THE INFLUENCE OF THE GENERAL BOARD OF THE NAVY ON INTERWAR DESTROYER DESIGN

A thesis presented to the Faculty of the U.S. Army Command and General Staff College in partial fulfillment of the requirements for the degree

MASTER OF MILITARY ART AND SCIENCE
Military History

by

JASON H. DAVIS, LCDR, USN
B.S., United States Naval Academy, Annapolis, Maryland, 1994

Fort Leavenworth, Kansas
2011-01

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*	**2. REPORT TYPE**	**3. DATES COVERED** *(From - To)*
10-06-2011	Master's Thesis	AUG 2010 – JUN 2011

4. TITLE AND SUBTITLE

The Influence of the General Board of the Navy on Interwar Destroyer Design

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)

DAVIS, JASON H., LCDR

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
U.S. Army Command and General Staff College
ATTN: ATZL-SWD-GD
Fort Leavenworth, KS 66027-2301

8. PERFORMING ORG REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT
Approved for Public Release; Distribution is Unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

The United States destroyer force underwent significant design improvement during the Interwar Period. The roles and missions of the destroyers evolved from WW I to the end of WW II, based on design and tactics improvements, as well as the overall expansion of the number of destroyers and the improved capabilities of destroyers. This was especially true of the *Fletcher* class, introduced during the end of the interwar period. The *Fletcher* class became the largest single type and class of warship ever developed, with 175 being built. The Navy's General Board, similar to a general staff, influenced all facets of the Navy from 1900 to 1950, when the General Board was disestablished and most of these duties assumed by the office of the Chief of Naval Operations. This thesis examines the General Board of the Navy's influence on destroyer design in the Interwar Period, specifically, improvements on destroyer speed, radius of action, armor and armament, habitability, and an array of mission capabilities.

15. SUBJECT TERMS
Interwar, General Board of the Navy, Destroyer, Navy, World War I destroyer operations, World War II destroyer operations, War Plan Orange, Treaty Navy

16. SECURITY CLASSIFICATION OF:			**17. LIMITATION OF ABSTRACT**	**18. NUMBER OF PAGES**	**19a. NAME OF RESPONSIBLE PERSON**
a. REPORT	**b. ABSTRACT**	**c. THIS PAGE**			**19b. PHONE NUMBER** *(include area code)*
(U)	(U)	(U)	(U)	186	

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std. Z39.18

MASTER OF MILITARY ART AND SCIENCE

THESIS APPROVAL PAGE

Name of Candidate: LCDR Jason H. Davis

Thesis Title: The Influence of the General Board of the Navy on Interwar Destroyer Design

Approved by:

_____, Thesis Committee Chair
John T. Kuehn, Ph.D.

_____, Member
Wilburn E. Meador, M.A.

_____, Member
David W. Christie, M.A.

Accepted this 10th day of June 2011 by:

_____, Director, Graduate Degree Programs
Robert F. Baumann, Ph.D.

The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

THE INFLUENCE OF THE GENERAL BOARD OF THE NAVY ON INTERWAR DESTROYER DESIGN, by LCDR Jason H. Davis, 186 pages.

The United States destroyer force underwent significant design improvement during the Interwar Period. The roles and missions of the destroyers evolved from WW I to the end of WW II, based on design and tactics improvements, as well as the overall expansion of the number of destroyers and the improved capabilities of destroyers. This was especially true of the *Fletcher* class, introduced during the end of the interwar period. The *Fletcher* class became the largest single type and class of warship ever developed, with 175 being built. The Navy's General Board, similar to a general staff, influenced all facets of the Navy from 1900 to 1950, when the General Board was disestablished and most of these duties assumed by the office of the Chief of Naval Operations. This thesis examines the General Board of the Navy's influence on destroyer design in the Interwar Period, specifically, improvements on destroyer speed, radius of action, armor and armament, habitability, and an array of mission capabilities.

ACKNOWLEDGMENTS

I would like to thank my thesis committee. Dr. John T. Kuehn's help and expertise in this endeavor were tremendous and invaluable. As my committee chair, he provided the right and left limits for completing my thesis and is the authoritative expert on the General Board of the U.S. Navy. His motivation, guidance, and attitude were instrumental in completing this project on time. I would like to recognize and thank Mr. Wilburn "Bud" Meador and Mr. David W. Christie, who provided guidance and suggestions on content, as well as rudder steers.

I would like to thank my family for giving me the time, space, and support. My wife, Heather, and son, Finnegan, both sacrificed in order to give me the time to research and write my thesis. I hope that the product presented is worthy of everyone's sacrifice. The ship shown below is for my son.

USS *Finnegan* (DE-307)

Source: Navsource.org, "Destroyer Escorts," http://www.navsource.org/archives/06/images/307/0630718.jpg (accessed 11 December 2010).

TABLE OF CONTENTS

Page

ACRONYMS

ADM	Admiral
ASW	Anti-submarine Warfare
BuC&R	Bureau of Construction and Repair
CAPT	Captain
CDR	Commander
CNO	Chief of Naval Operations
CO	Commanding Officer
DP	Dual or Double Purpose
GB	General Board
kt	Knot (nautical mile per hour)
kts	Knots (nautical mile per hour)
LCDR	Lieutenant Commander
nm	Nautical mile
NWC	Naval War College
RADM	Rear Admiral
SecNav	Secretary of the Navy
SLOC	Sea Lines of Communication
TB	Torpedo Boat
TBD	Torpedo Boat Destroyer
U-boat	Unterseeboat (aka a German submarine)
U.S.	United States
VADM	Vice Admiral
WW	World War

ILLUSTRATIONS

Page

TABLES

Page

CHAPTER 1

INTRODUCTION

Torpedo technology changed the sea power equation in the late 19th century. The combination of the self-propelled torpedo, arguably warfare's first ―ife and forget" weapon, with the steam powered warship, resulted in a new class of ships, destroyers. These ships eventually became the most ubiquitous warship type of the 20th century.

The invention of the ―self-propelled torpedo ultimately led to the creation of the destroyer. . . . Inventors hoped that the detonation of such a device would produce a hole below the waterline and lead to flooding that would sink the ship." The Royal Navy of Great Britain, one of the world's greatest navies of the modern era, quickly realized the potential of the torpedo. It was the original user and producer of the torpedo boat, designed to employ torpedoes against enemy capital ships.[1]

The British needed to have a ship like the torpedo boat in order to survive economically (see figure 1). Historian Norman Friedman calculated that Britain imported over 80 percent of its foodstuffs by 1891, which means it needed a strong navy in order to protect its commerce, sea lines of communication (SLOC), colonies, and very existence.[2] French Captain, Baron Louis-Antoine-Richild Grivel stated ―that naval warfare consisted

[1]Eric W. Osborne, *Destroyers: An Illustrated History of Their Impact* (Santa Barbara, CA: ABC-CLIO Inc, 2005), 23. A capital ship was defined as either a battleship or an aircraft carrier. However, the multiple naval treaties in the Interwar Period separated them into capital ships (battleships) and airplane carriers (aircraft carriers).

[2]Norman Friedman, *U.S. Destroyers: An Illustrated Design History* (Annapolis, MD: Naval Institute Press, 1982), 258.

of three distinct types, on the open seas between battle fleets comprised of capital ships, coastal warfare, and guerre de course (war on commerce)."[3]

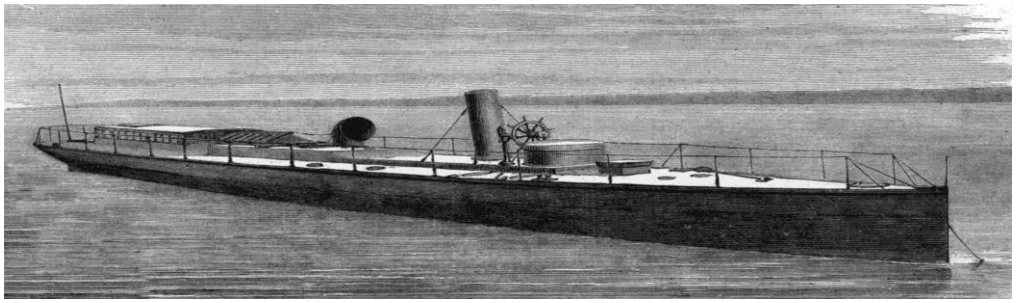


Figure 1. HMS *Lightning*, 1877 (first British torpedo boat)
Source: Battleships-Cruisers.co.uk, "Torpedo Boats," http://www.battleships-cruisers.co.uk/torpedo_boats.htm (accessed 11 December 2010).

Realizing their dependence upon foreign commerce, foodstuffs, and the vulnerability of their battle fleet to other torpedo boats, the British invented, according to naval affairs writer Eric Osborne, "a new class of ship, the torpedo boat destroyer (TBD), with both torpedoes and deck guns."[4] The primary mission of the TBD was "defense of the battle fleet against torpedo attack, while assuming the role of torpedo boats to mount attacks against other nation's forces."[5] The British combined the torpedo boat and the answer to the torpedo boat, the TBD, which subsequently became the class of ships henceforth known as the destroyer at the turn of the century. The destroyer is a small and

[3]Jason Davis, "The Influence of the General Board of the Navy on Interwar Destroyer Design" in *Destroyers: An Illustrated History of Their Impact*, by Eric W. Osborne (Santa Barbara, CA: ABC-CLIO, Inc., 2005), 28.

[4]Osborne, 29.

[5]Ibid., 31.

cheap vessel, when compared to battleships, cruisers and aircraft carriers, but with greater speed and light to moderate armament.[6]

The torpedo boat and torpedo boat destroyer demanded attention due to their smaller size, maneuverability, mission, and weapons capability, which consisted of the torpedo and small caliber deck guns. The original torpedo boats were small in size, ranging from under 100 tons to approximately 400 tons. The torpedo boat destroyer averaged around 1,000 tons at the beginning of World War I (WW I). Both ships were comparable in maneuverability, speed, and weapons capability. They differed in mission. The torpedo boats' mission was to engage capital ships with torpedoes, while the destroyers mission was to protect against the torpedo boat, as well as launch torpedoes themselves.

The mission of the destroyer, prior to WW I, was to engage enemy torpedo boats to prevent torpedo attacks against capital ships. However, with advances in technology and the need for multi-role ships, the mission of the destroyer changed. The destroyer assumed the role of the torpedo boat on the offense, engaging the enemy's capital ships, and the destroyer on the defense, engaging the enemy's torpedo boats. Therefore, in many naval powers, the move was to build only destroyers and not torpedo boats and destroyers.[7]

At the end of the Interwar Period (1918-1941), the United States Navy (USN) developed the *Fletcher*-class of destroyers, which was perfectly suited for a two-ocean

---

[6]Ibid., vii. Destroyers were some of the fastest ships in the fleet, generally capable of speeds above 35 kts. Armament refers to the types and size of all weaponry and how the pieces were mounted.

[7]Ibid., 45.

war due to its size, speed, and cruising radius. The *Fletcher* class became the largest single type and class of warship ever developed, with 175 being built. This thesis will investigate how these sophisticated multi-mission warships came to be built, specifically through the agency of the Navy's General Board in development of the designs that ultimately led to the *Fletcher*-class.

The United States (U.S.) destroyer force saw significant changes and challenges between the World Wars. From a fleet that had direct impact upon the outcome of WW I with convoy escort, to facing possible disaster at the outset of WW II with the debacle at Pearl Harbor, to an unparalleled world naval power that protected the SLOC in both the Atlantic and Pacific, projected power ashore, conducted and protected amphibious landings with the U.S. Marine Corps (USMC), and helped to defeat Nazi Germany U-boats and the Japanese Imperial Navy, the U.S. destroyer was doing it all.

Background on the General Board of the U.S. Navy

The main proponent prior to WW II for the changes to force structure of the Navy, and destroyers specifically, was the General Board of the Navy. The General Board was made up of a group of senior naval officers acting as advisors to both the Secretary of the Navy (SecNav) and later, the Chief of Naval Operations (CNO).[8] "The

[8]Hereafter referred to as the Board. In a 5 March 1920 Hearing before the General Board, 317, Admiral Charles Badger read the provision in Navy Regulations with regards to the Board: "It shall consider the number and types of ships proper to constitute the fleet, the number and rank of officers and the number and ratings of enlisted men required to man them, and shall advise the Secretary of the Navy respecting the estimates therefore to be submitted annually to Congress."

Board was arguably the nation's first modern general staff."[9] The role of the Board in this process has not been completely examined. Given their important role and influence on design processes for the fleet, bases, and manning, the Board's influence on destroyer design in the Interwar Period will be investigated. By the start of WW II, the Board's recommendations contributed to the U.S. Navy's creation of a large and effective destroyer force, capable of a multitude of missions, while operating in all theaters of the war. This thesis's purpose is to investigate the efficacy of the Board's recommendations and their influence on destroyer design.[10]

Research Question

The primary research question of this thesis is: did the General Board of the Navy, overall, exert a positive or negative influence on destroyer design in the Interwar Period? In addressing the primary research questions, some secondary questions emerged. How well did the destroyer Navy perform in WW I, in comparison to WW II? This area includes merchant convoy, U.S. troop ship, and capital warship protection. How many tons of shipping were sunk after escorted convoy operations started in 1917? What other factors influenced destroyer design during the Interwar Period? Were there any design decisions that the Board did not recommend that could have increased its war

[9]John T. Kuehn, "Revive the General Board of the Navy," *U.S. Naval Institute* 136 (October 2010), http://www.usni.org/magazines/proceedings/2010-10/revive-general-board-navy-0 (accessed 10 May 2011). The General Board connected Fleet design, building policy (i.e. prioritization of types of ships and numbers to be built), and war plans to ensure the Navy was building the Fleet needed to fight the next conflict.

[10]John T. Kuehn, *Agents of Innovation: The General Board and the Design of the Fleet That Defeated the Japanese Navy* (Annapolis, MD: Naval Institute Press, 2008), 9, 15, 16, 22.

fighting capabilities? Were there any design decisions that the Board did recommend, but were not implemented?

Limitations

Possible limitations during this study are access to official correspondences from the Board from primary sources and that I would have to rely on secondary sources, although the Hearings of the General Board on micro-film do occasionally include correspondence as attachments to the transcripts. The Board's studies on destroyer design (the serials) reside in the National Archives in Washington, D.C., but the actual transcripts of the hearings, as mentioned, are available on micro-film at the Combined Arms Research Library (CARL). This study will only reflect what information is available through unclassified sources and is limited by the experience of the investigator in conducting original research.

Delimitations

This thesis will not cover destroyer action in WW I or II in detail, but will analyze how destroyers were used, their tactics, techniques, and procedures in each war, as well as summarize the effectiveness of the destroyer on enemy submarines, surface combatants, and in the anti-aircraft role. This thesis will not cover destroyer escorts, which were built at the request of the British after 7 December 1941, which is outside the timeframe of this thesis.

Other very important factors that increased destroyer capabilities were either not examined or only briefly discussed. These included important destroyer technological advances, like sonar and radar, because the Board did not significantly discuss them.

To keep the focus and scope narrow and on the General Board and their influence on destroyer design, this thesis will not investigate several ancillary organizations that also played key roles in the development of the destroyer in the Interwar Period, such as the Joint Board, Office of the Chief of Naval Operations (OpNav), Naval War College (NWC), and the different Bureaus of the Navy.

Significance

Although little is known or written about the General Board of the Navy due to classification of the Board's proceedings and correspondences until many years after its disestablishment, the General Board helped to modernize the U.S. Navy while complying with multiple Naval treaties and limitations following WW I. Simultaneously, it prepared and shaped the U.S. Naval forces that would play a large role in the Allied victory during WW II. The General Board influenced destroyer design, but there is limited literature analyzing how they influenced destroyer design in the Interwar Period.

Literature Review

There are many books, journal articles, and official records on destroyers. Destroyer operations in WW I and WW II were well documented in primary and analyzed in secondary sources. The Interwar Period (for this thesis's purpose, 1918 to 7 December 1941) has less literature than either World War, but there were a number of useful primary and secondary sources available for research.

The General Board's archival records embody a useful resource for this investigation. The records of the Board from 1900 to 1950, recorded on micro-film,

provided the bulk of primary research material. The transcripts of the Board include deliberation transcripts, memoranda, and correspondence from and to the General Board.

The majority of the information on the General Board was from *Agents of Innovation: The General Board and the Design of the Fleet that Defeated the Japanese* by John T. Kuehn. Kuehn focused on the influence of the General Board of the Navy in the Interwar Period, including the treaties affecting the maritime powers in the Interwar Period, battleship development, aircraft carrier development, and other innovation in the U.S. Navy in the Interwar timeframe. Kuehn believed that the General Board positively affected the U.S. naval forces that fought in WW II through the influence it exerted on all facets of the Navy, specifically as regards the Board's relationship with the Secretary of the Navy (SecNav), the Chief of Naval Operations (CNO), and the Naval War College (NWC). Kuehn's book is the definitive work on the General Board in total, and the Interwar Period specifically. There are very few sources that acknowledge the General Board in any way, shape, or form, but of the sources that do, they do not conduct any analysis of the Board's influence on ship design, specifications and the resulting fleets that fought in both the Atlantic and Pacific theaters of war.

James W. Hammond, Jr.'s, *The Treaty Navy: The Story of the US Naval Service Between the World Wars,* provided a vital understanding on naval innovation in the Interwar Period. Hammond's book ranged across a variety of topics, from the Washington Naval Treaty to various Chiefs of Naval Operations to the Marines and their impact on the US Navy to the COLOR and RAINBOW Plans. Hammond's book, while entertaining, was poorly edited with a multitude of typos and grammatical errors. It contained no endnotes, footnotes, quotations, or bibliography, so his work could not be

used for quality research, but was used as a pointer towards subjects that needed more review and study.

One source that provides an outstanding overview of destroyers across 100 years of history, including interwar destroyers, was Norman Friedman's *U.S. Destroyer: Revised Edition*. Friedman's book covered the interwar destroyer period in detail, using official records, General Board transcripts, serials, memoranda, and correspondences.

Thomas C. Hone and Trent Hone's *Battle Line: The United States Navy, 1919-1939*, focused on the Interwar Period, the budgetary constraints and treaties affecting the navy, innovation in the face of those same budgets and treaties, tactics, techniques, and procedures developed during Fleet Problems, as well as the shift from battleships to aircraft carriers as the dominant ships of the seas. The Hone's produced a strong body of work using both popular and archival history.

Edward S. Miller's *War Plan Orange* was used to understand the U.S.'s secret war plan to defeat the Japanese. This book provided an outstanding overview of the Japanese naval threat to the U.S. (in the Interwar Period) and how the Navy planned to counter that threat. This is one of the few sources that specifically analyzed War Plan Orange in great detail.

Research Design

There was no shortage of literature covering all aspects of destroyers, but few specifically look at just destroyers in the Interwar Period, as most books and articles cover battleships, cruisers, aircraft carriers, and submarines. Most books and articles cover WW I and WW II, but not the Interwar Period. Significant data exists on destroyer specifications, missions, and roles in both wartime periods, as well as understanding the

importance of all the destroyer design successes and failures. Additionally, understanding how destroyers evolved from torpedo boat destroyers to the multi-role and multi-functional platform at the end of WW II is required and will be addressed in chapter 2. Finally, the external factors, such as the war-weariness, economic factors, treaties and arms limitations that altered the building program of the U.S. destroyers deserve study.

All the Board's transcripts, from 1917 to 1950, were available via micro-film in the CARL. Transcript records included both correspondences and memoranda to and from the Board. These transcripts provide a means to objectively analyze the Board's recommendations for destroyer specifications, missions, and employment.

To determine if the Board made a positive influence on destroyer design in the Interwar Period, an examination of the hearing transcripts showed how their recommendations and guidance shaped the destroyer force for WW II. The Board's recommendations, when compared with the capabilities dictated by the War Plans division, looked at four factors. The first was speed. The second endurance, or radius of action, the ability to operate long distances from U.S. bases, away from friendly resupply bases. The third factor was armor and armament. This primarily examined armor protection and anti-aircraft guns, guns, torpedoes, and depth charges. Finally, the study examined habitability, which included protection and crew comfort needed for long-range operations.

