper. Benes fled to exile in France and then

England after the war started. His prime minister, Jan Syrovy, on seeing the document

(Munich Agreement) later, said that "his country had the choice between being murdered

---

[30] Veranov, 83
[31] Ibid, 83

and committing suicide."[32]

Hitler felt that when the Western powers had granted his demands at Munich, they had boxed him in, limiting his success to his basic demands. He had wanted a war over Czechoslovakia, and now he was determined to have one over Poland.[33]

The Polish cryptologists watched in horror as the Czechs were demolished and absorbed by Hitler's army. The Poles did not yet have access to the new enigma codes. Prior to the Munich settlement, the German command changed the codes to ensure security. Rejewski seemed to uncover one impossible trick after another. Then Rejewski was asked to perform another breakthrough.

The Germans had made many structural and daily code changes to their enigma. These new changes could not be understood. This standstill halted all work in September 1938. All transmits were incomprehensible. The Poles figured it had to do with the Munich Conference. The cryptologists put their minds together to figure out the new changes.

The changes were eventually recognized. This new pattern ruined all the previous methods of unraveling the order of the rotors and the plugs, since they had been based on cycles, which were no longer viable, as the Germans had changed their normal routine of using the same cipher through an entire day. They now transmitted several broadcasts on the same day on different Enigma settings.[34]

Rejewski took this as a personal challenge. He set about to design a *Bombe*, which

---

[32] Ibid, 82
[33] Ibid, 88
[34] Garlinski, 42

was six Enigmas, connected together. They would run potential setting(s) until one matched. The principle was that the rotors of these six machines revolved, powered by electricity, and in two hours tested every possible position.

Speed was essential, so they designed six *Bombes,* one for each rotor position. This was the first primitive computer, without electronics or memory.[35] With this process, by November 1938, the *Bombes* were ready and breaking German signals. One month later, the Germans devised a new innovation, which left the Poles in confusion.

The year was 1939; the Polish government had fears of a German invasion. The Poles had already carried out a partial mobilization. Her army of 1.75 million with an additional half million reserves was impressive. The Poles realized a war was on the horizon and began to prepare. The Polish morale was high at first. With support from France and Britain, the Poles figured that the Germans would not dare invade.

The Enigma had evolved through three models, I, II and III. Then the Enigma had undergone two more changes with new models, IV and V. The cryptologists were only able to follow the older models. Not all codes were using the new models exclusively, but enough were so that enough intelligence was readable. Decipherment was extremely slow at this time. The lack of resources forced the Poles to let the French and British know of their discoveries.

The Polish cryptologists hosted a conference for the British and the French in July 1939. The Poles had built a secret camp in the outskirts of Warsaw at Pyry. The

---

[35]Ibid, 42

French and British were amazed by the advancements made by the Poles.

The French had given the Poles copies of diagrams and instructions ten years earlier that had proven invaluable to the research. The British wanted to call in their experts and examine every detail. The French and British were obviously much further behind in the cryptology department. The Poles now admitted their inadequate resources and impeding war with Germany.

The Poles decided to turn everything over to the British and French. At this same time the Germans were constantly upgrading their systems. The Germans had just improved all their engimas from three drums to five. This made decipherment last ten times longer. Both delegations, the British and French, would receive a copy of an Enigma, built in Poland, together with drawings and plans of the Bombes and perforated sheets. This gift would be Poland's first contribution to the common victory.[36]

David Kahn, in *Seizing the Enigma* says, "In the end, what France and Britain lacked -- and not only in cryptology -- were vision and will. Poland had both. It was the great merit of Pokorny and Ciezki to have seen, before their counterparts in Europe are other cipher bureaus, the value of cryptoanalysts with a strong mathematics background."[37]

During World War II decoding the enigma made a major difference. During Operation Torch (Landing in North Africa), the Germans sent numerous messages outlining their demands and troop positions. These messages were deiciphered and

---

[36] Garlinski, 53
[37] Kahn, 67

enabled the Americans and British to move quickly and safely to take advantage of the information.[38]

Rommel sent Hitler his intention to make a stand at Buerat in North Africa. British General Montgomery knew this and it prompted him to move his armored tank divisions. Montgomery was chasing Rommel from Egypt to Tunisia. Montgomery decided to move his tanks around Buerat and attack from the west because of the decoded intelligence.

In Sicily, German General Kesselring informed Berlin of his troop dispositions on the island. Kesselring decided to keep his three divisions in the middle of the island to counter any invasion. This let the Allies know that any landings would be met by light resistance.

In mainland Italy, the Allies knew where each of the defensive lines were laid out. Kesselring constantly sent reports outlining his defensive intentions. The Allies also read the Germans discussing their evaluations of the next allied attack. With this information, the Allies could move to where the Germans were weak or least suspecting.

There are many other examples of how breaking the enigma machine assisted the Allies in the war. One of the major coups related to the D-Day invasion. Rommel and Hitler believed that the invasion would come at Normandy. General von Rundstedt firmly believed it would occur at the Pas de Calais. The debate was over where the four reserve Panzer tank divisions should deploy. Rommel wanted them near Normandy. General von Rundstedt wanted them further inland to help ward off an attack in any

---

[38] Kozaczuk, 172

direction. Hitler decided to keep the divisions inland and send them wherever they were needed. This knowledge helped the Allies in their planning.

One of the most critical items deciphered during the Second World War was the inventory of formations. German generals sent word of strengths and losses of each unit. This allowed the allies to see the whole battlefield. This concept went back over two thousand years. "If you know the enemy and know yourself, you need not fear the result of a hundred battles."[39] If the allies did not have the knowledge that the enigma gave them, perhaps they might not have won the war.

The secrets surrounding the enigma and its keepers lasted for nearly thirty years. The two greatest factors of the war were the atomic bomb and the breaking of the German enigma. For the enigma to remain secret for the remainder of the war much less thirty years is a testament to the people who used and valued this treasure.

In the end, the Poles and their cryptologists deserve a great deal of credit and praise. The war could not be decided by one country. This is where the industrial might of the United States mixed with British tenacity and some Polish math majors made the difference. Without the sophisticated technology of the West they nonetheless decoded the German enigma. What they did have was common sense and some very bright people.

---

[39] Clavell, 2

CHAPTER THREE

POINT LUCK

How Intelligence made the difference at Midway

Midway was essentially a victory of intelligence.

Admiral Chester Nimitz, Commander in Chief, U.S. Pacific

The following section will deal with the impact of intelligence at the decisive

American victory at the Battle of Midway during World War II. This strategic victory

would not have been possible if not for the work of the American cryptologists stationed

at Pearl Harbor and Washington D.C. As always, the work of these cryptologists would

be for naught without the fighting ability of the American pilots, sailors, and soldiers.

The first part of this section will focus on the background and events leading up to

Midway. The latter portion will detail the cryptological efforts and successes made

against several Japanese codes before and during the war.

An ambitious naval commander brought his fleet of ships just north of Hawaii for

a special operation, bent on surprising the forces arrayed in Pearl Harbor. The attack was

launched from his carrier decks. The flights of dive bombers and torpedo planes achieved

a complete surprise on battleship row in Pearl Harbor. This attack occured in 1932.

The officer who led that exercise was Captain Ernest J. King, U.S. Navy, [the future Commander in Chief, U.S. Fleet (COMINCH) and Chief of Naval Operations (CNO)]. While commanding the aircraft carrier *Lexington,* Captain King succesfully proved that such a raid on Hawaii was possible. Captain King and his fleet had provided the basic mock-up for the eventual Japanese raid nine years later. [1]

This idea was not new. In 1925, Hector Bywater, a British journalist, had written about an attack on the naval base. Two years later, Kusaka Ryunosuke, a lieutenant in the Imperial Japanese Navy and staff college instructor in aviation, drew up a plan for an air attack on Hawaii. [2] The importance of Hawaii and Pearl Harbor as a base "increased exponentially when the administration decided to make Pearl rather than the West Coast the principal base of the U.S. Fleet in May 1940." [3]

Hawaii and Midway would prove to be vital to the American offensive in World War II. The coral atoll of Midway would prove to be the decisive location that changed the tide of the war in the Pacific. Key intelligence and the gallant forces quickly arranged by Admiral Chester A. Nimitz would make the difference. By mid 1942, Japan had not encountered any opposition in their initial campaign to expand the Greater East Asia Co-Prosperity Sphere. Victories in the Phillipines, Guam, Indochina, Dutch East Indies, Singapore, Wake Island and Malaya allowed the Japanese to succeed in their first goal.

---

[1] Dan Van der Vat, The Pacific Campaign - The U.S.-Japanese Naval War 1941-1945. (New York, Carroll & Graf, 1991.) 67
[2] Ibid, 67
[3] Ibid, 67

That first goal included establishing a defensive perimeter and obtaining the vital oil fields in Indochina and Dutch East Indies.

Japan's next goal involved extending the perimeter to include New Guinea, Midway, and the Aleutian Islands. This would allow Japan to strengthen their position and hopefully force the United States to sue for peace. Japan never intended to defeat the United States in a war of attrition. Japan respected America's immense industrial capacity.

The Japanese leaders hoped for a quick and decisive victory that would give them a temporary position of power from which to negotiate. The United States could not have been more enraged or moved as quickly to war without Pearl Harbor. America had been in an isolationist mindset, although President Franklin Roosevelt had stated that he wanted "all aid short of war" to go to Great Britain. [4]

Japan had hoped to catch the few American aircraft carriers in Pearl Harbor on December 7, 1941. That did not occur. In addition to extending their defensive perimeter, an additional goal of Japan was to draw out the American carriers for a major decisive fleet engagement. This would culminate in the Battle of Midway.

Background

Hawaii provided the United States to project its power away from the continent with its natural harbor and anchorage were ideal for stationing a fleet. It has a narrow

---

[4] Ibid, 79

channel from which to enter. This channel was easily monitored and controlled. The

islands provided space for airfields and training.

During the late nineteenth century, the United States began to expand and develop

a navy. A new social atmosphere caused changes within the military. Professional

military boards were developed. The government began to support military education

programs such as the Naval War College in 1884.

According to Fareed Zakaria in From Wealth to Power,"the navy in particular

flourished in the 1890s." Zakaria mentions that thanks to several reform-minded

secretaries of the navy and bipartisan support for naval expansion, "the navy had

professionalized itself." The United States had built a vast fleet and acquired a large

budget; it was generally regarded with respect around the world. [5]

In 1898, the Spanish-American War brought the U.S. Navy to the Pacific.

Admiral Dewey shocked the world by routing the Spanish fleet in Manila Bay. With the

conquest of the Philippines and Guam, a permanent naval presence was required in the

Pacific. Hawaii, also officially annexed in 1898, would become the ideal base for U.S.

forces. President Theodore Roosevelt, former Assistant Secretary of the Navy, made a

show of force to the world in 1907 by ordering the "Great White Fleet" on a tour of the

world. Thus, the American Navy became a player on the world scene.

