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The *SMS Ostfriesland*: A Warship at the Crossroads of Military Technology

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THE *SMS OSTFRIESLAND*: A WARSHIP AT THE
CROSSROADS OF MILITARY TECHNOLOGY

BY

WESLEY R. HALE

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF

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MASTER OF ARTS THESIS

OF

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ABSTRACT

In the 21st century, the applicability of aeronautics in civilian and military life is common place. The use of planes allows loved ones to visit each other across countries and continents, reducing what was once an almost insurmountable distance to a few hours of discomfort. Military strategists accept as a matter of course that the nation that controls the skies will often control the field below. The 21st century features human control of the skies as a fact of life. The use of planes as a form of transportation is thought of little more than the use of trains and automobiles as fixtures in daily business. Yet what is now taken for granted has only existed for a single century. At its genesis, airpower faced its opponents and witnessed its champions.

The following thesis is a technological history in which the German battleship *SMS Ostfriesland* serves as a focal point for the technological changes in the early 20th century. From the ship's commission during an era dominated by battleships and fleet action, to its demise as a target in an aerial bomb test, the *Ostfriesland* provides a snapshot into the technological history of naval warfare and the development of modern military thought.

ACKNOWLEDGMENTS

When I tell my friends and family about my pursuits as an historian, many of them have a vision of me holed up in an archive somewhere, poring over some dusty scrolls that haven't been seen by another human before I decided to investigate some little-thought of history. While their vision is close to the truth, the underlying assumption that I work in a virtual vacuum, cut off from the rest of society, is false. Historians rarely work alone, even if they complete most of their work in solitude. I have many people to acknowledge for their assistance in the completion of this project, and while most of the work was done alone in an archive or at my desk, the guidance and support of my friends and mentors proved an invaluable asset throughout the course of this endeavor.

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PROLOGUE

When the Great War ended in 1918, Imperial Germany's soldiers and sailors were demoralized and angry at their defeat. During the Armistice, Britain interred the bulk of Germany's battle fleet at Scapa Flow until the combatants could negotiate an official end to the war. At the end of the war, Germany had nothing of value to bargain with, leaving their fate in the hands of their bitter enemy. Rather than surrender to that fate, the commander of the interned fleet, Admiral Ludwig von Reuter, gave the order for his captains to scuttle their ships, depriving the Allied and Associated Powers of their coveted war prizes.¹ The ratification of the Treaty of Versailles in 1919 mandated that the *Kaiserliche Marine*, Imperial Navy, be decommissioned and portioned out to the Allied and Associated Powers in accordance with Article 185. To replace the vessels lost at Scapa Flow, the Allied and Associated Powers demanded an additional five light cruisers and 400,000 tons of docks, tugs, dredges, cranes, and other support equipment.²

The sailors of the *Kaiserliche Marine* resisted their vanquishers with a variety of unique and non-violent methods, but no less effective. With the surrender of their fleet to the Allies at Rosyth, the German sailors not only refused to clean their vessels before transferring custody, but actively defiled them through mechanical and biological sabotage. In many ships and submarines, the sailors rendered the engines inoperable. With others, they looted anything that could be taken, and damaged what

¹ Dan Van Der Vat, *The Grand Scuttle: The Sinking of the German Fleet at Scapa Flow in 1919*, (Edinburg, Scotland: Berlinn Ltd, 2007).

² Holger Herwig, *"Luxury" Fleet: The Imperial German Navy 1888-1918*, (New York: Routledge, 1980), 256.

couldn't. Doors were loosened from their fastening catches and watertight compartments were sabotaged.

More than just damaging the equipment on board the vessels, the sailors also refused to clean the ships before handing them over to their new wardens. The natural buildup of dust and grime that accompanies the operation of a warship created a dingy environment that tarnished the prestige that came with the capture of a high-profile prize like the German Battle Fleet. The filth was compounded by blatant acts of defilement by German sailors who were especially intent on complicating the jobs of the Allied and Associate Powers taking custody of the ships by defecating in the sinks and otherwise disposing of their human waste in several places throughout the ships excluding the intended lavatories. The acts of vandalism served as forms of resistance from a frustrated and war weary fleet that was underutilized during the Great War. Once their ability to wage war had been neutralized, the vanquished sailors resisted with the only means left to them: sabotage and wanton destruction.

In 1921, the United States took possession of its 'victory fleet' of four submarines, three torpedo boat destroyers, the light cruiser *Frankfurt*, and the battleship *Ostfriesland*. Many of the vessels in the U.S. share of spoils were the most decorated and prestigious vessels of the *Kaiserliche Marine*, though they also experienced the vandalism of their former crews. American inspectors and engineers assessed the damage done to the vessels, and while many ships were repaired enough to make the trans-Atlantic crossing, the submarines and the *Frankfurt* had to be towed to their North American ports for their display to the American public as war trophies.

As spoils of war, the German vessels represented physical symbols of the American victory in the Great War. *The New York Times* described the ships as agents to “play a part in reducing the world to Teutonic thralldom. And now, like any human felons, they are to meet the ignominy of execution.”³ In 1921 the ships were transferred to the Department of Aeronautics in the United States Navy where they were used as targets in a series of weapons tests off the coast of Virginia. Some fell to the guns of American battleships, and others, like the *Ostfriesland*, sank as a result of aerial bombardment.

The vandalism and sabotage that characterized the German naval resistance after the war has its roots in the war itself. The following pages describe those origins and place them in the context of changing attitudes about naval warfare and the future of fleet action in the 20th century. The apparent underutilization of the High Seas Fleet during the war was a contributing factor to the diminishing morale that led to mutiny, but underutilization itself was a signifier of evolving attitudes about the role of the battle fleet in wartime. The following thesis seeks to address those evolving ideals and provide the context that will help explain the motivations of the German sailors to vandalize their ships at the end of the war.

³ “German Prize Ships Reach This Port,” *New York Times*, August 10, 1920.

CHAPTER 1

INTRODUCTION

In the 19th century, Admiral Alfred Thayer Mahan wrote his famous work *The Influence of Sea Power Upon History*, in which he utilized historical conflicts to demonstrate the significance of control of the seas in achieving wartime victory. By commanding the waterways and sea lanes, maritime nations achieved victory by disrupting enemy supply lines while protecting their own, as well as removing the sea as an option for retreat. In the Napoleonic Wars, British victory was less attributed to the tactics of the Duke of Wellington and more to Admiral Lord Horatio Nelson's ability to out maneuver and outfight the French at sea. Those victories led to a tradition in which maritime powers considered the ship of the line the pinnacle of naval technology, a behemoth unmatched by any vessel of a lower class.

In 1921, Brigadier-General William "Billy" Mitchell published a book titled *Our Air Force, The Keystone of National Defense*, in which he argued the nature of warfare was shifting from the sea to the air. Mitchell emphasized the United States' history of introducing technological advances and then abandoning them while other nations continued research and development. Regarding air power, Mitchell noted that "although the United States was the first nation to demonstrate the practicability of heavier-than-air flight, we allowed ourselves to become so deficient in the development of this science that we were hopelessly behind when the war in Europe

started.”⁴ In *Our Air Force*, Mitchell utilized Mahan’s own arguments against the Navy, emphasizing the use of aerial bombers and control of the air as superior to the battleship and its command of the sea.

Mitchell’s foresight into the significance of air power was ahead of its time. In retrospect, while his arguments seem obvious, the Naval Bureau of Aeronautics found them difficult to acknowledge. To demonstrate the legitimacy and effectiveness of aerial combat against battleships, Mitchell and his Army pilots participated in a series of bomb tests in which the use of bombs ranging in size from 180 to 2000 pounds against surrendered German vessels would demonstrate the destructive power of aerial bombardment against battleships. To the Navy’s great chagrin, Mitchell frequently violated their testing parameters, refused to wait for orders, and blatantly defied orders in the final run of the experiments. Mitchell’s actions served him in making his case about the applicability of air power in naval combat, but his methods antagonized the navy, increasing the political and professional divide that characterized his quest for a unified air service.

As a condition of the Versailles Treaty, which went into effect in 1920 and signified the official end of the First World War, the Allied and Associate Powers forced Germany to surrender a large portion of its fleet to the Allied powers as a portion of the reparations package.⁵ The United States received a small fleet consisting of submarines, destroyers, light cruisers, and the battleship *Ostfriesland*, and the Treaty stipulated that the United States must destroy the vessels or otherwise

⁴ William Mitchell, *Our Air Force, the Keystone of Our National Defense*, (New York: E.P Dutton and Company, 1921), Xviii.

⁵ Van der Vat, *The Grand Scuttle*, 160.

render them unfit for military service by August of 1921, though the method of destruction remained vague. General Mitchell seized the opportunity to argue for his bomb tests, which he believed would demonstrate the superiority of air power. The United States Atlantic Fleet assembled in Chesapeake Bay in the early summer of 1921 to observe Mitchell's Project B tests, which demonstrated the destructive power of aerial bombardment against various classes of vessels, providing evidence to Congress that air power was effective against maritime fleets, both civilian and military, and that with a unified air force under his command Mitchell could render navies obsolete. The first stage directed fire at the submarines and destroyers and utilized small bombs around 180 to 200 pounds. The results demonstrated conclusively that planes were highly effective against light craft such as "transports, merchantmen, or any kind of vessel not protected by armor."⁶ As the classes of ships increased in size, the experiment utilized bombs of greater explosive power which achieved the same success as experienced with the smaller classes.

Mitchell and his pilots knew that the Navy would not be satisfied with the destruction of smaller, lightly armored vessel, as many of them "considered this trial to be utterly useless, because they reasoned that it was entirely impossible to sink, or even injure, a battleship. That, neither could a battleship be hit by an aerial bomb, and, if it were hit, could it be damaged to any great extent."⁷ While the success of the smaller tests was integral to the larger argument, Mitchell knew that the real demonstration must be against a battleship of significant size and strength for

⁶ William Mitchell, *Winged Defense: The Development and Possibilities of Modern Air Power – Economic and Military*, (Port Washington, New York: Kennikat Press, 1925), 64.

⁷ *Ibid*, 56.

Congress and the military traditionalists to be convinced of the practicability of military aircraft. Among the German warships surrendered to the United States was the *SMS Ostfriesland*, a *Helgoland*-class battleship that was one of the most decorated and powerful ships in Germany's High Seas Fleet. Designed to engage the best battleships of the British Navy, the *Ostfriesland* displaced 22,800 tons, had a top speed of twenty-one knots, and was powered by coal-fired triple expansion engines. The major design feature that made German warships unique were their 30.5cm guns and 50cm torpedoes.⁸ The size of Germany's guns characterized their approach to naval warfare, which was deeply rooted in Wilhelm's and Tirpitz's study of Mahan. Without the rich maritime heritage possessed by England, France, and Russia, Germany was fervently trying to catch up to her more experienced naval rivals. The larger caliber guns were indicative of the shifting attitudes about naval warfare which began with Britain's development of the *Dreadnaught*, a fast battlecruiser with fewer, more powerful weapons and longer range that the British Admiralty believed would usher in a new age of naval warfare.

Laid down in 1908, the *Ostfriesland* occupied a critical space in the history of naval warfare. Designed to contend with the larger fleet of battleships that characterized the era of Pax Britannica, Kaiser Wilhelm and his Admirals envisioned the *Ostfriesland* and her sister ships in the High Seas Fleet elevating Germany to a maritime power in line with A.T. Mahan's notion of military strength. First published in 1890, Mahan's book *The Influence of Sea Power Upon History, 1660-1783* argued that numerical superiority accounted for much of the maritime success of the major

⁸ Herwig, "Luxury Fleet," 64.

world powers against their enemies. While he highlighted several naval battles throughout history, Nelson's victories at the Battle of the Nile and Trafalgar were both particularly important to this argument and still relatively recent history. To that end, Mahan begins his introduction with a discussion of the basic tactics of those battles, which were "to choose that part of the enemy's order which can least easily be helped, and to attack it with superior forces."⁹ Mahan's work became one of the most influential geo-political pieces of its time, eventually becoming recommended reading for every major world leader with global ambitions, including Theodore Roosevelt and Wilhelm II. His book became a manual that set the naval standard to which all major powers subscribed, and to which Imperial Germany aspired.

At the beginning of the 20th century, England possessed the largest navy in the world, having established in 1889 a Naval Defense Act that formalized the "'Two Power Standard' of parity with the next two naval powers, France and Russia."¹⁰ Kaiser Wilhelm II sought to earn prestige as a monarch by elevating Germany to a maritime power in the same manner his grandfather Wilhelm I had transformed the Prussian Army to unify Germany under one flag. Unlike his grandfather, whose reorganization efforts benefited from a long history of military institution, where the Prussian army was a fixture of society, Wilhelm II faced the challenge of developing a formidable navy in a country lacking a cohesive naval tradition.

This thesis looks at the *Ostfriesland* as a battleship built during a crossroads of naval technology. By tracking the ship's construction and service history up until her

⁹ Alfred Thayer Mahan, *The Influence of Sea Power Upon History: 1660-1783*, (New York, NY: Dover Publications, Inc., 1894), 11.

¹⁰ Peter Padfield, *Maritime Dominion and the Triumph of the Free World: Naval Campaigns that Shaped the Modern World*, (New York, N.Y.: The Overlook Press, 2012), 59.

ultimate demise as an American test subject, the ship's history reveals the degree to which Wilhelm II achieved his goals, and the extent to which the *Ostfriesland* illustrates changes and innovations in naval technology. By studying this battleship, this thesis will explore in greater detail the German naval strategy in relation to the standard set by Mahan and upheld by Great Britain, an approach that few historians have taken. This is not a German naval history, nor is it a history of the First World War, though there are strong elements of both within the following pages. Rather, it is a history of technological advancements, and how those advancements contributed to an international shift in attitudes about naval warfare. The *Ostfriesland* began her life in a world dominated by the prophet of sea power A.T. Mahan and met her fate at the hands of Billy Mitchell, whose crusade for air power would spell the beginning of the end for the battleship's dominion over the sea. Through a study of the *Ostfriesland*, this thesis argues that World War I and the technological developments associated with it represented the transition from the sea to the air as the determinant factor in victory over a country's enemies.

HISTORICAL CONTEXT

After the British navy defeated the combined fleets of France and Spain at the Battle of Trafalgar in 1805, it effectively established itself as the superior naval force in the world, beginning an era that became known as Pax Britannica, or a peace enforced by British rule. None of England's traditional rivals were able to match the enormous size of the British fleet, and while the United States and Japan were quickly

establishing a presence for themselves on the world stage, neither could challenge Britain at the turn of the century.¹¹

In April of 1897, during Queen Victoria's Diamond Jubilee, Britain displayed its naval strength in an extravagant exhibition of force near the port of Spithead located on the southern coast of England. Six columns of warships, each five miles in length, a sight that *The Times* glorified by reporting that "it is at once the most powerful and far-reaching weapon which the world has ever seen."¹² The display not only demonstrated the power of the Empire, but also the discipline and tradition that made Royal Navy the standard of naval custom to which aspiring navies must strive to imitate if they seek recognition as a viable naval force. While the world witnessed the magnificent naval parade with awe, Germany announced her plan to build a sizable battle fleet focused in the North Sea, a direct challenge to Britain's Home Fleet, her only defense in those waters.

Kaiser Wilhelm II and Grand Admiral Alfred von Tirpitz envisioned a battle fleet of 41 battleships, 20 large cruisers, and 40 light cruisers with which to protect the colonial holdings Germany had obtained under the guidance of Chancellor Otto von Bismarck during the 1880s. As would-be disciples of Mahan, Wilhelm and Tirpitz subscribed to the notion that Germany required a strong navy to support their colonial holdings and imperial aspirations. Unfortunately, Germany lacked a naval tradition on the scale of its rival empires. The country was young compared to the other world powers, having only unified under the Prussian king in the 1870s following a series of

¹¹ Herwig, "Luxury Fleet," 1.

¹² "The Naval Review at Spithead," *The Times* (London, England), Friday, June 25, 1897, Issue 35239.

wars that shook the European continent. Germany's military tradition remained Prussian, and the ruler of Germany was determined through the Prussian bloodline. Voltaire had described Prussia's strength by noting that "where some states have an army, the Prussian Army has a state," and the military tradition permeated throughout the fiber that defined German culture.

After unification, the Reichstag frequently debated the issue of foreign expansion and German colonialism. In 1879 Dr. Friedrich Fabri, a Protestant theologian widely considered the father of German colonialism, wrote the book *Does Germany Need Colonies?* in which he argued that

as we see it, public sentiment is now, as a result of our general development during the last few years, fully prepared to apply itself with lively interest to the question of whether the German Reich stands in need of colonial possessions. The reasons for this change of mood are readily discernible. Three considerations may be said to be chiefly decisive in this connection: our economic position, the crisis in our tariff and trade policy, and our navy which is growing mightily.¹³

Fabri and his contemporaries felt strongly that a nation's prosperity required expansion, which required an overseas policy. During the century in which the British Royal Navy controlled the seas, an effective overseas policy was unfathomable without a navy powerful enough to demand respect for a nation's commercial interests in peace and to defend them in war. Despite the numerous advocates of colonial expansion, there remained powerful opponents to the notion of colonization in the so-called "French style."

¹³ Friedrich Fabri, *Bedarf Deutschland der Kolonien? Eine politisch-ökonomische Betrachtung* [Does Germany Need Colonies? A Political-Economic Reflection] (orig. 1879), 3rd ed. (Gotha, 1883.) http://germanhistorydocs.ghi-dc.org/sub_document.cfm?document_id=1867. Accessed 23 January 2018.

Chancellor Otto von Bismarck resisted the 19th-century European colonial practices, citing that they required too much government involvement and national expense. Instead, he favored colonies based on a Royal Charter in the tradition of Britain's colonies, where responsibility for government and protection lay solely with the colonists themselves.¹⁴ He described his approach to German colonialism by claiming that "our intention is not to establish provinces but rather to protect commercial enterprises. We will, however, use the most advanced methods to ensure their free development and protect them against attacks from their immediate neighbors and from oppression and damage wrought by other European powers."¹⁵ Though he was not opposed to individual efforts to expand German territory, Bismarck was reluctant to provide national aid until a colony had proven itself economically beneficial to the Reich.