The general importance of subjects in front of the General Board could best be seen by the frequency of hearings on that same subject, as well as the fact that the subject had its own hearing, instead of being combined with another type of ship and being included into the proceedings of the hearings.

The thesis consists of six chapters. The first chapter introduced the history of the torpedo boat destroyer, the General Board, the research question, and the research method. Chapter 2 will establish historical context in reviewing the advent and history of the destroyer, U.S. destroyers prior to WW I, and the missions and roles of destroyers in WW I. Chapter 3 explores the Board and its impact on destroyer development from U.S. entry into WW I to the Washington Naval Treaty signed in 1922. Chapter 4 discusses the timeframe from the Washington Naval Treaty to 1933. Chapter 5 covers the years 1933 to U.S. entry into WW II, 7 December 1941. Finally, Chapter 6 addresses conclusions, both tentative and more pronounced, on the Board's influence on destroyer design, and suggested areas for continued analysis and research raised by them.

CHAPTER 2

HISTORY OF THE DESTROYER

Chapter 2 will establish historical context in reviewing the advent and history of the destroyer, U.S. destroyers prior to WW I, and the missions and roles of destroyers in WW I. In addition, this chapter will explain why the destroyer, in just over 40 years time, became one of the most widely used and versatile warships of that time and beyond.

The Navy began building the torpedo boat and destroyer classes of ships at the end of 19th century when they built the USS *Farragut* in 1899, a torpedo boat (see Appendix A). Shortly thereafter, the nine ships of the *Bainbridge* destroyer class were commissioned, starting in 1902 (see Appendix A). This class marked the beginning of an increase in destroyer production that focused primarily on surface craft designed for the defense against torpedo attacks on capital ships. Following the *Bainbridge*-class were the *Smith* (five ships in class) and *Paulding* (10 ships in class) classes,[11] with the latter being a virtual repeat of the *Smith*-class, but with oil-fired boilers instead of coal (see Appendix A).[12]Just prior to the outbreak of WW I in 1914, the eight vessels of the *Cassin*-class were built, mainly for seaworthiness and endurance, and were the most heavily armed

[11]Post Great White Fleet timeframe.

[12]Osborne, 46. The *Bainbridge*-class was the first, multiple-unit class of destroyer in the Navy. Equipped with a raised forecastle. Like the Germans, U.S. constructors saw a slight decrease in speed as acceptable in exchange for greater seaworthiness and habitability. The *Smith*-class were the first destroyers with turbine engines. To stay at sea for the longest time possible, the *Cassin*-class were equipped with reciprocating engines for cruising and turnbines when it was necessary to attain the ships maximum speed of 29 kts. The *Cassin*-class, and those similar to it, represent the culmination of a tremendous effort to make destroyers more seaworthy vessels, capable of extended operations at sea with the battle fleet.

destroyer to date[13] (see Appendix A). Prior to the U.S. entry into WW I in 1917, there was a limited number of destroyers in the U.S. navy. However, after seeing the need for more destroyers due to the submarine threat posed by the Germans, the U.S. began a massive, destroyer building program, resulting in the *Wickes* and *Clemson*-classes of destroyers (see Appendix A).[14]

Background on the Destroyer (1914-1918)

The importance of the destroyer to fleet and commerce protection is exhibited by the threat and how the countries chose to respond to the threat. The U.S., being a neutral country for the first three years of the war, failed to grasp the impact that the submarine would have on the transit across the Atlantic, and when ~~s~~ubmarine warfare finally went wholly unrestricted in 1917, no neutral ship was safe from the U-boats. . . . The U.S. on April 6, 1917, declared herself in the war on the side of the Allies."[15] Conversely, Great Britain had almost five times as many destroyers at the beginning of WW I than the U.S. and still needed more in order to defend its SLOCs. ~~—~~By the outbreak of WW I on 1 August 1914, the destroyer was the most numerous type of warship in the navies of the maritime powers. These would prove invaluable not only in the primary tasks envisioned for them in the prewar years but also in new roles. By the end of the conflict, destroyers

[13]Note: Armed or armament refers to the types and size of all weaponry and how the pieces were mounted, whereas armor refers to side armor, deck armor, barbette armor, and turret protection (listed in measurements of inches).

[14]Osborne, 64.

[15]William G. Schofield, *Destroyers—60 Years* (New York: Rand McNally and Company, 1962), 27.

would be multi-role vessels that performed more duties than any other type of warship.[16] The U.S., as the numbers indicated above, displayed a shortage in the destroyer class, especially for the commerce and convoy protection mission. However, by July 1917, there were 34 U.S. destroyers operating in conjunction with Great Britain. This destroyer force expanded to 80 ships before wars end.[17]

Table 1. Destroyer Numbers

Country	Number of destroyers
Great Britain	228
Germany	154
Russia	105
France	84
U.S.	54
Japan	50
Italy	32
Austria-Hungary	26
Total	703

Source: Created by author using data from Eric W. Osborne, *Weapons and Warfare: An Illustrated History of their Impact* (Santa Barbara, CA: ABC-CLIO Inc., 2005), 54.

The destroyer's primary role, envisioned by the Navy, at the beginning of WW I was the defense of the battle fleet against enemy torpedo boats and destroyers. However, by the wars end, the maritime powers realized that the utility of destroyers was limited only by the imagination of the country employing them, for example, in commerce protection against the submarine threat. Great Britain's reliance on food stuffs and war

[16]Osborne, 54.

[17]Schofield, 30.

materials from the U.S. played into the German plan of isolating and starving Great Britain into submission. The speed, maneuverability, and shallow draft of the destroyer made it the ideal weapon employed against the submarine threat. The speed of the destroyer allowed it to quickly close on and engage a surfaced submarine, while maneuverability allowed the destroyer to turn quickly and re-engage a submarine that had submerged or was attacking the convoy or the destroyer itself. The shallow draft made the destroyer extremely difficult to hit with torpedoes, the primary weapon of the submarine while submerged.[18] Since submarines in this era were faster on the surface of the water than they were below the surface, most submarine attacks were conducted with deck guns on the surface and torpedoes below the surface, in order to maximize the chances of scoring a hit against enemy, neutral commerce ships or combatants.[19] Convoys, and convoy protection, began in May 1917, with immediate and lasting repercussions for the Germans and their U-boats. In April 1917, 140 German submarines were able to sink 900,000 tons of Allied shipping, but by November of that same year, the number had shrunk to 300,000 tons.[20] The efficacy of the convoy system against the U-boat was proven by the numbers, but for some reason, forgotten at the start of WW II.

---

[18]Osborne, 59. Note: Shallow draft meant that the hull did not extend very low into the water and torpedoes could consequently pass under them without detonating.

[19]John Terrain, *Business in Great Waters: The U-Boat Wars 1916-1945* (South Yorkshire, UK: Pen and Sword Books LTD, 2009), 19-21.

[20]Schofield, 30. Terrain, 131. Terrain further broke this information down: In March 1917, U-boats had been destroying an average of more than one ship every two days (0.55 ships per U-boat per day), by June 1918, this had dropped to an average of one ship every *fourteen* days (0.07 ships per U-boat per day). Emphasis original.

War had raged across the Atlantic for two years before a device was used effectively against submarines, the depth charge. Prior to this, many ships were equipped with re-inforced bows in order to ram surfaced or shallowly submerged submarines. U.S. navy destroyers were fitted with reinforced bows to ram submarines too.[21]

The most advanced U.S. destroyers at the beginning of WW I were the *Cassin*-class and those similar to it. However, the number of destroyers that the U.S. possessed at the outbreak of war placed a high demand on this low density asset. The primary mission of U.S. destroyers entering WW I was the protection of the battle fleet, in particular the capital ships of the battle fleet, with a secondary mission of convoy/commerce protection. However, circumstances changed based on necessity. The success of the German submarines in the Atlantic forced the U.S. ship building program to shift from battleships and cruisers to destroyers, with the primary mission focus changing from Mahanian decisive engagement to anti-submarine warfare (ASW).[22] The convoy system, first introduced in 1917 to protect merchant vessels, used destroyers as escort vessels patrolling for German U-boats.[23] The secondary mission of convoy escort, primarily against enemy submarines, marked the advent of the ASW mission for destroyers.

By the end of the war, the ASW mission convoy mission for the destroyer proved well founded, with the destroyer accounting for a large portion of the 178 German submarines sunk throughout the conflict.[24] However, ASW was just one of the many

---

[21]Osborne, 60.

[22]Ibid., 64.

[23]Ibid.

[24]Ibid., 61.

roles that destroyers filled for the maritime nations involved in WW I. The British used destroyers for ASW when guarding merchant convoys and battle fleets, as well as providing protection for troop carriers for amphibious landings, and even being used as troop carriers themselves during the British Expeditionary Force (BEF) transit to France.[25] Additionally, destroyers filled several non-combat roles in WW I. Destroyer non-combat roles included the guiding of amphibious landing craft towards the beach, the rescuing of crewmen from crippled vessels, the torpedoing of crippled, friendly vessels to prevent capture by the enemy, and as a search and rescue platform for survivors.[26]

U.S. destroyers being built towards the end of WW I were the famous flush-deckers. The six ships of the *Caldwell*-class were the first flush-deckers for the Navy.[27] "These vessels dispensed with the raised forecastle of earlier models, meaning that the main deck was a single, long, flat structure. This was meant to create a more seaworthy hull."[28] (see Appendix A). The U.S. shipyards produced 109 destroyers before the end of the war, with the bulk of these being the *Wickes*-class, followed by the 156 destroyers of the *Clemson*-class, built after the end of the war. The U.S. navy had found a deterrent to the submarine, the destroyer, produced in large quantities. By 1921, just three years after the end of the war, the *Clemson*-class destroyer program was completed, doubling the

---

[25]Ibid., 61. The U.S. Navy was credited with one U-boat sunk during WW I.

[26]Ibid.

[27]Ibid., 64. This class served as a basis for two mass-produced groups of destroyers, the *Wickes* and *Clemson*-classes, which comprised about 300 ships, but not all of them were launched by the close of the war. Like the British, the Americans opted for producing large numbers of destroyers in the fastest time possible. The best way to accomplish this goal was the use of only a few designs.

[28]Ibid.

size of the U.S. destroyer fleet and creating a future problem for the navy, mass obsolescence and overage ships coming to the end of their service with a two to three year time span (see Appendix A).[29] Destroyer construction following the end of WW I would later haunt the Navy and the General Board due to budget constraints and the fact that the navy had over 250 new destroyers in the fleet. Budget constraints, anti-war sentiment, and treaties limiting ship type, size, armament, and production numbers would dominate the next 15 years. As a point of fact, no new U.S. destroyers would be laid down for over a decade.[30]

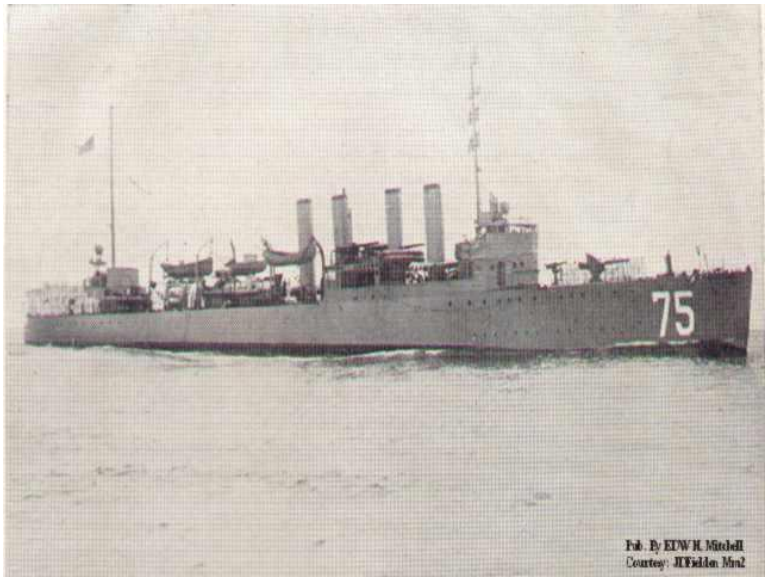


Figure 2. USS *Wickes* (DD-75)
Source: Navsource.org, "Destroyers," http://www.navsource.org/archives/05/0507502.jpg (accessed 16 December 2010).

[29]Ibid., 70-71.

[30]Schofield, 36. Most of the destroyers launched immediately after the war were in the process of completion upon the close of hostilities. Despite the fact that the destroyer had proven its importance in WW I, few politicians wished to consider the construction of new warships in the post-war climate. In the aftermath of the Washington Naval Treaty, no less than 200 destroyers were decommissioned and placed in reserve, while 40 were scrapped.

The signatories of the Washington Naval Treaty of 1922 (see appendix C for excerpts of the treaty) were the United States of America, the British Empire, France, Italy, and Japan. The purpose of the treaties design was to promote peace following WW I, while reducing the potential cost of a naval arms race. The treaty specified building ratios, total capital ship tonnage, tonnage of single capital ships (not to exceed 35,000 tons standard displacement), armament maximums (no gun carried on a capital ship could exceed a caliber in excess of 16 inches or 406 millimeters), total tonnage for aircraft carriers, tonnage of single aircraft carriers (not to exceed 27,000 tons standard displacement), armament maximums on aircraft carriers (both in numbers of guns and inches), limits of gun size in non-capital ships to 8-inches or less, the transfer of any vessels of war to another foreign power to be used as a vessel of war for that power, fortification and naval bases, rules for scrapping and replacement of vessels, and that the treaty shall remain in force until 31 December 1936, to name a few of the provisions.[31]

[31]Kuehn, 181-197.

CHAPTER 3

FROM WAR TO THE WASHINGTON NAVAL TREATY

After the defeat of the Central Powers ending WW I on 11 November 1918, the U.S. continued to build destroyers, creating the most modern and up-to-date destroyer force in the world, at that time. The utility of the destroyer as an anti-submarine warfare platform, defender of convoys against the U-boat threat, its planned duties of both torpedo boat and destroyer for the battle line, succeeded beyond expectations.[32] The Navy relished the fact that the destroyer proved to be such a capable, multi-role ship in the face of the war that they had to contend with, not the one they originally envisioned.[33] When compared to the cost of a light cruiser, the destroyer proved to be a more practical and economical choice, easier to produce in large numbers as a deterrent to the submarine, and able to perform a variety of other missions.[34]

This chapter examines the current U.S. destroyers that would be the mainstay of the destroyer navy for the next 15 years, the *Wickes*- and *Clemson*-classes. It details

---

[32]Officially called the Conference on the Limitation of Armament, signed on 6 February 1922. Hereafter, referred to as the Washington Naval Treaty of 1922. U-boat: Abbreviation for Unterseeboat, the name commonly used for German submarines in WW I and WW II.

[33]The Navy envisioned fleet on fleet conflict with the Germans, not escort duty for merchant and troop convoys. The Navy was prepared, aligned, and balanced to fight a fleet on the high seas, but adapted well to the needs of the Allies, producing destroyers at the expense of other ships, namely battleships and cruisers.

[34]The standard destroyer missions were to defend the U.S. battle line against enemy, destroyer torpedo attacks, while simultaneiously conducting torpedo attacks against the enemy's capital ships, mainly battleships during this timeframe. The non-standard missions were convoy escort, anti-submarine warfare, scouting, the rescue and recovery of downed aircrew from aircraft carriers.

technological and other problems with the current classes of destroyers, current missions and tactics for destroyers, the General Board's recommendations for updating current destroyers, and the Navy's budget plan for building future ships. It will identify how destroyers fit into that building program, the political, economic, and social constraints affecting the Navy, the focus and plan for future destroyers, the Board's lost opportunities and shortcomings, and offer some initial conclusions for this timeframe.

The Navy used every destroyer in the inventory, from the *Bainbridge*-class through the *Wickes*-class, during the war, with the *Clemson*-class all being commissioned after WW I.[35] Within one year, the Navy decommissioned, or placed in reserve, every class up to the *Cassin*-class, and within four years (by 1922), the Navy decommissioned, or placed in reserve, every class of destroyer except the *Wickes*-class, and the newly built *Clemson*-class. The U.S. Navy had the most modern destroyer fleet in the world; however, this prevented the U.S. from building any new destroyers until 1932, beginning with the *Farragut*-class (the first of the 1500-ton destroyers) for a variety of reasons. Public aversion to the atrocities of war, a decreasing military and naval budget, competing ship building priorities, and the spirit of naval limitation contributed to the paucity of naval construction.

U.S. destroyers increased in size, speed, radius of action, armor and armament, and mission capabilities through technological evolution and innovation. The increase in size contributed directly to an increase in seaworthiness in most cases, and an increase in

[35]Most of these classes served in both coastal waters and in theater, with the older classes being replaced as *Wickes*-class destroyers became available.

length leads to greater speed.[36] Radius of action increases with size, the ability to hold more oil for fuel, and an increase in engine efficiency at speeds between 12 and 20 kts.[37] Most destroyers are lightly armored, if armored at all, and only armored in key areas of the ship, mainly in the vicinity of the bridge and engine compartments. The larger size of the destroyer enables the ship to carry more and bigger armament, mainly with increases in gun size, total number of guns carried, and the number and location of torpedo tubes. As destroyers progressed from pre- to post-WW I designs, the greater size of the *Wickes*-class allowed four 4" guns and twelve 21" torpedo tubes, an increase in four extra torpedo tubes, the addition of depth charge tracks at the stern of the ship, and anti-aircraft guns, as differentiated from the *Caldwell*-class, built in 1916.

U.S. shipyards continued producing the *Clemson*-class, 156 in all, with all of them being built and commissioned after the war. This shipbuilding program ended in 1921 and effectively doubled the size of the destroyer force. The *Wickes*- and *Clemson*-class ships, 265 total, created a problem for the Navy in the mid-1930s when all the U.S. destroyers would become overage nearly simultaneously, within a two to three year time

[36]Size here refers to tonnage. The greater the tonnage of a ship generally leads to a more stable and seaworthy platform. The length increase allows more, and in many cases larger, boilers for greater speed.

[37]Radius of action refers to how far a ship can travel without having to refuel. The most recent U.S. destroyers of the time generally had a radius of action enabling the ship to transit the Atlantic without having to refuel underway, or pull into port to receive fuel. Those of Great Britain would have had to refuel to make the trans-Atlantic crossing.

span.[38] The Navy dealt with destroyer obsolescence as well, both the *Wickes*-and *Clemson*-classes possessing the smaller 4" guns and no centerline armament.[39]

U.S. destroyers, when compared to their British counterparts during the war, exhibited some superior qualities, namely ruggedness for North Atlantic operations and radius of action, but they faced serious technological problems. The aforementioned issues came to light during General Board hearings held during and after the war. Upon the outbreak of war the Board held hearings in order to analyze and assess the effectiveness and performance of the Navy during the conflict. It brought in subject matter experts (SMEs), most often former Commanding Officer's (CO) of vessels, officers in charge (OICs) of groups or flotillas, or officers who had been observers with the British Fleet, in order to assess and compare U.S. ships to those of foreign nations, namely Great Britain, who at that time was still seen as the yardstick to measure one's own navy against. The Navy tried to give the Allies what they wanted and needed desperately, help on the anti-submarine warfare front.

The major deficiencies of U.S. destroyers were armament arrangement, turning radius, inadequate depth charge power, and protection from the weather for crewmembers outside the skin of the ship (gun and torpedo crews and bridge watchstanders). Centerline gun and torpedo tubes on British destroyers demonstrated to U.S. naval officers the capabilities that this location for armament brought to the fight, which began a long series of debates within the General Board of both the pros and cons

[38]Osborne, 70-71.

[39]Friedman, 43. Only five of the *Clemson*-class destroyers had 5" guns to test the ability of the ship and crew to handle the large gun system, but the entire class had the deck and hull strength to take the 5" guns.

of centerline gun and torpedo tube arrangements on destroyers. Armament size for guns on the destroyers became an issue when intelligence reports stated the newer German submarines carried a 5.9" deck gun, compared to 4" guns on U.S. destroyers.