The U.S. Navy did not play a large role in World War I. The lack of battle

experience would carry into the opening stages of World War II. The interwar period was

---

[5] Fareed Zakaria, From Wealth to Power. (Princeton, Princeton University Press, 1998) 125-126

marked by the Washington Naval Conference which limited the sizes of the world's fleets. The worldwide depression also affected the military. Training and infrastructure began to diminish. Only in the late 1930s did the United States begin an effort to modernize and energize the military.

A potential conflict was brewing with the Japanese since their invasion of Manchuria in 1931. Already, limited trade embargoes had already been initiated. In 1939, the war in Europe began. Hitler steam-rolled over Poland and then France. French Indochina appeared to be vulnerable. Japan began to make moves to secure this opportunity. The United States hoped to protect the French and Dutch assets in the area by threatening and finally installing a full oil embargo. Japan was completely dependent on imported oil for its economy. Japan thought they were being backed into a corner with no other choice then to fight. In two of their previous wars (Sino-Japanese 1894, Russo-Japanese 1904) the Japanese made surprise attacks to open hostilities with no warning. This would prove to be a habitual method of action.

In 1904, the Japanese launched a surprise attack on the Russian Navy and land forces at Port Arthur (present day Korea). During the attack, the Japanese Navy destroyed the Russian Pacific Fleet. Russia decided to deploy the rest of its fleet which was stationed in the Baltic Sea to Japan.. This fleet had to traverse almost half the way around the globe.

Upon reaching the Straits of Tsushima, Admiral Heihachiro Togo made the

famous statement, "The enemy has been sighted; the Combined Fleet is moving to

annihilate him."[6] The Japanese Navy then completely obliterated the Russian Baltic

Fleet in just a few hours. This sea engagment was so decisive that it rates among the fifty

battles that changed the world according to The Guinness Book of Decisive Battles. [7]

The battle of Tsushima was a shattering blow to Russia and proved to her that the

war was over. Japan won more than a war; it created a legend that was to haunt Japan's

leaders for forty years. "A British admiral once said,'It takes three years to build a ship,

but 300 years to build a tradition.'" [8]

Japan thought this victory had validated the Japanese Navy as a major power.

Japan thought that Admiral Togo was their Admiral Nelson (British hero at Battle of

Trafalgar). The Japanese owed much of their development as a world power to their

navy; a navy that, for example, looked to Great Britain for naval instruction and advice on

warship design. Admiral Togo had even attended the Royal Naval College in 1871.

Japan had designs for their new navy which had drawn up plans for future naval

engagements. The only other major naval power within their sphere was the United

States. The Japanese had prepared war scenarios against the United States even before

World War I.

Following World War I and the Washington Naval Conference, Japan felt slighted

when they were forced to accept a ratio of 5:5:3 for battleship development. This ratio

---

[6] Masanori Ito, The End of the Imperial Japanese Navy. (Westport, CT, Greenwood Press, 1956) 12
[7] Geoffrey Regan, The Guinness Book of Decisive Battles. (New York, Canopy Books, 1992) 178
[8] Ibid, 178

applied to the United States, Great Britain and Japan. Fleet Admiral Tomosaburo Kato

helped write the Washington Treaty of 1922. His stature and abilities helped Japan "rise

in international prestige." [9] His untimely death allowed elements which objected to the

treaty to become more vocal.

In 1930, the London Disarmament Conference was held to renew the Washington

Treaty. Significant supporters of Admiral Kato were still in power to help retain the

current ratio. By 1932, the opponents of treaties came to power and dominated the Navy

"at the policy-making level." [10] The next conference in London in 1935 led to a

renunciation of the treaty.

A new program of vast battleships were also undertaken. The keels of these ships

were actually planned two years earlier. Clear signs of a growing conflict were developing

in Japan. Admiral Yamamoto was a firm believer of Admiral Kato's ideas. It was

Yamamoto's firm opinion that "Japan should never be so foolish as to make enemies of

Great Britain and the United States." [11]

Japan gradually fell under the control of the Army. The Navy had rejected a

strong Japan-Germany alliance. The Army forced their own man into the office of

Minister of War. This faction was violently pro-German and anti-American. Admiral

Yamamoto was promoted to Commander in Chief Combined Fleet. This is the highest

office in the Imperial Japanese Navy. This new office forced Admiral Yamamoto to sea.

This also saved his life. The opposing factions in power did not like Yamamoto. Admiral

---

[9] Ito, 13-14
[10] Ibid, 14
[11] Ibid, 16

Yamamoto "would have been assassinated if he had stayed in Tokyo, and that would have been a great loss to our country." [12]

War with the United States appeared to be inevitable. Admiral Yamamoto stated if war was inevitable than a surprise attack upon American forces at Pearl Harbor was essential. If Japan waited for the American fleet to move to the Western Pacific, then they risked giving up the initiative to the Americans. If Japan could knock out the entire fleet in Hawaii, then they could secure any other possessions without fear of attack. The Western Pacific would become a Japanese lake.

Japanese Conquests

From December 1941 to late May of 1942, Japan steam-rolled over all opposition. The only speed bump was Wake Island. The initial Japanese invasion force of three old light cruisers and six destroyers, plus 450 Special Naval Landing troops was beaten off by a small number of Marines and their coastal guns. "Their gross overestimation of what was needed to subdue Guam was now offset by serious underestimation of what was required to take Wake." [13]

The previous Guam operation had called for a heavy cruiser supporting an invasion force of over five thousand men. The garrison of 365 Marines fought for only twenty five minutes until the commander, Captain G.J. McMillin, USN, ordered the Stars

---

[12] Ibid, 18
[13] Vat, 27-28

and Stripes hauled down. [14] The Japanese calculated the same result for Wake Island. Wake did not cooperate with the Japanese plans.

Wake Island, actually an atoll of three islands around a lagoon, lies about six hundred miles north of the Marshall Islands. The Marshall Islands were mandated to the Japanese following World War I. Wake, roughly halfway between Guam and Hawaii, had possessed an airfield by late 1941. In fact, the aircraft carrier *Enterprise* had delivered a Marine Corps squadron of Grumman "Wildcats" on December 4, 1941.

Japanese forces from the Marshalls raided the island for three days preceding the initial invasion. The American coastal batteries hit the Japanese flagship, a light cruiser and drove her off, sank a destroyer and hit three other ships in quick succession. Marine Corps fighters also damaged a cruiser and sank the destroyer *Kisaragi*. [15]

This is where the first military and political mistakes of the new war were made. America needed a victory and a hero. Wake could have provided that to a stunned nation. Admiral Husband E. Kimmel and Lt. General Walter C. Short commanded the naval and army forces at Pearl Harbor on December 7, 1941. The lack of intelligence information from Washington as well as the need for scapegoats doomed their careers. Kimmel and Short were relieved of command a week after the Pearl Harbor debacle. Kimmel had posted orders sending all available forces including his aircraft carriers to Wake Island to resupply and save the garrison.

---

[14] Ibid, 27
[15] Ibid, 28

President Franklin Roosevelt ordered Admiral King to the post of Commander in Chief, U.S. Fleet (COMINCH) following Pearl Harbor. Roosevelt also picked a quiet submariner by the name of Chester Nimitz to the post of Commander in Chief, Pacific Fleet (CINCPAC). With Admirals King and Nimitz in Washington and Admiral Kimmel relieved, the interim job of commanding U.S. forces in the Pacific fell to acting CINCPAC, Vice Admiral William S. Pye. Admiral Pye was given permission by Washington to relieve Wake at his discretion.

Wake now hung in the balance. A fleet of American carriers and troops were en route to the island. Admiral Pye did not want to risk any more American losses and ordered the fleet home. "His order to pull back was received with incredulity and rage bordering on mutiny in the *Saratoga* (aircraft carrier) group." [16]

Admiral Pye's supporters stated that since naval intelligence knew that the Japanese had at least two carriers, two battleships, and two heavy cruisers within range of Wake. Pye's order to call off the *Saratoga* group was reasonable. Had Wake become a full fledged battle, the Japanese could have had six carriers at their disposal, not to mention two battleships. The Americans could have scrambled three carriers but no battleships.

This fiasco did not get out into the general public at the time. Washington and Admiral Pye dropped the ball at Wake. Wake would prove to be a costly defeat in terms of public relations, manpower, and geography. In the future battle of Midway, Wake

---

[16] Ibid, 29

would support the Japanese naval forces with land-based reconnaisance planes and bombers. The problem with Wake was the potential for an early victory was abandoned due to fear of a fleet engagement with the Japanese. Maybe Admiral Pye made the smart move. The next time the U.S. Navy and Marine Corps make a move on Wake will be costly.

American Cryptology Evolution

As mentioned earlier, the Washington Naval Conference established new guidelines for Naval ships following the First World War. The Japanese dramatically advanced their navy (patterned after the British Navy) over the previous fifty years. The Japanese also joined the First World War on the side of the allies. Japanese forces defeated and secured German islands in the Pacific. These actions, along with a modern navy, gave the Japanese reason for expecting an equal footing.

The United States had a secret weapon at these Washington Naval Conference talks. Herbert Yardley, a cryptologist who had served in World War I, pushed for a continuation of the wartime cryptographic bureau. This unit was set up by the War Department as MI-8. MI-8 stood for Military Intelligence, Section Eight. This group of cryptologists began working on foreign encrypted communications. Many U.S. commercial telegraph companies volunteered to copy transmissions made through their lines. Yardley and his small group of part-time staff members were able to solve the Japanese diplomatic codetexts. This task was made even more difficult because of ideographic writing within the Japanese language. Staff members had to study and learn the Japanese language fluently.

In 1921, Yardley's staff determined that the Japanese were using an alphabet called "*kata kana*", which reportedly used some 70 syllables that had been given roman letter equivalents. [17] By using frequency counts and manipulating combinations, the group was able to link a series of two letter codewords and their equivalents. This work paid off in the fall of 1921.

The Washington Naval Conference would determine the ratios of numbers of ships and tonnage weight of ships. "Originally they (Japanese) had sought a ship ratio of ten to seven." This meant that the Japanese would be able to build seven capital vessels, weighing more than 10,000 tons with guns of 8 inches or more, to every ten built by America and England. [18]

The Japanese delegation would receive their orders from Tokyo. The United States was able to read these terms. Thus, the American delegation was able to negotiate from a position of power. This forced the Japanese to accept a ratio of ten to six. These numbers were significant because, in addition to their military capability, capital ships were symbols of national prestige.

The closing agreement, called the Five-Power Treaty, included Japan, England, America, France and Italy. Thanks to Yardley's group, this conference ended up as an important diplomatic coup for America. Years later, Yardley's group was dissolved by the Hoover administration because of their unethical practices. Yardley published a book outlining his practices over the previous decade. This book caused outrage overseas.

---

[17] Fred Wrixon. Codes, Ciphers & other cryptic & Clandestine Communication. (New York, Black Dog & Leventhal Publishing, 1998) 625
[18] Ibid, 77

Several countries changed their diplomatic codes at once. The Japanese, among those who changed practices, saw this as a serious "breach of honor." [19]

The Japanese learned from this episode that their codes could be compromised. Their future operations at the outset of World War II in the Pacific held strict radio silence. There were signs of the impending war with Japan. Many factors led to the lack of intelligence at Pearl Harbor on December 7, 1941.