His lack of interest in an overseas empire meant that Bismarck wanted the German navy to remain "a sea power of the second rank."¹⁶ Bismarck's primary concern lay with securing Germany's continental presence in the European political sphere, but in 1888 Wilhelm II ascended to the throne with visions of a grand German battle fleet, placing his and Bismarck's ambitions at odds. In March of 1890, the Kaiser dismissed Bismarck, obsessed with the notion that the world was about to undergo a reapportionment through which old empires would die and Germany would

¹⁴ William Harbutt Dawson, *Bismarck and State Socialism: An Exposition of the Social and Economic Legislation of Germany since 1870*, (London: S. Sonnenschein & Co., 1891), 149-51, reprinted in Theodore S. Hamerow, ed., *The Age of Bismarck: Documents and Interpretations*, (New York: Harper & Row, 1973), 305-307. [Please note: the final paragraph was omitted from Hamerow's anthology. Erwin Fink for German History in Documents and Images translated it.] http://germanhistorydocs.ghi-dc.org/docpage.cfm?docpage_id=2712. Accessed 23 January 2018.

¹⁵ *Ibid.*

¹⁶ Herwig, "Luxury Fleet," 15-16.

be able to rise. Wilhelm spent the first decade of his reign working to build the first iteration of the “High Seas Fleet,” commissioning several battleships and overseeing advances in vessel design. His obsession with control over the formation of his fleet led him to dissolve the Imperial Admiralty and replace it with two rival naval commands; the High Command and the Navy Office, effectively destroying unity between planning and command.¹⁷



Figure 1: Bernhard von Bülow

In the years immediately prior to Tirpitz’ appointment as State Secretary of the Navy Office, Wilhelm focused his attention on the construction of torpedo boats and a uniform design of battlecruisers that would be suitable for both protection of colonial possessions and service in the main battle fleet. This focus on smaller vessels was due in part to the French author Théophile Aube who challenged Europe’s reliance on ships of the line by arguing that torpedo-boats were the main weapon with which

¹⁷ Herwig, “*Luxury Fleet*,” 25.

secondary naval powers could hope to neutralize Britain's battleship superiority.¹⁸ Tirpitz himself was initially an ardent supporter of torpedo-boats, but with the publication of Mahan's *Influence of Sea Power Upon History* in 1890, both he and Wilhelm II embraced Mahan's model of naval superiority. In an 1897 address to the Reichstag, Foreign Minister Bernhard von Bülow, depicted in Figure 1, asserted that Germany must demand respect for its overseas holdings, especially those in Kiaochow, China.¹⁹ The tone of his speech was passionate, yet careful to avoid provocation of rival empires. The most famous line that proponents of a German battle fleet would use to justify naval expenditure came toward the end when he declared "we do not want to put anyone in our shadow, but we also demand our place in the sun."²⁰

The industrial revolution of the late 19th century helped inspire Germany to catch up with her rival powers that had the advantage of centuries to carve out their place on the world stage. The Empires of Britain and France, as well as the Western Frontier into which the United States was expanding, left Wilhelm and the German Empire with a sense of claustrophobia and constraint. When juxtaposed with the belief that the 20th century would involve shifts of power in Asia and South Africa, Tirpitz argued that the Imperial Navy had become a question of survival for Germany. He argued that if Germany were not prepared to take advantage of the anticipated power shifts with a large battle fleet, Germany "would sink back to the status of a poor farming

¹⁸ Herwig, "Luxury Fleet," 15.

¹⁹ Bildarchiv Preußischer Kulturbesitz.

http://germanhistorydocs.ghidc.org/sub_image.cfm?image_id=1705

²⁰ Stenographische Berichte über die Verhandlungen des Reichstags [Stenographic Reports of Reichstag Proceedings]. IX LP, 5th Session, Vol. 1, Berlin, 1898, p. 60. http://germanhistorydocs.ghi-dc.org/pdf/eng/607_Buelow_Place%20in%20the%20Sun_111.pdf. Accessed 23 January 2018.

country.”²¹ Historian Holger Herwig assessed Tirpitz political maneuvering and economic motives aptly:

Vast ship-building contracts would also act as a pump-primer for German Industry. Especially, regular placements of contracts would help to overcome the vicissitudes of the capitalist business cycle, and bring added prosperity to the German proletariat. Tirpitz description of the fleet as ‘a strong palliative against Social Democrats’ expressed his hopes for its effect in settling domestic social rifts.²²

Britain’s Two Power Standard in the last decade of the 19th century directly contributed to Germany’s feeling of inadequacy in her confinement to continental power status, rather than the world power it aspired to be. After the Spanish-American War, the United States developed a navy powerful enough to cause England to realize the limits of its Two Power Standard and presented a new maritime rival for Germany. Most of Germany’s political leaders became convinced that to secure their place in the sun, they would need foreign possessions and a battle fleet capable of challenging not only England but also America. In a letter to Admiral von Stosch dated February of 1896, Tirpitz argued that Germany’s growing industrial capacity demanded a strong navy. He asserted that German foreign policy had overlooked the political significance of naval power and wrote “if we want to go out into the world and increase our economic strength at sea, we will only construct a hollow edifice if we do not obtain a degree of naval strength.... Naval power is the only politically versatile type of power there is.”²³ Tirpitz then described a hypothetical war with England based on the

²¹ Herwig, *Luxury Fleet*, 35.

²² *Ibid.*

²³ Rear Admiral Tirpitz to Admiral von Stosch on the political function and significance of naval power in Germany’s relations with England (February 13, 1896) Bundesarchiv-Militärarchiv Freiburg, Nachlaß Tirpitz N 253/321

current naval capabilities of the respective nations, concluding that Germany's current battle fleet was incapable of securing victory against England without the intervention of France or Russia.

Germany's naval expansion was not unique. Aside from England and the United States, other industrialized countries were rapidly expanding their colonial holdings, which required naval protection. On its own, the first German Navy Law, which passed in 1898, was not unjustified nor unreasonable. It was significant and viewed with such apprehension because it directly challenged England and aimed to create a modern battle fleet stationed in the North Sea, poised to directly threaten Britain in its own waters. In June 1897, the same month Wilhelm appointed him Minister for the Reich Navy Office, Tirpitz wrote in a memorandum to the Kaiser that "our fleet must be so constructed that it can unfold its greatest military potential between Heligoland and the Thames."²⁴ Tirpitz chose the North Sea as the focal point for his battle fleet not only because it was one of Germany's only coastal regions, but it was also England's least protected region. There was no denying that the construction of a massive fleet in England's weak point would capture the attention of the most powerful navy in the world. To this end, the First Navy Law passed the Reichstag in the spring of 1898 and authorized the construction of "two homogeneous squadrons of eight battleships and one fleet flagship, seventeen capital units in all, each to be replaced automatically after twenty-five years."²⁵

²⁴Cited in Appendix. Johnathan Steinberg, *Yesterday's Deterrent: Tirpitz and the Birth of the German Battle Fleet*, (New York: The Macmillan Company, 1965).

²⁵ Padfield, *Maritime Dominion*, 80.

The following year, Wilhelm and Tirpitz doubled the size of the proposed fleet to four squadrons, establishing a three-ship per year pace. The push for further expansion required some explanation to the Reichstag. The argument Tirpitz presented was known as the “Risk Theory,” in which he asserted that

England’s second point of weakness is that it lacks an army to protect the mainland in the event that the home fleet is defeated. We will be secure from an English attack if it is possible for us to build a battle fleet that is capable of taking on England’s home fleet – raising the specter of a loss of this fleet and of an unprotected mainland.²⁶

Though it was far from the final realization of Tirpitz’s vision of a German battle fleet, the Novelle of 1900 was an important step in the naval arms race between Germany and England. The First Navy Law of 1898 and the subsequent Novelle of 1900 marked Germany’s official embrace of the battleship as the focal point of its High Seas Fleet and Germany’s earnest competition with the Royal Navy in an arms race that would have far-reaching consequences.

In 1905, First Sea Lord John “Jackie” Fisher sought to shake the Royal Navy out of a century of complacency to meet the danger presented by Germany’s growing battle fleet. Fisher’s vision for success involved phasing out Britain’s obsolete battleships and reforming the fleet into a modernized scheme of torpedo boats, submarines, and fast, lightly armored ships with uniform armaments of heavy guns, a class later designated as ‘battlecruisers.’²⁷ Britain’s advances in long-range gunnery further contributed to the mounting naval competition, and in 1905, Fisher

²⁶ The “Risk Fleet:” Excerpt from a draft memo from the Budget Department of the Imperial Naval Office on “Securing Germany against an English Attack”. Bundesarchiv Militärarchiv Freiburg, RM 3/6657, AB 214-220.

²⁷ Padfield, *Maritime Dominion*, 82.

commissioned a new type of battleship that would integrate the benefits of a battlecruiser with the traditional notion of a warship. The *HMS Dreadnought* hosted a battery of ten 12-inch heavy guns with no secondary battery, only supplementary rapid-firing guns to repel torpedo boats. Rather than the triple-expansion engines of her predecessors, the *Dreadnought* was fitted with a turbine engine, granting her a speed of 21 knots, faster than any contemporary battleship.²⁸ Her revolutionary design rendered all previous classes of battleships obsolete and served as the model for future battleships throughout the world. The new design caught German naval planners off guard. They had planned for traditional designs. The move forced Germany to completely redesign their proposals for naval expansion and forced a halt on current battleship construction to update shipyard facilities to accommodate the new advances.

The *Dreadnought* disrupted Tirpitz entire plan, and the deviation required to meet the threat of the new battleship standard exploded the budgetary requirements.

Historian Peter Padfield observed that

Had Germany been governed rationally Tirpitz would have been removed or forced to rethink his goals. But the fleet was an extension of Wilhelm's ego, and he clung to Tirpitz even as the Reich was forced farther and farther into internal and external deadlock.²⁹

Tirpitz's reaction to the *Dreadnought* challenge was to double down on his battleship construction and pursue his original notion of superior numbers being synonymous with a tactical advantage. He disregarded the significance of long-range gunnery and speed, as evidenced by the size of his battleships, and failed to realize the potential of submarines against a superior force. Ever the traditionalist, Tirpitz did not

²⁸ Padfield, *Maritime Dominion*, 82.

²⁹ *Ibid*, 83.

anticipate England conducting a war in a manner other than their traditional strategy of imposing a naval blockade. That assumption was the focus on which he devised the entire battle fleet design, envisioning a decisive naval battle that would leave England weakened, if not defeated.

Germany found her circumstances further complicated when England reached an entente agreement with France, her traditional enemy. After a similar agreement with Russia, Reich Chancellor Bülow branded the policy “encirclement,” which he

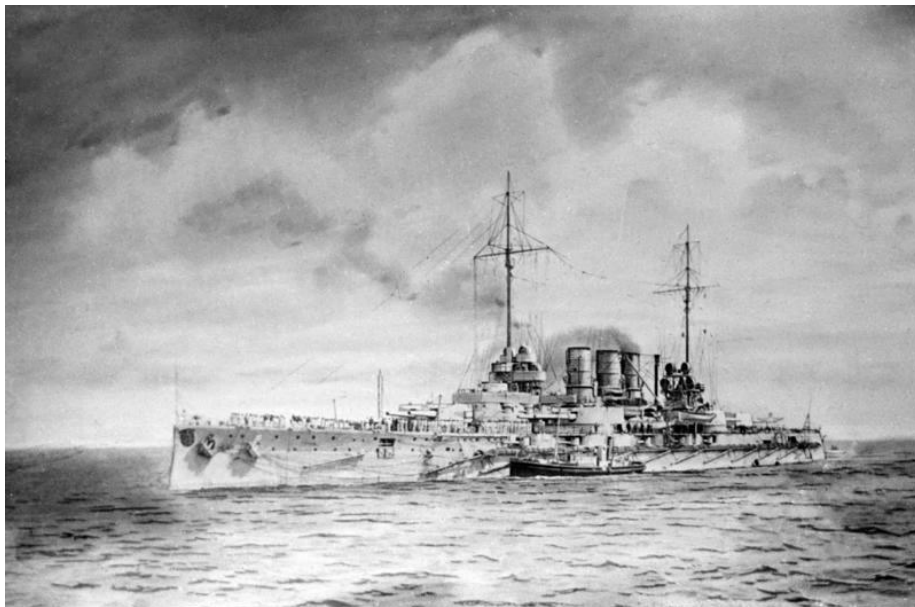


Figure 2: The SMS Ostfriesland Under Steam

defined as “the creation of a ring of powers around Germany to isolate and cripple her.”³⁰

Tirpitz used the concern and fear generated by Britain’s new allies to pass another *Novelle*. This increased the number and size of capital ships between 1908 and 1911 and reduce the service history of each ship from twenty-five to twenty years.

With the passage of this new *Novelle*, German industry became extremely reliant on naval construction contracts, which gave Tirpitz the political leverage to

³⁰ Padfield, *Maritime Dominion*, 118.

continue pushing his ambitions for a strong German Navy. Herwig described the 1908 increases as having “heated the Anglo-German naval race to a fiery white.”³¹ In 1907, Germany had established a Naval Artillery School in which it tested the applicability of large-caliber guns on battleships. The application of the large guns would be the defining characteristic of all future capital ships of the High Seas Fleet.

Between 1908 and 1912, Germany began construction on four battleships of the *Helgoland*-class, each characterized by the adoption of 30.5cm guns as their primary armament. Examining the service history of one of these vessels, the *SMS Ostfriesland*, (depicted in Figure 2 under steam) from her construction to her final sinking allows us to explore its innovations and adaptations in the larger context of shifting attitudes of naval warfare.³² As a second-generation dreadnought battleship, the *Ostfriesland* was far from the final and most advanced capital ship constructed in Tirpitz’s grand vision, but it was one of the last to be constructed prior to the threat of aircraft, placing it in a unique place in the history of 20th-century naval warfare and technological evolution.

³¹ Herwig, *Luxury Fleet*, 64.

³² Bundesarchiv DVM 10 Bild-23-61-25, Linienschiff "*SMS Ostfriesland*." Accessed from Wikipedia.

CHAPTER 2

TECHNOLOGICAL HISTORIOGRAPHY OF THE GREAT WAR

A complete historiography of the First World War would require several hundred pages. It would include notable works focused on topics like armies and commanders, which are of limited use for this study. Historiographical essays on Grand Admirals Tirpitz and Scheer alone would represent major undertakings. Likewise, historians have extensively researched the rulers and political advisors that orchestrated the first modernized war. Despite the depth and range of scholarship on the war in general, studies of the High Seas Fleet and technological changes in early 20th-century naval advances are remarkably absent.

A few notable scholars have addressed this dearth of knowledge. At the top of the list is undoubtedly Holger Herwig. His 1980 work, *"Luxury Fleet: The Imperial German Navy 1888-1918"*, provides an important framework for scholars interested in the history of the 20th century Imperial German Navy. He skillfully recounts the lack of naval tradition in the Prussian military and the challenges Kaiser Wilhelm II faced in realizing his naval ambitions. By recounting the state of the German navy at the point of unification, Herwig provides his readers the context in which a young Alfred Tirpitz became the ambitious fleet builder of the late 19th and early 20th century. More importantly, Herwig discusses the greater significance of the fleet as a symbol of Imperial Germany's global ambitions and its search for a "place in the sun." Through his insightful analysis, Herwig demonstrates that Germany sought to use its navy to

assert her role as a global power, not one confined to the limitations of its army. For these reasons, this book is invaluable to placing the story of the *Ostfriesland* in its proper historical and political context.

In telling the story of the *Ostfriesland* and its place in shifting naval attitudes, it is also necessary to discuss the use of aircraft in the Great War. For the history of strategic bombing and its origins in the Great War, Neville Jones' work *The Origins of Strategic Bombing: A study of the Development of British Air Strategic Thought and Practice up to 1918* is particularly useful.³³ This book, about British air power rather than German, is important to the technological history of the Great War and Mitchell's bomb tests, because it was the Royal Navy airplanes that provided cause for the various refits the *Ostfriesland* experienced to provide defense against aerial attack.

Jones' work discusses the conflicting attitudes concerning air power in the beginning stages of its military deployment. Through a detailed analysis, he clarifies the technological context of the *Ostfriesland's* story. His research provides information that helps demonstrate the origins of the military attitudes that Mitchell was facing when planning his bomb tests, and why the *Ostfriesland* was key to his success. He notes that it was the Germans who possessed an effective aerial service during the war, and that German air power had grown to a level that represented a clear and present danger to Britain's military facilities. One of his most important arguments is the reluctance of the Air Commanders to utilize air power for anything but support for the land forces in the trenches.

³³ Neville Jones, *The Origins of Strategic Bombing: A study of the Development of British Air Strategic Thought and Practice up to 1918*, (London: William Kimber and Co. Limited, 1973).

Quentin Reynolds' work *They Fought for the Sky: The Dramatic Story of the First War in the Air* presents a social history of the pilots that served in the first war featuring aircraft. None felt the frustration of underutilization more than the pilots who were ordered to conduct scouting missions rather than test their mettle against the German Aces like Manfred von Richthofen, better known as the Red Baron. Written in 1957, Reynolds utilized interviews with Great War flyers from many nations to tell his story. His bibliography boasts over a hundred sources, and in his introduction, he explains to his readers that "the bibliography listed at the end of this experiment (every book is an experiment) lists about one hundred books, but does not list the hundreds of magazine and newspaper articles I lived with for so long. If this be stealing, I hope my critics will at least do me the compliment of accusing me of grand larceny, not of petty theft."³⁴ There are few historical facts that Reynolds produces that cannot be found elsewhere, but his narrative style contributes a great deal to the spirit of this history. Without his witty writing and amiable treatment of his subjects, his would be just another drab history of a violent and brutal war.

A discussion of the manner in which the *Ostfriesland* intersected with colliding attitudes of naval warfare necessitated a thorough investigation of the air services in the Great War. John H. Morrow, Jr.'s *Great War in the Air: Military Aviation from 1909-1921* breaks down the air services of the Great War year by year, diligently recording their prominence in the latter years of the war, and the rapidity with which the air services fell from dominance in the interwar period. His book is important for placing Mitchell's struggle in context. Alan Clark's *Aces High: The War in the Air*

³⁴ Quentin Reynolds, *They Fought for the Sky: The Dramatic Story of the First War in the Air*, (New York: Rinehart and Company, 1957), xiii.

over the Western Front 1914-18 is useful in providing background for the evolution of air combat during the first war in which aircraft were built for military service.

Key to the technological history of the early 20th century is Brigadier General William “Billy” Mitchell, the Army General who was ambitious enough to design an experiment in which the applicability of aircraft in naval warfare could be tested. Many of the biographies written bear titles describing Mitchell as a “pioneer” or “crusader” for air power. Others have called him a “prophet without honor.” All of them focus on the fact that Mitchell was one of the first advocates for air power in an application more diverse than support for ground troops.