U.S. destroyers became known for their ruggedness and ability to function well in the harsh climate of the North Atlantic, especially in rough seas. The drawback to U.S. destroyers became apparent to both U.S. and British seamen when the ships engaged German U-boats with depth charges. The depth charge, the primary weapon to engage a submerged submarine, required a quick turning ship in order to re-engage a maneuvering submarine. U.S. destroyers, around the same tonnage as their British counterparts, were typically 30 feet longer, which enabled greater speed and radius of action with larger fuel tanks, but drew criticism from destroyer CO's when it was discovered that U.S. destroyers failed to turn quickly enough to re-engage submarines with more depth charges. The U.S. turning radius, according to LCDR Francis Craven in a Board hearing in 1920, means, "our large destroyers have a radius of about 530 yards. If we find a submarine inside that radius we could not drop a depth charge without turning off. The British can turn in about 300 to 400 yards."[40] CDR Walter Vernou, former CO of the destroyer *Cassin*, testified before the Board that "the British destroyers have a decided advantage over ours in their maneuvering qualities. They handle much quicker than ours. As to seagoing qualities, personally I think our own destroyers are better."[41]

U.S. destroyers and their crews, unbeknownst to them, went to war with substandard and inadequate depth charges, the primary weapon against a submerged

[40]GBH, 23 April 1920; HBGB 1917-50, vol. 3, year 1920, 429.

[41]GBH, 17 December 1917; HBGB 1917-50, vol. 2, year 1917, 731.

submarine. CDR Joseph Taussig, former CO of the destroyers *Ammen* (750 tons), *Wadsworth* (1100 tons), and *Little* (1200 tons), testified before the Board on anti-submarine operations, including depth charges, in December 1917.

> TAUSSIG: On each side of the stern on the deck there is a sloping plate which slopes at an angle of about fifteen degrees from aft forward. The depth charge is secured on the plate so that when it is released it will roll off over the stern. It is secured by a wire strap which passed from the after side, over, and into a hook on the forward side. This hook is released by a hydraulic gear which operates from the bridge. The officer of the deck has a man standing at the releasing gear on the bridge, and when it appears that the ship is in the proper position he gives an order, the lever is pulled and the charge automatically drops into the water.
>
> REAR ADMIRAL [CHARLES] BADGER: How many are you equipped with?
>
> TAUSSIG: Two in position to drop, and two spares.
>
> BADGER: Made abroad?
>
> TAUSSIG: Yes, sir. We had the small depth charges from the U.S., but they were too small and didn't function satisfactorily.
>
> BADGER: Do the British depth charges function all right so far as the explosion goes?
>
> TAUSSIG: I dropped 12, of which 11 functioned.[42]

U.S. destroyer officers, having inadequate depth charges, understood the requirements needed in order to damage German U-boats, adapted to the situation and changed from U.S. supplied depth charges to British depth charges. Vernou testified that U.S. depth charges ~~–w~~were too small. You have to get 300 pounds to do much damage" and that U.S destroyers were all retrofitted to carry the British made depth charges once they discovered this issue.[43]

---

[42]GBH, 4 December 1917; HBGB 1917-50, vol. 2, year 1917, 690-691.

[43]GBH, 17 December 1917; HBGB 1917-1950, vol. 2, year 1917, 735.

Destroyer habitability, especially in the harsh North Atlantic, remained vital to crew morale. U.S. destroyers lacked proper protection from the elements for gun and torpedo crews, as well as bridge watchstanders. Taussig appeared before the Board to address these deficiencies, when compared to British destroyers.

> TAUSSIG: Their bridges and chart houses have been made more for real service in all kinds of weather than ours. They have taken up the question of proper protection which leads to efficiency in handling the ships. They use on their decks and other exposed places cocoa matting for covering as affording better footing than our bare decks or canvas covered decks. We have placed cocoa matting on some of our destroyers' decks.[44]

Both CDR Alfred Johnson and Taussig argued for better protection for the crews out in the elements, with the implementation of metal spray shields for the forecastle guns, as well as wind and spray protectors for the bridge watchstanders.[45] Vernou corroborated the testimony of commanders Johnson and Taussig.

> VERNOU: Our bridges are very satisfactory for the weather we experienced after we had them closed in. But as originally constructed we could never have lived in the bad weather as there was no protection at all. A design for closing was submitted which is more or less a copy of the British.[46]

The other guns, aft of the bridge, and the torpedo tubes, typically, did not have wind and spray protectors until later design modifications were implemented.

The feasibility and utility of the centerline gun and torpedo tube arrangements on British destroyers drove U.S. destroyer design and characteristics throughout much of the

---

[44]GBH, 4 December 1917; HBGB 1917-50, vol. 2, year 1917, 692-693. Cocoa matting provided a super absorbent surface capable of standing up to the weather experienced in the Atlantic.

[45]Ibid., 695. The spray shields were sometimes reinforced to provide splinter protection from shrapnel, GBH, 17 October 1917, 470.

[46]GBH, 17 December 1917; HBGB 1917-1950, vol. 2, year 1917, 733.

1920s and into the 1930s, culminating in those characteristics incorporated in the *Farragut*-class. Vernou spoke to the Board concerning gun and torpedo placement, as well as the inability to use certain weapon systems based on the weather and sea conditions.

> VERNOU: The forecastle gun as now located on the destroyers can seldom be used in the weather experienced. It is almost impossible to get a crew on the forecastle in the seas experienced. The British have a gun amidships on the centerline on a raised platform which some officers said is the only gun they can use in very bad weather. We are practically in the same fix. Our forecastle gun can't be used in bad weather, nor can the waist guns.
>
> BADGER: So the after gun is the only one you can depend upon?
>
> VERNOU: Yes. The sea is washing over the waist gun and it would be practically useless. As a matter of fact I have had some trips myself in bad weather so we couldn't use the guns and upon arrival in port found everything frozen. That practically makes the guns useless.
>
> BADGER: Frozen by rust?
>
> VERNOU: Yes. I am in favor of centerline guns and tubes. The constructors opposed the centerline tube although I heard some say that the Bureau of Ordnance is really behind it because they can't get clear of the rail. If it can be accomplished, I favor the centerline tube.[47]

The use of centerline gun and torpedo tubes allowed for greater broadsides, to either side, instead of being limited by the train of the gun and torpedo tube to engagements forward and abaft the beam of the destroyer on the side that gun is positioned. In many cases, rough weather precluded U.S. destroyers from manning their torpedo tubes, as well as

---

[47]GBH, 17 December 1917; HBGB 1917-50, vol. 2, year 1917, 732. CDR Vernou was alluding to the fact that the current torpedo could not clear the deck or railing of U.S. destroyers when mounted on the centerline, thus damaging both the deck or railing and the torpedo itself. The British, on the other hand, with roughly the same beam as U.S. destroyers, maintained the ability to launch torpedoes over the side from a centerline torpedo tube arrangement. The forecastle is used to indicate the forward most part of the upper deck. The centerline gun and torpedo tube arrangement dominated destroyer Board hearings until the 1930s.

losing torpedoes over the side of the ship. CAPT Orton Jackson testified before the Board about the situation abroad, including testimony on destroyer guns and gun locations.

> JACKSON: Our destroyers are very good except the guns. They should be on the centerline if we can get them there.
>
> BADGER: The new ones will be armed with three 5-inch guns on the centerline. It would probably be impracticable to change the armament on the present destroyers.[48]

Armament size, for the guns on the destroyers, became an issue when intelligence reports stated the newer German submarines carried a 5.9" deck gun, compared to 4" guns on U.S. destroyers.

> BADGER: The armament of your boat was four 4" guns?
>
> TAUSSIG: Yes, sir.
>
> BADGER: In view of the fact that the later German submarines are reported as carrying 5.9" guns, etc., what would you think about an increase in the caliber of guns for future destroyers to 5-inch?
>
> TAUSSIG: I think three 5-inch guns on the centerline would be better than 4-inch guns as now placed. That is, if the structure can be made strong enough to support them. I have not been fired at by a submarine but I was under the impression that their guns were shorter than ours and probably didn't get as much range.
>
> JOHNSON: They even outrange our own 4" guns aboard the destroyers. I think this is due to the fact that they can elevate them more.[49]

Throughout the 1920s, foreign navies continued to build destroyers with centerline armament and guns greater than 4" in size.

The missions and tactics that U.S. destroyers planned for prior to entry into the war never materialized, as a fleet engagement between the U.S. battle line and that of Germany never happened. The primary mission of a destroyer, protecting the U.S. battle

---

[48]GBH, 10 December 1917; HBGB 1917-50, vol. 2, year 1917, 723.

[49]GBH, 4 December 1917; HBGB 1917-50, vol. 2, year 1917, 691.

line from German destroyers, while at the same time launching torpedo attacks against the German battle line, was not needed. However, the success of the German U-boat campaign against Allied shipping necessitated protecting groups of ships in convoys, in order to keep Great Britain, France, and Russia fighting against the Central Powers. The U.S. destroyer force adapted well to the change in mission and tasking once the Allies implemented the convoy system.

On 16 October 1917, CDR William Pye appeared before the Board to discuss the status of the naval war abroad. Pye had been an observer in Great Britain and part of the Atlantic Commander's staff, where he earned the Navy Cross He would go on to achieve the rank of Vice Admiral (VADM) during WW II. Also present was RADM Frank Friday Fletcher, who requires a special introduction. He was a recipient of the Medal of Honor for service in operations off of Vera Cruz in 1914 and then named Commander in Chief of the U.S. Atlantic Fleet that same year. The *Fletcher*-class destroyer, the dominant destroyer of WW II, was named for him.

> PYE: I think the War today is going to be decided by the ability or inability of the Germans to sink enough commercial shipping to seriously embarrass Allied operations. I feel firmly convinced that the Germans will sacrifice enough of their fleet in order to restrict Allied shipping. The last Naval battle was caused by the British battle cruisers which were making raids against German shipping . . . I think they will use battleships, light cruisers, or whatever they believe is effective against the commercial shipping of the World this winter. I think they will take advantage of the fact that the shipping of the World is concentrated in the convoys which will permit them to get enough of value when they are sighted to pay for being sighted. The sea is now practically clear of everything except convoys and if a battle cruiser gets into a convoy she will probably get many of them.[50]

[50]It was not stated whether this view was shared by the Board or just CDR Pye with regards to the convoy system being fairly easy targets for surface raiders, instead of the prime reason for the convoy system being protection against the U-boat.

> BADGER: What is your opinion on the strategy of distributing the fleet to the Allies?
>
> PYE: Personally, I think we should comply. I think the policy of keeping the Fleet together is ordinarily the right one, but I think that the submarine menace is great enough to make it necessary for us to use every endeavor to assist in putting anti-submarine craft into operation and by sacrificing our policy of maintaining our battle fleet together we can relieve personnel of both British and French Navies, now employed on battleships, to place them on ships which will be effective against present submarine operations.[51]

The Board wanted to ensure that the assets the Navy provided to the war effort were being used correctly against the U-boat threat. The Board continued to question Pye, ending with the recommendation for increased numbers of anti-submarine vessels being sent to the war zone.

> RADM [ALBERT] WINTERHALTER: I was referring more to larger offensive and aggressive operations. Was there anything more the English want so far as your visit developed?
>
> PYE: No, sir, nothing except the battleships, mines, increased number of destroyers and as many as possible additional anti-submarine vessels and assistance in personnel for the purpose of relieving battleships so that they can put in more anti-submarine craft and some mechanics to help them get out more mines.[52]

The destroyer, coupled with the convoy system, proved to be the most reliable combination of anti-submarine warfare tactics in WW I.

> BADGER: To sum it all up, what will help the situation in your opinion is to increase the number of destroyers on that station. The number we have there is as efficient as could be expected.

---

[51]GBH, 16 October 1917; HBGB 1917-50, roll 1, year 1917, 412-3.

[52]Ibid., 416. Pye was alluding to using British Sailors from their battleships and cruisers in order to man up their new destroyers. This is why the British wanted U.S. battleships in theater, to relieve those British battleships so that they could park them and use the Sailors for different missions. See Appendix B for information on British General Naval Plans, Plans for Naval Operations, and the Convoy System.

VERNOU: Yes. The destroyer is the greatest enemy the submarine has. Even if you don't run up a great total of sinkings you block his game.[53]

Again, in December of 1917, Taussig and Johnson testified to the Board about anti-submarine warfare (ASW), destroyer missions and capabilities, and anything that could lead to the improvement of destroyers for the ASW mission. It is apparent that they were basing their testimony on their initial impressions of the serious British situation they at first encountered. At the end of the hearing, Taussig revisited the offensive versus defensive mission posture:

TAUSSIG: The great drawback with present operations is that they are entirely defensive. We only encounter submarines when defending convoys. Except when encountering convoys, the submarines are unmolested because we haven't enough vessels for an effective patrol at the same time.

BADGER: I would like to have your idea with regard to the effect that the sending of our destroyers over there has had.

TAUSSIG: I think they have been a valuable asset.[54]

Two weeks later, Vernou discussed "Destroyer Operations Abroad" (the title of the 17 December 1917 hearing) and the convoy system, again with ADM Badger presiding.

BADGER: You have no doubt in your mind as to the superior efficacy of the convoy over the patrol system?

VERNOU: It is very superior.

BADGER: Suppose you had three times the force of destroyers you have now at Queenstown, would you go back to the patrol or the convoy or a combination?

---

[53]GBH, 17 December 1917; HBGB 1917-50, roll 2, year 1917, 729-736. See Appendix B for Memorandum outlining "The Problem of Providing Anchorage for the Fleet at Hawaii in a War with a Pacific Power" and GBH on the Development of Pearl Harbor, T.H.

[54]GBH, 4 December 1917; HBGB 1917-50, roll 2, year 1917, 701-702.

> VERNOU: I would have not exactly a combination. My idea would be to get everything under convoy and give more destroyers to each convoy depending on its size . . . If they had sufficient destroyers to handle the convoy and then had a number in the base they could send them out when a submarine was located and make him keep down and make life so miserable for him he would have to leave.[55]

The British philosophy of patrols and patrolling by sector, basically the ~~–o~~ffensive" part of hunting for submarines, coupled with Taussig's statement about it being hard to spot submarines, makes actually finding a submarine and engaging it similar to searching for a needle in a haystack. The convoy system, concentrating multiple ships in a smaller area with escorts designed to defend the convoy, was essentially ~~–d~~efensive in nature" and essential to Great Britain's survival, both physically and psychologically. The ability to force the submarine to submerge allowed the convoy ships to escape at the convoy's greatest speed, generally that of the slowest ship in that convoy. Submarines, especially in that era, typically are much slower when submerged than when they are transiting on the surface.

Taussig and Johnson together addressed the British situation before the Board in its December 1917 hearings. Topics included British ASW, destroyer missions and capabilities, and anything that could lead to the improvement of U.S. destroyers for the ASW mission.

> TAUSSIG: The operations were practically all offensive. In other words, the patrol boats were looking for the submarines, especially in those areas through which shipping came and went . . . The patrol system was not adequate for the proper protection of the shipping as shown by the loss of 95 British ships in the two weeks previous to our arrival. The question of convoy then came up . . . ADM Sims was a strong advocate of the convoy and urged it from the very first. The advantages of the convoy, it seems, would be that it concentrated the shipping into small units and in that way the small number of patrol vessels

[55]GBH, 17 Decmeber 1917; HBGB 1917-50, roll 2, year 1917, 728.

> available could more nearly protect all the shipping than they could if they were scattered all over an area. The submarines appeared to operate against the home bound loaded vessels, and continued this until the home bound convoys started. This necessitated their always fighting for any shipping they succeeded in torpedoing with the result that they commenced operating against out bound ships in ballast, which were not under convoy.
>
> JOHNSON: CAPT Long told me that of the vessels sunk 75 percent were home bound and 25 percent not loaded. Then with the convoys the figures were reversed.[56]

After WW I concluded, the Board advocated using twelve not built, but authorized, destroyers from a 1916 appropriation to be the test platforms as a specialized type to be known as destroyer leaders. These ships were necessary to counter the destroyer leaders of foreign navies, namely those of Great Britain, France, and Japan. The Navy envisioned using this class of destroyers differently than other navies, which used them as just a larger type of destroyer. The officers appearing before the Board recommended several different mission sets for the destroyer leader.

The primary mission of the destroyer leader centered on leading a flotilla of destroyers against the enemy's battle line. The leader would provide guidance and tactics to the flotilla through the use of radio and flag communications. The guidance included range to the enemy ships, for both torpedo and gun attacks by the flotilla, hence the need for accurate range finders on the leader.[57] The secondary mission concerned screening of the battle line against submarines, as a standard destroyer would do. The destroyer leader retained the same qualities as a standard destroyer, but would also have more speed,

---

[56]GBH, 4 December 1917; HBGB 1917-50, roll 2, year 1917, 687.

[57]GBH, 23 April 1920; HBGB 1917-50, vol. 2, year 1920, 445. The Board recommended placing small aircraft aboard destroyer leaders to enhance the scouting capabilities, provide information to the flotilla commander on enemy movement, and spot the fall of gunfire from the ships of the flotilla.

bigger guns, centerline torpedo and gun arrangements, separate plotting and larger communication rooms, and a range finder for accurate information on the enemy.[58] Lastly, the destroyer leader could accompany battle cruisers for both ASW protection and provide additional gun support during scouting missions. The leader possessed anti-aircraft capabilities to support both the cruisers and main battle line.[59]

The Board recognized the importance of making modifications to fix deficiencies in the destroyer designs brought out by action in the war, sought to update the *Wickes*-class of destroyers.[60] The *Clemson*-class, the mass-production destroyer built after the war, consumed most of the destroyer budget for the Navy, leaving little to no money left over for modifications, as demonstrated in this 1920 Board hearing.

> BADGER: The question of cost and the possibility of making changes?
>
> CAPT [ROBERT] STOCKER: As far as alterations on the existing boats are concerned, it is hopeless. There is no money.
>
> BADGER: And following the general rule it is a mistake.
>
> STOCKER: (Intervenes) There is no money under ~~I~~ncrease of the Navy". If it is done at all it must be done under ~~C~~urrent Appropriations".
>
> BADGER: The General Board has found it essential for many reasons to cut down alterations to vessels built or building as much as possible.[61]

---

[58]GBH, 23 April 1920; HBGB 1917-50, vol. 2, year 1920, 445.

[59]Ibid., 445. Anti-aircraft capabilities included the use of double purpose guns, as well as machine guns.

[60]As previously mentioned, the Navy would decommission all classes of destroyers up to the *Wickes*-class by 1922.

[61]Ibid., 440. Changing design plans while building was very expensive. The Navy focused on getting platforms to the fleet as quickly as possible at the 80 to 90 percent solution, instead of providing the perfect solution after it was no longer needed.

Inadequate funding and authorization by Congress, as well as competing ship building priorities outlined by the General Board delayed the modifications needed for both the *Wickes*- and *Clemson*-class destroyers until the late 1920s, when both classes reached approximately half of the expected life of the ships.[62]

Budgetary constraints forced the Navy to build ships that they hoped they would need in the future. Prior to WW I, the Navy focused on a creating a fleet "second to none," meaning a fleet equal to that of the greatest naval power in the world--that of Great Britain. This building program, drawn up in 1915 and submitted in 1916, outlined how the Navy would build its fleet to equal that of Great Britain by 1924. Although this program called for appropriations at the rate of two capital ships per year, along with auxiliary ships, WW I intervened and forced the battle ship building program to fall behind, while significantly increasing both the destroyer and submarine building programs. In 1921, the General Board again advocated carrying out the 1916 program.[63] Every year, the Board would submit, to Congress through, and directed by, the Secretary of the Navy (SecNav), the Naval Policy and Ship Building Programs for the next few years. In July 1921, the Board submitted the program to Congress, stressing the needs of the Navy to continue to build all types of ships in order to bargain from a position of

[62]This does not mean modifications were actually done, but Hearings on modifications were held in 1928.