I can raise havoc with them for one year, but after that I can give no guarantee.

People who don't gamble aren't worth talking to.

Admiral Isoroku Yamamoto, Imperial Japanese Navy

Ultimately, war is a political act. The growing number of militarists in the Japanese government and military could not have begun a war on their own. They would need the permission of Emperor Hirohito and Prime Minister Prince Fumimaro Konoye. The Emperor understood the immense challenge of a war with America. During a cabinet conference in September 1941, the Emperor "reminded his ministers of the awesome consequences of what they were deciding." [20]

Emperor Hirohito and Prime Minister Konoye were being pressed into war by a faction including the Minister of War General Hideki Tojo and Foreign Minister Yosuke Matsuoka. Prime Minister Konoye still wanted to work towards an agreement with the

---

[19] Ibid, 81
[20] John Keegan, The Second World War. (New York, Penguin Books, 1989) 248

Americans. Foreign Minister Matsuoka kept pressing for war, especially with the Soviet

Union. Prime Minister Konoye could not fire Foreign Minister Matsuoka because of his

supporters.

> The Army and Navy were convinced that Matsuoka had become
> *persona non grata* in the United States, and that his presence in the
> Cabinet jeopardized the negotiations. They apparently believed
> that if they could just get rid of the Foreign Minister, the United
> States would be more willing to cooperate. However, Prime
> Minister Konoye did not feel that he could simply fire Matsuoka -
> -partly because he feared that Matsuoka's admirers would charge
> that the Japanese Government had bowed to American pressure,
> and partly because he had brought Matsuoka into the Government
> despite the reservations that the Emperor had expressed at the
> time. Therefore, Konoye, after consulting with the War, Navy, and
> Home Ministers, as well as the Director of the Planning Board,
> asked for the resignation of the Cabinet on July 16 (1941) [21]

Two days later, Prime Minister invited the same people who had previously

served in the cabinet to join him, except for Matsuoka. This was the Third Konoye

Cabinet. The new Foreign Minister, Admiral Toyoda Teijiro, was thought to be trusted

by the United States.

The internal struggle over war with America did not stop with Matsuoka. The

cabinet still had War Minister Tojo and Navy Chief of Staff Nagano who pressed for

action before the United States had a chance to build up its defenses. Navy Chief of Staff

Nagano stated at the 40th Liaison Conference on July 21, 1941,

> As for war with the United States, although there is now a chance
> of achieving victory, the chances will diminish as time goes on. By
> the latter half of next year it will already be difficult for us to cope
> with the United States; after that the situation will become

---

[21] Nobutaka Ike, Japan's Decision for War. (Stanford, Stanford University Press, 1993) 104

increasingly worse...If we could settle things without war, there would be nothing better. [22]

The Japanese Government agreed to make demands on the French Vichy Government to allow Japanese troops to occupy southern Indochina. Force was threatened if the Vichy Government did not acquiesce. Prime Minister Konoye repeatedly attempted to convince War Minister Tojo that war was not necessary. "Since he was unwilling to lead the nation into war, Konoye resigned." His hopes for peace were gone. [23]

War Minister Tojo formed a new government. Tojo became Prime Minister and still retained his previous role as War Minister. Attempts were made toward an agreement with America, but the military was "in high gear" towards preparing for war. [24] Japan at this time tried to assess its ability to go to war. Japan's steel production was one-thirteenth that of the United States. Japan had imported sixty percent of their oil from the United States in 1940. [25] Prime Minister Tojo and his government resolved on December 1, 1941, since the United States would not accept Japan's "just demands" for East Asia, the imperial conference formally resolved to go to war one week later. [26]

Japan was definitely on a war footing and now prepared for the initial battles. Admiral Yamamoto, long time advocate of peace, submitted a plan for a surprise attack at Pearl Harbor. Meanwhile, the Japanese Army would race down to the Phillipines, Dutch

---

[22] Ibid, 106
[23] Ike, 184
[24] Ibid, 187
[25] Ibid, 187-188
[26] Vat, 108

East Indies, Singapore, Burma, Wake and Guam. Thus the first phase of the defensive

barrier from which Japan would protect themselves would be complete. The oil reserves

of the Dutch East Indies would solve the oil supply problems and vast ocean expanses

would inihibit foreigners from establishing a foothold to get at the Imperial homeland.

The United States Government followed this whole episode through the use of

cryptologists. America was not always privy to foreign correspondence. This

convenient operation was the result of many years of training and research.

The United States intelligence capabilities evolved significantly after the First

World War. The U.S. Department of State used basic, child-like codes during that war. "

The United States must have been the laughingstock of every cryptanalyst in the world."

[27] The United States used a version of a code that had been "demolished a half century

before." [28]

European nations and even Mexico were able to read or steal American codebooks

from embassies and consulates. There were rumors that even the British were reading

American codes during the war. A rumor of the time talked about the Germans sending

messages to Washington "taunting us (Americans) about our childish ciphers, and

suggesting changes." [29] Another rumor talked about six missing codebooks and a seventh

[27] David Kahn, The Codebreakers. (New York, Macmillan, 1968) 489
[28] Ibid, 489
[29] Ibid, 491

which was returned, wrapped with a courteous note, from the Japanese who already had one. [30]

The United States had more success breaking foreign codes than enciphering their own. World War I proved to be a learning experience for American cryptologists. Herbert Yardley (mentioned before) and William Friedman would prove to be the fathers of American cryptography. Yardley grew up in humble surroundings. He eventually worked his way from railroad telegrapher to a code clerk for the State Department. While at State, Yardley "amused himself by solving some State Department codes and thereby enhanced his reputation as an expert." [31]

During World War I, Yardley obtained a captain's commission and direction of MI-8, the new cryptologic section of U.S. military intelligence. Yardley's energy and innovations helped create new Army codes, break international encryptions, and develop invisible inks. His work greatly advanced the knowledge and experience of Army and State Department codes. Following the war, Yardley pushed for a full time State Department Cryptologic Team. Yardley and his group were eventually shut down due to isolationist attitudes and funding cuts. He eventually published a book, *The American Black Chamber*, about his work with the government. This book set off a firestorm around the world. Japan immediately changed their codes as did many other countries. He stated that his book was intended as a warning to the United States to strengthen its own

---

[30] Ibid, 491
[31] Wrixon, 625

encryptions. [32]

William Friedman began his career in the Army training officers about cryptology. He published numerous papers and articles dealing with cryptology. After the war, Friedman and his wife, who also worked with codes, accepted jobs with the War Department. His team, though underfunded during the interwar period, was able to decipher the Japanese diplomatic machine. This machine was dubbed "Purple" and the information obtained became known as "Magic." [33]

Friedman remained with the Signal Intelligence Service (SIS) as their director throughout the war. Following the war, Friedman continued work as a consultant with Army intelligence and the newly created National Security Agency (NSA). These two men were able to enlighten not only the American government to the need of secure communications, but also the general public.

Through Yardley, Friedman, and other cryptographic teams, the United States was able to read many Japanese codes prior to World War II. As mentioned previously, the Japanese diplomatic code had been broken by Friedman's team years before. This enabled the Americans to read the messages being sent to the delegations in Washington D.C. In fact, there were several instances where the American delegation was able to read the messages from the Japanese Foreign Minister before even the Japanese Ambassador in Washington.

---

[32] Ibid, 625-626
[33] Ibid, 599-600

Through their access of the Japanese diplomatic ciphers, the United States were aware as early as November 7, 1941 that "November 25 marked a key date in the progress of their negotiations with Toyko." [34] Even though American cryptanalysts had broken the Japanese codes, they had not determined the preliminary military moves ordered by Tojo and his cabinet. This was due to "stringent radio silence imposed by Japanese headquarters on the movements of the Combined Fleet and the Twenty-Fifth Army in southern Indo-China." [35]

November 25, 1941, remained a date that concerned Secretary of State Hull and American cryptanalysts. The day passed without a declaration of war. On the following day Secretary of State Hull presented a blunt statement to the Japanese Ambassador. This statement included provisions for the Japanese to withdraw their troops from Indo-China and China. The statement also included the acceptance of Chiang Kai-shek's government and the abandonment of the Tripartite Pact. [36]

This statement infuriated the Japanese government. If accepted, this would be a humiliating diplomatic surrender by the Japanese. The Japanese army and navy agreed immediately that this note was unacceptable. Tojo issued orders to his soldiers and ships to proceed to their attack stations. "It revealed (Hull's note), as he (Tojo) and his followers had long argued, that the United States did not regard the Japanese empire as its equal in the community of nations..." [37]

---

[34] Keegan, 249
[35] Keegan, 249
[36] Ibid, 250
[37] Ibid, 250

On December 6, 1941, the United States, through the "Magic" machine, was able to read a thirteen part manuscript sent from Tokyo to the Japanese Embassy in Washington D.C. This text was designed to prolong talks and give time for the Japanese military to prepare their attacks. The crucial fourteenth part was sent on December 7, 1941. "This means war," said Roosevelt when he scanned the Magic intercept. [38]

When the Ambassador arrived to deliver the fourteenth part, the raid on Pearl Harbor had already begun. The embassy's cipher clerks delayed transmission to the Ambassador because of hangovers from the previous night. [39] When the Ambassador finally delivered the message, Secretary of State Cordell Hull "orally blasted the Japanese Ambassador out of the building." [40]

Diplomatic codes do not mention the movement of ships and troops. They do not reveal the intentions of the government towards war. A key element to the surprise of Pearl Harbor was the fact that the Japanese delegation in Washington D.C. did not know any details regarding the attack. Also, the Japanese fleet maintained a strict code of radio silence during their voyage across the Pacific. There were absolutely no messages transmitted stating that a war would begin on December 7, 1941.

Many scholars and Congressman questioned the ability of the American intelligence services prior to Pearl Harbor. After many hearings, the only tangible intelligence item that could be found did not announce war. Warnings had been sent to

---

[38] Vat, 109
[39] Vat, 109
[40] Ibid, 109

Hawaii as early as the previous summer. In fact, a feeling of laxness had set in from the months of alertness.

After reading the latest Japanese message through "Magic"(American name for deciphering Japanese diplomatic codes) General George C. Marshall, U.S. Army Chief of Staff, tried to send a flash warning to all posts on the morning of December 7, 1941. His message carried through to all posts except Pearl Harbor. An atmospheric condition prevented the message from connecting. An alert communications clerk decided to use a commercial line. The clerk sent an attack warning to Pearl Harbor through *Western Union*. The message was received in Hawaii almost immediately. The messenger had to drive it to the naval base. While enroute, the Japanese dive bombers were lining up on Battleship Row.

Some have exclaimed that Pearl Harbor was a blessing in disguise. Admiral Chester Nimitz said, "It was God's mercy that our fleet was in Pearl Harbor on December 7, 1941." [41] The United States Navy was no match for the Imperial Japanese Navy at the beginning of the war. Japan had superior ships, fighters and experience.