Though somewhat dated, *Billy Mitchell: Founder of Our Air Force and Prophet without Honor* by Emile Gauvreau and Lester Cohen is an incredibly well-written and accessible piece that brings the story of Mitchell’s political battle with the Navy to life.³⁵ One of the authors, Emile Gauvreau, was a long-time friend of Mitchell’s, and the story begins with a meeting between Gauvreau and James V. Martin, renowned aircraft innovator, in which they sat at Mitchell’s favorite table in his favorite restaurant in New York during a blackout in 1942 and reflect on the ways in which Mitchell was correct about the applicability of air power in warfare. The writing styles are reminiscent of a novel, but the arguments and events are historically accurate. Particularly important is Chapter IV entitled “The *Ostfriesland* and Mister Katsuda,” which details Mitchell’s frustration with the Admiralty’s restrictions on his tests and his defiance in the final engagement with the ship of interest. Gauvreau and Cohen wrote the book in 1942, when Mitchell’s prophecies were painfully evident

³⁵ Emile Gauvreau and Lester Cohen, *Billy Mitchell: Founder of Our Air Force and Prophet without Honor*, (New York: E.P. Dutton and Co., Inc., 1942).

every day of World War II. Despite its age, it still provides valuable material for the political environment that is essential to this story.

Mitchell's handling of the *Ostfriesland* caused a significant controversy within the command structure of the U.S. military. In his work *The Mitchell Affair*, Burke Davis accesses both Mitchell's court-martial record and his personal military file, both released in the sixties, after their fifty years of confidentiality had expired. His work serves as a biography of sorts but is also valuable in its analysis and breakdown of Mitchell's Project B plan, and the significance of the *Ostfriesland* to it. Davis is the perhaps the only biographer of Mitchell to refer to the *Ostfriesland* as "unsinkable," and as such provides another layer of analysis to the complex history of Mitchell's rivalry with the Navy. The depth of Davis' history is beneficial to the intricate and nuanced political battlefield Mitchell found himself in while trying to build the air force he saw as indispensable to national defense.

No history of Billy Mitchell and the *Ostfriesland* is complete without the inclusion of Thomas Wildenberg's recent work *Billy Mitchell's War with the Navy: The Interwar Rivalry Over Air Power*. Published in 2013, Wildenberg's book represents the most recent scholarship on the controversy surrounding Mitchell and his rivals in the Navy during the 1920s. Unlike other works on Mitchell, Wildenberg depicts the story from the Navy's perspective, whose leaders were not afraid to admit that Mitchell's arguments for air power had merit, but despised the man for his tactics and brash disrespect of the naval service.

Wildenberg leaves no stone unturned as he delves into the creation of the public relations war that Mitchell fiercely waged against the Navy in his crusade to

unify all of America's air services into a single branch under his command. Through manipulation and hyperbole, Mitchell ruthlessly antagonized the Navy's claim on air power by arrogantly asserting his belief that with the proper funding and support, a unified Air Service under his command would render the role of the Navy as the nation's first line of defense obsolete. Wildenberg's thorough investigation of the relationship between Mitchell and his counterparts in the Navy reveals how complex and entrenched the competition was, tracing it back as far as the Great War.

Wildenberg's scholarship does not attempt to discredit the previous works on Mitchell and his contributions to the development of air power in the United States, but he does work to create a more comprehensive narrative that gives credit where credit is due and provides criticism where necessary. He emphasizes that money motivated Mitchell's rivalry with the navy, which had also developed an air service during the Great War, and both services were vying for a piece of the limited funds Congress allocated to the military in the post-war period. The financial argument places the technological history in a context where aeronautical services were struggling to develop during a period of peace, when there was no justification for their application.

CHAPTER 3

SERVICE HISTORY OF THE SMS OSTFRIESLAND

The *SMS Ostfriesland* was the second vessel of the *Helgoland*-class battleships authorized by the *Novelle* of 1908. Constructed at the Wilhelmshaven Dockyard, she measured 546 feet long with a beam of 93.5 feet. She displaced 22,800 tons and was propelled by three four-cylinder triple expansion steam engines driving three screws with 28,000-35,000 horsepower, giving her a top speed of 21 knots. Like her sister ships,³⁶ the *Ostfriesland* featured twelve 30.5cm (12-inch) guns mounted on six rotating turrets. While the idea of fewer, more powerful guns stemmed from the *Dreadnought* design, Britain's Grand Fleet hosted smaller guns with longer range. The *Ostfriesland* also bore fourteen 5.9-inch and another fourteen 4.1-inch rapid-fire guns for use against torpedo boats, as well as six 50cm torpedo tubes. Heavily armored with 300mm plating around the belt, turrets, and barbettes, as well as 63.5 mm on the deck, the Germans designed her to be a tough nut to crack.³⁷ A mammoth of a ship, the *Ostfriesland* exemplified the role of the battleship as the backbone of a battle fleet.

After completing sea trials in September of 1909, the *Ostfriesland* was assigned to the I Battle Squadron of the High Seas Fleet, where she conducted individual ship exercises, followed by 1st Squadron, and the fleet maneuvers. In April of 1912, she became the I Squadron flagship, a role she would fill until the end of the

³⁶ The four ships of the *Helgoland*-class battleships were *Helgoland*, *Ostfriesland*, *Thüringen*, and *Oldenburg*.

³⁷ H.M. Le Flemming, *ABC Warships of World War I: No. 1: Battleships*, (London: Ian Allan, 1959).

First World War. In July of 1912, she led I Squadron on their annual summer cruise to Norway when word of the assassination of Archduke Franz Ferdinand and Austria's ultimatum to Serbia reached the German Admiralty, cutting their cruise short and causing their return to Wilhelmshaven. By the end of the month, Austria-Hungary declared war on Serbia, whom they deemed responsible for Ferdinand's death, and her allies shortly followed suit, marking the start of the War to End all Wars.

The first naval battle of the war took place on 28 August 1914, when ships of the British Grand Fleet engaged a German patrol off the Helgoland Bight, a German-controlled bay that extends from the mouth of the River Elbe to the islands of Helgoland and lies between the East Frisian island of Wangerooge and the North Frisian peninsula of Eiderstedt. The British had noted the regularity with which the High Seas Fleet conducted its North Sea patrols and devised a plan of attack to sink or damage several of its battlecruisers. A small force of submarines served to draw out the German patrols while a joint task force of nine British submarines and thirty-one destroyers moved to cut off their retreat.

The *Helgoland* held her post as ship of the watch at Schilling Roads when the crew heard fire from the direction of Helgoland. Fog and rain from an impending storm drastically reduced visibility, lending cover to the British forces and allowing them to approach the German fleet with ease. Richard Stumpf, in his diary written shortly after the battle and based on accounts given to him by sailors who witnessed the action, related that many of the German ships in position to respond did not fill all of their boilers with steam, causing them to engage the British one by one, rather than

in formation.³⁸ Stumpf recorded that after a lengthy wait for the dockyard tug to offload the unnecessary but expensive equipment such as shell casings from gunnery practice, the *Ostfriesland* issued the order at 1630 to raise anchor and follow in a keel line. En route, the *Ostfriesland* and *Helgoland* encountered the cruisers *Frauenlob* and *Stettin*, which had been engaged in the battle and suffered minor damage.

Stumpf noted that the British used shells without delaying fuses, meaning they would explode on contact with the German ships' armor, rather than detonating after penetrating through the armor to more vulnerable portions of the vessels. In fact, Britain continued to use black powder shells until after Jutland, making them inferior to German ammunition.³⁹ Despite their inferior ammunition, Britain still managed to soundly defeat the German fleet in the first naval action of the war. Germany lost three cruisers and a torpedo boat and suffered 1242 casualties. Britain lost 75 men and had to tow their cruiser *Arethusa* back to port. This naval loss spurred the Kaiser to order the Commander of the High Seas Fleet to avoid further losses of ships at all costs, mandating all plans for further missions and sorties receive approval from him personally, effectively stripping the navy of its scope for action.

After *Helgoland*, the *Ostfriesland* resumed training cruises in September, and by October 1914, the use of aircraft had become sufficiently threatening that the ship's 4.1-inch guns were replaced with 8.8cm Flak guns for anti-aircraft defense. While on its own, this detail may seem insignificant, it reflects some of the changing attitudes and technologies occurring early in the war. In November 1914, the German naval

³⁸ Richard Stumpf and Daniel Horn, *War, Mutiny, and Revolution in the German Navy: The World War I Diary of Seaman Richard Stumpf*, (New Brunswick, NJ: Rutgers University Press, 1967).

³⁹ *Ibid*, 41.

command sought ways to attack Britain without risking the loss of its ships. Given the superior numbers of the Grand Fleet in relation to the High Seas Fleet, Germany formulated a plan to lay mines near the English coast and sink smaller, individual ships. The raid was designed as a minelaying mission, with a secondary objective to lure smaller British ships to sea, where the rest of the High Seas Fleet would be waiting in ambush.

Carried out by battlecruisers under the command of Admiral Franz von Hipper, the *Ostfriesland* and the I Squadron sailed with the bulk of the fleet waiting to ambush any British vessels unfortunate enough to cross their path. In that capacity, the ship saw little action, and the raid accomplished little tactically, although it emboldened the German naval command and encouraged future raids. In December, the High Seas Fleet would again venture toward the English shore, this time with greater effect.

On 15 December, Hipper once more sailed for the English coast to lay mines and lure unsuspecting ships into an ambush. Many of Germany's admirals knew that victory at sea required a reduction of Britain's superior numbers, and the raids on Scarborough, Hartlepool, and Whitby sought to force the British to divide the Grand Fleet to better protect England's shore, rather than stay together as they had done so far. While Hipper's battlecruisers shelled the English shore, Admiral of the High Seas Fleet Friedrich Ingenohl held the rest of the battleships and destroyers in the Dogger Bank, where they could engage or retreat as necessary.

History benefits from the gift of hindsight. Had the main force of the High Seas Fleet had a more competent commander, the Royal Navy would have faced an engagement in which six of the most powerful dreadnoughts and four battlecruisers of

the Grand Fleet would be forced to contend with the entirety of the dreadnoughts and support craft of the High Seas Fleet.⁴⁰ Unfortunately, Commander Ingenohl lacked the daring and decisiveness inherent in successful fleet commanders, and when he first encountered the British dreadnoughts, he ordered his superior force to retreat, believing the bulk of the Grand Fleet was nearby. Had he pressed the attack, he would have earned recognition as the commander to even the odds against the most powerful navy in the world. His lack of daring instead caused him to miss a strategic opportunity and the *Ostfriesland* again returned to port without meaningful engagement with the enemy.

The missed opportunities at the Dogger Bank prompted Kaiser Wilhelm II to replace Ingenohl as Fleet Commander with Admiral Hugo von Pohl, a cautious commander who favored unrestricted submarine warfare over surface fleet engagements with the Grand Fleet. Consequently, the High Seas Fleet was inactive in the North Sea for nearly a year, as Pohl limited its deployment “to several minor ‘tip-and-run’ sorties,” a phrase which here means a rapid engagement followed by a swift retreat.⁴¹ As a member of the Admiralty Staff, Pohl even went to lengths to hinder the operating freedom of the High Seas Fleet “in order to use it for security at the peace table,”⁴² an opinion he shared with many in the Imperial Headquarters who still believed in 1915 that the war would be a short one. Pohl’s command deprived the *Ostfriesland* and the other surface vessels of the High Seas Fleet from opportunities to engage the Grand Fleet and inflict any meaningful damage on the Royal Navy.

⁴⁰ Herwig, “*Luxury*” *Fleet*, 150.

⁴¹ *Ibid*, 153.

⁴² *Ibid*, 160.

The fleet's inactivity was short-lived, however, as in January 1916, Admiral Pohl's cancer had advanced to such a degree that he could no longer perform his duties as an Admiral of the Fleet. The vacant office was quickly filled by *Vizeadmiral* (Vice Admiral) Reinhard Scheer, who adopted a more aggressive policy designed to force the Grand Fleet into confrontation with the *Kaiserliche Marine*. In April 1916, the *Ostfriesland* supported Admiral von Hipper's battle-cruiser bombardment on Yarmouth and Lowestoft, in which Scheer intended to draw out defending ships and pick them off. As with previous engagements, the results were inconclusive, and the High Seas Fleet withdrew before the bulk of the Grand Fleet could meet them. Scheer's aggressive policy held more promise than either Ingenohl or Pohl's and on 31 May 1916, the High Seas Fleet executed a sortie into the North Sea that held the potential to definitively determine which navy was the victor in the arms race of the previous decades.

SKAGERRAK: 31 MAY – 1 JUNE 1916

The action of 31 May 1916 began as a sortie. It was part of Scheer's overall strategy to draw out and defeat a portion of the Grand Fleet so as to slowly reduce Britain's numerical superiority by engaging and sinking its ships through a series of smaller actions. Scheer's plan required the battlecruiser fleet, under the command of Admiral Franz von Hipper, to screen the approach of the larger battle fleet while also baiting the Grand Fleet into battle. Scheer took the dreadnoughts of I and III Squadrons north toward the Skagerrak, which would then move to intercept the Grand Fleet as it approached the battlecruisers.

Overall command of the Grand Fleet rested with the Commander-in-Chief Admiral Sir John Jellicoe. His plan at Skagerrak called for a division of the fleet into two units, the battlecruiser unit commanded by Vice-Admiral David Beatty, and the larger dreadnoughts that made up the main force. His plan of battle called for Beatty's battlecruisers to act as the vanguard, engaging the German van with long-range fire and torpedoes, destroying what they could and slowing the main force before the final confrontation with Jellicoe's battle fleet. Jellicoe's fleet left their ports at Scapa Flow and Moray Firth at midnight 31 May, followed shortly by Beatty's departure from the Firth of Forth at 1 a.m. The two fleets cruised into the North Sea for a rendezvous with what would prove to be the largest fleet action in the Great War.

Hipper set sail from the Jade Basin at 4 a.m.⁴³ on 31 May, flying his flag from the battlecruiser *Lützow*. He had under his command five battle cruisers of the 1st Scouting Group, four light battlecruisers of the 2nd Scouting Group, and a total of thirty destroyers from the 2nd, 6th, and 9th Flotillas. Scheer followed at 4:30 a.m., setting sail from the Jade and the Elbe with his flag aboard the *Friedrich der Grosse*. He had under his command the dreadnoughts of the 1st and 3rd Squadrons, six pre-dreadnoughts of the 2nd Squadron, which he included last minute after the squadron commanders appealed for inclusion in the sortie, five light cruisers of the 4th Scouting Group, and thirty-one destroyers. The combined strength of the High Seas Fleet

⁴³ When comparing British and German accounts of the battle, the times given differ by two hours, because of what Scheer calls "summer-time in Central Europe," which is two hours ahead of Greenwich Mean Time, as opposed to the one-hour difference through most of the year. I will use Central Europe time while the *Ostfriesland* is in her service, and Eastern Standard Time once she is transferred to the Americans.

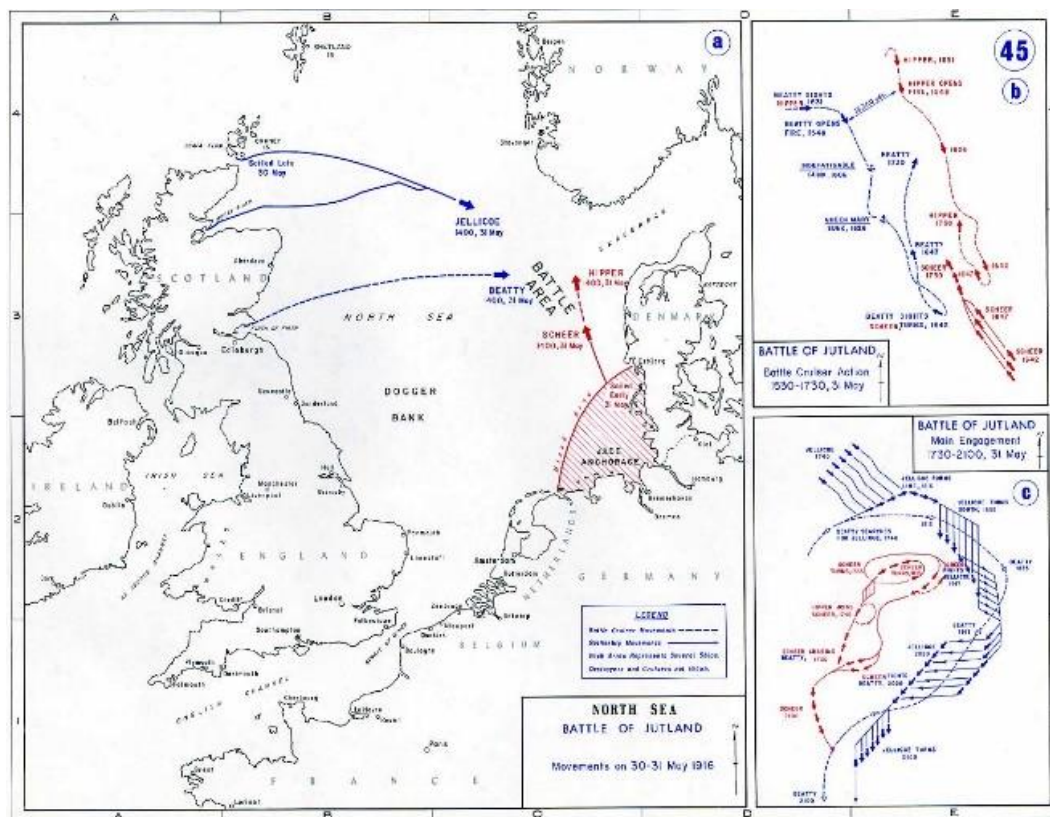


Figure 3: Fleet action at Jutland

sailing toward the Skagerrak was sixteen dreadnoughts, six pre-dreadnoughts, five battlecruisers, eleven light cruisers, and sixty-one destroyers.⁴⁴

Figure 3 illustrates both German and fleet movements in the battle of Jutland from the initial stages to the point where the two fleets engaged in combat.⁴⁵ A heavy mist descended over the North Sea as Hipper and Scheer steamed northward and Beatty and Jellicoe moved their squadrons east. With only seven miles of visibility, Beatty moved his cruisers from their port at the Firth of Forth and Jellicoe led the bulk of the Grand Fleet from their anchorage in Scapa Flow. At 3:51p.m., Beatty gave the order for his fleet to adopt a heading of North by East to rendezvous with Jellicoe and

⁴⁴ Arthur J. Marder, *From the Dreadnought to Scapa Flow Volume III, Jutland and After: May to December 1916*, (Annapolis, MD: Naval Institute Press, 1978), 37-38.

⁴⁵ Map obtained from the United States Military Academy.