[63]NARA,RG-80, General Board No. 420-2, Serial No. 1083, 15 July 1921. These building program policy statements were listed as 420-2 serials and were known as General Board Policy Serials.

strength.[64] The Board suggested maintaining the incremental building programs in place, instead of building rapidly, like they had done with destroyers and submarines during WW I. The Navy needed to be ready to respond to anything, as reflected by the experience in battling the unrestricted submarine warfare by Germany. The General Board wanted to be able to respond with the immediate application of force to counter that threat against commerce and transportation of goods on the oceans.[65] Recognizing that fiscal constraints brought on by the war precluded the massive authorization required to build up to the strengths of the Royal Navy, the Board warned against neglecting the personnel and material well-being of the Navy, as the Navy would lose its efficiency in combat. "Navies are not built in a day; it is a matter of years, even of generations."[66]

The Board recommended implementing a replacement program for ships, as ships become obsolete, due to age or technological changes, in about 15-20 years. The destroyer leader, first brought to the Board's attention in hearings during and after WW I, was recommended to be built at the rate of six per year for fiscal years 1923, 1924, and 1925, but that no destroyers be built during that same timeframe. The 156 ships of the *Clemson*-class were being completed at that time.[67] Unfortunately for the destroyer force, destroyer leaders occupied the sixth place in the building priority for the Navy. The list was as follows:

---

[64]The Board, knowing that the Washington Naval Conference was just months away, wished to negotiate at the conference from a position of strength, not one of weakness.

[65]NARA, RG-80, General Board No. 420-2, Serial No. 1083, 15 July 1921.

[66]Ibid.

[67]Ibid.

1. Aircraft Carriers
2. Light Cruisers
3. Large Submarines
4. Mine Laying Submarines
5. Medium Sized Submarines
6. Destroyer Leaders[68]

Along with these recommendations, the Board advocated the decommissioning or movement to the reserves of all destroyer classes up to the *Wickes*-class, leaving just the *Wickes*- and *Clemson*-class of destroyers in the U.S. Navy inventory by 1922.

The Board, sensing the reality of America's international views and tendencies towards isolationism, especially after WW I, and the entanglements that came from the alliance system, recognized the fact that an incremental building program was necessary across the vast array of different ships. The Navy needed to start to build and lay down platforms every year, instead of trying to play catch up and building large numbers of ships all at once. Although the industrial capacity of the U.S. was able to build numerous ships in a short time span, the ability for the Navy to man and train those ships to fight in a cohesive fashion would take more time. Experienced sailors and capability could not be generated overnight. Since the *Clemson*-class of destroyers were being completed during 1921, the recommendation for not building destroyers over the next few years made sense. However, the Navy wanted to experiment with the destroyer leader concept and recommended to Congress that they fund and build six leaders each year for the next three years. Congress was bent on bringing back fiscal responsibility in the wake of the end of the war, which more than quadrupled the national deficit, and with a new

[68]GBH, 8 July 1920; HBGB 1917-50, vol. 3, year 1920, 593.

Republican President and Congress bent on bringing back fiscal responsibility to the Capitol.[69]

The focus and plan for future destroyers centered around completing the building plan for the *Clemson*-class and a look toward the future with the creation of the large type destroyer, alternatively known as both a destroyer leader and a flotilla leader.[70] Incorporated into the destroyer leader concept contained many of the modifications wished for the *Wickes*-class, but were unable to do so for funding reasons. These modifications included armament changes, protection for the crew, technological advances, accommodations for the flotilla commander and associated staff, communications upgrades, and range finders.[71]

On 4 September 1917, the Board met to discuss the newest destroyer to be built. These became the *Clemson*-class. The purpose of the hearing centered around status updates on the new destroyer regarding ship design and characteristics. The Board used the feedback from the war to adjust requirements and design characteristics to build the newest destroyers. Admiral William Benson, the Navy's first Chief of Naval Operations

---

[69]Kuehn, 42, 51, 56.

[70]Foreign navies were calling the larger type ship a Destroyer Leader, while the U.S. Navy tended to call the ship a Flotilla Leader. This thesis will use Destroyer Leader nomenclature for the repeated Board hearings on the large type destroyer.

[71]These modifications were reflected in lessons learned from operations during and after WW I, many broached before the General Board in December 1917. Armament changes included the incorporation of the 5" gun, centerline arrangement of both guns and torpedo tubes, multi-speed and range torpedoes, and anti-aircraft guns. Habitability and protection included spray shields for guns and torpedo tube crews, wind protection for the bridge watchstanders and enclosing the bridge itself, as well as stateroom additions for the flotilla commander and his staff. The use of a kite balloon was to provide over-the-horizon visibility of the enemy during smoke generating operations.

(CNO) had directed CAPT Josiah S. McKean, later reached the rank of Vice Admiral and was Commander in Chief Scouting Fleet, to update the Board (including admirals Winterhalter and Badger).

> MCKEAN: The Bureau has been trying to get the General Board's characteristics for a standardized destroyer which could be built rapidly and in addition to the fleet destroyers of the 35-knot type . . . Two principle objects in view – one to increase the radius of action and the other to simplify and speed up building and results . . . It has four triple tubes, two boilers only, 13,000 horsepower (hp) and a single smokestack and foundations at least for 5" guns, two on top of the galley for head fire and stern fire and a 5" gun in this position astern (indicating) . . . So the top speed at deep draft is 28 knots (kts) . . . We figured that during the war the probable minimum cruising speed would be 15 kts and we had to go 4900 nautical miles (nm). The General Board gives 3900 at 15 kts. We must get 1000 miles more with the probability that we will have to convoy others on way across, troop transports with destroyers or we will at least have to convoy them until we meet the escort from the other side and then the destroyers must get back on their own fuel.
>
> WINTERHALTER: Work at a cruising radius of 18 kts?
>
> MCKEAN: No, they can't do it at 18 kts.
>
> CAPT [WILLIAM] SHOEMAKER: Do it at 15?
>
> MCKEAN: They can do it at 15 . . . Then in Number 6 they overlooked the anti-aircraft guns and they redesigned the Number 6 to provide for them. The 3-inch anti-aircraft guns are placed on the forecastle which does not give them end fire and so they shifted these 5" guns way forward in the nose of her.[72]
>
> SHOEMAKER: What is the total displacement?
>
> MCKEAN: Your total was 1150 and this is about 1100.[73]

---

[72]This was design Number 6 for the new destroyer. Norman Friedman, *U.S. Destroyers: An Illustrated Design History, Revised Edition* (Annapolis, MD: Naval Institute Press, 2004), 42. The *Clemson*-class destroyers, virtually a repeat of the *Wickes*-class, but had more fuel capacity and were much slower, around 26-28 kts maximum speed, as compared to the predecessors 35 kts.

[73]GBH, 4 September 1917; HBGB 1917-1950, roll 2, year 1917, 70-72.

The Board shifted to comparing this new destroyer to the *Wickes*-class of boats currently being built and in use.

> BADGER: Do you get as good a boat as the 35-kt?
>
> MCKEAN: I think for the work you ask you are getting a relatively stronger boat. The Chief Constructor said that the latest type was practically 20 percent stronger than those they had been building.[74]

The *Clemson*-class's major deficiency was speed. The Navy was forced to compromise on design characteristics in order to get this class of destroyer built faster. However, since all of the *Clemson*-class were built after the end of the war, this was a poor tradeoff, leaving a discrepancy in speed of seven kts between the two types of destroyers that the Navy would use over the next two decades. The priority in the yards to build these destroyers was fierce, with McKean telling Admiral Friday Fletcher that "this has been given precedence over battle cruisers, scouts, and all that sort of thing, and merchant marine."[75] The submarine threat to the Allies was so effective that the anti-submarine mission became the priority ship building effort until the completion of the *Clemson*-class and remained this way for three years after the war ended.

Concurrently with the building of the *Clemson*-class, the Board focused on different armament arrangements and systems, and a new type of destroyer for the Navy

---

[74]The British were using short range, short radius, near shore, coastal boats, trawlers, sloops, etc., for their war on submarines. Since they were relying on the U.S. Navy to provide convoy escort across the open oceans, they were better able to protect the English Channel, North and Irish Seas with these smaller boats supplementing their destroyer force. Ibid., 74. The problem again was speed. The *Clemson*-class, due to building limitations at the ship yard and time constraints to get the ships built and into the war effort, were modified from the *Wickes*-class to have a smaller number of boilers, less speed, but the same radius of action. Friedman, 42.

[75]GBH, 4 September 1917; HBGB 1917-1950, roll 2, year 1917, 75.

as discussed earlier, the destroyer leader. The efficacy of the arrangement of torpedo tubes on the centerline and the drop of the torpedo from the side of the ship to the surface of the water was argued in this Board hearing.

> RADM [JOSEPH] STRAUSS: You mentioned a practical case in which the torpedo flotilla steaming along would have fired the starboard torpedo tubes and some the port tubes, which would have caused difficulty the next day. Whereas, if they had centerline installation it would not have taken place.
>
> LCDR [FRANCIS] CRAVEN: I referred to a division which had some boats which fired their starboard torpedo tubes because the enemy was on the starboard side and others fired the port torpedoes. The next day they found they were ill assorted.
>
> STRAUSS: Would they have been very much better off if the torpedo tubes had been on the centerline?
>
> CRAVEN: There would have been no need for the day torpedo attack. It is my idea to put the greatest striking force where it is most needed.
>
> STRAUSS: You would recommend therefore that the torpedo be redesigned and made stronger and the handling difficulties increased by raising the torpedo.
>
> CRAVEN: Yes, sir. The torpedo has been redesigned and will do the work and the proposition of redesigning the torpedo tubes is very simple.
>
> STRAUSS: How much of a drop would that entail?
>
> CRAVEN: About 5 feet plus the freeboard of the ship, or say 16 feet.[76]

The type of torpedo for the attack on the enemy's battle line created controversy and consternation at one point in this same hearing.

> CRAVEN: I think that we ought to show them the way.[77] I went over there satisfied that our destroyers were the finest in the world and I very soon decided that they were not. I didn't do this work as a critic but with every hope that the

---

[76]GBH, 23 April 1920; HBGB 1917-50, vol. 3, year 1920, 438. Freeboard is the height of the deck above the surface of the water.

[77]Meaning the British. Most often, the Navy seems to follow the navies of the world in ship design, often making a similar ship, then making it bigger, faster, and with more and larger weapons.

> matter would be viewed entirely as a military criticism so we could improve our military design. . . . For instance, for many years we have been building single speed torpedoes without realizing we were handicapping ourselves for short range work.
>
> STRAUSS: We have had plenty of multiple range torpedoes.
>
> CRAVEN: Not for six years.
>
> STRAUSS: We didn't think much of them.
>
> CDR [GARLAND] WRIGHT (NWC): No, sir; except by the use of reduction gears in order to get uniform turbine speeds. We want three speeds – 45, 32, 27.
>
> STRAUSS: Three speeds.
>
> WRIGHT: How it is going to work out I don't know.[78]

The ability to change torpedo speeds allowed the crews to engage targets closest with the fastest speed setting, while the slowest speed setting achieved the greatest distance to engage the furthest targets.

After the war the Board considered the recommendation to build a whole new class of ship, the destroyer leader, or to build just a few in order to experiment with the fleet. The general consensus was to build the 12 authorized destroyers to function as a test platform for the destroyer leader mission.

> BADGER: I can ask CDR Rowcliff this,--whether he believes in the pilot vessel or to branch out at once into what might be called quantity production?
>
> CDR [GILBERT] ROWCLIFF [NWC WAR PLANS DIVISION]: That depends on the state of preparedness of the Bureaus concerned as to getting plans ready.

[78]GBH, 23 April 1920; HBGB 1917-50, vol. 3, year 1920, 442-443. The Board covered types of masts, 5" guns over present 4" guns and the use of these guns in twin mounts, spray shields for guns, sights, and torpedo tube crews, weather protection for the bridge, listening devices, and kite balloons.

> What we recommend is that the 12 boats authorized, but not begun, be made into destroyer leaders without starting to build them as destroyers.[79]
>
> BADGER: That means thirty-six million dollars.
>
> ROWCLIFF: That means a great deal of money. We conclude these will cost not less than three million dollars apiece.
>
> STRAUSS: There is an implied limit to the cost. We would have to get authority from Congress to shift that into an equivalent number in cost,--five or six. But he has in that paper a very significant thing. They have placed the destroyer leaders sixth in priority in construction.[80] If they do that, I think that affects the question. It doesn't mean you have to hurry to build all the destroyer leaders we want.
>
> ROWCLIFF: We recommend the starting of those 12 that were authorized and their building as destroyer leaders. If the Bureaus aren't able to do that and there isn't money enough, we couldn't do it. . . . We want one group of flotilla leaders for the battle cruiser attacking force; and another group of flotilla leaders for leaders of flotillas of from 12 to 18 destroyers. The ratio is about what CAPT Robison calculated as being from 1 to 15.[81]

The Board failed to move the expensive leader up the priority list, and Congress never authorized the funding to build the 12 leaders.

The General Board lost several opportunities to correct deficiencies in ship's being designed and exhibited deficiencies and short-sightedness with regard to the future role destroyers would have in the Navy, as well as technological innovations that could have made the U.S. Navy's destroyer the most effective force in the world. For example,

---

[79]The meaning of CDR Rowcliff's statement was to build them as destroyer leaders first and foremost, and not modify an existing destroyer to assume the role of the leader.

[80]This was important to note. WW I was over, the Navy was still building the *Clemson*-class, and the Bureaus recommended the destroyer leader to be placed sixth in order of priority. This was a death sentence to the large type destroyer, at least for the 1920s and on into the 1930s.

[81]GBH, 9 July 1920; HBGB 1917-50, vol. 3, year 1920, 582-583. See Appendix B for Memorandum on Flotilla Leaders (dated 7 July 1920) and document on the "Military Characteristics of Destroyer Leaders."

the Board failed to investigate the possibilities associated with the hydrophone and the Anti-Submarine Detection Investigation Committee (ASDIC), the precursor to what became known as Sound Navigation and Ranging (SONAR). Hydrophones, first brought to the attention of the Board in September 1917, generated some interest by the Board, but failed to elicit any substantial funding or plans to implement this device to aid destroyers in the hunt for submerged submarines.[82]

The Board lost an opportunity to redesign the *Clemson*-class destroyers following the cessation of hostilities in late 1918. The decrease in speed, vital to a destroyer, and the lack of centerline armament remained an impediment to the progressive design of building destroyers with an eye toward correcting past deficiencies.

The most effective weapon against the primary naval threat in WW I, the submarine, was the destroyer. The fact that the *Clemson*-class was still built even after the war was over demonstrated the importance of the destroyer to the future of naval combat. However, the recommendation to continue building a slower destroyer with small 4" guns and not correct those deficiencies is bewildering. Additionally, the recommendation to place the destroyer leader at sixth on the priority of building doomed this class of ship until the mid 1930s, and placed the Navy at a disadvantage when leaders were finally built due to lack of integration and training with the fleet.

Conclusions

The General Board began to assess the efficacy of the U.S. destroyer contribution to the war effort immediately after sending the first ships overseas. The Board's process

[82]Although the fish hydrophone technology was poor at this time, the Board failed to further investigate the possibilities offered by the hydrophone after the war ended.

included interviews of subject matter experts and officers with practical experience returning from duty in the war. The use of destroyers against U-boats, mainly in convoy escort duties contributed greatly to the successful defeat of the U-boat threat. On whole, the Board believed that the U.S. destroyers operating overseas were as good as their British counterparts. At the same time, the Board wanted to fix shortcomings in the basic design of the next destroyer class (*Clemson*), but failed to do so.

The Navy exited WW I almost on par with Great Britain. In the 1921 Building Program recommendations it hoped to achieve parity with the British by 1924. This would only happen as long as the U.S. kept building the right type of ships for a balanced fleet. At the same time, the Board continued the planning and modification of the *Clemson*-class. The deficiencies of the *Wickes*-class centered on the destroyer's turning radius and the location of the armament (guns and torpedo tubes). The Board struggled with how to fix the turning radius issue, but saw that the primary fix for the armament issue was a centerline placement for both the guns and torpedo tubes.

The Board, looking to the future, recommended building a new class of destroyers, the destroyer or flotilla leader, both for experimentation and to incorporate into the fleet for the purposes of leading groups of destroyers into combat. It also wanted to use them to provide a scouting capability in conjunction with both cruisers and battleships. The mistake the Board made in this period was to continue building the *Clemson*-class of destroyer, even after the war ended. An incremental build of the *Clemson*-class throughout the 1920s would have better served the Navy, as all of the *Wickes* and *Clemson*-class destroyers would reach their end of useful service life within a four year span in the 1930s. Additionally, placing the destroyer leader sixth on the

priority list doomed this concept until the mid-1930s, but the design characteristics of the leader prepared the foundations for the design that ultimately resulted in the *Fletcher*-class destroyers in WW II.

The era of the Treaty Navy and treaty system dominated the rest of the Interwar Period. From the signing of the Washington Naval Conference in 1922 to the London Naval Conference of 1936, the treaty system, designed to avoid mass expenditures by the naval powers to rearm, rebuild, and modernize their fleets, failed. It did force the navies of the world to be innovative in the process of advance naval weapons, namely the aircraft carrier and carrier-borne aircraft. The General Board influenced the speed, both positively and negatively, for the *Wickes*-and *Clemson*-classes, respectively. Although in hindsight, it was better for the Navy to have a class of slower destroyers built after the war, giving the Navy the most modern destroyer force in the world, than to have stopped building the *Clemson*-class altogether, leaving the Navy on par with the British as far as destroyer numbers, and planned in all classes by 1924. The recommendations for the future destroyer leader emphasized the necessity of having a much faster destroyer than the aforementioned *Clemson*-class. The Board had a positive influence on destroyer radius of action, requiring the *Wickes*- and *Clemson*-classes to have the ability to transit across the Atlantic at speeds between 12 and 20 kts, while the destroyer leader would have roughly the same radius of action as the destroyers it would be leading. The recommendations on armor and armament by the Board increased the protection for the crew and ship, offensive and defensive capabilities with the move towards larger size deck guns and the centerline weapon arrangement advocated for future destroyers and the destroyer leader.

The Board's recommendations on a Navy –second to none", combined with a set of ship building programs to get there by 1924, concluded with the reality that the U.S. must deal from a position of strength at the Washington Naval Conference. Chapter 4 will cover the timeframe from the signing of the Washington Naval Treaty of 1922 until the end of 1932 and the role played by the General Board during this period.

CHAPTER 4

WASHINGTON NAVAL TREATY AND AFTER

The Washington Naval Treaty sought to minimize the chances of another conflict by limiting the post WW I naval arms race heating up between Great Britain, Japan, and the United States, with Italy and France also as signatories.[83] The treaty predominantly dealt with capital ships and aircraft carriers.[84] However, the treaty left open some glaring loopholes in the wording that many of the countries took advantage of, but these loopholes closed at the London Naval Conference of 1930.

This chapter examines the political, economic, and social constraints affecting the Navy and the U.S., effects of the treaty system on the Navy in general and the destroyers in particular, current U.S. destroyers that would be the mainstay of the destroyer navy for the next eleven years, the *Wickes*- and *Clemson*-classes. It will also examine technological and various other problems with the existant classes of destroyers, current missions and tactics. The primary focus will be how the General Board played a roll in making recommendations for updating commissioned destroyers, the Navy's budget plan for building future ships and where destroyers fit into that building program, the focus and plan for future destroyers, and the General Board's lost opportunities and short-

[83]The Washington Naval Treaty was actually an arms limitation conference with three distinct treaties that came out of it. The Five Power Treaty focused on tonnage limits and capital ship ratios. The Four Power Treaty focused on consultation prior to one of the signatories taking action in a future crisis in the East Asia. The Nine Power Treaty focused on the Open Door Policy on China, respecting the territorial integrity of that county. For the purposes of this thesis, when the Washington Naval Treaty is discussed, it is about the Five Power Treaty only, signed by the U.S., Great Britain, Japan, France, and Italy.

[84]In this case, the treaty defines both and they are separate entities.

comings. Some tentative conclusions will be offered at the close of the chapter summarizing this period.

