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Surface Ships:

The Kriegsmarine's Downfall during the Second World War

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During the early days of the Second World War, the German Reich had steamrolled a large portion of the European continent. By July of 1940, Germany had total control of France, Austria, Czechoslovakia, and its agreed upon portion of Poland, amongst others. At this stage, Germany only remained at war with the United Kingdom. Hitler's Germany no longer had the option of launching Operation Sea Lion, a planned invasion of the British island, due in large part to the naval losses sustained in the invasion of Norway.¹ Therefore, Hitler decided to launch a campaign of terror and starvation against the British defenders. While the Luftwaffe bombed RAF airfields from the sky, German U-boats raided thousands of tons of war and merchant shipping in the Atlantic. This strategy was outlived very quickly, as Germany was unable to starve the UK into submission before ground warfare in the Soviet Union, Africa, Italy, and eventually France and Germany itself ground the Third Reich to a screeching halt. The strategy was, in large part, an effective one. However, Germany severely hindered its own ability to starve the UK into

¹ Norman Stone, *World War Two* (New York: Perseus Books Group, 2013), 41.

submission through submarine warfare by splitting its naval production between surface vessels and U-boats.

First, it is important to understand a few important statistics. Of utmost importance is the tonnage sunk by both U-boats and surface raiders by the Kriegsmarine. Following right behind is the amount of tonnage built by the Kriegsmarine during the interwar period through the end of World War II. The comparison of these two statistics will be the first piece of evidence which shows that the U-boat strategy was the most effective strategy that Germany had at sea, and why splitting the production of naval vessels between surface ships and submarines was costly to Germany's ability to cripple the British nation.

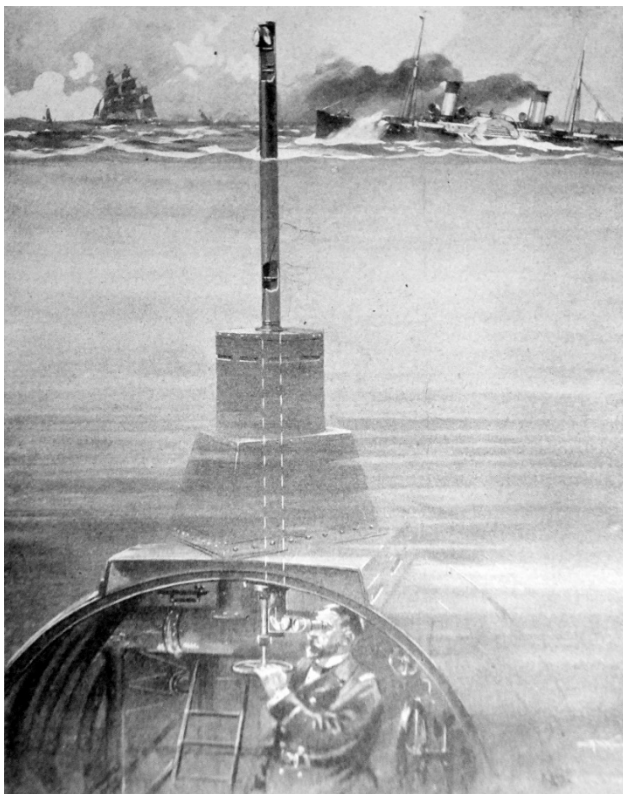


Figure 1. Lot-3632-7: Periscope of a German Uboat during battle
National Museum of the US Navy, "Lot-3632-7," Library of Congress.

During the war, hundreds of thousands of tons of Allied shipping were sunk as a result of Kriegsmarine raids. Both surface and submarine raiders were responsible for these losses. As a brief comparison, the small fleet consisting of the Gneisenau, Scharnhorst, and Admiral Hipper sank 115,000 tons of merchant shipping between January and March of 1941. For March and April alone of the same year, German U-boats sank nearly 500,000 tons of Allied merchant shipping.² According to uboat.net, during the war, a total of 14.1 million tons of Allied shipping were lost to U-boats. The same source accounts these losses for roughly 70% of tonnage lost by the Allies during the war.³

It is extremely evident that U-boats were effective at sinking merchant shipping. They were hidden terrors, making them even more efficient than the cruisers and pocket battleships created for the exact same role. They were also much more efficient at remaining hidden in close proximity to Allied coastlines. According to the May 13, 1942 issue of the New York Times, a freighter was sunk in the St. Lawrence River in Canada, and the U-boat was never seen. At the time of the article, searches were still ongoing for the submarine.⁴ U-boats were effective at being hidden killers, responsible for more merchant shipping loss than the Kriegsmarine's surface fleet.