<https://www.usma.edu/history/SiteAssets/SitePages/World%20War%20I/WWOne45.jpg>.

the main battle fleet. Though that heading would have eventually led to contact with Hipper's cruisers, the battle began when both squadrons sighted a Dutch fishing boat. As Beatty moved to investigate, his cruisers found that two of Hipper's destroyers had stopped the boat and the lead ship *Galatea* immediately raised the signal "Enemy Sighted" and the opened fire with *Phaeton* at 4.28 p.m., initiating the largest naval battle of the Great War.⁴⁶

Years later, after the war had ended and the official narrative had labeled the action at the Skagerrak as the Battle of Jutland, Scheer wrote down his version of events. When describing the morale at the beginning of the battleship phase, he wrote "there was never any question of our line veering round to avoid an encounter. The resolve to do battle with the enemy stood from the first."⁴⁷ While Hipper and Beatty engaged each other in open combat, each working to outmaneuver and outgun the other, Scheer and the Main Fleet arrived on the scene around 4:48 pm in which Squadron III led the center line and *Friedrich der Grosse* sailed at the head of Squadron I at the center, with the *Ostfriesland* astern.⁴⁸ As they closed the distance with Beatty's ships, the *Ostfriesland* and ten cruisers fired on Beatty's 2nd Light Cruiser Squadron. The *Ostfriesland* targeted the *HMS Southampton* but failed to score a hit. She then shifted fire to the *HMS Birmingham* and *Nottingham* but again failed to

⁴⁶ The details of the cruiser phase of the Battle of Jutland can be found in many locations, especially Marder's book, which is written with an Anglo-centric perspective. For the purposes of this thesis, I skip ahead a few hours to when Scheer and Jellicoe join the fray, as that was the portion of the action in which the *Ostfriesland* was involved.

⁴⁷ Admiral Reinhard Scheer, *Germany's High Seas Fleet in the World War*, (New York: Peter Smith, 1934), 152.

⁴⁸ *Ibid*, 146.

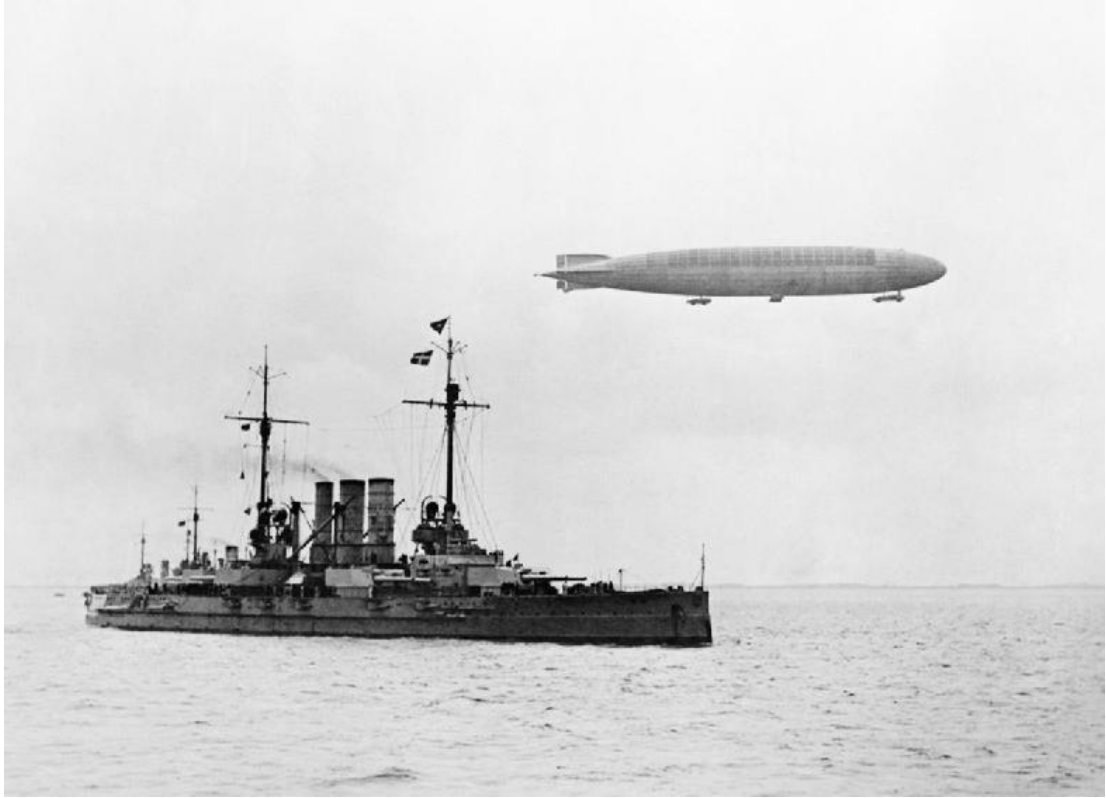


Figure 4: A Zeppelin occupies the airspace over the Ostfriesland

damage her targets. Shortly after 7:15 that night, *HMS Warspite* ventured into range of *Ostfriesland's* heavy guns. The German battleship managed to score hits with her third and fourth salvos, riddling the *Warspite* with a total of thirteen heavy shells.

As the battle progressed, the German vanguard continued to take heavy fire. Historians have tried to interpret Scheer's maneuvers in many ways, but Scheer himself argued that when his battleships veered away from the Grand Fleet, he felt it was too early for a full retreat, arguing:

It was still too early for a nocturnal move. If the enemy followed us our action in retaining the direction taken after turning the line would partake of the nature of retreat, and in the event of any damage to our ships in the rear the Fleet would be compelled to sacrifice them or else to decide on a line of action enforced by enemy pressure....and would therefore be detrimental to us from the very outset. Still less was it feasible to strive at detaching oneself from the enemy, leaving it to him to decide when he would elect to meet us the next morning. There was but

one way of averting this – to force the enemy into a second battle by another determined advance, and forcibly compel his torpedo-boats to attack.⁴⁹

Under the assumption that the second encounter was by Scheer's design, his tactic was for his ships to deal a blow to Jellicoe's center line. Jellicoe's ships targeted the battle cruisers of the Fifth Division, which combined with the pre-dreadnoughts of the 2nd Division drew the brunt of the British fire. This allowed German torpedo-boats the opportunity to inflict significant damage to the Grand Fleet. This second action served primarily to provide a delay, so the High Seas Fleet could withdraw under cover of darkness. At 9:17 p.m., Scheer issued the order to turn about and the *Ostfriesland* led the rest of the ships in a starboard turn that would eventually take them home.

The battle continued through the night. Scheer utilized the cover of darkness to attempt to outmaneuver the British encircling movement and reach Horns Reef, insuring the "liberty of decision" for the next morning belonged to him. The British harassed them with brief but intense skirmishes, and at 2 a.m., the *HMS Black Prince* sailed within 1500 meters of the *Ostfriesland* and *Thüringen*, both of whom immediately opened fire. Within seconds the ship was on fire. Four minutes later an explosion sent her to the bottom with all 857 hands.⁵⁰

Scheer and his battle fleet arrived at Horns Reef at 5 a.m., where they waited for Hipper to arrive on the *Lützow*. British guns had damaged Hipper's flagship to a startling degree. From 11:30 p.m., the ship had only been able to sail at 13 knots, with limited means of navigation, and her gun power was reduced to twenty percent. The

⁴⁹ Scheer, *High Seas Fleet in the World War*, 155.

⁵⁰ Stumpf, *War, Mutiny, and Revolution*, 202.

convoy boat *G-40* relayed news to Scheer that at 4 a.m., the Hipper ordered the crew to abandon ship.⁵¹ At that news, Scheer “had no difficulty in drawing on [his] own conclusions. As the enemy did not come down from the North, even with light forces, it was evident that he was retiring, especially as nothing more could be seen of him notwithstanding that his torpedo-boats were about until dawn.”⁵² Using this information, Scheer ordered the Main Fleet to return to Germany at daybreak. On the way back to Wilhelmshaven, the *Ostfriesland* hit a mine causing her to take on 400 tons of water but was able to return to port under her own power.

During the Battle of Jutland, the *Ostfriesland* had fired 111 rounds from her main battery, 101 shells from her 15 cm guns, and a single 8.8 cm Flak shell. Her only damage was from the mine, which killed one sailor and wounded ten, but left a sizable hole in her bow. Richard Stumpf described the damage as “a hole as big as a medium-sized barn door gaped in the outer shell; the torpedo bulkhead had been shattered as though it was a pane of glass and the vertical and horizontal ship’s ribs stuck out like the bristles of a porcupine.”⁵³ The ship would remain in drydock for repairs until 26 July 1916. It is important to note that throughout the Battle of Jutland, as well as many of the German sorties into the North Sea, Zeppelins were utilized as reconnaissance scouts to locate the Grand Fleet and communicate the positions of British ships to the High Seas Fleet. Figure 4 depicts a German Zeppelin flying above the *Ostfriesland*, presumably conducting a scouting mission during a sortie into the North Sea.⁵⁴

⁵¹ Scheer, *High Seas Fleet in the World War*, 164.

⁵² *Ibid*, 164.

⁵³ Stumpf, *War, Mutiny, and Revolution*, 209-210.

⁵⁴ A public domain photo obtained from Wikipedia.

Accounts of the Battle of Jutland varied depending on who was reporting it. Since the outcome has largely been considered a British victory, casualty reports tend to come from British sources. The losses for the British amounted to three battle cruisers, three cruisers, and eight destroyers. The High Seas Fleet lost one battle ship, one battle cruiser, four light cruisers, and five torpedo boats. The Grand Fleet suffered 6,784 casualties while the Germans counted 2,400 killed and 400 wounded.⁵⁵ The tactical victory went to Germany. As Arthur Marder expressed in his definitive work on the Royal Navy in the First World War, “Jutland revealed the Royal Navy’s general technical inferiority as compared with the German Navy.”⁵⁶ The battle demonstrated the skill of German sailors at sea, although Jellicoe focused his strategy more on the long-term confinement, rather than outright action. Where Germany sought decisive action against the Grand Fleet, Jellicoe resisted the Nelsonian tactics of fleet-to-fleet action and opted for a long-distance blockade to keep the High Seas Fleet confined to the German Bight. Scheer was the only commander of the High Seas Fleet to directly challenge Jellicoe’s strategy by actively trying to lure the Grand Fleet into battle. After Jutland, however, he had to wait for his ships to return to full fighting strength before sending them back out, though he utilized the time to plan a repeated attempt of the May 31 action.

Scheer planned the next sortie to take place in late August of 1916, which he would execute after the fleet had been repaired and was returned to full strength. The goal was the same as always: to draw out part of the Grand Fleet and ambush the unlucky ships, sinking as many as possible. Scheer deployed German zeppelins to

⁵⁵ Scheer, 167-68.

⁵⁶ Marder, *From the Dreadnought to Scapa Flow, Volume III*, 196.

perform reconnaissance in the North Sea to scout for signs of Grand Fleet ships in conjunction with twenty-four U-boats deployed from the Dogger Bank and throughout the southern North Sea. As with his earlier raids against the English coast, Scheer's plan called for the battle cruiser fleet to bombard a coastal town to compel portions of the Grand Fleet to sail against them. Those cruisers would then initiate a chase in which the unwitting British sailed into firing range of the bulk of the High Seas Fleet.

The timing of the raid was particularly important because Scheer wanted to maintain pressure on the Grand Seas Fleet to keep up morale within his own battered fleet. Only two battlecruisers were serviceable after Jutland, so he supplemented the force with three battleships. The *Ostfriesland* remained with the bulk of the fleet to reinforce or ambush the British fleet.⁵⁷ The German fleet set sail from the Jade river basin at 10 pm on 18 August 1916, bound for the English town of Sunderland.⁵⁸ The plan was that after the bombardment, the fleet would return to the German Bight while the U-boats remained to engage the Grand Fleet when it entered the area in response.

The British not only had the numerical advantage, but also a superior intelligence division, known as "Room 40," which early in the war had obtained German code books from a sinking ship. Room 40 intercepted and decoded radio messages about the raid and recalled Admiral Jellicoe from his leave, stripping Scheer from his element of surprise. Jellicoe sailed with twenty destroyers, five light battle cruisers, and the 5th Battle Squadron of five fast battleships to scout for Scheer's vanguard.

⁵⁷ Scheer, 180.

⁵⁸ Ibid.

During the voyage south, the Grand Fleet lost the light cruiser *HMS Nottingham* when *U-52* struck her with three torpedoes.⁵⁹

At 2:30 P.M on 19 August, the zeppelin *L-13* reported the position of the Grand Fleet along a course that would have led to an engagement in two hours' time. Scheer sent Scouting Division and Torpedo Flotilla II ahead for reconnaissance, but the fleets never encountered each other. The fleet continued to advance until they reached the minefields to the south of Sunderland around 4:35 pm. Then Scheer ordered the ships to begin their return journey. He felt that there was no longer a possibility of encountering the enemy, and it was too late to carry out the bombardment.⁶⁰

During the return trip, the German U-boats and airships continued to report the presence of the British fleet relative to the Germans. A small British force consisting of six small cruisers and two destroyer flotillas matched the German fleet's easterly course until nightfall. Scheer believed they were close enough to see the smoke billows from his big ships and felt they were biding their time for a night action. To his great surprise, there was no night action, and the High Seas Fleet continued to port. The U-boat *U-63* successfully sank another British cruiser, demonstrating the effectiveness of submarines if deployed in the proper manner.

Aside from the minor victories of the U-boats, the sortie was generally ineffective. True, Scheer had demonstrated that the British should remain watchful for any attack by the High Seas Fleet, but the *Ostfriesland* and the rest of the German dreadnoughts once again completed a mission without firing their guns. Scheer

⁵⁹ Scheer, 182.

⁶⁰ Ibid.

continued to plan and execute sorties against the Grand Fleet throughout the remainder of 1916 and continued to get the same result. While the Royal Navy retained superior numbers, they remained in a position to maintain a loose blockade over the German Bight. Scheer later wrote

the behavior of the enemy after the battle of the Skagerrak showed clearly that he intended to rely entirely on economic pressure to secure our defeat and would continue to keep his fleet in the northern waters of the British Isles. Nothing but serious damage to his own economic life could force this opponent to yield...as English economic life depended on sea trade, the only means of getting at it was to overcome the Fleet, or get past it. The former meant the destruction of the Fleet, which, in view of our relative strength, was not possible.⁶¹

With that realization, the role of the surface fleet shifted to U-boat support, and by the end of 1916 the High Seas Fleet was rethinking its entire naval strategy for the rest of the war. Obsolete ships were decommissioned, and crews were reorganized to accommodate the increasing number of U-boats. No longer the focus of the High Seas Fleet, the powerful dreadnought battleships were redeployed to other posts, and the *Ostfriesland* became the guardian of the German Bight, where it served until called to serve in Operation Albion in October 1917. In September 1917, the German Army seized control of Riga from the Russian 12th Army, straightening their lines on the Eastern Front and freeing up troops for redeployment to France. After their victory, the German Command felt it necessary to clear Russian-held islands in the Baltic through an amphibious assault with combined army and navy forces. Figure 5 depicts the German battle plan for clearing the islands in the Gulf of Riga.⁶² The Straits of Irben were guarded by Russian guns at Zerch, making a troop landing on the Island of

⁶¹ Scheer, 191.

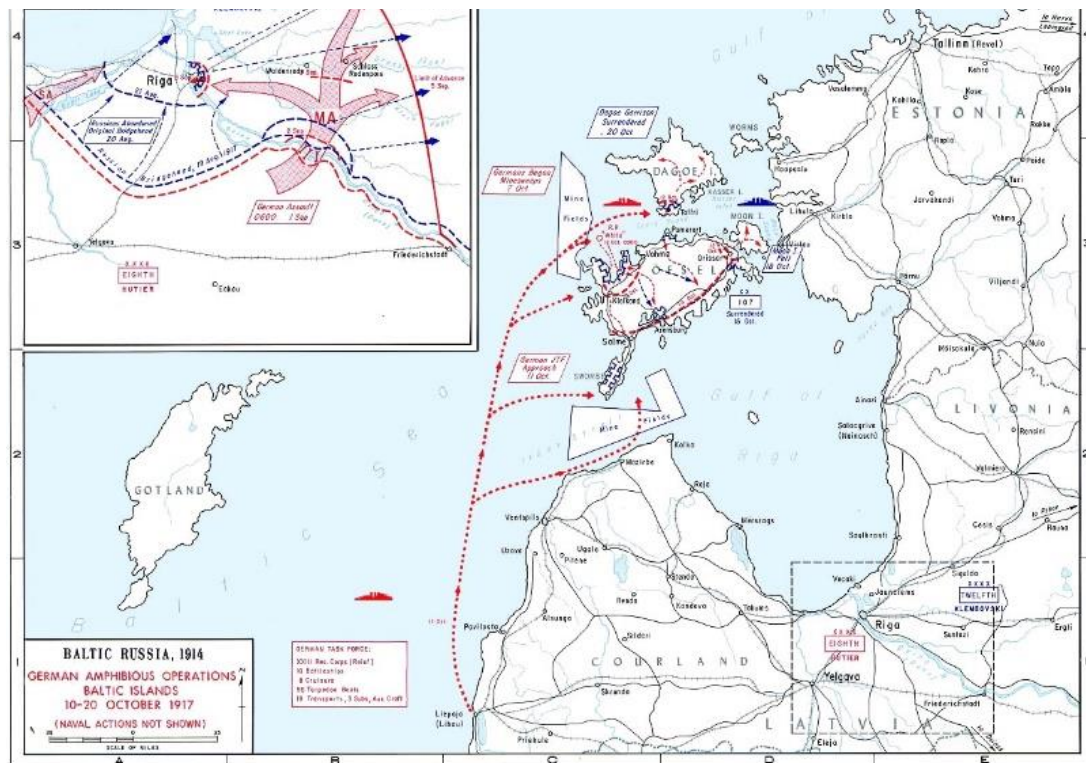
⁶² Map of Operation Albion from the U.S. Military Academy.
<https://www.usma.edu/history/SiteAssets/SitePages/World%20War%20I/WWOne40.jpg>

Oesel too hazardous. Consequently, the commanders in charge of the operation chose the Bay of Tagga for the troops to put ashore, as it was the only bay in the north of Oesel that could support the large number of transports and provide protection from the west winds that characterize the Baltic autumn.