The U.S., at the end of WW I, was poised in a position to lead the world politically, economically, and socially. However, the revulsion caused by the war tipped America back towards its natural position, that of an isolationist country. In fact, the U.S. failed to enter the League of Nations after the war, refusing to enter into any relationship, because it viewed the alliance system as a causal factor for WW I. The government, immediately after the war, sought to curtail the growing deficit with budget cuts and focused on the large size of the military. The economic downturn following the Great Crash of 1929 further hampered the Navy's ability to modernize their ships and build the ships necessary for a balanced fleet. The feelings of isolationism, although strong, were not strong enough to prevent the U.S. from participating in several arms limitations conferences, including hosting the Washington Conference of 1921, the failed Geneva Conference of 1927, the London Conferences of 1930 and 1935-36, and the second failed conference at Geneva in 1932-34. Washington and the two London Conferences all produced naval arms limitation treaties. The treaty system encompassed all these conferences and their resultant treaties.

The Washington Naval Treaty of 1922 predominantly focused on capital ships and aircraft carriers, but it did have one important clause concerning fortifications and naval bases in the territories and possessions of the signatories.[85] The clause (listed as

[85]The Geneva Conference of 1927 ended in failure, without closing any of the loopholes left open by the Washington Naval Treaty of 1922, and in fact, started a new naval building race until the London 1930 conference. The Geneva Conference had several disputed issues, among them were the issue of parity, tonnage vs numbers of

Article XIX, see Appendix C for full Washington Naval Treaty of 1922) prohibited any new fortifications and naval bases being established in those territories or possessions nor an increase in coast defenses as well. This clause, more than any other, shaped the Navy's, and General Board's, focus and efforts until Japan pulled out of the treaty system prior to the 1936 London conference. The fortification clause forced the Navy and General Board to examine the use of oilers for fueling at sea and the increase of fuel capacity on all their ships, including destroyers.[86]

The Washington Naval Treaty of 1922 had lasting repercussions on all the signatory countries' navies, but especially for the U.S. Navy.[87] The Navy, dominated by battleships since the 1880's, was forced to look in other directions of ship building, namely the aircraft carrier. Although the treaty limited both capital ships and aircraft carriers in both tonnage and armament, it did not limit what were called auxiliary ships, namely cruisers, destroyers, and submarines. This treaty established tonnage ratios among the signatories, those being 5:5:3:1.75:1.75 for Great Britain, the U.S., Japan, France, and Italy, respectively, as well as total tonnage limits. The U.S. achieved naval parity with Great Britain, on paper, but failed to do so in reality when Congress failed to authorize the budget necessary for the Navy to maintain the manning of the current ships

---

ships, the fact that Great Britain had used the incorrect tonnage standard and was actually over the limit according to the 1922 treaty, as well as cruiser limitations, both tonnage and total numbers. John T. Kuehn, "The U.S. Navy General Board and Naval Arms Limitation: 1922-1937," *The Journal of Military History* 74, no. 4 (October 2010): 1129-1160.

[86]Friedman, 47. Fueling at sea was practiced throughout the 1920s, with both astern and broadside deployment of hoses experimented with.

[87]Appendix C for the Washington Naval Treaty of 1922 in its entirety. Article XIX for the fortification clause.

in the inventory, especially the destroyers. Despite the U.S. being in the best position financially at the end of WW I, Congress and the President cut the budget for the Navy, resulting in a drastic decrease in destroyers available for duty. The treaty forced the General Board to prioritize the ship building effort based on the goal of a balanced fleet for a possible two ocean conflict.

The London Treaty of 1930 sought to reduce the naval arms race through the closing of loopholes left over from the Washington Naval Treaty of 1922. However, instead of limiting the naval arms race, the treaty actually forced the U.S. to renew its ship building efforts in order to comply with both treaties and remain a viable sea power in the 1930s. This treaty placed tonnage limits on auxiliary ships (cruisers, destroyers, and submarines) that the treaty of 1922 did not. It limited the tonnage and armament of these individual ships, including placing a maximum tonnage restriction on the classes of ships. The ratio for Japan increased from 5:5:3 in capital ships and aircraft carriers (Great Britain, the U.S. and Japan, respectively) to a 10:10:7 ratio for light cruisers and destroyers, and a 10:10:6 ratio on heavy cruisers. In addition, the capital ship building ―holiday" was extended for another 5 years.[88] The Geneva Peace Conference of 1932-1934 ended in failure and produced no tangible results. The highlights of this conference

[88]Globalsecurity.org, ―London Naval Conference, 1930," http://www.global security.org/military/world/naval-arms-control-1930.htm (accessed 15 February 2011). U.S. destroyer treaty limits were 150,000 tons, no gun greater than 5.1 inches, and no more than 16 percent of destroyer tonnage larger than 1500 tons. British tonnage limit was 150,000 tons for destroyers and Japanese limits were 105,500 tons. In addition, no greater than a 10 percent transfer of overall tonnage between light cruisers and destroyers was allowed under Article 17. Only the U.S., Great Britain, and Japan signed this treaty.

featured the withdrawal of both Japan and Germany from the League of Nations in 1933, while this conference was held.[89]

The Navy possessed 319 destroyers in the early 1920s, including 14 minelaying destroyers. Budget cuts forced the Navy to decommission multiple classes of destroyers, placed destroyers in a reserve status, ready to be recommissioned into active service, and gave over two dozen to the Coast Guard throughout this timeframe. Just three months after the signing of the Washington Naval Treaty, the General Board adopted a policy that the Navy only needed 152 destroyers to be maintained in active service. This number reflected more on the poor state of readiness, manning, and budget constraints than destroyers needed for an actual war plan, such as Plan Orange against Japan. By early 1926, 161 –flush deckers" were out of service, split almost evenly between Philadelphia and San Diego.[90] These ships expected to be recalled to active duty in order to either supplement or replace those on active duty. In addition, ten destroyers were lost to collision and grounding incidents in the first two years of the treaty navy.

By the late 1920s, wear and tear on the *Wickes*- and *Clemson*-class destroyers forced the Navy to plan the replacement of some of the active service destroyers with those in reserve status. Additionally, those destroyers made with Yarrow boilers had to be replaced and removed from active service, totaling three destroyer squadrons of 54 ships. By 1930, with the London Treaty placing limits on destroyer tonnage, 35 more destroyers

[89]Globalsecurity.org, –Geneva Naval Conference, June 20-August 4, 1927," http://www.globalsecurity.org/military/world/naval-arms-control-1927.htm (accessed 15 February 2011).

[90]Friedman, 47-48.

had to be scrapped.[91] Although diminished in numbers and suffering wear and tear throughout the years, the *Wickes*- and *Clemson*-classes remained a visible and steadfast deterrent to the submarine threat should another conflict break out. As a result of keeping these vessels in service and ready for action, the U.S. transferred 50 WW I-era flush deckers to Great Britain in September 1940.[92]

The same problems highlighted during World War I with regards to the destroyers existed during the treaty fleet period, although for different reasons, with additional insights brought out in Board hearings and proceedings through 1932. Prior to WW I, destroyer officers touted the torpedo as the paramount engagement weapon against the enemy and guns only added weight and higher crew numbers. Since they did not want guns, they shunned the idea of fire control for their guns. During the war, of course, they all wanted guns and fire control. However, the Navy did not have the time to refit all of the active destroyers with fire control systems, and after the war, did not have the money due to budget constraints to modernize the destroyer fleet.[93]

Manning shortages in the Navy, again due to budget cuts, forced the decommissioning of a number of destroyers and submarines as early as 1924. Rear Admiral William R. Shoemaker, Director, War Plans Division, brought up this point in a meeting on Navy Personnel Requirements, —We are not keeping in commission as many

---

[91]Friedman, 49. 150,000 total tonnage allowed for the U.S. under the Treaty of 1930.

[92]Ibid., 51. This was known as the Destroyers for Bases Agreement. The U.S. transferred the destroyers to Great Britain in exchange for land, rent free, for naval and air bases in order to better protect the East Coast of the U.S.

[93]GBH, 1923; HBGB 1917-50, vol. 2, year 1923, 315-316. Admiral McVay comments to the Board.

destroyers and submarines as ought to be. We had recently to lay up 29 on account of shortage of complement. The destroyers are not up to the mark and submarines are not as many as should be and complements allowed are not sufficiently large." Not only did the Navy have to take ships out of active service, but it had to send out many ships at less than 90 percent manning.[94] Subsequently, Rear Admiral Hilary P. Jones commented on the General Board's duty to the Navy, "When a war comes on, the Navy ought always to be able to say to the country the General Board has recommended what the Navy needs. Let the responsibility go back to Congress always."[95] In other words, the principle was that the General Board and the Navy should recommend what the Navy needed in order to be an effective and efficient fighting force, and let Congress take the blame when the Navy went to war short on ships, equipment, training, and men.

The requirement for speed in a destroyer was essential, as was proved in World War I, both for the offensive and defensive mission. Any adjustments to the ship, such as the addition of armor for protection, adds weight to the ship, affecting the overall speed and consequently slowing a destroyer down. This was why destroyers were known as fast ships with little to no armor on them. Speed can not be sacrificed for additional protection. In a discussion on strengthening the bottoms of ships against bottom attacks, this vulnerability was pointed out for the destroyers. Rear Admiral John D. Beuret, Chief of Bureau of Construction & Repair (BuC&R), testified, "On destroyers there is no protection against contact explosion, that is, side protection against contact explosion of charges of any size, and the same applies to bottom explosions, so that you have to rely

[94]GBH, 14 April 1924; HBGB 1917-50, year 1924, roll 18, vol. 1, 54.

[95]Ibid., 63.

entirely in this class of ships on transverse subdivision."[96] Beuret later said, "I think the weight that would be absorbed in any protection that would be appreciable would result in unacceptable reduction in other characteristics – either the speed or the offensive power, which the Board has always put ahead of protection on these vessels."[97] Speed and the mission, whether offensive against the enemy's battle line or defensive in protecting one's own battle line, dominated over the self-protective aspects of ship design.

In conjunction with speed, and necessary in rough seas, was the design requirement for stability, or seaworthiness. The *Wickes*- and *Clemson*-classes demonstrated stability issues when light on fuel oil. On reflection, Commander H. H. Norton, Fleet Training Division, said "I think the present destroyer is a perfectly good sea boat except for her instability when she is not full of oil. That is serious in the present destroyer."[98] Stability affects the destroyers turning capabilities as well as the ability to perform as a solid gun platform in which to engage the enemy.

The Board met just after the signing of the Washington Naval Treaty in order to evaluate and determine the roles and missions of the destroyer. In a hearing in March 1922, the Board discussed the feasibility of putting small scouting and reconnaissance

---

[96]GBH, 26 January 1927; HBGB 1917-50, year 1927, vol. 1, 16. Transverse subdivisions help strengthen the ship, as well as help provide compartmentalization for protection against flooding, fires, and fumes.

[97]Ibid., 23. This quotation also applied to the standard cruiser.

[98]GBH, 4 November 1930; HBGB 1917-50, year 1930, vol. 2, 484. The recommended fix was to ballast with sea water as the fuel oil was consumed, then to pump out the water when refueled.

planes (float planes) aboard destroyers, but not fighting planes. Another mission for the destroyer was to act as a plane guard for the carrier. A transcript of that hearing follows:

> CAPT [HENRY C.] MUSTIN: The only space for getting fighting planes back will be on the carrier deck. The great majority of those sent out will be lost because there will not be space and time enough to get them back.
>
> ADM [HARRY McL. P.] HUSE: What becomes of the aviators?
>
> MUSTIN: The aviators must be picked up by the destroyers.
>
> ADM [WILLIAM V.] PRATT: Isn't a destroyer the most agile for picking up these aviators?
>
> MUSTIN: We hope the destroyers will be detailed to support the carriers on a basis of 6 destroyers to each carrier. That will give us an adequate number for picking up combat pilots and the pilots of other types of planes which will have to be abandoned under certain circumstances.

The hearing switched to the speed of the destroyer and the ability to keep up with an aircraft carrier and the ability of the destroyer to have a small seaplane aboard.[99]

> ADM [WILLIAM L.] RODGERS: If you utilize her speed, the equal smooth water speed of the destroyer isn't anywhere except in smooth water. She can not get more than two-thirds speed.
>
> PRATT: The destroyer will keep up with almost anything except sudden spurts.
>
> MUSTIN: We don't expect the carrier will have to use her full speed except in running away from battle cruisers.
>
> CAPT [LUKE] MCNAMEE: Can you launch a seaplane from a destroyer?
>
> MUSTIN: A small seaplane, yes. The Bureau is working on a special design of catapult for installation on destroyers, so there won't be any need of hoisting them out, an operation that depends entirely on weather conditions.[100]

---

[99]GBH, HBGB 1917-50, roll 16, 1921-1922, 41.

[100]Ibid., 42. However, no matter what, the seaplane would have to be hoisted back aboard the destroyer or abandoned to sink.

The catapult for the seaplane was to be built in combination with one of the triple or quadruple torpedo tubes on the destroyer. Following the flight, the aircraft would be winched aboard the destroyer, time and mission priorities permitting.

The Board did not look at modernizing either the *Wickes*- or *Clemson*-classes of destroyers throughout this timeframe. These two classes were nearing the end of their active service by 1932, and were deemed capable of carrying out the standard duties of a destroyer until the next destroyer class could replace them. The age of the ships and the unknown repercussions of the yet to be signed London Treaty, needed to be evaluated against the fiscal constraints imposed by Congress throughout the 1920s. ~~"~~It would be impractical and unwise to install new and expensive armament on our present destroyers: the ships are all more than ten years old now, and fifty-seven of them have already reached the end of their lives."[101] The Navy did not have the excess budget to modernize older destroyers.

In the first post-treaty budget, submitted in May 1922, the General Board stressed that the treaty ~~"~~gave formal international recognition to the principle of an American Navy second to none, which has thus become the national policy."[102] The Board emphasized that a strong Navy supports a strong merchant fleet, which in turn fosters world peace. The Navy provided military protection in both peacetime and wartime, but

---

[101]GBH, 14 January 1930; HBGB 1917-50, year 1930, vol. 1, 30. This excerpt came from a paper submitted to the Board by CDR Manly.

[102]NARA, RG-80, General Board No. 420-2, Serial No. 1130, 31 May 1922. 1. ~~"~~It would be folly to risk the future of this great nation by accepting a policy of partial naval disarmament or of a limititation of naval armament below the strength of any other power whatever. Within the limitations of the treaty we must have a navy at least equal to any other in material and number of personnel, and superior to all others in efficiency."

protection to the economy during both times as well.[103] America's geographic isolationism, although a great protection from attack, was a powerful argument for a strong and ready Navy and highlighted the need for forward bases from which to refuel and rearm from. However, Article XIX of the treaty prevented the fortification and expansion of U.S. bases in the Pacific.

The first post-treaty budget recognized America's dominance in destroyer numbers and tonnage, but recognized the need for destroyer leaders in the future. The Board recommended no new destroyers, or leaders, be built for the near future.[104]

The Board, trying not to sound alarmist, did sound an alarm of sorts in its 11 December 1926 Construction Program for the Navy. The letter from the Board to the Secretary of the Navy emphasized the loss of naval parity with Great Britain since the end of WW I, as well as the loss of skilled workers needed to build navy ships due to lack of phased construction and fiscal authorization from Congress. "The design and construction of naval vessels is a special art. In the absence of steady employment on naval construction, the most competent specialists in the art are scattering to other employments."[105] Just one year later, the Board again recommended building destroyer

---

[103]NARA, RG-80, General Board No. 420-2, Serial No. 1130, 31 May 1922, 2.

[104]Ibid., 7. In the 1 December 1922 U.S. Naval Policy, attached to a 17 January 1925 Board transcript, recommended the following for destroyers: complete destroyers now building; maintain effective destroyer tonnage in conformity with capital ship ratios (even though destroyers were not limited by the ratios); lay down destroyer leaders when it becomes necessary to undertake new destroyer construction; scrap no destroyers unless its material condition or its military characteristics make it undesirable for retention; and make no further structural changes in existing destroyers with a view to their assignment to mine laying, scouting, or other special operations.

[105]NARA, RG-80, General Board No. 420-2, Serial No. 1338, 11 December 1926, 1. The Board also emphasized the importance of building every year, instead of trying to

leaders, six to be laid down in 1929, in order to replace some of the aging destroyers and in the hopes that newer destroyers could join the fleet before the ―holiday" on capital ships expired in 1931.[106] Less than one year later, January 1928, the Board promulgated a Fifteen-Year Replacement Program for ships. Of course, battleships were mentioned first, with their impending building ―holiday" about to be over, but destroyers were second, emphasizing the importance of destroyers to the Navy and the Board.[107] Four months later, the Board submitted a five year building program, placing destroyer leaders at number three on the priority building list.[108]

For the building program for 1931, submitted in 1929, the destroyer force was desperate for replacements to be laid down. The Board recommended four leaders each year for 1929-30, one leader for 1931, along with five destroyers for that same year, and

---

build all the ships needed in a short period of time, which causes shoddy building practices, as exhibited in the Yarrow boilers plaguing the mass-production destroyers of post-WW I era. The destroyer leader moved from sixth to fourth in prioritization, as well as giving both destroyers and destroyer leaders a 13 year ―life after completion" for services in the active Navy. Since it takes almost two years to build either a destroyer or a leader, this shows that the *Wickes*-class are nearing the end of their service life in just four to five years.

[106]NARA, RG-80. General Board No. 420-2, Serial No. 1345, 5 April 1927, 3. The Board recommended building new destroyers after the destroyer leaders were built. This was the first mention of building new destroyers since the *Clemson*-class was completed in 1922.

[107]NARA, RG-80. General Board No. 420-2, Serial No. 1369, 11 January 1928, 1. The Board emphasized the age of the current destroyers and that from 1934-37 257 destroyers would reach the theoretical age limit of 16 years. Which was different from the 13 years age limit mentioned three years prior. In 1935 alone, 105 destroyers would reach this age limit. The Board recommended building destroyers incrementally, starting immediately, in order to avoid excessive charges against the Budget in any one year.

[108]NARA, RG-80, General Board No. 420-2, Serial No. 1415, 12 April 1928, 2. This was the first time that a properly constituted fleet was mentioned, which turned into a ―balanced fleet" in less than a few years time.

13 destroyers for the next two years. By 1936, the loss of tonnage in destroyers due to being at the end of their service life placed the Navy almost 40,000 tons behind Great Britain and 80,000 tons behind Japan, stressing the fact that the 10:10:7 ratios were completely upside down with regards to destroyers.[109]

House Resolution (H.R.) 12283 authorized the President of the U.S. to construct light cruisers, destroyers, destroyer leaders, submarines, and airplane carriers as authorized under the London Naval Conference. The destroyer community received the most funding at $150,000,000 for 55,500 tons of destroyers, which equates to approximately 37 ships at 1500 tons, but most likely around 33 destroyers and destroyer leaders combined.[110] Five months after H.R. 12283, the Board submitted the building program for fiscal year 1932, recommending 150,000 tons of destroyers and destroyer leaders to be built in order to replace all of the current destroyers in inventory, all of which will be overage by 31 December 1936. ~~–~~Some of them may have several years of useful life remaining, but these vessels were designed prior to 1917 and are not equal to similar vessels of recent construction by other nations. . . . Out of 246,156 tons of destroyers . . . there are not 150,000 tons that can be relied on for an overseas campaign. . . . Construction of about 50,000 tons each five years is considered appropriate."[111]

---

[109]NARA, RG-80, General Board No. 420-2, Serial No. 1415, 4 April 1929, 3 & 7. The Board emphasized that 12 of these destroyers had already been authorized by Congress in 1916, but not appropriated for.

[110]H.R. 12283, 71st Congress, 2nd Session, 9 May 1930, 1.

[111]NARA, RG-80, General Board No. 420-2, Serial No. 1473, 16 October 1930, 1-3. In all the categories of ships, a more or less steady flow of construction should be maintained, in order to provide a balanced fleet as early as practicable, to avoid peak loads of work and of appropriations required and to avoid as far as practicable a

However, as of 20 April 1931, Congress and the Navy were still not building as planned. Just two weeks later, the Board promulgated a new construction program in order to reduce expenditures and relieve some of the wear and tear on the active duty destroyers. The Board recommended putting approximately 20 destroyers currently out of commission into condition for commissioning and future use. These destroyers, combined with the current compliment of 106 destroyers, light mine layers, the five destroyers given to the Coast Guard and 11 destroyers authorized by Congress, would give the Navy a total destroyer tonnage of 145,190 tons, still almost 5000 tons below the limit of the 1930 London Treaty. The plan centered around keeping 86 destroyers in full commission with the ability to surge, in case of emergency, the remaining 36.[112]

By the fall of 1932, the Board highlighted the destroyer issues in a revised building program for 1934. "Until the present year no destroyers have been laid down by the U.S. since 1920. During these years Japan had maintained a continuous, evenly distributed building program of destroyers of large displacement and more recent design, which outclass any existing types in our Navy."[113] The following comparison of destroyer strengths (in total tonnage) demonstrated the situation the U.S. Navy was in, given no new building by any of the countries over the next four years. If they Navy failed to build any new destroyers, the U.S. would possess only five destroyers that were not over the age delineated by the London Treaty of 1930.