The next figure to look at is regarding the German naval production through the interwar period to the end of the war. In terms of U-boats, Germany produced 63 U-boats between 1935 and 1939, a rather small number of vessels relative to their size and crew compliments. This was largely due to disagreements between High Command and Kriegsmarine admirals regarding the

² Murray Williamson, "Why Germany's Kriegsmarine Lost the Battle of the Atlantic," HistoryNet (World History Group), accessed November 9, 2019, <https://www.historynet.com/why-germanys-kriegsmarine-lost-the-battle-of-the-atlantic.htm>.

³ "How Many Ships Did the U-Boats Sink?" uboat.net, 1995, <https://uboat.net/special/faq.htm?question=4>.

⁴ "U-Boat Sinks Ship in St. Lawrence," *The New York Times*, May 13, 1942, 1.

tactical uses of the submarines.⁵ By the latter half of 1941, German naval yards were delivering up to 20 U-boats every month. This was still less than the expected number of U-boats every month.⁶ Reasons for the lack of U-boat production include resource shortages, as well as disagreements with naval brass. These issues will be discussed in more detail further on in this text. In terms of surface vessel production, Germany possessed, in 1933, the following: battleships Scharnhorst and Gneisenau, pocket battleships Scheer and Graf Spee, heavy cruiser Admiral Hipper, twenty-two destroyers, and “some” torpedo boats. Battleships Bismarck and Tirpitz were under construction, as well as five heavy cruisers, eight destroyers, “some” torpedo boats, and two aircraft carriers.⁷ Altogether, throughout the war, Germany produced 1,156 U-boats and 30 surface ships, not including the torpedo boats, as well as several surface ships that Germany had prior to the start of the war.

Germany did in fact place a paramount importance on constructing surface vessels in the early stages of the war. This is evident when looking at Admiral Raeder’s proposed Plan Z. Plan Z’s major goal was to create a navy strong enough to challenge Britain’s Royal Navy on the High Seas.⁸ Had the plan gone completely through, Rob Arndt estimates that the Kriegsmarine would have been approximately 800 units in size, and would include 13 battleships/battlecruisers, 4 aircraft carriers, 15 pocket battleships, 23 cruisers, 22 reconnaissance cruisers, and dozens of

5 Karl Dönitz, *Memoirs Ten Years and Twenty Days* (London: Frontline Books, 2012), 47.

6 Dönitz, *Memoirs*, 125.

7 Karl Dönitz, *The Conduct of the War of Sea*, (Auckland: Pickle Partners Publishing, 2014), 15-16.

8 Matthew Connors, “The Kriegsmarine and Compound War at Sea in WWII,” Center for International Maritime Security, December 31, 2018, <http://cimsec.org/the-kriegsmarine-and-compound-war-at-sea-in-wwii/38813>.

torpedo boats.⁹ The plan was a flagrant violation of the 1935 and 1937 Naval Agreements, which limited the Kriegsmarine to a total fleet tonnage of 35% that of the Royal Navy, except for submarines, which were limited to a total fleet tonnage of 45%.¹⁰

There was, as aforementioned, a massive disagreement within the Kriegsmarine brass regarding both the tactical use of submarines as well as which overall naval strategy to practice. Grand Admiral Erich Raeder states in his book, *My Life*, that Hitler had a very large-scale way of thinking regarding the Kriegsmarine. Raeder stated that Hitler wanted a designed put together that would see an equality of submarines with Britain, while the surface vessels that Germany was allowed to have according to the London Naval Agreement was to be of such high technological advancement that they could match Britain's superior numbers.¹¹ On the other side of the argument was Grand Admiral Karl Dönitz, who argues that submarines were a "first class weapon of offense," and that even though under the Naval Agreement Germany was limited to only 24,000 tons of submarine shipping, this could be spun as a result of Britain's lack of submarines, making an argument for why it would be acceptable for Germany to violate the Naval Treaties.¹² Dönitz argues for a focus on submarine construction and use as a primary method of naval offense. This has a serious impact on the Kriegsmarine's naval construction program throughout the war, and it would continue to be a frustration for Karl Dönitz, who would state that the necessary buildup of U-boats by Germany would never happen.¹³

9 Rob Arndt, "Z-Plan H-Class Super battleships," Strange Vehicles, accessed November 11, 2019, <http://strangevehicles.greyfalcon.us/Z.htm>.