If the American fleet had sortied and met the Japanese, the few American carriers could have begun the war at the bottom of the Pacific. Most of the battleships that were sunk at Pearl Harbor, were able to be raised and used again during the war. If they were sunk at sea, they would not return to battle.

---

[41] Gordon Prange, Miracle at Midway. (New York, Penguin Books, 1982) 9

The loss of life was horrible at Pearl. It could have been worse, if the Americans used the foreknowledge through "Magic." Pearl Harbor was a devastating defeat, but it could have been worse. First, most of the battleships, except *Arizona*, were able to be recovered and used in battle. Second, the three American aircraft carriers were not in port that morning. Third, the Japanese did not attack the naval dockyards, submarine base and oil storage facilities at Pearl Harbor.

As the first wave of Japanese pilots landed back at the carriers, they demanded that another wave be sent to demolish the remanants of the harbor. This could have been a crucial blow. "Had the Japanese destroyed the oil supply, it would have prolonged the war another two years." [42]

Pearl Harbor brought America into World War II. Winston Churchill had his greatest wishes come true. "Churchill's joy turned to anxiety when the declaration of war proved to be limited to Japan. What price "Germany first" now --would Washington go back on the agreed Anglo-American policy of treating Hitler as enemy number one, to be defeated first?" [43]

Hitler took care of any doubt when Germany declared war on America on December 11, 1941. No significant reason could be found to support this except for an opportunity for Admiral Dönitz's submarines to move west and attack within the previously neutral zones.

---

[42] Ibid, 9
[43] Vat, 114

Churchill stated upon America's entry to World War II, "So we had won after all." [44] This jubilation only lasted a short time. In early December, the British Navy sent some capital ships to their naval base at Singapore. This precautionary move, included the new battleship *Prince of Wales* and the old battlecruiser *Repulse*. An aircraft carrier was to escort this group, but was retained in home waters to watch the German battleship *Tirpitz* hiding in Norweigian waters.

Upon hearing news of the Japanese invasions of nearby Thailand, the *Prince of Wales* and *Repulse* were sent to intercept the invasion force. The British commander was warned about Japanese torpedo bombers, but insisted on pressing the attack. Two hours later, both the *Prince of Wales* and *Repulse* laid at the bottom of the sea. The loss of the brand new battleship and the famous battlecruiser to shore-based aircraft was a disaster which horrified Britain. "In all the war," wrote Winston Churchill," I never received a more direct shock." [45]

The war brought a great demand for intelligence. The main responsibility for breaking the Japanese codes in the Pacific at all levels (diplomatic to military, including the army and naval communications) centered around a small group of men in Hawaii. This is where the first steps towards the pivotal battle of Midway began. The man responsible for this effort was Lieutenant Commander Joseph Rochefort, U.S. Navy.

---

[44] Keegan, 240
[45] Ibid, 256

Lt. Commander Rochefort commanded a unit called the Combat Intelligence Office (Op 20 02). This command was commonly known as "Hypo." The H stood for Hawaii and was the current British alphabet word for H. Hypo was connected administratively to Naval Communications in Washington D.C.

Commander Laurence F. Safford, chief of Security Intelligence of Naval Communications, had set up the first cryptanalytic teams for the U.S. Navy. (Prange, 17) Commanders Safford and Rochefort and their staffs worked together to break a particular Japanese naval code designed JN25. The JN25 code was the backbone of the Japanese fleet cryptgraphic system. This code transmitted about half of the naval messages sent by Japanese naval forces. Three other cryptanalytical groups had been working on this code since before Pearl Harbor--the 16th Naval District group on Corregidor, a British group in Singapore and Naval Communications in Washington D.C. Rochefort's group had previously been working on diplomatic and flag officer systems. Now all four groups routinely shared any successes or ideas about JN25.

Codes change their settings or editions fairly often to avoid possible breaches of intelligence to other countries. Japan was no different. By November 1940, American cryptanalysts were able to read most of the Japanese transmissions on a version called JN25a. On 1 December, 1940, the Japanese updated their system to JN25b. This was a crucial element towards the secrecy of Pearl Harbor. The fact that the Pearl Harbor attack group kept absolute radio silence also reinforced the fact that no presentable information existed to allow the American commanders advance warning.

This updating of codes would prove crucial at the Battle of Midway. Lt. Commander Rochefort practically lived in the cellar of the Administrative Building where the Combat Intelligence Unit operated. Rochefort and his staff spent their time in a super-security chamber where the sunlight never penetrated.

> The American Army or Navy cryptanalyst was a rare bird, in the service but not fully of it. No one knew exactly where he fitted in the scheme of things, for his was a shadow land south of Intelligence and north of Communications. To excel in this work required a particular type of mentality, combining a well-above-average IQ, verging on the genius in mathematics, with an infinite capacity for painstaking detail. He should have genuine enthusiasm for the work, yet maintain a scholarly detachment. He must be without ambition as the world generally understands the term, for his chances of pinning a star on his shoulder were roughly those of being elected President of the United States. Awards or decorations very rarely came his way. [46]

Hypo worked in close unison with the other commands. This collaboration make it difficult to credit any one group with the eventual deciphering of JN25b. "Gradually the isolated fragments of plaintext that they were recovering grew denser, enlarged, touched, made sense. Parts remained unread, but the large patches of coherence offered clues to Japanese thoughts and plans." [47]

Cryptanalysts work long hours on nearly impossible projects. This sort of work is not a simple matter of translation. "One should not visualize a process such as translating a passage of Russian into English. It was much more like the initial attacks on

---

[46] Prange, 17
[47] Kahn, 565

the Rosetta stone -- a comparison here, an assumption there, a small breakthrough with many large blanks." [48]

This breakthrough allowed cryptanalysts to see a plan to seize Port Moresby on New Guinea and threaten Australia on April 17, 1942. Admiral Nimitz immediately sent two aircraft carriers, *Lexington* and *Yorktown*, to meet this threat. This encounter would take place in the Coral Sea.

Rear Admiral Frank Jack Fletcher commanded this carrier task force in the Coral Sea. On May 7, his forces attacked and sunk the light carrier *Shoho*. The next day the American and Japanese reconnaisance located each other at the same time. "It was the first naval battle in history which was fought entirely by air and in which the opposing ships never even sighted each other." [49]

The Battle of the Coral Sea was a tactical victory for the Japanese. The Japanese began the war with a ten to four carrier advantage. The U.S. Navy could not afford to exchange carriers. The Japanese had so badly damaged the *Lexington* that she had to be torpedoed by an American destroyer after the battle. The Japanese forces had also scarred the *Yorktown*.

The engagement was a strategic victory for the United States. The invasion force turned back and never again threatened Port Moresby or Australia. This was the first time the Japanese Navy was denied an objective by the U.S. The two Japanese carriers suffered damage of their own. This damage required enough service that both would miss

---

[48] Prange, 19
[49] Kahn, 565

the Midway episode. This would limit the availability of six carrier battle group that struck Pearl to only four. [50]

The Japanese thought both American carriers were sunk. The *Yorktown* limped back to Pearl Harbor. Damage was so severe that experts said it would take three weeks to repair. Admiral Nimitz gave the dockyard three days. The *Yorktown* sailed towards Midway three days later. The Battle of the Coral Sea was one of two actions that had a heavy impact on the Battle of Midway. The other action did not result in a victory, but the fury it raised forced a premature action.

This other action was the brainchild of Admiral King's staff. One of his officers, Captain Donald B. Duncan USN, filed a plan immediately after Pearl Harbor. The purpose of this action was to bomb Toyko in specific retaliation for Pearl Harbor. [51] Conventional naval fighters could not deploy close enough to Japan without notice or interception. Army Air Force Bombers, however, could make the trip. Problem was how to get them close enough to take off and land them. Aircraft carriers and China proved to be the answers.

Colonel Doolittle and his eighty volunteers loaded their B-25 bombers onto the carrier *Hornet* in San Francisco Bay on April Fools Day 1942. [52] The carrier *Enterprise* would escort the *Hornet* and protect it from any Japanese attacks. This bombing raid would serve notice to the Japanese that they were not beyond the reach of the Americans. The Hornet and Enterprise group closed to within 700 miles of Japan before they were

---

[50] Ibid, 565
[51] Vat, 153
[52] Ibid, 155

spotted. The bombers had planned to launch from around 500 miles. After a cruiser sank

the Japanese picket ship, Doolittle and his volunteers took off from 650 miles out.

Fourteen bombers were designated for this raid. Thirteen would bomb Toyko and three

others would bomb Nagoya, Osaka, and Kobe. This was meant to confuse the

Japanese. [53]

The Doolittle raid accomplished very little as a bombing raid, but it caused a fury

within the Japanese military leaders. Admiral Yamamoto believed his emperor's security

was the navy's responsibility and thus was his own. This raid shook the confidence of

the Japanese leadership. An immediate result was the approval of the Midway plan.

This idea had been delayed for months for various reasons. Now the army and navy fully

agreed.

The Midway battle plan involved two parts. The first task included the

amphibious invasion of the Midway atoll. This would be followed up by supporting

forces from Wake Island. (Remember, Wake Island had been abandoned following Pearl

Harbor) The second element to the Midway plan was a decisive fleet action.

Alfred Thayer Mahan's The Influence of Seapower Upon History proclaimed

that a decisive sea engagement was essential for victory. The Japanese hoped to lure out

the remaining American carriers for a major fleet battle. The Japanese plan figured that

the American fleet would sail immediately upon hearing of the invasion of Midway. This

would allow the Japanese to pick the time and place of their engagement.

---

[53] Vat, 155

The Americans, through cryptanalysts, were able to prepare for this battle. The Japanese JN25b had been in use from December 1941 to April 1942. The newest version was due to begin 1 April 1942. The new fleet system had been delayed one month because of the difficulty in distributing the new version to all the units in newly acquired territory. "Perhaps the very extent of the Japanese conquests defeated their distribution efforts." [54] The new version had been delayed from 1 April to 1 May. Further problems and a lack of communication awareness delayed the new system until 1 June 1942. This delay enabled Rochefort and his team to read most of the intercepts during the preparations for Midway.

An immense naval buildup had begun for an Japanese operation in May 1942. American cryptanalysts could not determine the location though. Commander Safford and his group in Washington figured the target was Oahu. Rochefort disagreed. Admiral King did not like Rochefort and would not have listened to his reports. Admiral Nimitz liked and believed in Rochefort. Hypo came across the location designators AF and AL. Rochefort knew it was Midway, but could not give definitive proof to Nimitz.

Lt. Commander Rochefort hatched a plan to force the Japanese hand. He asked for and received permission from Nimitz to send a message to Midway asking them to radio in the open (without code) that their fresh-water distillation plant had broken down. This message was intercepted by Japanese. Two days later, a message was deciphered by Rochefort's group stating that "AF was short of fresh water." [55]

---

[54] Kahn, 567
[55] Ibid, 569

This absolutely proved that Midway was the focus of the Japanese battle group.