---

repetition of the present condition whereas large numbers of vessels of the same class would reach scrapping age at about the same time.

[112]Memorandum, 2 May 1931, "New Construction Program."

[113]NARA, RG-80, General Board No. 420-2, Serial No. 1578, 16 September 1932, 2.

Table 2. Destroyer Tonnage by Year and Country

Year	U.S.	G.B.	Japan
1932	86,570	61,501	110,019
1933	24,060	58,336	97,339
1934	11,070	58,336	86,199
1935	7,500	57,431	84,659
1936	7,500	55,191	83,889[114]

Source: Created by author using data from NARA, RG-80, General Board No. 420-2, Serial No. 1578, 16 September 1932, 3.

It took over six years, from February 1922 to April 1928, before the General Board devoted an exclusive hearing for just destroyers or destroyer leaders, and eight years between hearings on destroyer leaders. At this junction in time, the *Wickes*-class destroyers have been in service for approximately 10 years, and the *Clemson*-class for approximately seven years, over half and just under half, respectively, of their active service life.[115] The Board met to discuss the destroyer leader in April 1928, again the concept and mission of the destroyer leader were debated, along with speed, armament, and a change in armament due to the recognition that aircraft were a much more viable threat to ships at sea than they were in 1920.

The missions of the destroyer leader revolved around the capabilities required at that time. The standard mission involved the leading of a flotilla of destroyers against enemy destroyers, using the leaders' advanced communications to coordinate the attack and the leaders' range finding equipment to keep the destroyers of the flotilla properly

[114]NARA, RG-80, General Board No. 420-2, Serial No. 1578, 16 September 1932, 3.

[115]This would be reaffirmed by the London Treaty of 1930, placing the service life of destroyers at 16 years.

informed of distances to the enemy. Plus, the leader must perform efficiently all the normal duties of a destroyer. A new secondary mission as only "super destroyers" of both greater tonnage and speed, using just the leaders for a scouting or other unnamed mission emerged in 1928. Lastly, a mission in conjunction with cruisers on a scouting or special mission was identified.[116] The superior speed of the leader, just 1 kt greater than the standard 35 kt destroyer instead of the 28 kts of the *Clemson*-class, lent itself to a wider variety of missions than that of a standard destroyer.

The armament focused on a centerline arrangement of 5" guns and torpedo tubes, as well as the possibility of replacing the 5"/.51 caliber gun with a dual purpose 5"/.25 caliber, quicker firing gun for both anti-ship and anti-aircraft roles. In addition, the destroyer leader should possess a number of machine guns for anti-aircraft fire. Rear Admiral William H. Standley, Director of Fleet Training, recognized the threat of aircraft to the battle line:

> one of the missions of a destroyer is in the anti-submarine screen around the fleet and that screen is also going to operate as an anti-aircraft screen eventually and I think that sooner or later we are going to come to those anti-aircraft guns on all destroyers. We are going to have some guns in the screen. It would add to the safety of the battleships if you have your destroyer screen manned with anti-aircraft battery that would be effective against bombing attacks.

The torpedo arrangement question seemed to appease everyone, with four triple tubes, two on the centerline and one on each broadside. Lastly, the leader would have 20 depth charges aboard to engage submerged submarines.[117]

---

[116]GBH, 25 April 1928; HBGB 1917-50, year 1928, vol. 1, 98, 102.

[117]GBH, 25 April 1928; HBGB 1917-50, year 1928, vol. 1, 99, 104, 110, 119, 127. There was considerable disagreement among the Board members and SME's with regard to which 5" gun was better for the ship and what the ship will use the gun for more, anti-ship or anti-aircraft work. This disagreement was a continuation of the ones

The larger size of the destroyer leader possessed more space around the ship, increasing the habitability for the crew. Additionally, the leader would "furnish excellent accommodations for the personnel necessary for the exercise of the command of a destroyer squadron, and excellent facilities for the exercise of that command." As previously mentioned in Chapter 3, the leader would provide a separate signal bridge and plotting room, and advanced communications enabling the control of a flotilla or squadron. The larger size allowed for the possibility to carry a light aircraft aboard for scouting and spotting of gunfire, launched from a triple torpedo tube and catapult combination.[118]

One of the main drawbacks of the larger sized destroyer leader was maneuverability and the turning circle, covered previously in chapter 3. The larger tonnage ship required greater length, thereby increasing the turning circle to the point that the destroyer leader could not engage a submarine without turning off prior to reattacking. Otherwise, the Board would have recommended creating a less stable hull, which decreased the turning circle, but also decreased the stability of the ship, making it a less seaworthy platform.[119]

Prior to the London Naval Conference of 1930, the Board held its first hearing on the standard destroyer in over a decade. CAPT H. Howard, Bureau of Construction and

---

from the 1920 meetings on destroyer leaders, still involved the rapidity of fire, range, trajectory, and weight of projectile.

[118]Ibid., 99, 111-112. The larger size of the destroyer leader allowed for greater fuel capacity, thereby keeping the same cruising radius, or radius of action, as the standard destroyer.

[119]GBH, 25 April 1928; HBGB 1917-50, year 1928, vol. 1, 122.

Repair (BuC&R), brought up a point of comparison between the envisioned destroyer leader and the destroyer that was about to be discussed during the hearing. Howard stated:

> As we have understood it, the so-called destroyer leader which is the only type of destroyer we have been considering in the design for several years past is really only what is considered a proper up-to-date destroyer with the additional quarters, signaling and other facilities necessary for a squadron commander . . . the characteristics on a destroyer leader represents very typically what we would give whether you call it a destroyer or a destroyer leader.[120]

The discussions of centerline gun and torpedo tube arrangement started again with the hearing's participants, with pro's and con's listed for each type, depending upon space, weight, and train of arc, as well as between single 5" guns or twin mounted 4" guns. Additionally, arguments and counter-arguments were made about the two different 5" guns, dual purpose with greater rates of fire versus the larger .51 caliber with greater range, both which needed some sort of fire control system associated with the guns.[121] The expanded capabilities, with the larger deck gun and associated fire control, allowed for expanded mission sets, according to Rear Admiral Luke McNamee, ~~–t~~he destroyer is of great value in protecting heavier vessels from air attack by its position in the anti-aircraft submarine screen where it can defend against torpedo planes and against machine gun attack by planes."[122] A second armament upgrade of multi-speed torpedoes was recommended for the new destroyer class.[123]

---

[120]GBH, 14 January 1930; HBGB 1917-50, year 1930, vol. 1, 9.

[121]Dual purpose equates to double purpose (DP)

[122]GBH, 14 January 1930; HBGB 1917-50, year 1930, vol. 1, 16, 28, 30, 31. Hull designs of foreign destroyers highlighted the broken-deck, high bow versus the flush deckers the U.S. Navy still used. Armament of foreign destroyers was on the centerline and boiler power was sufficient to produce higher and more economical speeds and

The poor performance of the destroyer's turning circle, when compared to foreign destroyers, facilitated the need for increased performance from the depth charge projectors. If the turning circle could not be decreased, then the performance of the projectors must be proportionally increased to offset the larger turning circle and increase the chances of successfully engaging a submarine.[124] The Board, again, recommended using the twelve previously authorized, but not funded, destroyers from the 1916 building program to function as a testing platform, —unless we build a few vessels and get them in service before it becomes necessary to replace large numbers of our present boats we will face the serious prospect of incorporating many new ideas in a large number of vessels without knowing from experience how well they have been worked out" [emphasis original].[125] Notice, too, how the Board refers to using commissioned and crewed new designs and learing from –experience," this was an obvious reference to the annual Fleet Problems conducted by the Navy.[126] This was the same concept that the Board tried with destroyer leaders in the mid-1920s, but failed to properly prioritize in order to get the leaders funded and built.

---

greater cruising radius. The Navy toyed with creating a 4.5" gun for the new destroyers. The most prolific gun on current destroyers in 1930 was the 4.7" gun, followed by the 4".

[123]GBH, 4 November 1930; HBGB 1917-50, year 1930, vol. 2, Appendix A, 600. Low speed of 27 kts for 15k yards; intermediate speed of 35 kts for 9k yards or 34 kts for 10k yards; high speed of either 42 kts for 7k yards or 46 kts for 6k yards.

[124]GBH, 14 January 1930; HBGB 1917-50, year 1930, vol. 1, 41.

[125]Ibid., 43, 44. The projector was planned to be placed forward in the ship, instead of the racks for depth charges, which were placed at the stern.

[126]For the Fleet Problems see Albert A. Nofi, *To Train the Fleet for War: The U.S. Navy Fleet Problems, 1923-1940* (Newport, RI: Naval War College Press, 2010).

The necessity of fueling at sea incorporated both the mission of screening battleships or aircraft carriers over long distances and plans dictated by the war games being conducted at that time. Rear Admiral Mark L. Bristol testified:

> to what extent you depend on oiling destroyers at sea in connection with war problems in the Pacific because we found that where we knew the problems which had been worked out they counted on oiling at sea where oiling would have been impossible on account of the weather. The kind of weather that you encounter generally in the Pacific does not permit oiling destroyers at sea. Especially over near the Japanese side of the ocean.[127]

The proposed radius of action of both the destroyer and leader spanned 8100 nm at 12 kts, minimizing the requirements for having to fuel at sea, but not getting rid of that ability or requirement totally.[128]

Protection for the crew improved the crew's ability to perform in adverse weather and conditions at sea. Light armor protection for the bridge, machinery spaces, and gun crews were recommended for the leader, but not the proposed standard destroyer. CDR

---

[127]GBH, 14 January 1930; HBGB 1917-50, year 1930, vol. 1, 56. The answer was to oil on any day that conditions were favorable to do so. The War Plans Division skipped this answer and said that it was the job of the Commander-in-Chief of that fleet to decide and that the Plans division only assembled the fleet at a given point.

[128]GBH, 4 November 1930; HBGB 1917-50, year 1930, vol. 2, 461. This was the first hearing on destroyers and destroyer leaders following the ratification of the London Treaty of 1930. 20 days later the Board held another hearing on the same topics. The proposed destroyer offered the following advantages over the current destroyers in service: accommodations for squadron commander and staff; 28 percent increase in radius; 5" vs. 4" guns; increased freeboard forward and aft; shorter turning circle; and adequate stability. The leader had 37 percent more radius; added protection over bridge, machinery, and gun crew shelter; one half knot greater speed; inner bottom construction; and four more torpedoes.

William Hall, Navy Yard Division, SecNav's Office, recommended gun housing and shielding for the gun crews, to protect from wind, weather, and spray.[129]

The proposed 1500-ton destroyer would outclass the current destroyers of the U.S., Great Britain, and Japan. The destroyer's seaworthiness, speed, armament, radius of action, and habitability, to include room for the squadron commander and his staff, increased communications, additional signal bridge, gun placement to minimize blast effects on personnel on the bridge, would provide a much needed and formidable upgrade in capabilities and missions to the Navy. LCDR Craven summed it up best when he said, "I really believe a ship with four centerline mounts and gun stations of this sort if she went to sea would be as big a sensation in her class as the dreadnought was."[130]

The Board recommended nine total torpedo tubes, instead of 12, no spray or weather protection for the gun and torpedo crews (but did have blast protection), no separate signal bridge for the squadron commander, and an extra stateroom for a division commander, but no additional space for any type of staff.[131] The gun size diminished from a 5" .51 caliber to a 4.7" .45 caliber, used by the majority of foreign navies on current destroyers, which might have the capability to be a double purpose gun. If weight

---

[129]GBH, 4 November 1930; HBGB 1917-50, year 1930, vol. 2, 490. In Chapter 3, the Navy copied some of the crew, bridge and gun crew, protective aspects, but it appeared that many officers sitting on the Board had forgotten this aspect of habitability for the crew.

[130]GBH, 4 November 1930; HBGB 1917-50, year 1930, vol. 3, 553.

[131]GBH, 27 February 1931; HBGB 1917-50, year 1931, vol. 1, 30. The spray and weather protection was reinstated for the foreward most gun, but removed from all of the aft guns and torpedo tube mounts. Additionally, when the gun was not manned, the protection served to protect the fire control instruments and sights, because often the gun took green water over the top of it.

permitted, twin mounted guns instead of single mounts to increase number of guns available in each broadside. However, the ship was equipped with one fire control director, but the director did not have the capability to do both anti-aircraft and anti-surface targets simultaneously.[132]

Ship handling in poor weather and heavy seas, as well as maneuverability, while key to a destroyer for both stability as a gun platform and turning circle for depth charge engagements, was sacrificed slightly due to a potential yaw with the ship design characteristics of a rounded, slightly flat stern that had been cutaway.[133] Commander Arthur Carpender, from Ships' Movement Division, said ―ouships, if cutaway in any sort of a seaway will yaw badly and I think the maneuverability is of very minor importance except in an anti-submarine screen. I think we are taking a great chance if we get away from sea keeping qualities of our present destroyer." Ironic, since most of the destroyer missions of WW I was in convoy protection and anti-submarine screening duties. Stability and seaworthiness remained vitally important to the success of any destroyer engagement, whether with guns, torpedoes, or depth charges, as well as the safety of the crew.

---

[132]GBH, 5 February 1931; HBGB 1917-50, year 1931, vol. 1, 5, 6, 8, 16, 17, 22. Since no destroyer leader was built, you get a homogenous class of destroyers, with each capable of playing the role of leader with the division commander embarked, however, you do not get the leader's enhanced abilities with a separate bridge, plotting room, advanced communications, etc.

[133]Pitch is the upward and downward movement of the ship in sea around the horizonal axis. Roll is the motion of left and right movement around the longitudinal axis. Yaw is the temporary deviation from a straight course along the vertical axis.

Conclusions

The General Board, and the Navy, largely ignored destroyers throughout most of the 1920s. After all, why talk about destroyers when the Navy possessed more, and newer, destroyers than they could properly man, equip, and keep ready for service at sea. The budgets imposed by Congress, and the move towards arms limitation, posed serious problems for the General Board on how to plan for and maintain a balanced fleet to face future threats. Diminishing budgets and treaties placed severe restrictions on the Board, forcing the prioritization of building efforts throughout the rest of the 1920s and into the 1930s.

The destroyer leader as a new class of ships and combat platform regained interest after eight years between Board hearings. Not only did the Navy need to start building destroyers in order to replace the *Wickes*- and *Clemson*-classes, now past their halfway mark of service life, but the Navy needed to be able to train and practice with a newer and larger destroyer to test the efficiency of the leader for the missions that the Navy and General Board needed the destroyer to fulfill. Those missions being that of a standard destroyer, the ability to act as a flag ship platform to leader a squadron or flotilla of destroyers from, and to perform scouting missions in accompany with cruisers or perform the mission solely with a group of destroyer leaders, the so called ~~–s~~uper destroyer." The Board did address destroyers throughout the early to mid-1920s, but not exclusively in destroyer only hearings and proceedings, but generally tacked them onto a discussion about battleships, cruisers, or manning for the Navy.

The wear and tear on the *Wickes*- and *Clemson*-class destroyers began to show in 1928 to 1929, with the process of decommissioning three squadrons of destroyers and

replacing them with destroyers placed in reserve after the Washington Naval Treaty of 1922. Although no restrictions had been placed on destroyers in 1922, this oversight was corrected in the London Naval Conference of 1930, along with restrictions placed on the other auxiliary ships, such as cruisers and submarines. Tighter budget constraints and adhering to the treaties dominated the Navy and General Board during this timeframe.

The Board, looking to the future, recommended building a new class of destroyers, the destroyer or flotilla leader, to both experiment with and incorporate into the fleet for the purposes of leading groups of destroyers into combat, as well as to provide a scouting capability in conjunction with both cruisers and battleships. The mistake the Board made in this period was to continue building the *Clemson*-class of destroyer, even after the war ended. An incremental build of the *Clemson*-class throughout the 1920s would have better served the Navy, as all of the *Wickes* and *Clemson*-class destroyers would reach their end of useful service life within a four year span in the 1930s. Additionally, placing the destroyer leader sixth on the priority list doomed the concept until the late-1930s as well, but did prepare the way for ship design improvements that resulted in the *Fletcher*.

The Board's recommendations on future destroyers and leaders stemmed from lessons learned from the aging *Wickes*- and *Clemson*-classes in hearings throughout the war and the 1920s. The lack of stability in both classes, when lightly loaded with fuel oil, remained a problem in future construction as well. Budget constraints forced the Navy to pull ships out of ready reserve and mothball status to replace destroyers that could not be modernized due to age and were suffering from the wear and tear of destroyer fleet service. Chapter 5 will cover the timeframe from 1933 to U.S. entry into World War II.

CHAPTER 5

1933 TO WAR

The rise of Hitler and Nazi Germany, coupled with the withdrawal from the League of Nations and the rejection of the Treaty of Versailles, led Europe towards war again as Germany rearmed. Meanwhile, Japan's rising militarism and actions in China, widely condemned by the rest of the world, led them to withdraw from the League of Nations in 1933. Just three years later, Japan would withdraw from the arms limitation process to pursue its own national interests and resume its ship building program, free of treaty limitations on size and quantity in all classes.[134] The U.S. faced potential conflict across two oceans, which fueled the need for a well-balanced fleet capable of performing a variety of missions across great distances.

This chapter examines the political, economic, and social constraints affecting the Navy and the U.S., effects of the treaty system on the Navy in general and the destroyers in particular, that became the force fighting in WW II. It also examines technological and other problems with the current classes of destroyers, current missions and tactics for the destroyers, the Board's recommendations for updating these ships as well as the Navy's budget plan for building future ships and how destroyers fit into that building program. Included will be the focus and plan for future destroyers and the General Board's lost

[134]Globalsecurity.org, "Naval Arms Control 1935," http://www.global security.org/military/world/naval-arms-control-1935.htm (accessed 15 February 2011); John T. Kuehn, "Revive the General Board of the Navy," *United States Naval Institute Proceedings* (October 2010): 66-71.

opportunities and short-comings, as well as any positive influences and some tentative conclusions for this timeframe.[135]

The U.S., still in the economic crisis brought on by the Great Crash of 1929, elected a democratic president in Franklin D. Roosevelt, who assumed that position on 4 March 1933. In addition, the country returned both houses of Congress back to the Democrats, which allowed the President to institute his New Deal programs. The Democrats held both houses and the Presidency from 1933-1945, while the U.S. still looked inward and tried to avoid the entanglements in Europe, which they managed to do until 1940. Public sentiment and national policy entwined in the late 1930s, as war in Europe loomed on the horizon. ~~I~~solationism now reached its peak. A public opinion poll revealed in March 1937 that 94 percent of the people thought American policy should be directed at keeping out of all foreign wars rather than trying to prevent wars from breaking out." In fact, Congress went so far as to pass several neutrality laws during the mid to late 1930s.[136] The U.S. stance on isolation changed as Germany expanded its powers throughout Europe, through annexation and direct attack, as was the case for Poland and France, as well as Japan's expanded militarism in the Pacific. Although the

---

[135]This chapter will differ slightly from Chapters 3 and 4 as the Navy built and modernized destroyers in the same timeframe, (and corrected those problems with the current destroyers because the Navy finally had the money to modernize and fix those problems) from testing and feedback from the Fleet. Only the *Fletcher*-class will be discussed in the plan for future destroyers.