10 "The German Navy," *The Times*, February 3, 1939, 13.

11 Erich Raeder, *My Life* (Annapolis, MD: Naval Institute, 1960), 268-269.

12 Dönitz, *Memoirs*, 9-10.

13 Dönitz, *Memoirs*, 119-125.

The next important statistic is the Kriegsmarine's losses during the war. Throughout World War II, the Kriegsmarine lost 7 capital ships, 6 cruisers, 7 raiders, and 27 destroyers, totaling 47 major surface ships. Under the surface, the Kriegsmarine lost 780 U-boats throughout the war.¹⁴ Take these casualty statistics in comparison to the nation's production. As already shown, Germany produced 1,156 U-boats and 30 surface vessels (bolstered by the older ships already in service). In terms of losses, the Kriegsmarine lost more surface ships than it produced throughout the war, while 67% of submarines produced were lost. It is also important to note that most of these submarine losses occurred in 1943-1945. U-boat losses during these three years account for 628 of the 780 submarines lost. Conversely, 20 of the 47 surface vessels lost during the war were lost between 1939-1942.¹⁵ The Kriegsmarine not only lost more in terms of surface vessel tonnage throughout the war than submarine tonnage but also experienced a much higher ratio of surface vessel loss to U-boat loss in the years before 1942.



Figure 2. The Wreck of the Bismarck
Dr. Robert Ballard, "The Wreck of the Bismarck," Discovery Channel, 2002.

To this point the prevailing evidence to prove that submarine warfare was more effective at starving the UK has merely to do with the serviceable ships available, how many ships have

14 "British Losses & Losses Inflicted on Axis Navies," Major British & Dominion Warship Losses in World War 2 (National Museum of the Royal Navy), accessed November 13, 2019, <http://www.naval-history.net/WW2aBritishLosses10tables.htm>.

15 Ibid.

been manufactured, how many losses were suffered, and how much tonnage was sunk. However, a secondary, but possibly even more important factor in the production of naval vessels, and a gleaming positive reason for focusing on submarine warfare, is the availability, or lack thereof, of resources needed to manufacture and operate ships. The basic resources needed for the manufacture and long operation of naval vessels include steel, oil or fuel, and manpower.

In all three of these areas Germany experienced large scale scarcity. Steel, for example, was extremely scarce, especially for Kriegsmarine use. In Paul Hehn's book, *A Low, Dishonest Decade*, Hehn discusses the state of the German steel industry before the war. He notes that Hitler was under intense pressure to do something about the depressed industry, and to confront the massive tariffs on steel being pressed by the French, because the German steel industry was under threat of total collapse.¹⁶ During prewar Weimar Germany, the steel industry was a quagmire of steel cartels and syndicates. Even in peacetime, Weimar Germany suffered from shortages of both steel and the semi-trucks to deliver the steel that was there.¹⁷

Germany's wartime economy was in just as much of disarray. There was no single entity in control of steel production, and the distribution of raw steel occurred on a quarterly basis. This was accomplished by processing requests from the leaders of each sector of production. The claim requests were in shambles as well. Generally, the head of a production sector would never be allocated what they requested. To ease this issue, they would request more than they could use, and this would result in each sector of production receiving more than they needed, even though they never received what they asked for.¹⁸ To add to this, Germany suffered from shortages of

¹⁶ Paul N. Hehn, *A Low Dishonest Decade* (New York: Continuum, 2005), 40.

¹⁷ Gerald D. Feldman, *Iron and Steel* (Princeton, NJ: Princeton University Press, 1977), 60-63.

¹⁸ Alan S. Milward, *The German Economy at War* (London: Bloomsbury Publishing, 2015), 53.

steel, which came as a result of bottlenecks in production. This was largely due to Hitler's attempt to move away from steel manufactured from imported Swedish ore, the importation of which was a result of the Treaty of Versailles forcing Germany to surrender the ore mines of Lorraine to France. Hitler wanted to replace imported Swedish ore with domestic ore. Hitler completely reworked the mining industry in order to gain enough ore to produce enough steel that Germany did not have to rely on Swedish ore. However, Hitler failed to devote enough capital to the project.¹⁹ This resulted in the bottlenecks, causing large steel shortages.