Now all preparations had been made to give Midway all available guns, planes, men,

barbed wire and anything else required. Nimitz even made a trip to the atoll to personally

inspect the defenses.

Now Rochefort could give Nimitz the place but not a date. Then on May 25,

Rochefort and his group intercepted a long transmission dealing with the impeding battle.

Rochefort was late to a staff meeting with Nimitz. "Rochefort was a good half hour late

when he showed up, and the admiral was definitely not happy. But when he saw what

Hypo had produced, any commander would have forgiven the cryptanalyst anything

short of treason or murder. The information amounted to the Japanese order of battle,

plus a few other items." [56] One of the other items included a date, 3 June 1942.

Now Nimitz had a location and date. Nimitz still had his doubters in Washington.

"The suspicions of the doubters may have been reinforced by an intercepted plaintext

request of a Japanese officer that all mail for his unit be addressed to Midway after June

5." [57] General Marshall commented on this intercept by stating, "that seemed a little bit

too thick." [58]

The American carriers positioned themselves about 350 miles northeast of

Midway. "The three carriers took up station at Point Luck on June 2." [59] The Japanese

---

[56] Prange, 72
[57] Kahn, 571
[58] Ibid, 571
[59] Ibid, 571

fleet had successfully converted to the new code JN25c version on 1 June 1942. This change had previously been delayed. Hypo was blacked out by the change. Only a few inroads were made before the next change JN25d in August 1942. The damage was already done. Plans were made and the forces enroute.

On June 3,1942, the American search planes from Midway spotted the invasion force. Bombers from Midway were launched to attack this force. The raid was largely ineffective. Search planes were out again on 4 June looking for the Japanese carriers. The American carriers sent out all their torpedo and dive bombers along with fighter escort.

Three waves of torpedo bombers attacked just as the Japanese were rearming and refueling aircraft from the Midway raid. The protective detail of Zeros and antiaircraft guns wiped out most of the torpedo bombers. Not a single hit was recorded by the three waves.

After the torpedo bombers were annihilated, waves of dive bombers fell upon the carriers. The combination of distracting torpedo bombers and tying up the Zeros allowed these groups to have full access at the carriers. These dive bombers immediately connected with the *Akagi*, *Kaga*, and *Soryu*. The remaining carrier *Hiryu* had temporarily escaped. American forces eventually found and sank the *Hiryu* as well. Japanese aircraft located the American forces, but could only successfully attack the *Yorktown*. The *Yorktown*, still reeling from the damage in the Battle of Coral Sea, finally succombed after a couple of rescue attempts.

The Battle of Midway was not seen as a turning point in the war following the engagement. The Japanese still had numerical superiority in ships and planes. This

advantage suffered greatly at Midway. The Japanese lost four carriers and 225 aircraft with their precious pilots. These would prove to be costly losses for a country that can not compete with America in a war of attrition. [60]

The Japanese made many mistakes leading up to the Midway debacle. The foremost was the lack of secure cryptographic communications for the fleet. Another problem was the "victory disease" that had set in from the six months of conquering all of East Asia and the Pacific. This "victory disease" clouded the judgements of professional officers leading them to overestimate the ability of the Japanese. This also factored into predicting American actions and ability to fight. [61][62]

The losses of two fleet carriers at Coral Sea played a significant role at Midway. The Japanese fleet had figured that American forces in Hawaii must have had some idea to their plans beforehand. Numerous submarines were found along the route taken by the Japanese fleet. The submarines were too numerous and well placed to be a coincidence. Japanese intelligence provided their own reports on the American fleet in Hawaii. "Of over 180 radio exchanges observed in the Hawaiian district, as many as seventy-two were tagged 'urgent.'" [63]

General Marshall summed up the Midway operation:

> As a result of cryptanalysis, he declared, "We were able to concentrate our limited forces to meet their naval advance on Midway when otherwise we almost certainly would have been some 3,000 miles out of place." The surprise, the concentration,

---

[60] Vat, 195
[61] Prange, 370
[62] Mitsuo Fuchida. Midway, The Battle that Doomed Japan, The Japanese Navy's Story. (Annapolis, Naval Institute Press, 1955) 245-248
[63] Prange, 137

were engineered days before in a basement office a thousand miles from the scene of the action, where the solution of messages in JN25b and its internal time and place ciphers forged effects more crucial to the course of history than any other solution except that of the Zimmerman Telegram. The codebreakers of the Combat Intelligence Unit had engrossed the fate of a nation. They had determined the destinies of ships and men. They had turned the tide of a war. They had caused a Rising Sun to start to set. [64]

---

[64] Kahn, 573

CHAPTER FOUR

WACHT AM RHEIN

But if Intelligence was not blame, who was? Brigadier General Kenneth Strong,

Eisenhower's chief of intelligence

Modern war is ... a conflict of logistics. -- David Kahn, *The Codebreakers*

The acquisition and use of intelligence has been the focus for the first two

chapters of this thesis. This third chapter will show how the lack of utilizing intelligence

proved costly at the Battle of the Bulge. By December 1944, American and British Allied

forces neared the German border. The eight month campaign from June, 1944 in

Normandy to mainland Germany moved swiftly. This success gave the Allies a "victory

disease" similar to the Japanese at Midway. Some Allied leaders had even placed bets

that the war would end before 1945. [1]

---

[1] Charles Whiting, Ardennes - The Secret War. (New York, Stein & Day, 1985) 10

The seeds to World War II can be identified at the end of World War I. It is within these seeds that the leaders and causes of World War II can be attributed. Germany, a major combatant in the war, was not even a part of the proceedings at the Treaty of Versailles. France, which had suffered the most of any country, vowed that Germany would never rise again to threaten Europe. Russia, on the eastern front, had been an ally before being forced by Germany to end their participation. The Communist revolution quickly overwhelmed Russia.

England suffered though not like the French, but had a measure of safety in the English Channel and the British Navy. America, a late addition to the war, helped turn the tide in the France. President Woodrow Wilson, Ph.D. in American Government, took the international stage at Versailles. His League of Nations plan would ultimately fail, but provided a clear grounding for the later United Nations.

J.M. Keynes, author of *The Economic Consequences of the Peace*, said "the intolerable burden placed on the defeated Germans, as punishment for their misdeeds, would further exacerbate the situation." [2] While the victors of the war spent six months writing the Versailles Treaty, the rest of Europe lined up for the scraps. Poland lobbied for territory. France liked this idea because it would take German lands and provide a buffer between the Germans and the Russian Communists. The Americans agreed with the French. The British were the only major power to object to a large Poland. [3]

---

[2] Martin Kitchen, Europe between the Wars. (London, Longman Group, 1988) 1
[3] Ibid, 5

France sought separation of the Rhineland from Germany. "The British sympathized with France's need for security, but feared that too punitive a peace would fuel Germany's desire for revenge." [4] France agreed to a fifteen year occupation of the Rhineland.

The German army and navy were also discussed at Versailles. The army would be limited to 100,000 conscripts set to twelve year terms of service. This would prevent a large surplus of troops for war. The German Navy was limited to 15,000 men and a handful of battleships and cruisers. Germany would not allowed to produce an airforce, tanks, submarines or gas. Imports and exports of weapons were forbidden. [5]

Each of these agreements dealing with territory with France, Poland or the military left a sore spot with Germany. The Allies were not done. Financial reparations were demanded by France and England. France demanded $200 billion, the British $120 billion and the Americans stated that $20 billion should be sufficient. The basis for German reparations was "the guilt clause" which was written into the Versailles Treaty.

The Allies needed a legal point from which to demand German reparations. That point came from Germany starting the war and engaging in unrestricted submarine warfare. The Versailles Treaty has the "guilt clause" listed three times. "In Germany the war guilt clause remains a highly emotional issue even to this day." [6]

---

[4] Ibid, 7
[5] Ibid, 8
[6] Ibid, 13

The guilt clause is a main ingredient towards German nationalism and World War II. Territory losses, military restrictions and financial reparations just added fuel to the fire burning in Germany from Versailles till 1939. World War II appeared inevitable after the treatment of Germany after World War I.

Ironically, Germany emerged from World War I with a strong infrastructure. The war was not waged on German homeland. The French suffered the war at home. Germany was surrounded by a severely weakened France and a torn Russia. The Allies could not agree on a common policy towards Germany. Germany was on a course towards exacting revenge.

Adolf Hitler, an Austrian by birth, emerged to power in Germany in 1932. He acquired authoritarian powers and slowly rid himself of opposition members. Communism was one of the many menaces he used as a platform to seize power. Hitler had served in World War I. He even earned a Iron Cross for bravery.

Hitler would transform Germany into a military state. His goal was to eliminate the Communist menace to his east and establish a new homeland for his people in the fertile Ukraine. Hitler outlined this plan in his book *Mein Kampf* while briefly serving time in prison in the 1923-24. If only the Allies had read his book before 1939?

Hitler's territory ambitions and international goals included Austria and Czechoslovakia initially. He did not forget about France or Poland. Hitler spoke "of the

iniquity of the disarmament terms, of the presumptions of the new states - Poland most

of all - which had been raised on historic German soil." [7]

France, "the most rapacious of the victors," had taken the Alsace-Lorraine and

maintained an army in the Rhineland. [8] Hitler's dreams of revenge would play

themselves out. Other threats to Hitler's ideology and ambitions included Soviet

Bolshevism. Communist parties actively operated in Austria, France, and

Czechoslovakia as well as Germany.

Hitler slowly made his moves towards reestablishing Germany in the world scene.

His first moves included reoccupying the Rhineland on March 7, 1936. [9] Hitler

calculated that France had internal problems and divisions in addition to impending

elections. Britain would not act unilaterally. Italy, bound to oversee the Rhineland

according to the Locarno Pact of 1925, ignored the German action. "Hitler already had

Mussolini's assurances that he would ignore the obligations under the Locarno Pact." [10]

Hitler claimed that France had violated the Locarno Pact by signing a treaty with

the Soviet Union. Along with Italy's new arrangement, France's internal divisions, and

Britain's inability to act unilaterally, Hitler successfully regained the Rhineland. His next

goal involved acquiring Austria.

Through financial, political and military pressures, Hitler coerced the Austrian

chancellor, Kurt von Schuschnigg, to step down and hand over the government. Hitler

---

[7] Keegan, 31
[8] Ibid, 32
[9] Michael Veranov, The Mammoth Book of theThird Reich at War. (New York, Carroll & Graf, 1997) 66
[10] Ibid, 66

conquered his homeland without bloodshed. His next attempt to expand his "Lebensraum" would focus on the new state of Czechoslovakia. Czechoslovakia emerged as a nation from World War I. The only successful liberal democracy in Europe Eastern, Czechoslovakia became Hitler's next desire.

The occupation of the Rhineland alone, altered the balance of power in Western Europe. Now with Austria and threats to Czechoslovakia, Hitler's aims rapidly became apparent to the rest of Europe. The leaders of England and France failed to dissuade Hitler in Münich. Czechoslovakia could only be assisted by either Russia via Poland, which Poland would never allow, or by an invasion of western Germany by France and England, "from which government and people in both countries shrank." [11]

Czechoslovakia, dismembered and occupied, sent a clear warning to England and France. "Munich marked 'the end of appeasement.' The rape of Czechoslovakia drove the democracies (France and England) to act." [12] Following the occupation of Czechoslovakia, Hitler turned his attention to Poland.