[136]John A. Garraty and Robert A. McCaughey, *The American Nation: A History of the United States* (New York: Harper & Row, Publishers, 1987), 801, 798. These neutrality laws ~~c~~ontinued the embargo on munitions and loans, forbade Americans to travel on belligerent ships, and gave the president discretionary authority to place the sale of other goods to belligerents on a cash-and-carry basis." Congress also passed the Johnson Debt Default Act, banning loans to nations that had not paid their war debts.

trend toward isolationism dominated the 1930s, this did not stop the U.S. from participating in the London Naval Conference of 1935-36, ending in the treaty being signed in March 1936.

The London Naval Conference of 1935-6 proposed discussion on the expiration of both the Washington Naval Treaty (1922) and London Naval Treaty (1930) articles.[137] The Treaty of 1936 made no mention of destroyers, but grouped them into the *light surface vessel*, subcategory c (vessels not exceeding 3000 tons and guns not exceeding 6.1", but tonnage limits still applied).[138] Japan had notified the Five Powers Treaty (Washington Naval Treaty) signatories (on 29 December 1934, meeting the two year notification requirement) that they would not be continuing in the treaty system as of 31 December 1936, in order to build a navy free of constraints imposed by said treaties. Japan withdrew from the conference in January 1936, stating:

> as it has become sufficiently clear at today's session of the First Committee that the basic principles embodied in our proposal for a comprehensive limitation and reduction of naval armaments cannot secure general support . . . we regret to state that we cannot subscribe, for the reasons we have repeatedly set forth, to the plans of quantitative limitation submitted by other Delegations.[139]

The withdrawal of Japan and Italy from the treaty system did not stop the London Treaty from being signed. Although Japan's withdrawal allowed them to build its navy up as

---

[137]The following parties attended the London Naval Conference of 1935-6: the U.S., France, Great Britain, Ireland, Canada, Australia, New Zealand, and British Dominions beyond the Seas, and India. See Appendix C for full London Treaty of 1936.

[138]Navweaps.com –Treaty for the Limitation of Naval Armament," http://www.navweaps.com/index_tech/tech-089_London_Treaty_1936.htm (accessed 25 April 2011).

[139]Globalsecurity.org, –Naval Arms Control 1935," http://www.global security.org/military/world/naval-arms-control-1935.htm (accessed 15 February 2011).

much as it liked and freed it from having to report on its building, this action also freed the U.S. to fortify its possessions in the Pacific, which had been forbidden by the 1922 treaty. But Congress refused to authorize this step, fearing that forition of U.S. territories and possessions in the Pacific would further provoke the Japanese. The treaty that resulted from the conference extended the next deadline to 31 December 1942, but Germany's invasion of Poland in 1939 effectively ended the treaty system.

The U.S., based on the Treaty provisions and articles signed in 1936, were allowed to increase the size of destroyers to 3000 tons, deemed this size unnecessary and too costly at the time, due to the current building program encompassing 1500-ton destroyers. The only indication that the Navy was immediately using the new treaty limits was the recommended increase of destroyer tonnage to approximately 1570 tons, in order to provide a stronger and more seaworthy hull.[140]

The U.S.'s plan to attack Japan, War Plan Orange, needed to be reviewed and updated, given the current status conferred by the latest treaty in 1936.[141] The lack of fortifications in the Pacific theater would force the Navy to fight its way across the Pacific Ocean. Based on Orange, ~~"t~~he primary function of the destroyer force must be to protect the battle line from the kind of unconventional attack likely to be mounted by the Imperial Japanese Navy."[142] Unconventional meant protecting battleships and aircraft

[140]Friedman, 92. The extra tonnage in these vessels would go to strengthening the hull and not toward an increase in armament. Recall stability problems due to increased topside weights in these destroyers. These Board recommendations were made in 1936.

[141]War Plan Orange, hereafter, referred to as Orange.

[142]Friedman, 93.

carriers from submarines, mines, and aircraft, forcing a change and emphasis in armament for the current and future destroyers.

The U.S. Navy possessed the same two classes of destroyers discussed earlier. Recall that the General Board started hearings on a new class of 1500-ton destroyers in early 1933. The Navy desperately needed to begin the incremental replacement of both the aging *Wickes*- and *Clemson*-classes, as well as provide the fleet with a larger and more modern destroyer with updated armament systems, greater seaworthiness, and greater speed than the 1000-ton flush-deckers of WW I vintage.

The Board's debate on armament centered around what type of primary gun to be used on the new destroyer, and whether to include a fire control director system with this new type of gun. Recall the previous Board discussions on gun type and size from Chapter 4, which dealt with the single purpose gun, anti-surface or anti-air, or double purpose guns to encompass both duties. The size of the gun was determined to be some sort of 5" guns, but the pros and cons of the 5" .51 caliber verses the 5" .25 caliber or the 5" .38 caliber were debated extensively in order to get the gun correct for the predicted future missions that destroyers would have to perform. CAPT Arthur C. Stott, from the Bureau of Ordnance, testified before the Board on the characteristics of the 5" .38 caliber, ~~–it~~ is a better gun ballistically. It is more accurate up to the maximum range a destroyer would be expected to use. As to the question, whether it should be an all purpose or surface gun, I think the all purpose gun will demonstrate its usefulness so that it will be decidedly better."[143] The main problem with the 5" .38 caliber was that it did not exist as

[143]GBH, 27 January 1933; HBGB 1917-50, year 1933, vol. 1, 3. The efficacy of the 5"/.38 caliber was discussed with regards to separate cartridge case and charge bag,

a complete gun platform at that time and still needed to be tested and evaluated in the Fleet. The double purpose gun allowed destroyers to help screen the battle line against the projected air threat. CAPT Royal E. Ingersoll, from the Fleet Training Division, addressed the usage of anti-aircraft guns on destroyers:

> I think if the destroyers are out on extended screen that they could place bombing aircraft under fire as soon as the aircraft begin to pass over the screen. The bursts alone, if no hits were made, would begin to harass the planes and their bursts alone would be instant indication of the location of attacking planes, both for the heavier ships that might be near the objective of the attack and for any plane flights in the air. In battle I think the destroyers with anti-aircraft guns might be able to use them effectively against torpedo planes or smoke laying planes.[144]

The number of guns, either four or five, on centerline, needed to be adjusted in order to get the correct topside weight for increased stability, also affected the number of torpedo tubes and their placement on the 1500-ton destroyer. CDR Allen J. Chantry, of BuC&R, summarized the weight, stability, gun type and torpedo argument during this 1933 hearing:

> The weight of the 5-inch 38 is what causes Construction & Repair considerable difficulty from the weight and stability standpoint because that is the prime reason why the torpedo armament is necessarily reduced. Any analysis we make of weights and moments immediately discloses a possible interchange between guns and torpedoes. The value of the guns for anti-aircraft work must of course be considered most carefully. I wish, however, to point out that from the weight standpoint we pay a considerable price in obtaining it. There is a ton and a half, or maybe slightly more, increased weight per gun due to the use of the 5-inch 38. The number of tons we have to play with after taking care of the necessary hull and speed considerations is very small indeed. It is now in the nature of just a few tons that make the difference between increasing the torpedo armament or not.

---

weight of projectile, loading motion, rapidity of fire, and weight of the gun itself, in both single or dual mounts.

[144]GBH, 27 January 1933; HBGB 1917-50, year 1933, vol. 1, 6.

RADM [FRANK] SCHOFIELD: There is practical unanimity of opinion in support of the 5-inch 38 as against the 5-inch 51. The real question which the Board has in mind is the question of torpedo versus gun.

RADM [EMORY] LAND: With due regard to treaty requirements it would be impossible to redesign this ship not only as regards guns and torpedoes but anything else if any weights were added which were not compensated for by the removal of equivalent weights. The margin is practically zero. This applies to our Farragut class so that it is incumbent upon all of us to realize that if any additional weight is put on, some equivalent weight must be taken off. Otherwise this type of destroyer will no longer be in the 1500-ton class . . . all designs being a compromise, the reason generally speaking is increased gun battery as to size and weights, increased accommodations and generally improved, we trust, seagoing qualities as well as additional modern installations which nine times out of ten result in increased weights throughout the ship. A summary of improvements of the 1500-ton destroyers over the present destroyers is as follows:

(a) Speed increase 3.3 kts

(b) Stability (about twice the G.M.)

(c) Armament, weight increase about 35 percent

(d) Probable decrease in turning circle

(e) Centerline gun and torpedo installation

(f) Power-operated ammunition hoists

(g) Improved habitability

(h) Improved behavior in a seaway due to improved freeboard and design of topsides

(i) Remote control of battery

(j) Greater cruising radius at low speeds

The foregoing has been obtained upon an increase in displacement of about 25 percent.[145]

---

[145]GBH, 27 January 1933; HBGB 1917-50, year 1933, vol. 1, 10-11. The discussion turned to reducing comforts and living conditions for the crew of the ship to save weight. The guns versus torpedo debate focused on the most likely mission and enemy for the destroyers in the future, i.e. guns for anti-surface or anti-aircraft work or torpedoes to be used against enemy capital ships.

The 1500-ton *Farragut*-class destroyer was so tight on weight that the Board could not get everything they wanted on the destroyer, but had to compromise on armament and either decrease the number of guns or the number of torpedo tubes, despite this class being 300-500 tons greater in displacement than the WW I era destroyers it was designed to replace. RADM Samuel M. Robinson, Bureau of Engineering, brought forth an argument from past destroyer history with —The history of the past war demonstrated that the torpedo is the weapon that is least used on the destroyer. They used guns, depth charges and nearly everything else ten times as much as they did torpedoes. We ought to take cognizance of that fact in our design and emphasize the gun power." The exchange continued:

> SCHOFIELD: Do you feel that you can generalize from the nature of the last war?
>
> ROBINSON: I think the next war will be similar to it, only more so.[146]

The guns verses torpedo debate continued throughout the rest of this hearing, with no resolution.

Less than two months later, the Board met to discuss the new proposed 1850-ton destroyer. This size destroyer was originally discussed and the design approved in 1928, but needed further revision based on changing missions for the destroyer in the Fleet. Similar to the 1500-ton destroyer hearing, armament was a major point of contention throughout the hearing. Torpedo tube numbers and locations needed to be determined, as well as whether the ship would have single or double purpose guns, and whether those

[146]GBH, 27 January 1933; HBGB 1917-50, year 1933, vol. 1, 17. Robinson was right in the Atlantic in WW II, but the Pacific was a totally different conflict involving much more fleet engagement, instead of convoy protection, which dominated the Atlantic.

guns would be in single or dual mounts or a combination throughout the length of the ship. The torpedo question involved whether eight centerline torpedo tubes in two quadruple mounts satisfied the requirement for torpedo power or if the Board desired twelve total tubes, both on the centerline and broadside.[147]

The Board addressed speed, radius of action, and habitability, as well as the armament issues mentioned before. The recommended speed was 35 kts at a set 42,800 shaft horse power (shp). The Board's recommended speed throughout the rest of the 1930s was a minimum of 35 kts, a departure from the *Clemson*-class that made approximately 28 kts, but now had trouble making that top speed. The radius of action was calculated at 12 kts for 8400 miles, an improvement of between two to four thousand miles over WW I classes. Habitability focused on shields for the two bow guns and an increase in the number of staterooms to be provided for the squadron commander and his staff.

Read Admiral Adolphus E. Watson questioned whether the Navy was getting everything out of the larger 1850-ton destroyer that it was supposed to. He said:

> It seems to me we have this additional 350 tons over and above the Farragut class and we are not obtaining any greater speed, any greater cruising radius, and the only increase in offensive armament is one gun. I have a feeling that we are not employing the additional 350 tons to the greatest advantage. It depends of course on the employment of these ships whether their gun battery shall be as heavy as possible and the torpedo sacrificed or whether it is necessary to carry twelve torpedoes.[148]

---

[147]GBH, 10 March 1933; HBGB 1917-50, year 1933, vol. 1, 40. The major sticking point was number of torpedo tubes, twelve or eight. Again, the Board focused on what the mission of the destroyer would be in the next conflict.

[148]Ibid., 44.

It was pointed out to Admiral Watson that the 1850-ton design included two 1.1 pounder anti-aircraft guns and additional .50 caliber guns for anti-aircraft defense, an additional set of improvements over the 1500-ton *Farragut*. The 1.1 pounders and .50 caliber machine guns justified the use of eight single purpose guns for the 1850-ton, instead of using a mix of single and double purpose guns. Rear Admiral Cyrus W. Cole, Fleet Training Division, emphasized the potential utility of the larger 1850-ton destroyers for the fleet, ~~–I~~t seems to me that with the lack of cruisers that we have, that anything we can build in the shape of a cruiser will be mighty helpful . . . it is my feeling that these ships should be made as much like a cruiser as possible and that they should have a single purpose gun."[149] The move toward less torpedoes in both proposed classes points to differing views on the future mission of the destroyer, moving away from torpedo engagement of the enemy's battle line and more toward a multi-mission platform capable of scouting, offensive, and defensive mission sets. The larger size destroyers allowed the Board to raise the level of armament to something approaching a light cruiser in number of guns, but not size of guns. Admiral William Pratt, CNO, emphasized ~~–t~~hat probably the most important thing today for a destroyer is to have mine tracks and depth charges. She is going up against a tremendous submarine menace."[150] Other members of the Board tended to forget, or at least minimize, the submarine and the threat it posed to the fleet at sea.

---

[149]GBH, 10 March 1933; HBGB 1917-50, year 1933, vol. 1, 45. Stott agreed, saying ~~–i~~t is really too big to be used primarily as a destroyer and torpedo carrying craft. I think she should be armed to be as useful as possible as a cruiser."

[150]Ibid., 54.

At the same March hearing and for the first time since WW I ended, the Board discussed listening equipment for destroyers, although the Board focused more on the weight of the system instead of the potential of the system.[151]

The Navy's incremental destroyer construction program allowed the Board to assess the ships once they were in the fleet, unlike what happened with the *Wickes*- and *Clemson*-classes during and after WW I. In March 1935, the Board met to discuss military characteristics of destroyers. The *Farragut*-class, first commissioned in 1934, was deemed ~~–s~~atisfactory, but, of course, it is necessary to make improvements in new construction where practicable in order to not fall behind in design progress."[152] These improvements were found in the follow-on *Mahan*-class 1500-tonners. At the completion of the current destroyer building program, including both the 1500-ton and 1850-ton classes, the Navy would have seven squadrons of 1500-ton destroyers and ten 1850-ton leaders, one for each squadron and three spares.[153]

The General Board received recommendations from the Board of Inspection and Survey, various officers on inspection trips, and the CO's of the *Farragut* and *Dewey*, that the present class was good, but needed improvements for follow-on ships. Chief among them were ship manning and armament. These two ships came in 135 tons under

---

[151]GBH, 10 March 1933; HBGB 1917-50, year 1933, vol. 1, 50. The listening equipment consisted of two different systems, sonic and supersonic. Sonic microphones were on each side of the ship to get bearings, while the supersonic system extended through the bottom of the ship and could be trained in any direction.

[152]GBH, 1 March 1935; HBGB 1917-50, year 1935, vol. 1, 71. Peacetime incremental building allowed the Navy to make adjustments to correct design deficiencies.

[153]Ibid., 79. Each squadron contained six destroyers. Three squadrons made up a flotilla of 18 destroyers.

weight, allowing the Board to improve the armament that had been compromised on during the initial design. The recommendations to the Board included an additional complement of 38 sailors to man battle stations and the ammunition supply on the ships. Armament changes included the movement of torpedo tubes from the centerline to the wings, an extra set of quadruple torpedo tubes, dual purpose guns verses the single purpose guns installed on the first two ships, and the installation of protection for vital spaces on the ship against .50 caliber machine gun attacks and fragments.[154] Admiral Pratt asked Rear Admiral Taussig to make some general remarks on the 1500-ton destroyer:

> we have produced a beautiful individual ship. There is no question about it. But is it a ship that we could in case of war reproduce quickly in large numbers to do destroyer work? I think we have tried to fill in the small light cruiser void by building a big destroyer. . . . Therefore it seems to me serious consideration should be given as to whether or not we should go ahead and build ships of this type or whether we should revert to the old destroyer type which is primarily a torpedo carrying vessel to be used in destroyer attacks with torpedoes, to be used in patrol and anti-submarine work. . . . We have got to do something towards simplification and we ought to have a ship, a destroyer, which is more simple and one which in case of war we could quickly produce in large numbers which we would certainly have to do.[155]

The Navy, thinking ahead of an impending conflict, still looked at simplification in order to mass produce a destroyer that was still capable of fulfilling the missions required of it, while at the same time, be simple enough in design to be able to be mass produced in the

---

[154]GBH, 1 March 1935; HBGB 1917-50, year 1935, vol. 1, 79-80.

[155]Ibid., 80-81. The hearing switched to whether the Navy even needed the 1850-ton ship, based on Taussig's comments from the CNO. Taussig stated that the CNO wanted 1850-ton leaders to lead the smaller 1500-ton destroyers and older 1000-tonners in the force. Taussig described what would become destroyer escorts in WW II and frigates after WW II.

minimum amount of time. This hearing covered the larger 1850-ton destroyer characteristics as well.

Taussig offered some insight into the efficacy of anti-aircraft guns on ships. ~~I~~ think the mere fact they even had one would be of value. The other people know she has them and you have got to have anti-aircraft. It does not make much difference whether you hit them or not. It has the same value as the depth charges had on the submarine. The mere fact that they were on the ships has a very good effect on the enemy."[156] This statement came in response to the cost and weight of 1.1 pounders and .50 caliber guns and ammunition. The 1850-ton destroyer was to have both types of guns for anti-aircraft work. The Navy ended up building sixty 1500-ton destroyers and thirteen 1850-ton leaders from 1934 to 1940.[157]

As late as 1940, the Navy and General Board sought to modernize the older destroyers (1200-tonners) to perform convoy escort missions in the Atlantic with enhanced anti-aircraft capabilities. These older and smaller destroyers no longer had the speed to keep up with the newer classes of ships, but could perform the convoy escort mission with modifications and upgrades to the ship's armament. The Board recommended removal of the 4" guns and replacement with six 3" guns, a torpedo tube on each wing, and .50 caliber guns to supplement the 3" guns for increased anti-aircraft

---

[156]GBH, 1 March 1935; HBGB 1917-50, year 1935, vol. 1, 89. The mission of the ~~l~~eader" was still up in the air. Would the destroyer act as a flagship for a squadron or flotilla? Would they group all the leaders into a squadron to perform special missions? Would the leader just be a bigger and nice destroyer?

[157]Friedman, 498-500. The Navy went on to build ninety-six 2000 ton vessels of the *Benson*- and *Livermore*-classes between 1938 and 1943, then followed up with the bigger *Fletcher*-class, and follow-on variants to the *Fletcher*, the *Sumner*- and *Gearing*-classes.

capabilities. Of course, aircraft were not the only threat to Allied convoys, with the submarine and surface raiders in the Eastern Atlantic as well. Since the submarine threat, remembered from WW I, was still there, these destroyers were provided with newer depth charges, racks, and throwers.[158]

In early 1941, the General Board shifted building priorities from the 2100-ton destroyer to the 1600-ton in order to provide more ships to the Fleet. In addition, the Board recommended several design changes to the latest in this class. Unfortunately, the Navy and the Board continued the process of design modifications in existing classes, furthering the lack of unity across the class and creating future problems when the Board had to recommend a single destroyer to be mass-produced. Rear Admiral H. Fairfax Leary, Fleet Training Division, said:

> I think we were in a very fine position in the last war in having a large number of a uniform type of destroyers that could do many jobs and any boat was the same as the others. The characteristics were well known by all the officers in the service. Men in one destroyer could step in to any other destroyer and perform the duties proficiently. There has been a tendency on a new building program to build a great many special types and variations. We run all the way from triple tubes to quintuple tubes, from centerline tubes to waistline tubes and four to five guns added, and so on . . . I think it would be very desirable to try to standardize all our destroyers considering what our probably use of the vessels is going to be in a war over large areas, as compared with the particular problems of the British in a very restricted area.[159]

The Board, of course, immediately following this statement, recommended removing any 1.1 pounders from these destroyers and replacing them with two twin Bofors 40 mm guns

---

[158]GBH, 5 December 1940; HBGB 1917-50, year 1940, vol. 2, 480. Stability, still an issue with these destroyers, required fuel-water compensation, but did not need fixed ballast at this time. Due to lack of availability, range finders could not be installed on these older destroyers.