When it comes to using steel in the manufacturing of ships, U-boats require far less of it than many surface vessels. For example, the type 1936 destroyer (The smallest class of major warship) displaced 2,411 tons.²⁰ In stark contrast, the Type VIIC U-boats displaced at most 871 tons.²¹ This is a remarkably large difference, even between U-boats and destroyers. However, it is important to consider the displacements of the larger vessels that the Kriegsmarine built. The Bismarck and Tirpitz displaced 41,676 and 42,900 tons, respectively.²²

Another important resource critical to the operation of any ship is oil. This is a resource so important, in fact, that on all sides, strategies to wage this war were largely centered around oil. For example, one of the key objectives of Operation Barbarossa, Germany's invasion of Russia,

19 Milward, 4.

20 H. T. Lenton, *German Warships of the Second World War* (New York: Arco Pub. Co., 1977), 71.

21 Lenton, 160.

22 Lenton, 46.

were the efficient and productive oil fields that occupy the Caucasus region.²³

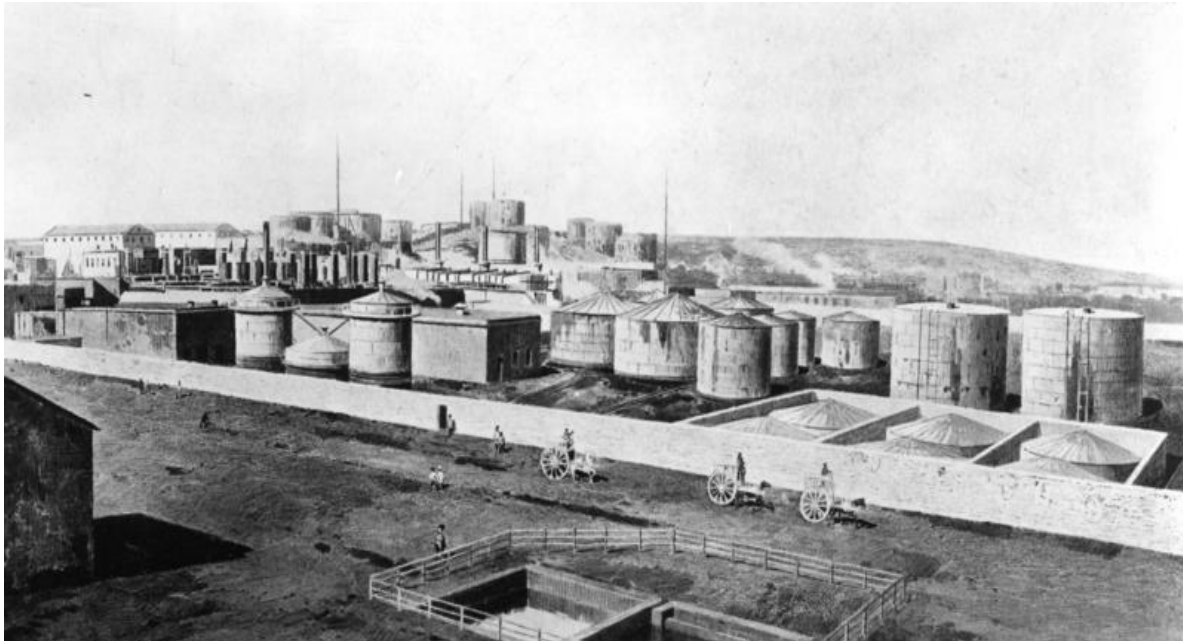


Figure 3. Oil Fields at Baku
Scherl Bilderdienst, “Bundesarchiv Bild 183-R00738, Baku, Erdöl-Tanks.jpg,” Bundesarchiv (1912).

Each nation involved in the war had its own problems with oil and fuel, even the allies. At the start of the war, Britain only had enough oil for 5 weeks of overland transport, and only possessed enough fuel to sustain the Royal Navy for 2 months.²⁴ The importance of oil during the war, the difficulties caused by oil shortages, and the consequences of such shortages are so vast that the topic warrants its own study. Germany’s oil shortages were unlike Britain’s, however. Britain, at the very least, had an empire that included regions of oil producing territory. Germany

²³ Joel Hayward, “Hitler’s Quest for Oil:” *Journal of Strategic Studies* 18, no. 4 (January 24, 2008): [https://kclpure.kcl.ac.uk/portal/en/publications/hitlers-quest-for-oil-the-impact-of-economic-considerations-on-military-strategy-19411942\(7d3979b3-1977-4f5e-8f29-73835faea16e\).html](https://kclpure.kcl.ac.uk/portal/en/publications/hitlers-quest-for-oil-the-impact-of-economic-considerations-on-military-strategy-19411942(7d3979b3-1977-4f5e-8f29-73835faea16e).html).