Scheer was especially aware of the challenges that such an undertaking presented, and sought to learn from the British, French, and Anzac experience in the Dardanelles in 1915. He prepared his fleet to transport 23,000 men, 5,000 horses, and the material to support them. The assault was an ambitious one, but the *Ostfriesland* and her sister ships served as escorts for minesweepers and kept out of direct action.⁶³

The *Ostfriesland* saw little action in 1918. She led 1st Squadron in the final fleet advance in April and was assigned to a special unit with the *Thüringen* and *Nassau* for

Figure 5: German Sweep of Riga



⁶³ Staff, *German Battleships 1914-1918*, 43.

a planned invasion of Petrograd. Like many of their previous missions, the operation was cancelled, and the fleet ordered back to Wilhelmshaven. In October of 1918, Scheer and Hipper planned one final sortie against the Grand Fleet, in which they intended to sail the entirety of the High Seas Fleet into a decisive engagement that would provide Germany with better conditions at the peace negotiations. *Ostfriesland* stood ready to sail, but a rash of mutinies stopped the advance before the fleets met.

On 16 December, the German Navy decommissioned the *Ostfriesland* and put her in service as an accommodation ship. Following the armistice, the allies allowed Germany to keep her, but after Admiral Ludwig von Reuter ordered the bulk of the High Seas Fleet to scuttle their vessels during internment at Scapa Flow, the United States claimed possession of the *Ostfriesland* to replace the vessels lost. On 9 April 1920, she became an American ship and sailed across to the Atlantic to begin the “victory cruise.” On 21 July 1921, the *Ostfriesland* met her fate when Billy Mitchell’s pilots dropped 2000-pound bombs on her to prove the efficacy of aerial combat in naval warfare.

A REFLECTION OF ITS TIME: THE *OSTFRIESLAND* AS A PRODUCT OF CHANGING TECHNOLOGIES AND REACTIVE NAVAL STRATEGY

Like many wars, the First World War was reflective of global issues at the time. Rapid industrialization led to booming economies at the expense of an exploited proletariat. A growing sense of nationalism helped keep the masses in line, ultimately contributing to the start of the Great War. Historically, warfare has sparked significant

advancements in technology, and the Great War was no different. Not only was the naval arms race and the invention of the Dreadnought significant, but the war also introduced armored tanks, aerial combat and reconnaissance, chemical warfare, and machine guns. Each of these advances influenced the designs of all and forced military strategists to reevaluate traditional notions of warfare. The scale of industrialization that characterized World War I caused a fundamental shift in tactics and strategy not experienced since the American Civil War. The *Ostfriesland* served as a physical reflection of those shifting strategies and technologies.

The development of the submarine was one of the most significant advances in naval technology and strategy during the 20th century. The use of submarines as commerce raiders helps to partially explain the inaction of Germany's surface fleet, especially with ships as advanced as the *Ostfriesland* and her sisters. But even these advanced weapons went underutilized in the German navy. The development of the submarine and the use of torpedoes in naval combat are landmarks in the development of ship-to-ship warfare, but beyond the significance just mentioned they have little influence on this story. Instead, the major technological shift in which the *Ostfriesland* found herself a part, was that from sea to air.

Neville Jones notes in his work *The Origins of Strategic Bombing* that “the essence of strategic bombing is the offensive, and the first interest in the flying machine as a potentially offensive weapon goes back at least to 1907.”⁶⁴ That year, the attending members of the second meeting of the Hague Conference decided not to renew an article ratified in 1899 prohibiting the use of flying machines in dropping

⁶⁴ Neville Jones, *The Origins of Strategic Bombing: A Study of the Development of British Air Strategic Thought and Practice up to 1918*, (London: William Kimber and Co., 1973), 25.

projectiles and explosives. Those attendees felt that aircraft would inevitably be used in warfare as auxiliary to ground forces and therefore would be fired upon. They saw it unfair to deprive them of the means to retaliate. By outfitting aircraft with weapons for their own defense, it opened the opportunity for offensive use, regardless of intent.

Beyond defense, however, early commanders of the air forces did not perceive the usefulness of aircraft for service beyond army support. As Jones states “during the whole of the First World War the greater part of Britain’s air strength was committed to the tactical support of the British Army on the Western Front.”⁶⁵ This short-sighted approach to aircraft applicability stunted the effectiveness and squandered the potential for a speedy end to the war. The reliance on aircraft in reconnaissance roles was useful but failed to realize their potential as offensive weapons. When the Royal Air Force did venture out to attempt air raids, they lacked the technology to affect any significant damage to the German fleet or industry. An important note to this history is that it was the Royal Navy who pushed for the development of bombers and all types of bombing.⁶⁶ It was the Navy that first conceived of the aircraft as an offensive weapon, rather than an auxiliary to the land forces. They increased the power of the engines to carry the weight of the machine guns and bombs they had started equipping them with, believing them to be the best defense against German air raids.

The Royal Navy’s vision for air power was forward thinking compared to the Army, which still held on to the notion of aircraft as reconnaissance only. It appreciated that aircraft required precise navigation to their intended targets as well as the ability to drop ordinance on their targets accurately, and from varying heights.

⁶⁵ Jones, 15.

⁶⁶ Ibid, 19.

Like ships, air navigation required the ability to determine the speed and direction of the wind and its effect on the aircraft in flight. This determination to utilize aircraft against enemy vessels, dockyards, and shore installations led the Navy to develop the greatest technological advancements in aeronautics during the First World War.

By 1913, the Navy had made significant advancements in aerial warfare and when war finally broke out the role of the airplane as an offensive weapon was well established. Though strategic bombing was far from effective during the Great War, in part because of the limited vision of the commanders, it still presented enough of a threat to facilitate a response from the German Imperial Navy. The balance of air power leading up to the war was solidly in Germany's favor, and had they utilized their Zeppelin fleet to attack the English coast early in the war, they may have caused panic and shock to morale in the country. Instead, the German Army also viewed air power through a lens of ground support and lost three of their nine Zeppelins in their first flights over the combat zone.⁶⁷ Their lack of ambition for their Zeppelin fleet allowed time for Britain to strengthen its air wing and deploy its planes in support of the Belgian coast in the first months of the war. While the role of aircraft remained largely auxiliary in nature, the tactical and strategic requirements of the war led to the Allied and Associated Powers developing planes with offensive capabilities.

Before the fall of Antwerp on 9 October 1914, the British used the city as a base from which their planes performed sorties against Germany's airship sheds at Cologne and Düsseldorf, representing the first use of aircraft against German forces. They carried out the first raid in September of 1914, to limited effect. Only one pilot

⁶⁷ Jones, 55.

found his target, and few of the bombs he dropped detonated as intended. The second British raid was conducted in October, on the day the British and civilians evacuated Antwerp. The pilot sent to Düsseldorf dropped his payload from six hundred feet and destroyed the zeppelin shed and the airship inside of it. The pilot sent to Cologne failed to find the airship yard so instead dropped his bombs on the railway station in the center of town.⁶⁸

Though the effectiveness was still miniscule compared to what air power would achieve in future wars, the early British raids still provoked German reactions. In October of 1914, Germany captured the Belgian coastal towns of Ostend and Zeebrugge, providing them access to both close and long range British commerce. In response to the threat to their supply chain, the British Admiralty bolstered its force of planes near Dunkirk to constantly harass the German naval bases. The timing would suggest a German reaction, as that same month the *Ostfriesland* traded in two of her 14cm guns in favor of two 8.8cm Flak guns for anti-air defense. The simple exchange is indicative of the growing influence of air power on the design and armament of naval warships. The influence was subtle, but significant in hindsight. The raids demonstrated the potential threat to naval and military facilities, prompting ships to undergo refits, but the commanders of both naval and air forces continued to see airplanes as little more than auxiliary to ground forces.

Despite the use of aircraft as auxiliary to the army, the Royal Navy utilized its own aircraft in a series of raids against German Zeppelin bases. It is significant that the Navy was the first branch to aggressively deploy aircraft, as it would be admirals

⁶⁸ Jones, 57.

in the United States Navy who proved to be General Mitchell's most vocal opponents during his bomb trials. The resolution to this apparent contradiction may lie in the chosen target of the naval raids. Rather than targeting the fleets, the Royal Navy pilots sought to destroy German Zeppelins and their support facilities. Yes, the Navy used planes offensively, but only against other air services and crews.

Though aware of the British predilection to target their Zeppelin force, the German navy equipped its surface ships with Flak cannons to defend against aerial assault. The battleship, especially those of the dreadnought design, remained the backbone of any battle fleet, but the possibility of air raids was finally presenting enough of a threat to warrant refits and redesigns. Shortly after the *Ostfriesland* received her own 8cm Flak guns, the Royal Navy executed its fourth raid against Germany's Zeppelin sheds. On Christmas Day 1914, seven British seaplanes left from three seaplane tenders,⁶⁹ supported by a force of cruisers and destroyers, to attack the Zeppelin sheds at Cuxhaven.

Typical December weather characterized the North Sea during that Christmas raid, which made visual location of the sheds difficult. Seaman Stumpf noted in his journal that "the extremely heavy fog prevented me from seeing anything, but I could hear the noise of their motors quite distinctly."⁷⁰ The fact that the *Ostfriesland* and her sister ships opened fire from their recently acquired anti-aircraft guns demonstrated the growing acceptance of airpower as a viable threat, although none at the time expressed concern for the damage British planes might do to the fleet.

⁶⁹ Seaplane tenders were ships designed to carry seaplanes to a point of deployment. Unlike flat-decked aircraft carriers, tenders would lower their planes into the ocean with a crane, and the sea planes would take off on their own.

⁷⁰ Stumpf, 58.

A common characteristic that heralds major shifts in attitudes and technology is the official denial of the impending technology being viable accompanied with the practical implementation of reactionary methods to it. In the 19th century, admirals and sailors refused to accept the applicability of steam for anything other than auxiliary to sail, but the American Civil War demonstrated the strategic and tactical advantages of steam when applied independently. The result was one of the largest technological leaps in human history, and an increase in pressure for industrialized maritime powers to acquire global territories to serve as coaling stations for their growing steam navies. The development of heavier-than-air flight in 1903 sparked a similar debate in which planes were accepted for their auxiliary uses as support for ground forces, but acceptance of their independent applicability was not accepted until they proved their worth during wartime. The Great War provided them the opportunity to convince key strategists of their usefulness.

Scheer wrote of the usefulness of seaplanes in his memoir and described the development of bases for air support throughout German-held territory, including the captured Belgian port towns of Zeebrugge and Ostend. He praised the commanders of the Naval Air Service with developing their branch to a degree that “rendered [the fleet] invaluable services as scouts, thereby relieving the fighting forces on the water a great burden.”⁷¹ Though still included as an arm of the Navy, the air service was slowly earning its place as an asset to naval operations. Not only did both the British and Germans expand their seaplane bases, but Germany also began converting cruisers to seaplane carriers and expanding the role of their air forces in general.

⁷¹ Scheer, 201.

Great increases in technology and industrialized warfare characterized the Great War. As demonstrated previously, the naval arms race between Britain and Germany led to enormous advancements in battleship construction, primarily in accordance with the arguments asserted by A.T. Mahan and the accepted notion of the battleship as the backbone of the battle fleet. Yet the war also saw the development of heavier-than-air flight and the evolution of planes from unarmed scouts to offensive weapons engaged in bombing missions and dogfights. Ironically, the Royal Navy was the first service to deploy aircraft offensively, while still asserting that they would be useless against enemy naval vessels.

The Great War was an experiment of sorts in which new technologies were deployed in compliance with old schools of thought. Air power in 1914 was in its infancy, and the Great War nurtured it into a healthy adolescence. Within the first year or two of the war, planes had moved away from their reconnaissance and support roles and toward independent combat units that helped determine the outcome of many of the war's battles. The winter of 1916-1917 witnessed Germany's greatest expansion of her air forces. In September of 1916, she began with only seven Albatross D III biplanes, expanding rapidly to a total of four hundred and thirty-four by May 1917.⁷² The rapid expansion of the superior planes securely placed aerial superiority in German cockpits, and the rigid training and organization of the German air service allowed them to operate in a much more effective way than their British counterparts.

As German biplanes took to the air in tight-knit formations, air groups within the British Army remained constricted to roles resembling cavalry reconnaissance

⁷² Alan Clark, *Aces High: The War in the Air over the Western Front 1914-18*, (New York: G.P. Putnam and Sons, 1973), 117.

divisions. Like cavalry squadrons, air groups could defend themselves and perform raids, but their *raison d'être* was collecting information. Such restriction of operation retarded the potential of the aircraft as an efficient weapon of war. The Royal Navy came the closest to realizing the full potential of aircraft as offensive weapons, and in 1918 they launched the first carrier-based raid in history, when seven Sopwith Camels took off from the flight deck of the *HMS Furious* to attack the German Zeppelin base at Tondern.⁷³

American Brigadier-General William Mitchell arrived in Europe just as the United States entered the War in the spring of 1917. What he witnessed in the Allied air services convinced him of the importance of air power to the future of warfare. Many in the top echelons of command failed to grasp the lessons of the Great War, but Mitchell saw the aeroplane as a herald of a changing world. In his view, command of the sea was no longer the deciding factor in war. Rather, he argued that “no navies can operate on the seas, nor armies on the land, until the air forces have first attained a decision against the opposing air forces, so as to allow those on the water to operate against their enemy.”⁷⁴The *Ostfriesland* saw little of the air war during her active service, but the addition of anti-air defense batteries demonstrated the influence air power was gaining. By Scheer’s own account, the High Seas Fleet relied heavily on Zeppelins and sea planes to scout for the Grand Fleet and provide intelligence information to the surface ships. When the war ended in 1918, the use of airplanes in a military capacity had rapidly moved beyond simple scouting and ground support and well into offensive engagements of both air and ground targets.

⁷³ Richard P. Hallion, “World War I: an air war of consequence,” *Endeavor*. Vol. 38. No. 2, 86-87.

⁷⁴ Mitchell, *Our Air Force*, Xix.

At the close of the Great War, the Allied and Associate Powers began downsizing their militaries to defensive forces, dramatically reducing the size of their fleets and air services, while taking much of Germany's from them as reparation for the extensive blood they spilled across all fronts. Germany agreed to intern her greatest warships at Scapa Flow during peace negotiations, but the *Ostfriesland*, no longer the top-of-the line battleship, remained in German hands as a barracks ship.⁷⁵ When Admiral Ludwig von Reuter scuttled the ships under his command, the allies seized the *Ostfriesland* to replace those irretrievable at Scapa Flow. For a brief period between the end of the Great War and her sinking of the Virginia coast, the *Ostfriesland* was commissioned as a United States naval vessel. Figure 5 depicts the ship in the New York Navy Yard flying the American flag while undergoing studies from U.S. Navy inspectors.⁷⁶ Though the *Ostfriesland's* war record as a German battleship had come to an end, she proved to be a key factor in the argument between air and sea.

⁷⁵ After the *Helgoland*-class battleships, Germany developed the *Kaiser*-class battleships, which were the first to utilize turbine propulsion with supplementary oil burners. The new class also had only five large gun turrets compared to the *Helgoland*-class' six, but unlike their predecessors, the *Kaiser*-class ships could bring all five batteries to bear at once, where the *Helgolands* could only bring four

⁷⁶ RG 19 Records of the Bureau of Ships. Album Prints of United States Ships. 1883-1941. Box No. 21. 19-A.



Figure 6: The Ostfriesland under an American Flag in the New York Drydock

CHAPTER 4

BILLY MITCHELL AND THE VICTORY FLEET

William Mitchell's military career began at the age of eighteen when he enlisted with a volunteer regiment to serve in the Spanish American War in 1898. The grandson of a wealthy banker and railroad king, and the son of a United States Senator, Mitchell spent a significant portion of his youth with "horses and guns."⁷⁷ His family's influence helped secure him a commission as a Second Lieutenant in the Army, and his jovial personality helped gain him the attention of senators and commanders like William Jennings Bryan and Major General Adolphus Greely, the Chief Signal Officer of the Army. Even at eighteen, Mitchell understood the ease with which he secured his commission had more to do with influence than merit.⁷⁸

Ironically, Mitchell built his career in an Army that was rapidly reorganizing into an expansionary force to assert the United States growing imperialist ambitions that Mitchell's own father vocally opposed on the Senate floor.⁷⁹ As an officer in the Signal Corps, Mitchell spent most of the war in Florida, but managed to make it to Cuba in time to see the transfer of power from Spain, which had controlled those waters for four centuries, to the United States, a rising power in the changing world.⁸⁰ While Senator Mitchell ardently opposed expansionist bills that crossed his desk,

⁷⁷ Major Alfred F. Hurley, USAF, *Billy Mitchell: Crusader for Air Power*, (New York: Franklin Watts, Inc., 1964), 2.

⁷⁸ *Ibid.*

⁷⁹ Isaac Don Levine, *Mitchell: Pioneer of Air Power*, (New York: Arno Press, 1972), 4.

⁸⁰ Mitchell's father, John Lendrum Mitchell, was a United States Senator from Wisconsin who was a determined anti-imperialist who vehemently opposed the early wars that helped shape Billy Mitchell's military career.

Lieutenant Mitchell enthusiastically embraced the mission to show the American flag around the world.⁸¹ When the inhabitants of the Philippines challenged American annexation, Mitchell volunteered for transfer to that station, and arrived at the start of a two-year campaign to quell the islanders.

Mitchell's service in the Philippines provided him with the experience necessary to become the youngest Captain in the Army at the age of twenty-four. His position as Captain in the Signal Corps exposed Mitchell to numerous technologies, including the telephone and telegraph, dirigible, and airplane. His post at Fort Leavenworth, Kansas, then known as the intellectual hub of the Army, afforded him experience with several of these cutting-edge technologies, and in 1906 he published his first article concerning air power, though in it he discussed the dirigible.⁸² Alfred Hurley notes in his biography that Mitchell did not participate in the Signal Corps early aeronautical work. The Signal Corps didn't formalize the Aeronautical Division until 1907 and didn't receive its first air plane until 1908. By 1913, it only had six planes and one dirigible. Hurley claimed that "Mitchell himself never expressed any ambition to fly before 1916. Thus, his remarks about military ballooning suggested no more than the range of his active mind at a time when a fast-moving technical revolution was challenging the entire Army, and the Signal Corps in particular."⁸³

After Leavenworth, Mitchell gained acceptance to the School of the Line (formerly the Infantry and Cavalry School) where his instructors labelled him a

⁸¹ The practice of "showing the flag" in the early 20th century was a remnant of pre-steam imperial practices in which aspiring nations would disburse their fleet throughout the world to assert their political influence. The practice was in part a distribution of vessels across an empire during a period when calling for aid during emergency situations took days or weeks. By having ships throughout the world, help was theoretically nearby.

⁸² Hurley, *Crusader for Air Power*, 11.

⁸³ *Ibid*, 12.