Poland would force France and England into war with Germany. Hilter's desire for war finally arrived. Germany and Russia signed a secret non-aggression treaty which outlined the portions of Poland each would occupy. This meant that Russia would not aide the Poles. England and France were alone against the growing threat.

Hitler eventually turned his attention back to France. In May 1940, Germany launched invasions against France, the Low Countries (Belguim, Netherlands and

---

[11] Keegan, 32
[12] Ibid, 40-41

Luxembourg), Norway, and Denmark. These successful operations pushed the Allies off the continent.

After a failed attempt at destroying the British airforce, Hitler called off plans for invading Britain. He then turned his attention east. Operation *Barbarossa*, the invasion of Russia, would command the attention of Germany's armies until the Allied invasions of Italy in 1943 and France in June, 1944.

As the war continued, the United States with its vast economic power churning out war materials for the Allied armies, Germany realized how bleak the situation appeared. As 1944 neared an end, the Allies felt confident that Germany was finished. The first German towns had fallen and the rest of the Reich was due to follow.

In the summer of 1944, Hitler had nearly been killed in an assassination attempt. On July 20, 1944, a group of army officers conspired to bomb Hitler's headquarters. Colonel Claus von Stauffenberg, a disabled veteran, placed the bomb under the conference table. [13]

By chance, the bomb did not kill Hitler. Though wounded, this attack reinforced the Führer's belief that he was invincible. This attack did influence Hitler's paranoia towards his commanding Generals. "Hitler's mind was no longer reliably clear...However, he did retain some strategic vision." [14] This strategic vision involved defeating the Allies and forcing a negotiated peace.

---

[13] Ibid, 394-395
[14] Trevor Dupuy, Hitler's Last Gamble. (New York, HarperCollins, 1994) 9

Hitler could not look east to attack because the Soviet Army was too vast and lacked strategic weak spots. The Western Allies did have a weak spot: The Ardennes Forest. The Allies were not using trains for logistical supplies. This burden fell upon a network of trucks running constantly from seaports in France and Belgium. Antwerp was undoubtedly the most important. Hitler's plan called for a huge concentration of forces to break through the Allied lines and seize the port of Antwerp.

By seizing Antwerp, German forces would split the British forces in the north and the Americans to the south and west. Hitler thought this might "create such a rift between the British and the Americans that the western Alliance would fracture, and Germany would face only a one-front war by early spring 1945." [15] This action would also forestall any campaigns into Germany and might extend the war several months to a year.

General Dwight (Ike) D. Eisenhower, at Supreme Headquarters, Allied Expeditionary Forces (SHAEF), commanded all the Allies in Europe. Ike's plan called for a wide offensive against Germany. This meant controlling a front that spanned 500 miles from the North Sea to Switzerland. [16]

British Field Marshall Bernard Montgomery and his British troops were fighting in the Netherlands and northwestern Germany. General George Patton and his Third Army were further south in France near the Swiss border. General Omar Bradley

---

[15] Ibid, 10

[16] Donald Goldstein, Nuts! The Battle of the Bulge. (Washington, Brassey's, 1994) xi

commanded the southern region which included the Ardennes. "This division of forces meant that the rest of the front would be defended very thinly." [17]

Hitler's counter-offensive in the Ardennes should not have been a surprise. Germany launched a major offensive through this same heavily forested area in World War I and again in 1940. The Ardennes Forest was officially deemed to difficult to operate within. Apparently, the two prior offensives failed to disprove the theory.

The Allies used the Ardennes area to rest their battle-weary troops. This is also where green units (newly arrived) were sent to get some field experience without a real danger. General Bradley had stated that an attack in the Ardennes was impractical. "An attack had to have one of two objectives -- to destroy enemy forces or to attain 'a terrain objective' -- and neither was attainable in the Ardennes." [18]

The Germans mustered an incredible number of men, tanks, ammunition, planes and supporting logistics for this offensive. The sheer size of the German counter-offensive shocked the American Army. General Bradley remarked to his intelligence aide, General Leven C. Allen, "Pardon my French, Lev, but just where in hell has the sonovabitch gotten all his strength?" [19] General Eisenhower accepted blame for the lack of preparedness of the American forces. It was his plan that called for a general offensive. This attack gave Ike an opportunity to seize the advantage against the Germans. General

---

[17] Ibid, xi
[18] Ibid, xii
[19] Whiting, 131

Eisenhower wrote the War Department, "if things go well we should not only stop the thrust but should be able to profit from it." [20]

A combination of factors led to the Allies lack of intelligence concerning *Wacht am Rhein*. The Allies had complete air superiority over the skies of Europe. Bad weather and German camouflage techniques helped deter the reconnaissance planes from discovering the most of the fuel depots and tank marshaling yards just beyond the front lines. Darkness was also a factor because "it doesn't get light until eight and it's dark again at four." [21] The winter season only allowed a few hours of viable daylight. The two American Night Fighter Squadrons, 422nd and 425th, contained the only planes with night and all-weather capability. These squadrons, both with less than twenty planes each, were taxed by German night bombers, night reconnaissance, and maintenance. [22]

Signals Intelligence, which had played key roles in revealing German intentions, via the Ultra machine, failed to provide any information about the impending attack. "No matter how diligent or skilled an interception/cryptanalysis unit is, it is at a loss if the enemy does not send communiqués, or is extremely careful when doing so." [23] To ensure security, Hitler had ordered that "nothing about the proposed plan be sent by wireless." [24]

Military Intelligence failed to notice the many clues and rumors floating around the front. The U.S. Army has various departments for staff officers. G-1 deals with

---

[20] Stephen E. Ambrose, The Victors. (New York, Simon & Schuster, 1998) 274
[21] Keegan, 441
[22] Dupuy, 39-40
[23] Wrixon, 107
[24] Goldstein, xi

Personnel, G-2 handles Intelligence, G-3 involves operations officers, and G-4 includes logistics and supply. Every unit from the top (Eisenhower) to each division has its own G-2 Intelligence staff. Bickering and insularity among the many G-2 staffs prevented the proper cooperation and exchange of information. This cooperation might have been able to reveal the German plans.

Captured Prisoners of War (POW's) had mentioned to American interrogators about an imminent attack. Some aerial reconnaissance had spotted tanks, fuel storage, and trucks. A front-line unit along the Ardennes Forest, 28th Division, reported massive tank movements at night before the attack. The top Army G-2 refused to believe the rumors and intelligence reports because the 28th Division was regarded as being the "nervous overreaction of a demoralized outfit to normal enemy road traffic." [25]

German counter-intelligence also played a role in denying the Allies information regarding the attack. Hitler insisted on complete secrecy from the start. All officers were required to sign a document of secrecy. This made their own lives and the lives of their families at risk. Even the name of the operation was chosen for its ambiguity. The German Army had always chosen names associated with the actions (ex. Operation Sea Lion, the invasion of England). *Wacht am Rhein* or Watch on the Rhine does not reveal the true intention of the plan.

The lack of wireless communications for this campaign confused the Allied cryptanalysis in England. Hitler had an idea that German radio communications were not

---

[25] Dupuy, 37

secure. All orders were conducted by telephone and telegraph lines. The fact that the German Army was mostly bottled up within mainland Germany allowed for secure communications. German forces had been forced to the use of radio in the early years of the war due to the expansive size of the territories conquered. Now a condensed German infrastructure could be secure.

Another German deception plan involved Lieutenant Colonel Otto Skorzeny. Skorzeny, a seasoned veteran of Africa, Italy and Russia, had carried out special operation missions including the glider-borne rescue of Benito Mussolini from Gran Sasso in the Abruzzi Mountains in September 1943. [26] Skorzeny had also deposed Admiral Miklós Horthy as Regent of Hungary in October 1944. Hitler instructed Skorzeny to assemble a group of English speaking soldiers. His mission would include infiltrating the American lines and seize and hold key bridges over the Meuse River for the German panzer divisions. These Germans would wear American uniforms and use stolen or captured American vehicles. These soldiers would also hamper Allied communications and spread confusion and disorder behind the lines. The name of this operation was called Operation Greif (Condor). The nature of this mission was not known to the Allies until after the German counter-offensive began. [27]

Allied expectations were also a factor in the Battle of the Bulge. "This final flaw...was perhaps the most damning of all, for it violated the basic tenet of sound military intelligence operations." [28] The best intelligence analysis is based on knowledge

---

[26] Dupuy, 13
[27] Ibid, 12-13
[28] Ibid, 40

of an enemy's capabilities rather than assumptions as to his intentions. With the apparent "victory disease" by the Allies following the sprint across France and the Soviet machine crossing Eastern Europe. American planners "expected early collapse of the German war effort." Most of the "Allied intelligence circle refused to consider the possibility that Hitler might gamble everything to wrest the initiative from the western Allies." [29]

The few Allied intelligence officers who saw the signs of German buildup were either not loud or convincing. British Major General Kenneth Strong, (Eisenhower's G-2 intelligence officer) began in early December to sense the growth of a threat. Strong confronted American Brigadier General Edwin Sibert, the 12th Army Group G-2 under General Bradley, with this threat. Bradley sided with Sibert, possibly because Strong was British. A similar situation developed between Colonel Monk Dickson of the First Army G-2 and General Sibert. His perspective towards a German counter-offensive changed when the Sixth and Fifth panzer armies were seen near Cologne.

Another intelligence officer trying to convince the Allies of a threat was Colonel Oscar W. Koch, Third Army G-2. On December 9, 1944, Koch invited General Patton to a special intelligence briefing. Patton was impressed with Koch's reasoning. "Patton ordered that contingency plans be prepared to meet any threat to the Third Army's left flank (facing the Bulge)." [30]

---

[29] Ibid, 40
[30] Ibid, 42

A final Allied flaw towards unmasking the intentions of the German Army included a lack of patrols along the front. The four divisions situated in the Ardennes did not adequately patrol the front for information or prisoners. After the war, German officers cite combat patrolling as a common failing among the American forces in Europe. [31]

The German Army had its own problems with regard to the Battle of the Bulge. Although, 410,000 men, 1,400 tanks, 2,600 artillery pieces, and over 1,000 combat aircraft were allotted for this campaign, another 100,000 men and 500 tanks were prevented from joining the battle due to lack of transportation, fuel and allied air attacks. The German Army had gathered the required amount of fuel for the attack, but "half of it remained east of the Rhine because the transport system could not move it forward." [32]

Rail lines were unavailable to move German forces toward the front due to Allied air bombing. Logistics for the massive campaign were affected by the weather, Allied air attacks, and priority of equipment at the front. "It was simply impossible to move combat units forward and at the same time assemble the stocks of fuel, ammunition, and other supplies required for the offensive." [33]

Hitler's miscalculation with *Wacht am Rhein* included his underestimation of the Allied soldier and command. American forces were green (new and inexperienced) in Africa when they first met German troops. Hitler thought the American soldier was inferior and ill-prepared for war. Hitler's 1940 attack through this region met a Franco-

---

[31] Ibid, 38
[32] Ibid, 19
[33] Ibid, 19

British force that lacked combat experience, a unified command, sound military doctrine, and an effective airforce. This time the Anglo-American force had all four of these factors in their favor.