²⁴ “Lesson 6 - Oil Strategy and World War II,” (Penn State University), accessed November 23, 2019, <https://www.e-education.psu.edu/egee120/book/export/html/237>.

had no such empire. Likewise, Germany also had no domestic oil reserves. Thus, much of the European fighting during the war was conducted with the strategic objective of securing oil.²⁵

The Kriegsmarine suffered greatly due to the oil shortages in Germany. Germany's policy under the National Socialists was a complete reversal of the Treaty of Versailles, opting to rearm the German military in violation of the Treaty's clauses limiting the military to 100,000 men and no air force, as well as the forbiddance of the manufacture of aircraft, tanks, and even submarines.²⁶ In order for rearmament to occur, Germany would have to decide how to best allocate its limited resources of oil. To the Kriegsmarine's dread, Hitler decided that the oil stock could be best used within the Wehrmacht and Luftwaffe, powering the nation's tanks, armored cars, and aircraft, rather than the ships.²⁷ This left the Kriegsmarine in a bind. According to the terms of Hitler's Z-Plan for ship building, after all the ships were manufactured, the Kriegsmarine would require more fuel than Germany produced in the whole country.²⁸

In terms of using fuel to operate warships, U-boats once again proved to be the more efficient choice. Take, for example, the Bismarck, which consumed approximately 8.3 tons of fuel per hour if the ship is sailing at a speed of 18 knots.²⁹ In stark contrast, U-527, a Type IXC submarine, consumed only 160 liters of diesel fuel per hour sailing at the same speed.³⁰ Obviously,

25 Gregory Brew, "How Oil Defeated the Nazis," OilPrice.com, January 1, 1970, <https://oilprice.com/Energy/Crude-Oil/How-Oil-Defeated-The-Nazis.html>.

26 "Treaty of Versailles," *Encyclopedia Britannica* (Encyclopædia Britannica, Inc., November 7, 2019), <https://www.britannica.com/event/Treaty-of-Versailles-1919>.

27 Anand Toprani, "'The Navy's Success Speaks for Itself?'" *Naval War College Review* 68, no. 3 (July 2015): <https://digital-commons.usnwc.edu/nwc-review/vol68/iss3/7/>

28 Anand Toprani, "'THE NAVY'S SUCCESS SPEAKS FOR ITSELF?':" <https://digital-commons.usnwc.edu/nwc-review/vol68/iss3/7/>.

29 Eric Grove, *German Capital Ships and Raiders* (London: Taylor and Francis, 2013), 45.

30 H.C. Train, *Report on the Interrogation of Survivors*, US Navy Dept. Washington DC, (1943), 3.

there will be stark contrasts between the fuel usage of a 1,000 ton submarine and a 41,000 ton behemoth of a ship. However, when looking at other, smaller classes of surface ship, U-boats still come out on top regarding fuel consumption. The Z-23, a type 1936A destroyer, consumes 3 tons of fuel per hour.³¹ To add to the raw statistical numbers that show U-boats were more fuel efficient than surface vessels, additional evidence acts as a clear indicator of this fact, especially when the effects of when U-boats are seen, and yet they unable to be found, on the east coast of the American continents.³² Meanwhile, surface raiders such as the Graf Spee relied on rendezvousing with friendly merchant tankers to refuel. The Graf Spee met up with the Altmark several times in the South Atlantic in order to refuel, resupply, and transfer prisoners.³³ These statistics and occurring events in the Atlantic are evidence that submarines are more efficient with the limited supply of oil that Germany had during the war.