Distinguished Graduate and selected him for admission to the Staff College. His training at those schools demonstrated the extent to which the Army was reorganized from a service designed for the subjugation of Native Americans to a global force designed for colonization and expansion. The school's curriculum "emphasized the preparation of the student body for mass warfare," and Mitchell applied the lessons he learned there to his career.⁸⁴

Mitchell returned to the Philippines for his next tour of duty where he applied his training to a reconnaissance mission in which he monitored Japanese activities in the areas between Formosa and the Philippines. He expanded his study of the Japanese military to battlefields of the Russo-Japanese War and Russian and Japanese forces. He drafted a report of his findings to the War College Division of the General Staff where he outlined his belief that war with Japan was inevitable and the Philippines were in great danger of falling into Japanese hands.⁸⁵ His was an extreme interpretation but not an uncommon one. Japan's victory over Russia in 1905 had shaken America and her allies and convinced them that Japan was a greater threat to their Pacific possessions than Germany.

His report aligned with the views of many military commanders, including Secretary of War Henry Stimson and Chief of Staff Major General Leonard Wood. The two influential men wanted an army with a regular component of 100,000 soldiers and a trained reserve to support it. Mitchell's harmony with his superiors' views of a large standing army contributed to his selection for duty with the organization of a

⁸⁴ Hurley, 12

⁸⁵ Ibid, 13.

regular and volunteer force.⁸⁶ His post to the General Staff sent him to Washington, D.C. where he was determined to build the necessary political partnerships that would insure his path to the rank of General. At the age of thirty-four, Mitchell was fully committed to a career in the military, the only place he felt he could match the record of his father and grandfather.⁸⁷

Mitchell's experience in the Signal Corps convinced him that the rapid advance of science was bringing global transportation to the point where distance could soon be measured in time, rather than miles. The rate at which technology was advancing served to shape Mitchell's views of the usefulness of aircraft, and in 1913 he began to listen to the aviators of the Aeronautical Division who maintained that an independent aviation service would produce more advances than one under the purview of the Signal Corps. In 1913, however, Mitchell and future legends in aviation like Lieutenant Henry "Hap" Arnold testified in front of a Congressional hearing that aviation and the Signal Corps were best suited to each other. At that point, Mitchell still viewed aviation as little more than an instrument of reconnaissance, which made it ideal to the Signal Corps communications system.⁸⁸

When the Great War began in Europe, Mitchell monitored the early action with immense interest. Hurley has compared Mitchell's interest in the Great War to George McClellan's role as an observer during the Crimean War. McClellan used his experience to claim a key position as a Union General at the outbreak of the Civil

⁸⁶ Hurley, 14.

⁸⁷ Mitchell's grandfather was a railroad tycoon and former US Senator who was one of the wealthiest men in the United States. Levine notes that if Wisconsin had anything resembling a dynasty, it was the Mitchell Dynasty, of which Billy was the third generation.

⁸⁸ Hurley, 17.

War, despite lacking the aggression and daring of his Confederate counterparts. Anticipating America's entry into the European conflict, Mitchell hoped to gain a post as an observer in Europe. He hoped the role would lead to his holding a key position at the outbreak of America's next war, as it had done for McClellan. With an eye on hostilities, the Wilson Administration issued a call for assessments of national defense in the event the war reached American shores and requested proposals for defense preparations. In one such proposal, Mitchell presented what Hurley called the "earliest comprehensive statements of American military aviation policy and an excellent statement of aeronautical thinking at this time."⁸⁹ The proposal called for continued attachment of aviation with the Signal Corps. The Air Service would serve as a second line of defense in case the Navy failed to keep the enemy from American shores.

The proposal retained the notions of an air service as auxiliary to more traditional and well-established ground forces. Attached to coastal defenses, the Signal Corps could deploy aircraft as spotters to enhance the accuracy of artillery. Flyers could also engage enemy aircraft offensively, destroying airships, attacking submarines, and disrupting minelaying operations. The situation became more convincing when the aircraft supporting General John J. Pershing's pursuit of Pancho Villa fell apart due to the rugged conditions of the Mexican desert.⁹⁰ The wooden propellers dried out and cracked under the southwest heat, and their engines could not perform efficiently in the mountainous terrain.⁹¹ Convinced of the need for better

⁸⁹ Hurley, 19.

⁹⁰ Ibid, 20.

⁹¹ Ibid.

planes, Congress allocated \$500,000, followed by the enormous sum of \$13,281,666 for the Aviation Section of the Signal Corps.⁹²

Mitchell's position in the General Staff began to wear on him physically, causing such ailments as eye strain and rheumatism. The absence of physical activity he had enjoyed in his youth contributed to health problems, and his superiors judged his temperament to be better suited for active field service rather than desk work. As an officer of the Signal Corps, the Aviation Division represented Mitchell's only opportunity for the field service he had always wanted. In July 1915, Mitchell achieved promotion to Major and transferred to the Aviation Section where he threw himself into the task of building up Army aviation.

His first task was to improve pilot training, and there he had his first encounter with the types of conflicting interests that would characterize his post-war career. One of the chief interests in aviation training in the early 20th century was the Aero Club of America, which wanted the government to focus pilot training on National Guardsmen. Mitchell and his colleagues preferred to increase the training of active duty flyers. Eventually, Secretary of War Newton Baker sided with Mitchell and he continued training pilots in the manner he saw fit.

Mitchell's proximity to pilot training inspired him to learn the skill himself when off duty. Although Congress had authorized officers like Mitchell to fly they had not allocated funds to pay for their training. As a result, Mitchell paid for his own training at Curtiss Aviation School in Newport News, Virginia. The expense of \$1,470, paid off in January of 1917 when the War Department decided to send an

⁹² Hurley, 20.

officer to Europe as an aeronautical observer. Mitchell secured the position and departed for France in March 1917, at a point in the war when German-American relations were rapidly disintegrating in response to Germany's unrestricted submarine warfare campaign. The following month Wilson asked Congress for a declaration of war against Imperial Germany.

Upon arrival in France, Mitchell immediately took an intensive aeronautical course to catch up to the Allied airmen. By listening to what they said, and more importantly observing what they did, Mitchell became convinced that American aviation was sorely underdeveloped and underappreciated in the United States.⁹³ Mitchell's exposure to the performance and daring of French pilots during the Great War demonstrated to him the tremendous tasks American aviation faced to reach the same level, as well as the importance and potential of aviation as a military force. He arrived at a time when French and English aeronautics had advanced to include fighters and bombers in an offensive force that operated efficiently and effectively after two years of combat trials. The level of organization of planes and their pilots developed by the Allies during wartime highlighted the academic amateurism with which the United States pursued air power, and left Mitchell wanting to explore the depth to which European aeronautics had advanced. Disregarding the objections of French Command, Mitchell spent ten days under fire and was the first American pilot to fly over German lines.⁹⁴

Historians have recounted Mitchell's experiences as an American observer in several books. It is not necessary to retell that story here. Suffice to say, Mitchell's

⁹³ Hurley, 22.

⁹⁴ Levine, *Pioneer of Air Power*, 90.

experiences on the Front during the spring and summer of 1917 thoroughly convinced him of the importance of air power, and in the wake of Versailles he became a vocal proponent of building an independent air force that would assume the role of America's first line of defense. He firmly believed that for a nation to control the land or sea, it must first obtain control of the air above the other fronts. His pursuit for a more powerful and independent air service would consume him during the interwar period, and with the surrender of the German warships at Scapa Flow, and the *Ostfriesland* to replace those scuttled by Reuter, Mitchell had the perfect targets with which to test his theories.

Mitchell's most vocal and ardent opponents in his quest to develop an independent air force were leaders in the U.S. Navy. The rivalry began on Mitchell's transit back to the United States when he was on board the Cunard liner *Aquitania* with Lieutenant Commander (Lt. Cdr.) Jarome C. Hunsaker, the Navy's leading authority on aircraft design. Hunsaker had just completed service with the Allied Naval Armistice Commission, which investigated German naval aviation and oversaw the surrender of German aircraft under the terms of the armistice. Despite their mutual interest in aviation, Hunsaker didn't like Mitchell, referring to him as a "politician in uniform,' 'charming' in some ways but with a certain 'asinine quality.'"⁹⁵ In the latest study of Mitchell's rivalry with the Navy, Thomas Wildenberg spoke of the *Aquitania* voyage as the initial planting of the seeds of enmity between Mitchell and the rival aviation service. Wildenberg describes the aviator's passion and resolve as the catalyzing element:

⁹⁵ William. F. Trimble, *Jerome C. Hunsaker and the Rise of American Aviation*, (Washington, D.C.: Smithsonian Institute Press, 2002), 62. Cited in Wildenberg, 33.

Mitchell expounded at length on the lessons of the war and the importance of an independent air force to anyone within earshot. The general and his cohorts, Hunsaker recalled, were “fully prepared with evidence, plans, data, propaganda posters and articles to break things wide open for air power as the sole requisite of the national defense in the future.’ Mitchell’s rhetoric spelled danger for the Navy and for naval aviation in particular.⁹⁶

After Mitchell’s return to the States, the military underwent a period of reorganization in which President Wilson’s executive order abolished the Military Aviation Division and put the civilian Bureau of Aircraft Production under the director of the Air Service, “who was to have all powers conferred by law and executive order that had previously been accorded the director of Aircraft Production.”⁹⁷ In the wake of the reorganization, Mitchell was assigned to the staff of the director of the Air Service as assistant executive in charge of the Training and Operations Division.

In his new position, Mitchell relentlessly dispatched suggestions and requests for aeronautical developments to director of the Air Service Major General Charles T. Menoher, who dismissed many of them, not because they were bad ideas, but because unlike Mitchell, Menoher realized that the General Staff would not authorize the exorbitant expenses such advancements would entail. In the early 20th century, the practice of nations in peace was to reduce the size of the military to defensive level. Mitchell’s suggestions for expansion, research, and development ran counter to those policies, impeding the level of advancement Mitchell hoped to achieve.

In addition to his rivals in the Navy, Mitchell faced other opponents in his quest to expand airpower, these more familiar and of the type that had existed

⁹⁶ Thomas Wildenberg, *Billy Mitchell’s War with the Navy: The Interwar Rivalry over Air Power*, (Annapolis, M.D.: Naval Institute Press, 2013), 33.

⁹⁷ *Ibid*, 34.

frequently during periods of technological and social advancement. On his side were the aviators and supporters of air power, who agreed with Mitchell's assessment that the air opened a new battlefield that would characterize future wars. Even naval aviators agreed with Mitchell on this point. But there remained the traditionalists, non-flyers who stubbornly clung to the writings of Nelson and Mahan and steadfastly believed the airplane was useless for anything other than auxiliary service to ground and sea forces. Wildenberg noted that "the nature of the controversy differed somewhat between the services. In the Army, the issue [centered] around the status of the airmen and the establishment of a separate air arm. Naval aviators were also concerned about their status, but their first priority was to obtain aircraft carriers, which was essential if aircraft were to accompany the fleet."⁹⁸

The rivalry with the Navy was partially genuine, but also designed to combat the traditionalists and convince Congress of the importance of air power in national defense. To that end, the General Board of the Navy, the advisory body of senior flag officers who reported to the Secretary of the Navy on matters of policy and ship construction, called Mitchell to appear at a hearing questioning whether the coastline should remain the dividing line between Army and Naval authority over national defense. Mitchell's belief in a singular air service convinced the Board to call him to testify, and much of the discussion revolved around the "types and numbers of planes that might be transferred to the Army as the Navy demobilized."⁹⁹ This hearing was the first instance in which the Navy or Mitchell raised the subject of surface ship vulnerability, and both sides agreed that they would have to perform tests to

⁹⁸ Wildenberg, 34.

⁹⁹ Ibid, 35.

adequately determine the applicability of aircraft, or vulnerability of naval craft, in such a contest.¹⁰⁰ At some point in the hearing, Mitchell lectured the flag officers on the necessity of fighter escorts for observation craft and the inadequacy of floatplane squadrons, which placed him solidly in favor of naval aviators who were pushing for the development of the Navy's first aircraft carrier.

Though naval aviators agreed with Mitchell's desire for a more developed aeronautical force, the new director of Naval Aviation Captain Thomas T. Craven believed that the Navy should design, develop, and deploy its planes in conjunction with other naval forces, just as any ship or weapon. Craven did not deny the notion that a unified air service would advance aeronautics more rapidly than divided services, but he felt deployment of those forces during wartime would be inefficient in terms of achieving victory. In response, Mitchell devised a plan for the deployment of aircraft carriers under a unified air service and called for two such craft with nine-hundred-foot decks. His goal in wartime was first to achieve air superiority through the destruction of enemy air forces, which was a concept that naval aviators had not yet considered.

Mitchell's rivalry with the Navy hit full stride when he testified in front of a Military Affairs committee concerned with the reorganization of the armed services in the post war period. The committee was especially concerned with the fate of the air services, which were in danger of being completely dissolved. Mitchell's August 20 1919 testimony drew the proverbial line in the sand when he declared "we believe that if we are allowed to develop essentially air weapons [as a] means of fighting in the air

¹⁰⁰ Wildenberg, 35.

that we can carry the war to such an extent in the air as to almost make navies useless on the surface of the waters. The Navy General Board I might say agrees with me on that.”¹⁰¹

In 1919, Mitchell and the Navy were solidly at odds with each other. Mitchell continued to push for a unified air force that would have final administration over all aviation, even carriers at sea. The flag officers of the Navy, as well as Acting Secretary of the Navy Franklin Delano Roosevelt, argued that naval aviation should remain a division of the Navy and the training of pilots, construction of planes, and deployment of aircraft carriers, should remain under the purview of the Navy. As the House Military Affairs Committee met in 1920 to discuss the Army Appropriation Bill for 1921, Mitchell again attacked the Navy, claiming that all aircraft for coastal defense should be solely under the direction of the Army Air Service, and that naval aviation should be restricted to the fleet. In his testimony, Mitchell exaggerated the facts by stating that the Air Service was developing planes capable of dropping five 1,000-pound bombs on battleships. He argued that the aerial bomb possessed more destructive power as a percentage of its total weight than shells, torpedoes, or mines, making it the ideal weapon for use against surface vessels. At the time, the Air Service was in the process of developing a plane capable of carrying a 5,000-pound payload, but its best plane in service was the Martin bomber, which had a max load of 1,040 pounds. Yet Mitchell willingly stretched that detail to challenge the Navy once again by claiming that the Air Service would render the fleet obsolete if given the chance.¹⁰²

¹⁰¹ U.S. Senate, *Reorganization of the Army, Hearings before Subcommittee of the Committee on Military Affairs*, 66th Cong., 1st sess., 299. Cited in Wildenberg, 40.

¹⁰² Wildenberg, 47.

In his quest for an independent air force under his command, Mitchell waged an outright public relations war against the Navy in the early 1920s. Aviators like Mitchell and Hunsaker had to fight for funding from a Congress seeking to cut costs to a military in the process of peace-time reorganization. To justify the expenditure attached to pursuits in aviation, be they naval or army, Congress required a test of the applicability of air power against naval forces. Wildenberg impeccably described Mitchell's reaction to the test requirement by pointing out that he "was so audaciously sure of himself that he immediately set in motion plans for sinking one of the naval service's cherished icons of sea power."¹⁰³ Understanding that his most threatening opponent during peace was the Navy, Mitchell was determined to prove the superiority of his vision of an air force as more advantageous than the traditional naval approach.

Mitchell had begun his public relations campaign to gain public support for increased funding of the Air Service toward the end of summer 1920. He understood that for people to recognize the importance of aviation to national defense, he had to first get them interested. He knew at the start that the public still believed the Navy to be the nation's first line of defense, a viewpoint that had helped secure funding in 1916 for the Navy's largest expansion bill in its history.¹⁰⁴ Mitchell was well aware of Congress's inclination to reduce spending in the post-war years, and felt that the service most capable of coastal defense would receive the most funding. He argued that once the initial cost of building 2000 planes had been allocated, the annual upkeep thereafter would not exceed the upkeep of more than one or two battleships.

¹⁰³ Wildenberg, 58.

¹⁰⁴ Ibid, 50.

The question of an aerial test was not a novel one at the time. The Navy had a long tradition of using its obsolete warships to test its most advanced weapons. The goal of those tests was to identify the most vulnerable points in ship construction, so they might be reinforced in the next generation of warships. In mid-October of 1920, the Navy scheduled such a test against the obsolete battleship *Indiana*. The goal of the tests was to determine the potential effects of aerial bombing against battleships and determine the best course to strengthen surface vessels against such an attack. The Navy invited four Army officers, including Mitchell, to observe the bombing trials. The final test was to detonate an 1800-pound bomb filled with nine hundred pounds of amatol explosive placed on the port side of the superstructure next to the 8-inch barbette. The explosion caused a gaping hole through the main deck, blew out most of the superstructure, toppled the forward smokestack, and damaged the barbette. Having witnessed the detonation first hand, Mitchell was convinced that a single 1,800-pounder could sink the toughest ship in service on the ocean.

The day after the tests, retired Rear Admiral Fullam published an article in the *New York Tribune* on the future of naval warfare. In the article, Fullam praised the development of aircraft and extolled the advances in submarines, mines, and torpedoes, which he believed would facilitate a revolution in battleship design and prevent the transportation of large armies overseas.¹⁰⁵ In his conclusion, Fullam asserted that sea power would continue its influence on history, but would now have to control the air above them.

¹⁰⁵ Wildenberg, 52.

Ever the opportunist, Mitchell used Fullam's arguments to fuel his propaganda war against the Navy. In the months leading up to his own bomb tests, he exploited the purpose of the *Indiana* tests and manipulated the findings to his own ends. Where the purpose of the tests was to determine how best to strengthen future ship designs against aerial attack, Mitchell highlighted those findings as indicative of the vulnerability of surface ships against aerial bombardment.¹⁰⁶ By pushing that information into the public, Mitchell effectively "wrested the initiative from the Navy and shifted the burden of proof to the sea service."¹⁰⁷

The public relations war between Mitchell and the Navy had generated so much interest in the bomb tests that the potential for experimental data had become irrelevant. High ranking officials within the Navy went as far as to assert their confidence in the failure of the aerial attacks that they would "be perfectly willing to be on board [the *Iowa*] when they bomb her."¹⁰⁸ The public saw the statement as a challenge, and from that point the aircraft-v-battleship argument became a win-or-lose contest. Nothing else mattered beyond the question of whether aerial bombardment could sink a battleship.

The public interest in the aerial bomb tests provided the necessary support for Senator Henry New, a strong supporter of aviation, to increase pressure on Secretary of the Navy Josephus Daniels to provide test vessels for the experiment. On February 9, 1921, New introduced a joint resolution to the Senate Committee on Military Affairs directing Daniels to supply obsolete vessels to the Air Service for use in

¹⁰⁶ Wildenberg, 58.

¹⁰⁷ Ibid.