The Battle of the Bulge lasted the better part of a month. From mid-December to mid-January, German forces pushed the American and British forces along a sixty mile bulge. The Germans main goal was the port of Antwerp. If this port were taken, the Allies who still had not cleared out the German occupied islands leading to the English Sea, the Allies would be prevented from potentially using the largest port in Europe to resupply their armies. This action would also extend the war several months to a year.

The western front gave the Germans the old Siegfried defensive network and the Rhine River as physical barriers from which to hold off the Allies. The Soviets had a larger army and no physical barriers to prevent them from entering Germany. Why would Hitler attack the western Allies and not the Russians? One idea could be to throw off the western advance and then move against the Soviets. Or disrupt the Anglo-American alliance and hope for a separate peace and a one front war against the Russians.

The Battle of the Bulge may have actually sped up the war against Germany. Following the exhausting month of fighting, the German army had lost over 100,000 killed, wounded or captured. Nearly all the tanks involved in the campaign were destroyed or abandoned due to lack of fuel. The sheer number of men who died in this month of fighting made it the highest death toll of the year for the Allies.

Intelligence will not win a war by itself. The Battle of the Bulge shows where complacency and "victory disease" can hurt a numerically superior army. The Allies

intelligence failure was due to the interplay of complex and forceful personalities, misappreciation of a large number of clues, and a massive army bureaucracy. [34]

The sexiest part of this campaign has made it to Hollywood. The Battle of the Bulge is shown to revolve around the Bastogne. The town was a vital link for the Germans and Allies. "This town commanded a network of highways that, when overtaken, would enable the Germans to pour troops and armor throughout a wide area and give them mulitple tactical choices on the way to the Meuse River." [35] The tenacity of the American soldiers and the infamous phrase "Nuts" from the American commander when asked if he would surrender, have assured this battle a folkloric place in the history books.

---

[34] Ibid, 36
[35] Goldstein, 110

CHAPTER FIVE

CONCLUSION

The previous case studies showed how vital intelligence was in the outcome and progress of World War II. The value of intelligence does not diminish in peace time. Pundits and Monday-morning quarterbacks can claim that correct intelligence would have prevented wars. Intelligence should not be regarded as a weapon, but as a tool. A tool that is required to construct the knowledge from which to conquer an enemy.

The Chinese philosopher Sun Tzu recognized the value of this advantage 2,500 years ago: "The reason the enlightened prince and the wise general conquer the enemy whenever they move and their achievements surpass those of ordinary men is foreknowledge." [1] Knowledge is powerful, but the need for Marines, pilots and sailors to go into harm's way is the ultimate weapon. Intelligence will not win a war, but it will help a country to avoid losing a war. Allied Intelligence has been credited with helping the Allies avoid costly defeats in the early stages of World War II.

According to William Henhoeffer, a former CIA officer, there were five major intelligence advantages by the Allies in the war. They included the British ability to read German

---

[1] Richelson, 7

communications; British exploitation of German agents; the ineffectiveness of German

Secret Intelligence Service (*Abwehr*) due to anti-Hitler sentiment at the high echelons;

Soviet intelligence assets (benefiting solely the Soviets); and the U.S. knowledge of

Japanese intentions. [2]

Two of Mr. Henhoeffer's points are illustrated by the case studies within this

thesis. These clear advantages helped the President Franklin D. Roosevelt and Prime

Minister Winston Churchill along with their military to chart a successful course against

the Germans and Japanese during the war. The most important aspect of the German and

Japanese Ultra communication intercepts was secrecy. America and England had to keep

their knowledge of the enemy's intentions extremely quiet.

The ability of these two countries, while at war and with vast bureaucracies, to

contain such a powerful secret was a major accomplishment. The U.S. intelligence

operations against Japan were revealed during and following the war as a result of

Congressional investigations, but the Allied efforts against Germany actually remained

secret till the late 1960s and early 1970s.

The third case study involved the lack of utilizing intelligence available before and

during the Battle of the Bulge. In this situation Allied military leaders fell prey to many

factors including overconfidence and bitter infighting among the Allied intelligence circles.

This case study illustrates an Allied intelligence failure but it also shows how intelligence

lessons can be learned.

---

[2] William Henhoeffer, The Intelligence War in 1941: A 50th Anniversary Perspective. (CIA, Center for the Study of Intelligence Monograph Division, 1991) 1

The Poles learned their lessons regarding intelligence the hard way. After being partitioned to nothing by Prussia, Russia, and Austria, Poland realized how important security and intelligence mattered. The crash program initiated after World War I evolved into an intellectual braintrust which the theoretical broke down the basis of German communication devices before World War II. These small victories and innovative operations paved the way for British and American cryptologists.

The Polish aspect to the intelligence war in Europe has been overlooked. The contributions by the Polish mathematicians accelerated the intelligence war against Germany by several years over the French and British. Just before the German invasion, the key Polish officials shared their knowledge with British and French cryptologists to their chagrin.

The Polish mathematicians made unprecedented theoretical breakthroughs in the relatively young art of cryptology. These successes laid the ground work for the Cold War era competition between the United States and the Soviet Union. These two former allies learned the Polish lessons from World War II to deduce each others communications systems. The emergence of computer technology has allowed intelligence organizations to apply lessons from the past.

The importance of the Polish cryptologists should not be overlooked in the intelligence wars of World War II. Without their vital insight, the British and Americans would not have acquired the necessary intelligence to prosecute the war. This contribution shows that a country's power may be measured in not so much by what it can produce physically, but for how it performs mentally.

The second case study dealt with the U.S. and Japanese navies dueling around Midway in the summer of 1942. Numerous factors led to this ultimate battle. The main contributing factors included the Battle over the Coral Sea , the Doolittle raid against Tokyo, and the U.S. Navy cryptological offices in Pearl Harbor led by Commander Joseph Rochefort. These three ingredients forced the Japanese to make quick, ill-planned and emotionally driven choices at Midway.

Prior to Midway, Japan had run rampant across the Pacific. After Pearl Harbor, Japan took possession of the Dutch East Indies, Singapore, Burma, the Philippines, Guam and Wake Islands. The Japanese Navy was undefeated on the high seas. A sense of "victory disease" or invincibility infected the Japanese military. The Battle of the Coral Sea was the first episode where the Japanese Navy was stopped in their mission to secure bases in the Solomon Islands chain. The battle was a tactical victory for the Japanese because they sank one large U.S. fleet carrier and severely damaged another. The U.S. forces sank one Japanese light carrier and damaged one large carrier. The Japanese began the war with a decisive advantage of ten to four in carriers. The U.S. had an incredible industrial base from which to develop warships, but the U.S. began the war at a serious disadvantage. Thus, the U.S. could not afford to trade carrier for carrier with the Japanese.

However, the battle was a strategic victory for the U.S.. This was the first time the Japanese had been stopped in the war. The Japanese had to change their plans and return their two large carriers to Japan. These carriers would be sorely missed a short while later at the Battle of Midway.

The second ingredient to the Midway picture involved the U.S. response to Pearl Harbor in the form of Colonel Doolittle's raid on Tokyo. This attack, though minor, affected the leaders of the Japanese military. Admiral Yamamoto was embarrassed by this attack upon the Japanese mainland. His plan to seize the island of Midway and lure out the American fleet for a major decisive engagement finally won approval.

This is where the Japanese responded emotionally. Rather than plan a clear, well-defined attack, Japan sought a counterstroke to Doolittle. Emotions were the first of many Japanese mistakes regarding Midway. The Japanese sent a decoy invasion force to the Aleutian Islands. This force was unnecessary and pulled vital resources and ships from the actual goal of Midway and engaging the U.S. fleet. The invasion force also sailed independently. And the supporting covering force led by Admiral Yamamoto sailed 300 miles behind the carrier strike force.

By separating their forces, the Japanese violated the strategic principles of simplicity, superiority at point of contact and economy of force. [3] Surprise, the paramount factor at Pearl Harbor, switched to the aid the U.S. "The essence of his (Yamamoto) scheme was the supposition that Nimitz and his forces would behave exactly as the Japanese planned they should." [4] With Midway and the U.S. fleet as goals for this mission, the Japanese planners lost the mobility edge. While the Japanese are attempting to invade Midway, their supporting forces must remain off the coast. Since

---

[3] Prange, 377-382
[4] Ibid, 379

the Japanese carriers were considered supporting forces, their ability to be mobile was lost.

This mission had nothing to do with an offensive against the U.S. Acquiring Midway only projected Japanese defensive lines further east. Seizing Midway meant little or nothing to the Japanese grand scheme. Midway did not prevent the U.S. fleet from moving. It did not cut a vital communication line (for example, Australia-Solomon Islands-United States). Midway only required more effort to station troops and hope the U.S. fleet will show up to defend it.

This victory has roots in the Polish case study. The innovative lessons learned from the Poles before the war aided the American cryptological efforts against the Japanese. The Japanese became afflicted with "victory disease" which the Americans themselves would fall prey later in Europe. "Victory at Midway resulted from American intelligence, civilian as well as military, from the wise use of what was available." [5]

> Study of captured Japanese records also demonstrated how effectively the Anglo-American cryptanalysts had done their jobs, especially during the last phase of the conflict. When the staff of the Strategic Bombing Survey carried out on-site inspections, they discovered that in the latter part of the war, information amassed by the U.S. Navy cryptanalysts about "the size and location of the Japanese merchant fleet on V-J Day had been more exact than the records of the Japanese Ministry of Merchant Marine. [6]

The third case study deals with the lack of utilizing intelligence before the Battle of the Bulge. A case was made that numerous intelligence sources provided tidbits and/or

---

[5] Ibid, 384

[6] Bradley F. Smith, The Ultra-Magic Deals. (Novato, CA; Presidio Press, 1993) 205

clear pieces of information to the Allies concerning a potential German counteroffensive. The overconfidence or "victory disease" among the Allies contributed to the lack of preparedness among the Allied forces in December 1944.

Since the landings at Normandy, the Allies had slowly pushed the German Army back to the frontiers of the *Third Reich*. The first German town of *Aachen* had fallen to American forces. With the end of 1944, the Allies successes resulted in a comfort factor. The German Army was thought to be tired and reeling. This was a mistake by the Allies. They should not have assumed that Germany was ready to roll over.

The project involved in amassing the men and material for the German counteroffensive was incredible. Even with constant Allied air attacks, the German logistical trains were able to build up a significant army just beyond the front lines. This section mentioned the various areas such as Signals Intelligence, Military Intelligence, Ultra intercepts in England, and Allied expectations.