Steel and oil, however important, were not the only two major resources needed to run a naval vessel. Every naval vessel requires manpower. Manpower was an issue for Germany, as the nation was fighting a very expensive war in terms of loss of life. Between September 1, 1939 and January 31, 1945, the German armed forces suffered a total loss of 8,333,978 men. This includes wounded, missing, and captured soldiers, sailors, and airmen.³⁴ By the time mainland Europe was in full conflict on east and west, Germany's manpower shortage was at a point that it was proving to be a major advantage for the allies. Also, the manpower shortage in Germany proved to be a major social change, as large numbers of women in postwar Germany remained unmarried, if only

31 Erich Gröner, Dieter Jung, and Martin Maass, *German Warships* (Annapolis, MD: Naval Institute Press, 1990), 203-204.

32 "U-Boat Sinks Ship in St. Lawrence," *The New York Times*, New York, (May 13, 1942), 1.

33 Gerhard Bidlingmaier, *KM Admiral Graf Spee* (Windsor, England: Profile Publications, 1971), 80.

34 Martin K. Sorge, *The Other Price of Hitler's War* (New York: Greenwood, 1986), 62-63.

because there were no men to marry.³⁵ In fact, at the end of the war, the German manpower shortage had become so egregious that certain divisions of the Hitler Youth program were transitioned into combat units, with the 12th Division being one of those. These divisions suffered extremely high casualties, not unlike divisions of adult soldiers.³⁶

However, once more, manpower is a subject in which U-boats excelled above surface vessels. The standard comparison applies between destroyer and U-boat. The type 1936A destroyers required a complement of 321 sailors and officers while the type VIIC U-boat only required a complement of 44 sailors and officers. Moreover, the larger ships of the Kriegsmarine required much more manpower than that. The Bismarck and Tirpitz, for example, required 2,192 and 2,530 men respectively.³⁷ The lower manpower requirements of the Kriegsmarine's U-boats were an advantage to a Germany suffering from severe shortages of manpower.

One final piece of evidence proving the submarine's superiority, especially in the early days of the war, has to do with Germany's wartime position, as well as the technological position of Germany's enemies. In July of 1940, Germany only had one functional enemy remaining: Britain. Even as the year progressed and Operation Barbarossa began, Britain remained Germany's only major naval combatant. The Soviet navy was small, and only meant as a defensive force.³⁸ The resistance that the Kriegsmarine could expect out of the Royal Navy in 1940 was not from a position of effective anti-submarine warfare. In fact, British merchant convoys, of which were the targets of the Kriegsmarine, lacked the destroyer screen generally used to escort merchants across

35 Sorge, 40 & 66.

36 Jean-Denis G.G. Lepage, *Hitler Youth, 1922-1945* (Jefferson NC: McFarland, 2009), 133.

37 Lenton, 75, 160, & 46.

38 "Soviet Navy in ww2," naval encyclopedia, accessed November 25, 2019, <https://www.naval-encyclopedia.com/ww2/soviet-navy>.

the Atlantic. This was until the United States' "destroyer base trade," during which the US traded 50 obsolete destroyers for a lease on a British naval base. This, according to Admiral Erich Raeder, completely compounded Kriegsmarine's problem of being outnumbered.³⁹

Britain also lacked any reliable method of detecting the German submarines. This remained true until the development and deployment of radar and ASDIC systems in late 1942. Although large, coastal based radar systems did exist in 1940, they were primarily used to detect large waves of air targets during the Battle of Britain.⁴⁰ It wasn't until new technologies deployed and the Royal Navy acquired large numbers of antisubmarine and escort vessels, as well as new radar systems, that German U-boats started having difficulty sinking British merchant shipping.

It has been made clear that Germany's submarines were more effective in sinking merchant tonnage than surface ships. It has also been made clear that submarines were all around more efficient vessels to build and operate, particularly in a nation suffering from economic strife with shortages of everything, from oil to steel to men. Finally, the point stands that at the beginning of the war, Britain was entirely unprepared to face unrestricted submarine warfare. Britain was, however, very successful in sinking the surface raiders, cruisers, and battleships that Germany deployed. Essentially, Germany wasted valuable time and resources on large surface vessels, only for them to be sunk without causing any considerable damage to the Allies. All of these points add together to show that Germany severely hindered her own ability to sink enough merchant tonnage to starve Britain out of the war, just what Britain had done to Germany 25 years earlier, before the United States joined the war. The failure of Germany to do this led to a prolonged war during which it was inevitable to lose.

³⁹ Raeder, *My Life*, 346.

⁴⁰ "Anti-Submarine Detection," Juno Beach Centre, August 19, 2019, <https://www.junobeach.org/canada-in-wwii/articles/anti-submarine-detection>.

About the author

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