¹⁰⁸ "Airmen Challenge Test with Big Ships," *New York Times*, February 7, 1921; Melhorn, *Two-Block Fox*, 62; Wildenberg, 58.

conducting extensive aerial bomb tests. Daniels' reply on February 24 indicated that he had already issued orders to the Commander-in-Chief of the U.S. Fleet to conduct bombing experiments on the German ships surrendered at the close of the Great War and invited the Army to participate.¹⁰⁹

The terms of the Versailles Treaty that authorized the transfer of German warships to the United States stipulated that the vessels be "rendered useless for military purposes and then destroyed."¹¹⁰ After their capitulation, German sailors sabotaged the vessels before surrender in a last act of defiance. When U.S. Navy personnel took possession of the vessels at Rosyth, their first task was to assess the damage and repair as much of it as possible before their transit across the Atlantic. The engines of the U-boats had been badly damaged, but Navy submariners repaired them enough to make the transit. The destroyers had been gutted and so extensively damaged that they had to be towed across the sea to the United States. The *Ostfriesland* had been sabotaged, but Navy crews were able to repair her to a level of serviceability in which they sailed her to American shores under her own power.¹¹¹ The Bureau of Ordnance officially authorized the use of the surrendered ships as bomb targets on February 28, 1920. The Navy drafted a series of proposals to demonstrate the destructive power of various bomb sizes against several ex-German warships. The aerial tests would be conducted against the U-boat *U-117*, the torpedo boat destroyer *G-102*, the light battlecruiser *Frankfurt*, and the *Ostfriesland*.

¹⁰⁹ Wildenberg. 59.

¹¹⁰ Ibid.

¹¹¹ Ibid.

A year after the Bureau of Ordnance's official sanction of bomb tests against the German ships, the Joint Aeronautical Board approved the final experiment design for the bomb tests against the surrendered vessels. The exercises were designed to determine:

1. The ability of aircraft to locate vessels operating in the Coastal Zone and to concentrate on such vessels sufficient bombing airplanes to make an effective attack.
2. The probability of hitting with bombs from airplanes a vessel underway and capable of maneuvering but incapable of antiaircraft fire.
3. The damage to vessels of comparatively recent design which will result from hits with bombs of various types and weights. The vessels to be attacked by bombing are battleship, light cruiser, destroyer, and submarine types.¹¹²

The authorization of a research design and transfer of ex-German warships for use in aerial bombardment demonstrated the effectiveness of Mitchell's public relations war against the Navy. Mitchell's true target was not the German ships and their destruction, but the Navy itself. If Mitchell's pilots and bombers successfully demonstrated the vulnerability of battleships against an aerial attack, naval aviation and the Navy's position as the nation's first line of defense would be jeopardized.¹¹³

By April of 1921, the bitter rivalry between Mitchell and the Navy had reached such an intensity that President Warren G. Harding felt the need to intervene. In an

¹¹² Joint Aeronautical Board No. 349 Serial 128, February 28, 1921, as cited by Turnbull and Lord, *History of Naval Aviation*, 858-59, cited in Wildenberg, 60.

¹¹³ Wildenberg, 61.

official address to Congress, he sided with the Navy when he remarked “aviation is inseparable from either the Army or the Navy...and I recommend the establishment of a Bureau of Aeronautics in the Navy Department to centralize control of naval activities in aeronautics.”¹¹⁴ Harding’s official recommendation severely undermined Mitchell’s quest for a unified Air Service under his command, which would be virtually impossible once a Bureau of Aeronautics was officially created. His best chance to regain the lost prospects was through the bomb tests.¹¹⁵

The Navy’s bomb tests featured the most complicated research design in the AirService’s long history of experimentation. Mitchell was to command the Army Air Service, but the final command authority was the Commander-in-chief of the Atlantic Fleet. The Navy wanted observers to board the German vessels after each test to assess the damage of the varying degrees of bombs. Newspaper photographers and correspondents would be present, creating an added layer of logistical difficulties for which the naval commander-in-chief was responsible. The issue that Mitchell found most absurd was the fact that the Army and Navy Air Forces were supposed to work together, but with the former under Mitchell’s command and the latter under the Navy’s command. He firmly believed that command of the air forces, in general but especially for this particular experiment, should be under his command and not divided. Division of command for the aeronautical element presented too many conflicts of interest to effectively execute the plan.¹¹⁶

¹¹⁴ Warren G. Harding, *Address of the President of the United States Delivered at a Joint Session of Congress, April 12, 1921*, (Washington, D.C., GPO, 1921) as cited in Wildenberg, 62.

¹¹⁵ Wildenberg, 62.

¹¹⁶ *Ibid*, 65.

Further debate arose over the types of bombs Mitchell could use in the experiments. The Navy agreed that the planes should use multiple bomb sizes and types to gather the most diverse range of data possible. Through careful study and analysis of previous tests, the Navy Department set limitations on the sizes and types Mitchell could use. Prior to the limitations, Mitchell had ordered the Ordnance Department to develop an experimental 2,000-pound bomb for use specifically against a battleship, but Commander Thomas R. Kurtz argued that everyone knew that a 2,000-pounder could sink a battleship, but use of a bomb that size would render the whole experiment useless.¹¹⁷ Mitchell was indignant at what the controlling and restrictive orders of the Navy Department in what he believed should be strictly an Air Service test, and he continued his propaganda war with the Navy right up to the day of the tests.

In his 1925 book, *Winged Defense*, Mitchell wrote that the Navy commanders considered the trial to be “utterly useless, because they reasoned it was entirely impossible to sink, or even injure, a battleship.”¹¹⁸ Mitchell knew that while the tests included the smaller, lightly armored craft like submarines, cruisers, and destroyers, the weight of his reputation and the future of aeronautics in the U.S. military relied solely on the performance of his planes against the *Ostfriesland*. The successful destruction of the smaller boats was not without merit, as Mitchell points out that their sinking demonstrated “conclusively that planes could sink merchantmen, transports, or

¹¹⁷ Wildenberg, 65.

¹¹⁸ Mitchell, *Winged Defense*, 56.

any kind of a vessel not protected by armor,” which would prove useful in harassing enemy commerce during wartime.¹¹⁹

The important precursor to the *Ostfriesland* test was the bombing of the cruiser *Frankfurt*, which possessed considerable hull and deck armor as well as watertight compartments to withstand considerable punishment from the Grand Fleet of the Royal Navy. The July 18th test provided the opportunity to demonstrate the destructive effects of multiple sizes of bombs, and after each successive test, observation crews boarded the vessel to assess the destructive potential of each size of bomb. Accompanying the official reports of the damage Mitchell and his pilots inflicted is video footage taken by one of the observation planes, which depicts the tests with remarkable clarity. As the bombs of varying sizes fell on and around the *Frankfurt*, the observation plane captured the extent that the shrapnel and fragments of steel were thrown by the force of the explosions. Mitchell wryly reflected on the implication of these tests when he later wrote “it made one think what might happen in case a real attack was made against naval vessels in war, whether the crews could be held to their posts in view of almost certain destruction.”¹²⁰

With the successful destruction of the German warships, Mitchell prepared his planes for their final assault on the *Ostfriesland*, the keystone target of his tests. The gravity of this test was not lost on Mitchell who knew that to secure a future for his Air Service and keep his argument for a unified Air Force alive, they “had to kill, lay out and bury this great ship in order that our people could appreciate what tremendous

¹¹⁹ Mitchell, *Winged Defense*, 64.

¹²⁰ *Ibid*, 65-66.

power the air held over battleships.”¹²¹ The *Ostfriesland* represented one of the most advanced warships of her time, and with her relatively recent service, she was not as obsolete as many of the Navy’s traditional test subjects. Germany built her in accordance with Mahan’s gospel of sea power to be a tough nut to crack. She was designed to contend with the dreadnoughts of Fisher’s Grand Fleet, and Mitchell was determined to use her to demonstrate the supremacy of airpower in military tactics and technology.

The conditions of the test are important to the public relations war that continued to surround Mitchell and the Navy observers. Mitchell’s primary purpose was to prove that a battleship as tough as the *Ostfriesland* was vulnerable to aerial bombardment. To make his point, the *Ostfriesland* was moored and abandoned, presenting a completely unthreatening target for Mitchell’s planes to focus. None of the features that made her formidable were serviceable in the test. Enemy sailors did not man her, she was not able to fire back in defense, nor was she even allowed to present a moving target. Her only defense against Mitchell’s bombs were those inherent in her construction, namely, her thick armor plating. With the ship handicapped in such a way to provide the most vulnerable target possible, Mitchell still stressed the need to sink her, as failure to do so would severely hinder his argument for the superiority of air power.

The bombing of the *Ostfriesland* began on the afternoon of 20 July, after a slight weather delay, with the deployment of small caliber bombs. Five Marine Corps DH-4s and two three-plane divisions of Navy F-5Ls began dropping thirty-three 230-

¹²¹ Mitchell, *Winged Defense*, 67.

lb bombs on the *Ostfriesland* at 1:39pm.¹²² Once the first bombing run had finished, the Board of Observers stationed on the *USS Shawmut* boarded the *Ostfriesland* to assess the damage. At 2:05 pm Captain Alfred W. Johnson ordered the Army to send its fourth squadron of Martin bombers to begin their run, which would include the use of 600-lb bombs. The time needed for transit from the airfield to the ship would provide ample time for the observers to assess the damage and return to the *Shawmut* before the next bombardment began. Unknown to Johnson, however, a flight of five MB-2s had breached protocol and left Langley Field at 1:36 pm with a payload of twelve 600-lb bombs.¹²³ Wildenberg argues that the breach in protocol was characteristic of Mitchell, who often disregarded his non-aviator superiors, willfully placing his own goals above those of the Navy. When the flight arrived on site, the observers were still aboard the *Ostfriesland*, and the flight commander Captain Walter R. Lawson radioed to the *Shawmut* that his flight had only forty minutes of fuel remaining. Lawson's breach of protocol caused his flight to arrive before the scheduled third test bombers, and the worsening weather and their declining fuel forced Captain Johnson's hand. Lawson's planes dropped their eleven 600-pounders one at a time, but only one successfully struck the *Ostfriesland*, damaging the starboard side of the forecastle.¹²⁴

Mitchell wrote later that he knew full well that any bomb under 1,100-lb would be insufficient to sink the *Ostfriesland*. When the Board of Observers surveyed the results of the bomb tests at the end of the day, they confirmed as much. Only the 600-

¹²² Wildenberg, 76.

¹²³ Ibid.

¹²⁴ Ibid, 77.

lb bomb dropped by Lawson's planes caused any noticeable damage below decks, having put the two six-inch ammunition hoists out of commission. The powerful ship's armor protected her from any significant topside damage, but the observation crew did discover a large amount of water entering from a ruptured seam in the forward boiler room, causing her to list to port.¹²⁵

The second phase of bombing began the next morning, and as the *USS Shawmut* arrived to observe more tests, the Board of Observers noted that the *Ostfriesland* had "settled into an even keel, but was down three feet by the stern, with the aft air ports on the third deck just awash."¹²⁶ Without a crew on board toiling to save her life and theirs, the *Ostfriesland's* demise was that much closer at hand, furthering the relative ease with which Mitchell's plan was achievable. At 8:00 am, six Army and five Navy Martin bombers arrived on site to begin their bombardment with 1,000-lb bombs. Mitchell's Army planes made the first run, dropping bombs one at a time and scoring the first direct hit at 8:32 am.¹²⁷ The rules of the test dictated that the planes cease bombing after each direct hit to give the Board of Observers a chance to assess the damage. Likely under Mitchell's orders, the bombers continued dropping their 1,000-lb payloads in rapid succession, blatantly disregarding radio and visual signals from the *Shawmut* to cease fire, so the inspection crew could board her. For twenty minutes the Army planes ignored the *Shawmut's* signals to continue their bombardment, scoring two more direct hits before returning the all-clear to Captain Johnson.

¹²⁵ Wildenberg, 78.

¹²⁶ Ibid.

¹²⁷ Ibid.

While the Army defied the Navy's parameters for the test, the Navy bombers waited for the *Shawmut's* signal to proceed, which never came as they were ordered to return to land and rearm with the next payload of 2,000-lb bombs. When the observation team finally made it aboard the *Ostfriesland*, they determined that the bombs had done no critical damage to the ship, though the near-misses had exacerbated the flooding, and the ship continued to take on water at a more rapid pace. Mitchell's experimental 2,000-lb bombs designed specifically for use against the *Ostfriesland* represented his last chance to prove the value of air power against a modern warship.

The rules of the tests stipulated that Mitchell's Army planes could only drop three 2,000-lb bombs, and only two were permitted to directly impact the ship before the Navy called a cease-fire to inspect the damage. Knowing that the coming flight was his last chance to sink her, Mitchell decided to change the rules and conduct the remaining flights on his own terms. If he were to demonstrate the obsolescence of navies in favor of air forces, his Army planes had to sink her before the Navy's planes. His devotion to air power as the future of warfare surpassed his respect for the chain of command. Mitchell radioed the Captain Johnson to inform him that his Army planes would not cease their bombardment until they had all dispensed their payloads on the *Ostfriesland*. Mitchell's timing was impeccable, reaching Johnson just as his Army planes flew into the testing area in their Flying V formation.¹²⁸

Mitchell observed the final assault on the *Ostfriesland* from his DH-4, watching his Army flyers adopt a single line formation to drop their payloads one at a

¹²⁸ Wildenberg, 79.

time. Each of the 8 MB-2 and 3 Handley Page 0/400s carried a single 2,000-lb bomb developed specifically to sink a battleship of the *Ostfriesland's* strength. Captain Lawson dropped the first sighting shot at 12:15 pm. The first two bombs dropped from 2,500 feet missed the massive ship, and a second sighting shot was dropped at 12:23. One minute later Captain Lawson's 2,000-lb bomb glanced off the *Ostfriesland's* side armor and exploded in the water on her port side. Once again ignoring the rules of the test, the Army planes continued dropping their payloads, and two more bombs detonated in the water about twenty-five feet from her port side. The concussive blast of the bombs cracked open the *Ostfriesland's* already weakened hull, flooding her with water. Mitchell's pilots dropped seven 2,000-lb bombs in twenty-five minutes. None of the seven directly hit the great vessel, but the power of the near-misses sent the once-proud ship to her final resting place just twelve minutes after the final bomb was dropped.¹²⁹

Mitchell later described the sight of the sinking vessel in *Winged Defense*, noting the sight of her passing with awe:

When a death blow has been dealt by a bomb to a vessel, there is no mistaking it. Water can be seen to come up under both sides of the ship, she trembles all over, as if her nerve center had been shattered, and she usually rises in the water, sometimes clear, with her bow or stern. In a minute the *Ostfriesland* was on her side; in two minutes she was sliding down by the stern and turning over at the same time; in three minutes she was bottom-side up, looking like a gigantic whale, the water oozing out of her seams as she prepared to go down to the bottom, then gradually she went down stern first.¹³⁰

Mitchell and his Army pilots viewed the sinking of the *Ostfriesland* with triumph and revelry. They had proven the applicability of air forces against modern

¹²⁹ Wildenberg, 80.

¹³⁰ Mitchell, *Winged Defense*, 72.

warships, but they had also solidified the rift between the Army and Navy air services. According to Johnson's plan for the bomb trials, the Navy's Martin bombers were supposed to get first crack at the mighty dreadnought, and the ship was supposed to receive three total hits. Mitchell knew that to make his point his pilots had to be the ones to sink the *Ostfriesland*, and he intended to sink her without permitting the Board of Observers to board her.

Mitchell's blatant disregard for the chain of command and the integrity of the Navy's design for the trials earned him the unrepentant and unflinching animosity of Johnson and the heads of the Navy, especially the aviators. In his own writing, Mitchell failed to address the enmity he inspired in his seafaring rivals, reveling that the tests "conclusively proved the ability of aircraft to destroy ships of all classes on the surface of the water."¹³¹ History is not as forgiving of the man, and Wildenberg's account of the story clearly demonstrates not only the professional indignation between Mitchell and Johnson, who was not an aviator, but the personal hatred the two had for each other.

Mitchell's conduct in the bomb tests permanently damaged his relationship with the Navy and solidified a rift between Army and Navy pilots that continued for decades afterward. The Navy designed the bomb trials to test the applicability of certain types of aerial ordinances against modern battleships, an objective Mitchell denied them by launching his planes without waiting for orders and refusing to cease bombing until all the Army pilots had dropped their payloads. His refusal to follow orders not only robbed the Navy of the opportunity to observe the applicability of their

¹³¹ Mitchell, *Winged Defense*, 73.

armor-piercing bombs, but speculation among historians and military experts suggests had Mitchell followed the research design, the Navy pilots would have been responsible for the sinking of the *Ostfriesland*.¹³²

Mitchell's failure to abide by the rules and his flagrant disregard of orders infuriated Vice Admiral Johnson to the point that he made it his mission to harass and thwart the former's efforts for a unified Air Service modeled after the Royal Navy.¹³³ Once Congress finally authorized the construction and development of aircraft carriers for use in the Navy, the deployment of those mobile platforms took shape in a strategic manner identical to Mitchell's vision for their use.¹³⁴ As he predicted in the wake of the Russo-Japanese War, the United States would go to war with Japan. In that conflict, the contest would be decided just as much in the air above the battlefields, as on the battlefields themselves. Twenty-five years after the sinking of the *Ostfriesland*, World War II demonstrated the accuracy with which Billy Mitchell prophesied the future of warfare. By 1945, Mahan's arguments for the battleship as the supreme battle platform on the ocean had been silenced, and Mitchell's arguments for a well-armed and well researched air force had become the accepted school of tactical thought. Mitchell's vision of a unified Air Force was never realized in the way he had imagined, and the Navy retained its own air service. Though the Army Air Corps eventually became the United States Air Force, aviation in the United States remains segregated between land and sea-based air services.

¹³² Wildenberg, 81.

¹³³ Ibid, ix.

¹³⁴ Charles M. Melhorn, *Two-Block Fox: The Rise of the Aircraft Carrier, 1911-1929*, (Annapolis, M.D.: Naval Institute Press, 1974), 66.

Mitchell's brashness and arrogance in his interaction with the Navy characterized his career, and the mutual animosity he shared with Johnson served to complicate relations between the aeronautical services of the United States. The enmity reached its climax in 1925 when the U.S. Navy's helium dirigible *Shenandoah* crashed in a storm, killing its entire crew. This, coupled with the loss of three sea planes en route from Hawaii to the mainland infuriated Mitchell. In a statement on September 5, 1925 when he condemned the Navy's aeronautical directors when he said "These accidents are the direct result of the incompetency, criminal negligence and almost treasonable administration of the national defense by the navy and the war departments."¹³⁵ The statements not only antagonized the Navy, but outraged President Calvin Coolidge, who issued a direct order for the arrest and court martial of Mitchell for violation of the 96th Article of War, a vague law designed to punish conduct prejudicial to good order and military discipline. ¹³⁶The court martial commenced in early November 1925 and lasted for seven weeks.