The key factor was the Ultra secret. For four years, the Allies had depended on German wireless radio traffic. These radio transmissions gave away intentions, strengths, and weaknesses. The Allies used the Ultra as a "crutch" during this time. The other available sources of intelligence were either ignored or glossed over. This failure on the part of the Allies allowed the German counteroffensive to develop and threaten the port of Antwerp.

The major elements that stopped this determined German effort included the American soldier and limited German logistical supplies. If not for diesel for the German tanks and the brave defenders of Bastogne, this month long counteroffensive could have

developed into something resembling Hitler's initial plan. The value of intelligence is priceless. The American army lost over 50,000 dead during the month of fighting. German losses reached over 100,000 dead and wounded. These were the highest body counts by month of the entire year. [7]

The lessons to be learned from the intelligence battles of World War II include 1) The need for developing a clear and distinguished intelligence community; 2) The dissemination of gathered intelligence up and down the chain of command; 3) The existence of an astute leadership with faith in intelligence; 4) The ability to adapt to the enemy and seize the initiative whenever possible; 5) Promotion of information sharing between allies; and 6) Maintain closely enforced measures for keeping any intelligence advantages completely secret.

The historic lessons of World War II can be applied to the current situation, between the U.S.-China situation, which lends itself to a economic and information war. The U.S. works through the National Security Agency (NSA). [8] This agency is in charge of securing U.S. communications and breaking foreign correspondence. This peace time mission could potentially be the difference between maintaining peace and war. No country should remain lax in its commitment toward obtaining intelligence or securing their own. Secrets are only as safe as those that keep them.

Current problems and factors involving intelligence include tensions with China and Russia along with the worldwide media. China's economy is growing and expanding

---

[7] Keegan, 447
[8] Richelson, 24

at an incredible rate. This economic muscle plus the sheer population make China a

economic and military threat to the United States.

Russia, though weakened from the breakup of the Soviet Union and trouble

adjusting to a free market economy, still retains enough strength and power to hurt the

U.S. Russia may become a key issue in resolving the current Kosovo situation. Russia

has blasted the NATO attacks, but realizing it's own economy depends on Western aid

and loans.

The last key to today's intelligence environment is the media. Secrets do not last

long in today's electronic immediate newsflash era. If a disaster occurs or if a major

sports figure will retire, the major news services appear to print the stories almost before

they happen. Government leaks and failures are also quickly disseminated to the public.

The Central Intelligence Agency is constantly under fire to disband its operations.

The fact that most of the Agency's mistakes are front page and any successes are

unknown does not help their public relations. The media bias against intelligence or

paramilitary organizations does not help the government either.

The United States has a clear mission in the next century. First, they must

maintain their modern military at levels necessary to project their power abroad. The

U.S. must have the men and materials for another Iraq or Kosovo, without drawing

exclusively from the reserve force. Secondly, the U.S. must constantly upgrade its own

intelligence apparatus. Constant vigilance is required to safeguard secrets. One current

example is the recent China scandal concerning the nuclear weapons labs in New Mexico.

Third, the U.S. must remember the past lessons concerning the importance of intelligence.

As the lone superpower in the world, the U.S. does not have the luxury of allowing lapses

in intelligence.

Bibliography

Aaseng, Nathan. *Navajo Code Talkers*. New York: Walker, 1992.

Ambrose, Stephen E. *Citizen Soldiers: The U.S. Army from the Normandy Beaches to Bulge to the Surrender of Germany, June 7, 1944- May 7, 1945*. New York: Simon & Schuster, 1997.

_____. *The Victors - Eisenhower and his boys: The Men of World War II*. New York: Simon & Schuster, 1998.

Barak, Michael. *The Enigma*. New York: William Morrow, 1978.

Beesly, Patrick. *Very Special Intelligence*. New York: Doubleday, 1978.

_____. Who was the Third Man at Pyry? *Cryptologia*. Vol.11 #2, 65-77.

Bennett, Ralph. *Ultra and the Mediterranean Strategy*. New York: William Morrow, 1980.

_____. *Ultra in the West*. New York: Charles Scribneris Sons, 1979.

Bertrand, Gustave. *Enigma*. Paris: Plon, 1973.

Bloch, Gilbert. Enigma: The Dropping of the Double Encipherment. *Cryptologia*. July 1986, 97-118.

Calvocoressi, Peter. *Top Secret Ultra*. London: Cassell, 1980.

Casey, William. *The Secret War Against Hitler*. Washington: Regnery Gateway, 1988.

Churchill, Winston. *The Second World War - The Grand Alliance*. Cambridge: Riverside Press, 1950.

Clark, Ronald. *The Man Who Broke Purple*. Boston: Little, Brown & Co., 1977.

Clavell, James. *The Art of War -- Sun Tzu*. New York: Dell Publishing, 1983.

Deacon, Richard. *A History of the British Secret Service*. New York: Taplinger, 1970.

Dunn, Dennis. *Caught between Roosevelt & Stalin*. Lexington: University Press of Kentucky, 1998.

Dupuy, Trevor N. *Hitler's Last Gamble*. New York: HarperCollins, 1994.

Fuchida, Mitsuo. *Midway, The Battle that Doomed Japan, The Japanese Navy's Story*. Annapolis: Naval Institute Press, 1955.

Gailey, Harry A. *The War in the Pacific*. Novato, CA: Presidio Press, 1995

Garlinski, Jozef. *The Enigma War*. New York: Charles Scribneris Sons, 1979.

Goldstein, Donald. *Nuts! The Battle of the Bulge*. Washington: Brassey's, 1994.

Haines, William. *Ultra and the History of the United States Strategic Air Force in Europe vs. the German Air Force*. Westport, CT: Greenwood Press, 1980.

Harris, Robert. *Enigma*. New York: Random House, 1995.

Hinsley, F.H. *Codebreakers*. Oxford: Oxford University Press, 1993.

Henhoeffer, William. *The Intelligence War in 1941: A 50th Anniversary Perspective*. Central Intelligence Agency, Center for the Study of Intelligence Monography Division, 1991.

Hodges, Andrew. *Alan Turing: The Enigma*. New York: Simon & Schuster, 1983.

Ike, Nobutaka. *Japan's Decision for War*. Stanford: Stanford University Press, 1967.

Ito, Masanori. *The End of the Imperial Japanese Navy*. Westport, CT: Greenwood Press, 1956.

Kahn, David. *Seizing the Enigma*. Boston: Houghton Miflin, 1991.

_____. *The Codebreakers*. New York: Macmillan, 1968.

Keegan, John. *The Second World War*. New York: Penguin Books, 1989.

Kitchen, Martin. *Europe Between the Wars*. London: Longman Group, 1988.

Kozaczuk, Wladyslaw. *Enigma -- How the German Machine Cipher Was Broken, and How It Was Read by the Allies in World War Two*. Warsaw: University Publications of America, 1984.

Lewin, Ronald. *The American Magic - Codes, Ciphers and the defeat of Japan.* New York: Farrar Straus Giroux, 1982.

Lord, Walter. *Incredible Victory.* New York: Harper & Row Publishers, 1967.

Macksey, Kenneth. *The Hitler Options.* London: Greenhill Books, 1995.

Mayer, Stefan. *Breaking up the German Ciphering Machine "Enigma" by the Cryptological Section in the 2nd Department of the Polish Armed Forces General Staff.* New York: Pilsudski Institute, 1974.

Miller, Nathan. *War at Sea.* New York: Scribner, 1995.

Morison, Samuel Eliot. *History of United States Naval Operations in World War II - Volume IV Coral Sea, Midway and Submarine Actions.* Boston: Little, Brown and Company, 1949.

Paine, Lauran. *German Military Intelligence in World War II - The Abwehr.* New York: Stein & Day, 1984.

Popov, Dusko. *Spy Counterspy.* New York: Grosset & Dunlap, 1974.

Prange, Gordon. *Miracle at Midway.* New York: Penguin Books, 1982.

Regan, Geoffrey. *The Guinness Book of Decisive Battles.* New York: Canopy Books, 1992.

Rejewski, Marian. How the Polish Mathematicians Deciphered the Enigma. *Annals of the History of Computing.* Vol.3, #3, July 1981, 213-234.

Richelson, Jeffrey *The U.S. Intelligence Community.* Boulder: Westview Press, 1995.

Rusbridger, James. *Betrayal at Pearl Harbor.* New York: Summit Books, 1991.

Russell, Francis. *The Secret War.* Alexandria, Virginia: Time-Life Books, 1981.

Skillen, Hugh. *Enigma and its Achilles Heel.* Southhampton: Hobbs, 1992.

Smith, Bradley F. *The Ultra-Magic Deals.* Novato, CA: Presidio Press, 1993.

Spector, Ronald H. *Listening to the Enemy.* Wilmington: Scholarly Resources, 1988.

Vat, Dan Van der. *The Pacific Campaign - The U.S.-Japanese Naval War 1941-1945*. New York: Touchstone, 1991.

Veranov, Michael. *The Mammoth Book of the Third Reich at War*. New York: Carroll & Graf, 1997.

Von Glahn, Gerhard. *Law Among Nations*. Boston: Allyn & Bacon, 1996.

Welchman, Gordon. *The Hut Six Story*. New York: McGraw-Hill, 1982.

Whiting, Charles. *Ardennes - The Secret War*. New York: Stein & Day, 1985.

Winterbotham, F. W. *The Ultra Secret*. New York: Harper & Row, 1974.

Wrixon, Fred B. *Codes, Ciphers & other cryptic & Clandestine Communication*. New York: Black Dog & Leventhal Publishing, 1998.

Woytak, Richard. *On the Borders of War and Peace: Polish Intelligence 1937-1939 and the Origins of the Ultra Secret*. Boulder: East European Quarterly, 1979.

Zakaria, Fareed. *From Wealth to Power*. Princeton: Princeton University Press, 1998.

Internet Sources

http://www.attlabs.att.co.uk/andyc/enigma/about enigma.html

http://www.cranfield.ac.uk/ccc/bpark/morebpark.html

http://gl.umbc.edu/~Imazial/Enigma/enigma.html

http://members.aol.com/nbrass/enigma.html

VITA

Francis "Red" M. O'Laughlin IV, was born in Honolulu, Hawaii, on July 24, 1973. Red is the son of Francis M. O'Laughlin III and Marilyn Ann O'Laughlin. Red grew up in Missouri City, Texas, but moved to Louisiana during high school. After graduating from East Jefferson High School in Metairie, Louisiana. Red attended Northwestern State University in Natchitoches, Louisiana, where he ran track and cross country. After one year, Red earned an appointment to the United States Naval Academy. Following his plebe year, Red left Annapolis and came back to Texas.

He then attended Southwest Texas State University where he earned his Bachelors of Arts in Political Science in 1997. He immediately began graduate school at Southwest Texas State. Red worked as an Instructor Assistant for the Political Science Department while working on his master's. In thefall of 1999, Red will begin his Ph.D. at the University of Kansas.

Permanent address: 3106 Indian Wells Ct.

Missouri City, TX 77459

This thesis was typed by Francis M. O'Laughlin IV.