Of the twelve judges to sit in Mitchell's court-martial, none were aviators, and several were removed for their favorable bias. The youngest judge was Major General Douglas MacArthur, who described the experience as the most dishonorable order he had ever received. Mitchell's supporters included famed aviators Hap Arnold, Eddie Rickenbacker, and Fiorello La Guardia. Mitchell's efforts to garner public interest in air service manifested during his trial, where public opinion was solidly in his favor.

¹³⁵ Mitchell's statement of September 5, 1925 as reproduced in the Charge Sheet Against Gen. Mitchell, September 24, 1925, 1, MP as cited in Wildenberg, 137.

¹³⁶ "War Powers and Military Jurisdiction." *J.A.G.S. Text No. 4*. (Ann Arbor, Michigan: The Judge Advocates General School, 1943), 14. http://www.loc.gov/rr/frd/Military_Law/pdf/war-powers-military-jurisdiction_4.pdf

Mitchell might have driven a rift between himself and the Navy, but the public still perceived him as a war hero and a visionary, making his court-martial a political issue as much a legal one.

The same press that had helped garner public interest in aviation and sensationalize Mitchell's case for air power seemed to turn on him now as most papers reported that the man had gone too far. Despite the forty-one witnesses who testified in his defense, Mitchell was found guilty of insubordination, conduct unbecoming of an officer, and violation of the ninety-sixth Article of War.¹³⁷ He was suspended from rank, command, and duty, with forfeiture of all pay and allowances for five years, which would allow him to remain in uniform long enough to collect a pension.¹³⁸ Though his military career was effectively over, Mitchell continued to advocate for the development of a strong air force for the rest of his life.

Though he died in 1935, World War II demonstrated the accuracy of Mitchell's predictions. In 1926, the Army Air Service moved out of the Signal Corps and was reorganized into the Army Air Corps. Though far from his vision of a unified air service, in 1947 the Air Corps was reorganized into the United States Air Force, an independent branch of the U.S. military focused on air and space superiority. While the Navy retains its own air service, the United States military has more aircraft and aircraft carriers than any other military in the world. A controversial figure in his lifetime, Mitchell's legacy lives on as he is considered the father of the United States Air Force, and a statue of his likeness was erected at the U.S. Air Force Academy. His rivalry with the Navy served to mobilize the United States to research the strategic

¹³⁷ Wildenberg, 142-143.

¹³⁸ Ibid, 146.

advantages of air power, and without him, the history of naval warfare would be drastically different.

CHAPTER 5

CONCLUSION

The *SMS Ostfriesland* sailed during a pivotal time in the history of naval technology and strategy. Built in 1908, the ship was part of Germany's efforts to elevate its empire in accordance with the doctrines set forth by Alfred Thayer Mahan in his *Influence of Sea Power Upon History*. A second-generation Dreadnought battleship, her design represented the most advanced features in naval construction at the time. She was built specifically to engage the British Grand Fleet in battle. In the years leading up to the Great War, she was the pride of the High Seas Fleet and symbolized Germany's search for their place in the sun. She sailed into a world dominated by the battleship, and in that capacity, she was born to contend.

The *Ostfriesland's* armament, defenses and technology intensified the naval arms race between Germany and Great Britain. At the close of the 19th century, Great Britain was at the twilight of the era sometimes referred to as *Pax Britannica*, in which it maintained a Two Power Standard naval policy that solidified its position as the world's greatest sea power. Essentially, *Pax Britannica* was peace enforced by British rule, it was an era in which the Royal Navy policed the ocean commerce connecting British colonies with the rest of the world. Britain had solidified its position as the world's largest military and colonial power with the defeat of Napoleon in 1815. Throughout the 19th century, no other country was able to challenge Britain's supremacy on the seas.

When Kaiser Wilhelm II took power in the late 19th century, he immediately sought to build a navy that could challenge Britain's naval supremacy. Wilhelm predicted a reorganization of global empires. As an ardent reader of Mahan's work, he believed that for Germany to be in a position to take advantage of the coming international reconfiguration, it needed a powerful navy that would secure its position as a global empire in the new world order. Once Britain had developed the Dreadnought style of battleship, the German Navy quickly adapted. In 1908, the *Ostfriesland* left drydock as one of the most powerful vessels on the sea.

For the first five years of her service, the *Ostfriesland* maintained her original weapons configuration, designed for ship-to-ship battle on the high seas. In 1914, however, she underwent a minor refit. The German navy replaced two of her tertiary guns with 8.8cm Flak cannons for anti-air defense. This seemingly insignificant refurbishing represented *Ostfriesland's* first interaction with the shifting attitudes of warfare in which she would play such a significant role. As a ship designed to engage the world's most powerful navy, the threat of an attack from above was not integrated into her original designs. The addition of anti-air defensive measures at a point so early in the Great War indicated the rapidity with which air power was emerging as a vital battlefield tactic.

Over a century after Jutland, historians still debate the capacity of the German Grand Fleet to challenge the British High Seas Fleet. Admirals Fisher and Jellicoe refrained from the Nelsonian tactics of the 19th century in favor of an effective blockade of the German navy by containing it in the North Sea. When the two powerful fleets did meet, the outcome of the battles were contested. Both sides

claimed victory; neither navy was destroyed. By the end of the war, however, morale within the German fleet had deteriorated to such an extent that when its Admiral sought to put their ships to the ultimate test in a direct, all-out battle, the crews mutinied, robbing Germany of the engagement for which it designed its battlefleet.

The attitudes among German sailors at the close of the Great War were tumultuous and complicated. While the many had refused to sail into a battle which they viewed as a lost cause, they still resented the victors who now controlled their fleet's destiny. Such resentment led Admiral Ludwig von Reuter to order his men to scuttle the fleet interred at Scapa Flow, and for the sailors to sabotage the vessels in vile and revolting ways (including the use of human excrement) to make the transition of their ships into allied hands as unpleasant as possible. This type of vandalism characterized the *Ostfriesland's* time sailing under the American flag, but the damage was not as extensive on board her as it was to other vessels transferred to the United States for reparations. While American sailors had to conduct extensive repairs on U-boats and tow some of the surface vessels, the *Ostfriesland* was mechanically sound and able to make the Atlantic crossing under her own steam.

Once in United States waters, she was part of what American politicians called a "Victory Parade," - the purpose of which was to display the might of the vanquished German *Kaiserliche Marine*. The terms of the Versailles Treaty dictated that the ships be removed from military service or destroyed by 9 August 1921, and General Mitchell's rivalry with the Navy provided the perfect end to a service characterized by

shifting attitudes and conflicting opinions on the future of naval warfare.¹³⁹ Through her involvement with the bomb tests, the *Ostfriesland* ended her life at the twilight of the battleship while ushering in the age of aeronautics.

The *Ostfriesland's* present resting place, 400 below the surface 65 miles off the coast of Virginia, represents a valuable point of study in which historians and underwater archaeologists might focus their attention. The wreck of the *Ostfriesland* and the other German ships sank in the bomb tests are only accessible for visitation by technical divers and remote operated vehicles, but they are vulnerable to damage by deep-water fishing, especially trawling. Because of her place in the history of technology and warfare in the early 20th century, the *Ostfriesland* is incredibly important to the historical record, and a thorough study of her remains could prove significant.

This thesis provides the context for such a study by tracking the life of the *Ostfriesland* from her creation to her final sinking. From her launch in a military and political climate that conformed to Mahan's notions of naval superiority to her demise as the target of an aerial bomb test in which Billy Mitchell argued that control of the seas depended first on control of the air. Mitchell firmly believed a well-developed and equipped air force would render surface fleets obsolete. The *Ostfriesland* bore witness to the shifting and conflicting attitudes about warfare unlike any other vessel of her time. Through the study of this great ship, this work has explored the historical

¹³⁹ Vice Admiral Alfred W. Johnson, "The Naval Bombing Experiments off the Virginia Capes June and July 1921." Website accessed 22 August 2016 at: <http://www.history.navy.mil/research/library/online-reading-room/title-list-alphabetically/n/the-naval-bombing-experiments.html>

context that motivated the great powers leading up to the First World War and the role the *Ostfriesland* played in the shifting strategies of the 20th century.

As in all cases of progress, the development of airpower met resistance from the traditionalists who insisted airplanes should remain auxiliary to the ground services and had little application beyond that service. The initial design of the *Ostfriesland* reflected these attitudes. Her sole purpose was to challenge the Royal Navy. Her designers omitted any provision for defense against attack from above.

On the other extreme, Billy Mitchell adamantly fought for the development of air power as the most important weapon in a nation's arsenal. In his vision of the military structure, all air services would be under a single command, including aircraft carriers, and the Navy would be reduced to escort and support service for aeronautics. He loudly and vehemently argued that adequate development of airpower would mean the obsolescence of naval power, and the battleship in particular. He envisioned a fleet of carrier groups deployed across the globe from which the United States would be in constant position to defend its shores against attack and retaliate with haste.

Naval aviators also contributed to the debate. They wanted to work within the existing structure of the Navy to develop aircraft carriers for offensive, defensive, and auxiliary purposes. This savvy group of flyers appreciated Mitchell's foresight, but sought to work more moderately to achieve their goals. They acted within the command structure, rather than loudly challenging it. It was the naval aviators who won the argument, and in World War II they unequivocally demonstrated that the outcome of war depended on the control of the air above the battlefield. After World War II, the United States embraced the use of air power and aircraft carriers,

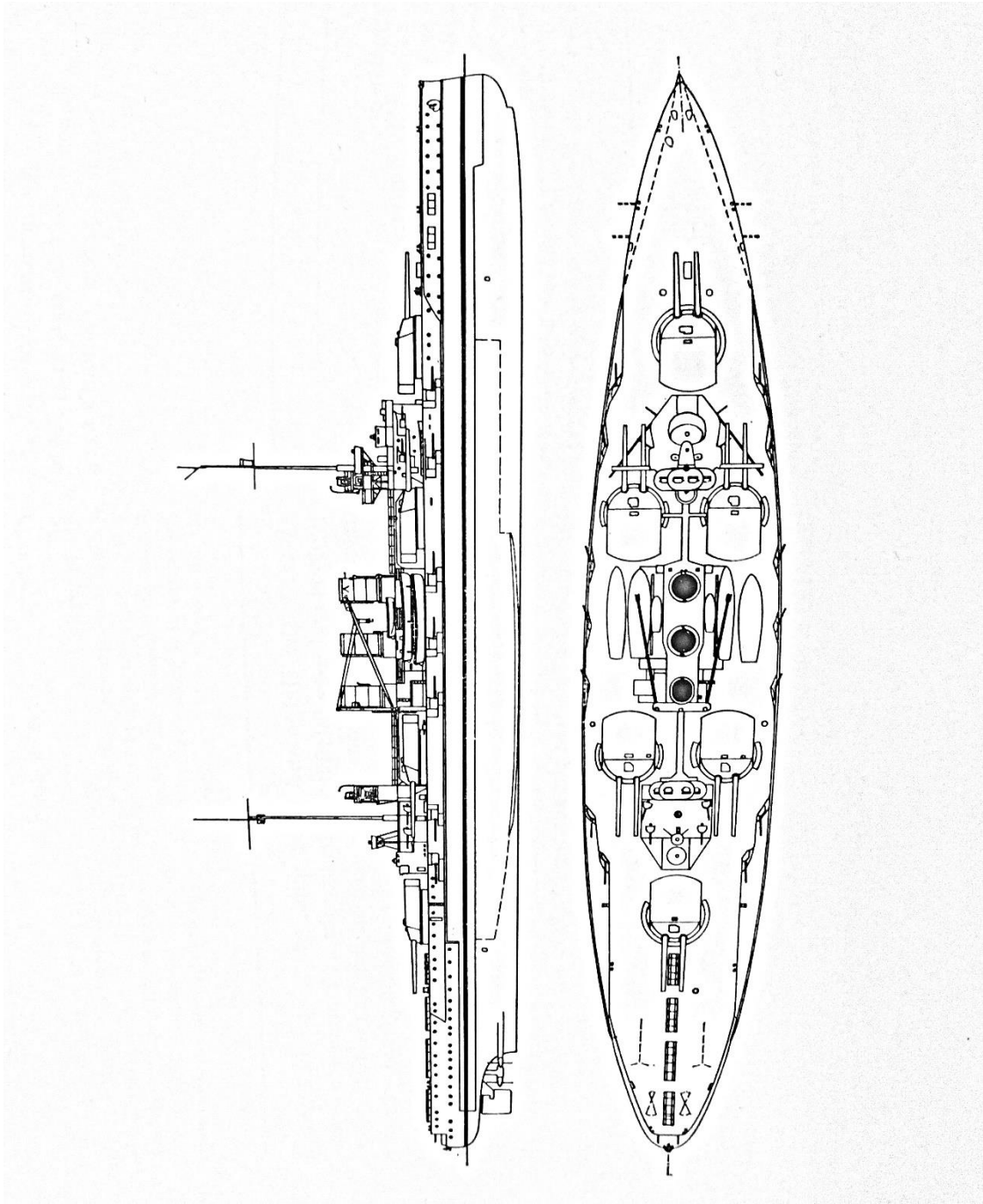
developing the largest carrier fleet in the world. Carrier groups make up the backbone of the modern U.S. Fleet, and while destroyers and cruisers haven't been discontinued, the battleship no longer plays a role in the formation of the United States Navy.

This thesis utilized the *SMS Ostfriesland* to demonstrate the conflicts surrounding air and sea power. Though she did not resolve them, she nevertheless contributed a verse to the powerful play in which Mitchell, Johnson, Tirpitz, Mahan, and Wilhelm were all actors. Few historical figures can claim such an integral role of intersectionality as this once-mighty ship. A proud sailor at her peak, she proudly helped shape the future she had served so diligently to advance.

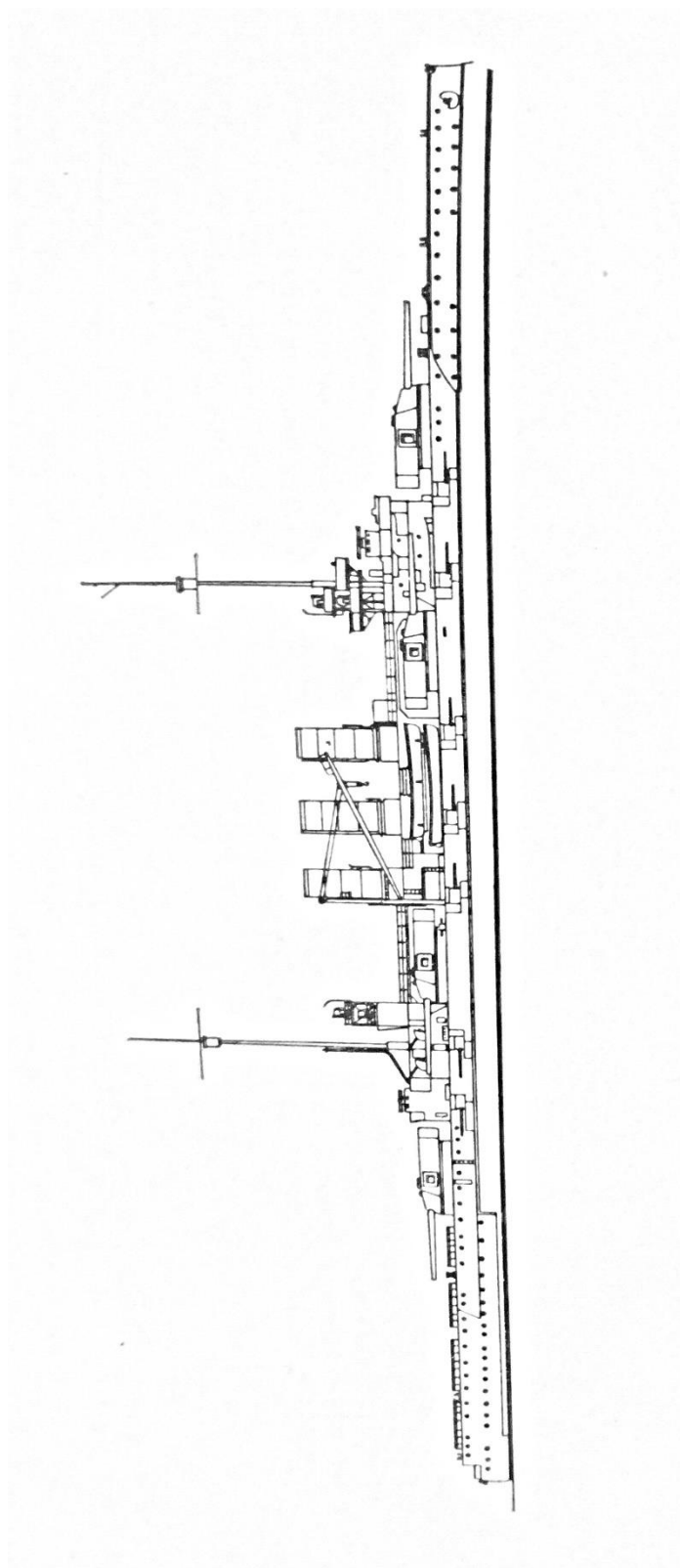
APPENDIX A: SHIPS SANK BY AERIAL BOMB TESTS

Vessel Name	Vessel Type	Year Built	Location Built	Length (feet)	Beam (feet)	Armament
<i>Ostfriesland</i>	<i>Helgoland-class Battleship</i>	1908	Wilhelmshaven Imperial Naval Yard	548.5'	93.5'	12 x 12" heavy guns 14 x 5.9" rapid fire guns 6 x 20" torpedo tubes
<i>Frankfurt</i>	<i>Wiesbaden-class Light Cruiser</i>	1915	Kiel Dock Yard	465'	45'	18 x 5.9" guns 4 x 20" torpedo tubes
<i>G-102</i>	Torpedo-boat Destroyer	1915	Kiel (Krupps Germania Yard)	312'	30'	3 x 4.1" guns 6 x 20" torpedo tubes Mines
<i>U-117</i>	Submarine	1918	Hamburg (Vulcan)	267'	24'	1 x 5.9" gun 1 x 3.4" gun 4 x 20" torpedo tubes 42 mines

APPENDIX B: PLANS OF THE *HELGOLAND*-CLASS BATTLESHIPS



APPENDIX C: PROFILE OF THE *SMS OSTFRIESLAND*



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