[159]GBH, 6 January 1941; HBGB 1917-50, year 1941, roll 25, vol. 1, 1941, 3.

for anti-aircraft fire.[160] The second change to anti-aircraft guns was the replacement of .50 caliber machine guns with 20 mm Oerlikon guns. In testimony to the effectiveness of the Oerlikon guns, "The British used the Oerlikon gun in the Norway campaign (April 1940). They had only a few of them but they shot down fourteen German planes...They intend to obtain 12,000 altogether and mount them in all types of ships from battleships to drifters."[161] Captain William H. P. Blandy, Bureau of Ordnance, summed up the ongoing war for the Board in the following statement, "It seems to me that that is a very important point about this war. This war is primarily a navy against an air force, except for submarines. As far as guns are concerned, the guns are used against planes rather than ships, whereas our next war may be as much against ships as planes, in which case torpedoes would be more important."[162] However, the Navy and Board needed to plan for the immediate war ahead of them instead of the next war. Part of that planning encompassed the priority of building of different classes of ships. In a hearing on escort vessels to be purchased by the British and made by the shipyards in the U.S., the Board discussed and recommended delaying battleships in order to increase the production of

[160]Recall that this tonnage of destroyer already had stability issues, so the addition of weight of guns and ammo would only add to the instability problem unless something else was removed to compensate for it. Or, the Navy could add more fixed ballast to the ships to counter the added topside weight.

[161]GBH, 6 January 1941; HBGB 1917-50, year 1941, roll 25, vol. 1, 1941, 5-6. In addition, the Oerlikon approximately 7 tons less than the 1.1 quadruple mount, thus saving on topside weight and increasing stability. The Bofors saved 6 tons when compared to the 1.1 pounders.

[162]Ibid., 20. CAPT Blandy imagined, correctly but separately, the dichotomy of Fleet actions in the Atlantic and Pacific, primarily anti-submarine warfare and convoy escort in the Atlantic and fleet engagement in the Pacific.

destroyers for the Navy, which showed what type of war could be expected, at least in the Atlantic.[163]

Five weeks before Pearl Harbor, the Board discussed modifications and improvements to the 2100-ton destroyer, including the incorporation from the CNO's office of the ultimate anti-aircraft battery for all types of ships, to be obtained if possible. The Bofors and Oerlikon guns were the preferred type of anti-aircraft guns, both for rate of fire and savings in topside weight. However, the 2100-ton design exhibited the same instability problems as the 1600-ton and required fixed ballast to improve it. One of the major drawbacks of fielding so many ships with similar armament and modifying older ships to upgrade their armament, for example the Bofors and Oerlikons, was the possibility of running short on these weapons systems, which is what happened in late 1941. The Board, in several destroyers spread between the 1600- and 2100-ton classes, had to recommend the less efficient and capable 1.1 pounders with .50 caliber machine guns for interim install until those Bofors and Oerlikons could be made in sufficient quantities to be fielded for both new destroyers and those older ones under modification.[164] The destroyers found a new mission prior to WW II, that of providing an anti-aircraft screen for aircraft carriers, so that the aircraft carrier did not have to fire its own guns in self-defense and inhibit flight operations. In this same hearing, the Board

---

[163]GBH, 28 October 1941; HBGB 1917-50, year 1941, roll 25, vol. 2, 334.

[164]Ibid., 501. The Board was faced with prioritization of limited assets and made tough decisions knowing that they would have to go back and upgrade the anti-aircraft armament once it was available. The CNO recommended anti-aircraft armament for all destroyers was two twin Bofors and four Oerlikons. On p. 510, the Board mentioned radar on destroyers for the first time, but a future destroyer and not yet on current destroyers.

recommended the removal of catapult installation from the 1943 destroyer building program.[165]

The 1500-ton *Farragut*-class, first commissioned in 1934, started receiving improvements immediately after the first two ships of the class were built. These improvements were mentioned above and incorporated into the *Mahan* and later destroyers. However, it was not until 1939 that the Board discussed problems facing the 1500-ton classes. First among the problems was the increase in hull weights due to an increase in armament and ammunition weights, as well as engineering weight factors. Secondly, the initial hulls were deemed too fragile and needed to be strengthened to withstand the punishment at sea.[166] About two-thirds through the 1500-ton class, starting with the *Sims*, the ships had to be lengthened due to the fact that "the ships were simply going deeper into the water with the increases in weight." The increase in weight between the lighter, initial destroyers and those produced afterwards forced the speed down from almost 40 kts to approximately 35 kts on those ships approaching 1600-tons displacement. The speed, essential to the success of the destroyer, was meant to provide a destroyer capable of making a minimum of 35 kts, fully loaded, in reasonable seas.[167]

---

[165]GBH, HBGB 1917-50, year 1941, roll 25, vol. 2, 363. This mission still exists today, shotgun cruiser or destroyer to protect the aircraft carrier from threats, both airborne and waterborne. The Board cited operational limitations for the removal of the catapult system.

[166]GBH, 4 May 1939; HBGB 1917-50, year 1939, roll 24, vol. 1, 37.

[167]Ibid., 38, 45. The tonnage of these destroyers now approached 1600 tons instead of the 1500 originally designed for this class. Speed was critical to the overall success of the destroyer to protect the battle line, because newer cruisers, aircraft carriers, and future battleships were capable of making speeds of roughly 5-6 kts faster than the WW I era ships of the same classes.

The 1500-ton classes also suffered from lack of uniformity in design characteristics, with some ships receiving light armor protection over the engineer spaces and around the pilothouses, while others received none. These variations caused weight and handling differences among the ships as well. Among all the ships in the 1500-ton category, none received any protection against strafing attack in the vicinity of the torpedo tubes, and after tested, found that torpedoes detonated when struck with .50 caliber rounds. Gun crews were protected from spray and fragments on some of the guns on some of the ships, but others had no protection on any of the guys. Armament configurations differed several times throughout the building program, switching from five guns and two quadruple torpedo tubes on centerline to four guns and four quadruple torpedo tubes back to five guns and three quadruple tubes, one on centerline and two on the wings.[168]

This lack of uniformity among the 1500-ton class proved problematic for the Board, as they faced the idea of having to choose to mass-produce a complicated destroyer in wartime. In a memorandum from The Office of the Assistant Secretary of the Navy: Shore Establishments Division, Commander Robert B. Carney, suggested ~~–t~~hat the simplest possible prototype plan is desirable should we go into a war-time construction program–desirable both from the viewpoints of speed construction and easier operation by quickly expanded and inexperienced crews."

The U.S. Navy proved in WW I that it had the ability to man, equip, and train a large number of sailors and ships for convoy escort duty, the primary mission during that conflict. However, different variations of the same class of destroyers can make training

[168]GBH, 4 May 1939; HBGB 1917-50, year 1939, roll 24, vol. 1, 56-58.

and manning much more difficult than if the class of destroyers was the same across the building program.

The 1500-ton destroyer, some of which possessed torpedo tubes on the wings, faced an issue that brought the centerline armament arrangement back. In Carney's 1939 memorandum he noted, "One weakness in our new destroyer from the point of high speed rough water operation is, I believe, the vulnerability to sea damage of the torpedo tubes placed close to the side of the ship."[169] The number of guns and torpedo tubes forced the Board to recommend placing torpedo tubes on the wings, or to get rid of a set of torpedo tubes completely, which was argued against by many officers before the Board.

The severity of the stability issues throughout the 1500-ton class forced the Board to hold back-to-back hearings in August 1939 in order to fix the stability issues brought to light during testing in early 1939. The Board hoped to fix these stability issues in destroyers 409-420 currently under construction before the Navy took possession of them in the Fleet.[170] The primary causal factor for the instability focused on these destroyers being extremely top heavy, which forced the Board discussions on removing guns or torpedoes from this class. The 1500-tonners proved inherently unstable during high speed turns and turns in heavy seas and winds. The BuC&R recommended to the CNO "to issue certain requirements as to liquid loading that should not be allowed to be decreased so

[169]GBH, 4 May 1939; HBGB 1917-50, year 1939, roll 24, vol. 1, 65. Memorandum, 2 May 1939, "Suggested Reduction in the Power of Destroyer Main Propulsion Plants with Attendant Reduction in Speed."

[170]Recall from Chapters 3 and 4 that the WW I era destroyers also had stability issues when light on fuel. The Navy recommended that these destroyers maintain a certain amount of fuel to increase stability or to take on water ballast in order to replace fuel oil spent during operations.

that the vessels could be at all times reasonably satisfactory notwithstanding the indicated unsatisfactory stability."[171] The need to maintain proper liquid loading required the destroyers to fuel at sea more often or pull into port to refuel dockside, thus limiting time at sea and training opportunities underway.

The BuC&R recommended several ideas to lower the topside weight and improve the overall stability of the destroyers. Among these ideas were:

the removal of protection from the fire control director, director tube, and pilot house

-reduce the ready service storage of all guns by 50 percent

-remove the #3 gun with foundation, hoist, proportionate ammunition, and associated personnel (16 men)

-remove one waist torpedo tube and reinstall the remaining one in the present #3 gun location

-reduction of the number of torpedoes and warheads on board (reloads).

In addition to these recommended changes, the idea of 100 tons of fixed ballast, located near the keel, was broached.[172]

A third hearing in October 1939 concerned stability conditions on destroyers numbered 421-444. Commander Edward L. Cochrane (BuC&R) raised an issue that had

---

[171]GBH, 28 Aug 1939; HBGB 1917-50, year 1939, vol. 2, 259.

[172]Ibid., 264. If the Board rejected the proposed changes, the size of the fixed ballast could be increased in order to lower the ship's center of gravity. However, this increased weight caused the ship have decreased freeboard as well as slowed down the ship by a half knot or more. If the fixed ballast was placed in the fuel tanks, the cruising radius would be decreased by 5 percent or give a radius around 6500 miles at 12 kts, which still meets the design requirements of the Board.

not been addressed before this hearing, the issue of additional gear, such as depth charge equipment (including racks and throwers), depth charges, and smoke-making gear. The increase in topside weight decreased the stability of the ships on which this gear was installed.[173]

In July 1940, the Board held a hearing on a variety of destroyer topics, mostly about anti-aircraft guns and protection of ships with armor, but also on the stability of the *Gleaves*-class of 2000 plus tons. Admiral Ernest J. King, the next CNO for the Navy and Commander in Chief of the Fleet (COMINCH) from 1942 to 1945, talked about the modification of the standard 1500- and 1600-ton destroyers. "For the 1500 and 1600-ton destroyer class there will be no questions about modifying them. The question reduces to whether the new design of 2100-ton destroyers shall be modified."[174] The Navy had yet to fix, in the design period and before production, the inherent instability in any of the destroyer classes since WW I. The Board recommended replacing multiple single mount 5" guns with dual mounts as a weight-saving measure, as well as lowering the guns one deck, two among many measures to reduce topside weights and lower the overall center of gravity on destroyers. The primary purpose was to increase stability of the platform in heavy seas and when turning at speed, but the secondary result was the ability to properly distribute the weight throughout the ship so that the Navy did not have to add fixed ballast, thus causing a reduction in speed, cruising radius, and possibly armament. Admiral King's statement about modifying new destroyers brought out the issue of possibly sacrificing some modifications, or at least limiting them, due to possible impacts

[173]GBH, 11 October 1939; HBGB 1917-50, year 1939, vol. 2, 312.

[174]GBH, 29 July 1940; HBGB 1917-50, year 1940, vol. 2, 294.

on the construction of newer destroyers that might delay their completion. There was also the issue of increased costs in time, money, and effort by the Navy's shipyards.[175]

The entire process of producing new designs was heavily influenced by the constant battle with administrations and Congresses over naval construction funding. Earlier, in 1933, the General Board sought to circumvent the Congressional authorization process by citing the Constitution, Article VI, "all treaties made, or which shall be made, under the authority of the United States, shall be the supreme law of the land."[176] The Board, and the Navy, hoped to force Congress' hand to build the Navy up to treaty limits and standards, something the previous Republican President and Congress had failed to do. Budgetary constraints, imposed by the Hoover administration and Republican Congress, had allowed the Navy to lag behind, in most classes of ships, the other signatories of the 1922 and 1930 treaties.[177]

The Board stressed that "world conditions have not improved since September, 1932. Due to the continuance of building in the interval by the other Powers the relative naval inferiority of the United States has increased rather than decreased," and recommended a large building program to correct this deficiency. The destroyer force faced the end of the service life for all but five destroyers by the end of 1936, if no new

---

[175]GBH, 29 July 1940; HBGB 1917-50, year 1940, vol. 2, 300.

[176]Department of the Navy, Office of the Judge Advocate General, Memorandum, 14 March 1933, "Treaty Tonnage–Authority to Build Up to Without Specific Legislative Authorization if Funds Otherwise Available."

[177]John T. Kuehn, "The U.S. Navy General Board and Naval Arms Limitation: 1922-1937," *The Journal of Military History* (October 2010): 1154-1156 for a discussion of the cancellation of approved naval construction by President Hoover after the London Conference.

destroyers were laid down. The Board recommended building four 1850-ton destroyers and twenty 1500-ton destroyers in fiscal year 1934, and at least four 1850-ton destroyers again in 1935.[178]

In October 1933, the Board proposed the following naval construction program to the Secretary of the Navy. In order to lay down the vessels before the 31 December 1936 treaty deadline, authorization was required for 15,200 tons of aircraft carriers, 99,200 tons of destroyers, and 35,462 tons of submarines, at a price of $660,000,000 for these classes plus the cruisers already authorized, to build the Navy up to treaty strengths.[179] The Navy hoped to find the current president and Congress more amenable to building the Navy up to treaty strengths codified in the treaties.

Rear Admiral Luke McNamee, the president of the Naval War College, addressing the 1935 Conference for Further Limitation of Naval Armaments (in a letter from 27 February 1934), wrote to the General Board stressing:

> that new political and economic alignments are in the processs of forming and that a war may break out at any time. . . . The one clear, outstanding fact is that the safety and security of our nation will depend to a large extent upon an efficient Navy capable of exercising influence in negotiations and capable of supporting our national policies. Such a Navy requires: (1) a well-balanced Fleet, fully manned, properly trained and at least equal in fighting strength to a probably enemy in the area of operations; (2) adequate docking, repair and supply bases in the area of operations; and (3) necessary auxiliaries and protection for lines of communication.[180]

---

[178]NARA, RG-80, General Board No. 420-2, Serial No. 1619, year 1933, 2.

[179]NARA, RG-80, General Board No. 420-2, Serial No. 1629, 13 October 1933, 1. Keep in mind the world's political climate at this time . . . the rise of Nazi Germany and the withdrawal of both Germany and Japan from the League of Nations in 1933.

[180]Letter, President of the Naval War College to the General Board, 27 February 1934, 1. Remain mindful that Japan has not withdrawn from the treaty system as of this time. That does not happen until December 1934.

McNamee stressed a properly trained, manned, and balanced fleet with supply bases and SLOC protection. The probable enemy, no longer thought to be Great Britain, was Japan and the Imperial Japanese Navy. Forcing a long-range engagement with limited base support, depending on whether Guam, Midway, and the Philippines were available for refueling, was not how the U.S. wished to conduct a Pacific crossing. ~~A~~ war between Japan and the United States alone under present conditions would involve us in losses entirely out of proportion to any possible gain."[181] The Philippines and other possessions of the U.S., while important, did not hold vital national objectives and were viewed as a ~~s~~ource of strategic as well as economic weakness to us, rather than of strength."[182] The requirement to protect these possessions, should war with Japan be realized, would force the U.S. to supply and defend these territories across great distances with little or no initial benefit. The letter recommended ~~n~~o modifications of destroyer quotas unless every sub in the world is destroyed. They might otherwise be supplied by an allied minor power. . . . Reductions, if any, to start with subs. If all subs destroyed reduce destroyers 1/3."[183] McNamee saw destroyer utility, even if no submarine threat was presented against the fleet.

President Roosevelt hoped to stimulate economic recovery through the National Industrial Recovery Act (NIRA), including the construction of naval vessels, which helped out both the Navy and shipyards that would prove vitally important in WW II.

---

[181]Letter, President of the Naval War College to the General Board, 27 February 1934, 1.

[182]Ibid., 2. The 1922 treaty forbade fortification of bases in the Pacific, rendered U.S. possessions vulnerable to any attack until the Navy arrived.

[183]Ibid., 4.

Additionally, the Act of 27 March 1934 (the Vinson-Trammel Bill) established ~~–t~~he composition of the United States Navy with respect to the categories of vessels limited by the treaties (Washington and London) . . . at the limit prescribed by those Treaties" and authorized the President to build, within eight years, the remaining available tonnage in aircraft carriers, destroyers, and submarines, as well as replace those vessels when permitted by treaty. Additionally, under appropriations for Public Works, the President intended to request two 1850-ton and twelve 1500-ton destroyers, and six submarines.[184] The long awaited authorization to build the treaty Navy delineated by the treaties of 1922 and 1930 was to be realized finally. By 1936, the U.S. still needed to build 15,200 tons of aircraft carriers, 17,100 tons of light cruisers, 5,500 tons of 1850-ton destroyers (3 vessels), 72,000 tons of 1500-ton destroyers (48 vessels) and 27,550 tons of submarines in order to complete the treaty Navy.[185] As can be seen, the Navy's construction challenges vis-à-vis funding only improved as the 1930s proceeded apace.

The 1941 ship construction program (enacted 22 April 1940) acknowledged that the Navy was properly balanced on 1500-ton and 1850-ton destroyers, but needed to focus on building the destroyer type of about 2100-tons, with seaworthiness and stability foremost in the General Board's mindset. The previous two classes, the 1500-ton and 1850-ton destroyers exhibited both seaworthiness and stability problems, hence the

[184]NARA, RG-80, General Board No. 420-2, Serial No. 1659, 9 May 1934, 2-3. The NIRA and Vinson-Trammel Bill provided the Navy with legislative cover to build up to treaty limits.

[185]Ibid., 3. Note: By the transfer privileges of the London Treaty, 15,000 tons of light cruiser tonnage may be utilized for destroyer construction, or conversely, 14,350 tons of the destroyer tonnage for light cruisers. Light cruisers were considered cruiser, subcategory (b) in the Treaty of 1930.

Board's emphasis on fixing the problems for this larger tonnage destroyer. The Board recommended building 70 of these destroyers over the period from 1940-48. This 2100-ton destroyer was the *Fletcher*-class and 175 were built in total over the next few years.[186]

Admiral King outlined the priorities in the Navy's two-ocean building program in an important memorandum to the General Board, dated 30 July 1941. The memo emphasized that the Navy's building program would, at a minimum, maintain relative strength compared to those of the Axis Navies (Germany, Italy, and Vichy France) in the Atlantic. King stated that Japan's navy was the primary opposition in the Pacific and that Japan had the advantage of shorter SLOCs than the U.S. The relative strength of destroyers, when compared to those of the Axis navies and Japan, combined, showed a deficit of 208, but were to be offset by the completion of 9 more destroyers by the end of 1941, 55 in 1942, and 92 in 1943. However, the total destroyer numbers do not reflect that Japan and the Axis Powers would be producing ships during that same timeframe, which might have the effect of increasing the already known deficiencies in numbers. The CNO outlined the following strategic and tactical considerations to the Board:

1. submarine attacks on Japanese communications would prove very effective
2. large numbers of destroyers were needed to protect U.S. and British shipping

[186]NARA, RG-80, General Board No. 420-2, Serial No. 1944, 22 April 1940, page number unknown. Keep in mind that the war in Europe has been ongoing for 8 months now.

3. the number of destroyers in the Fleet had a certain relation to the number of major ships (battleships and aircraft carriers)[187]

King recommended the acceleration of the following building priorities: submarines, destroyers, aircraft carriers, cruisers, and finally battleships.[188]

The General Board, in September 1941, three months prior to Pearl Harbor and U.S. entry into WW II, recommended an extension of the current building program for the Navy. Eighty additional destroyers were recommended to the current fiscal year program already authorized and funded.[189]

The expected future conflict, and the method that it would be fought, forced the General Board to design ships for a variety of missions, especially destroyers, whose mission set had the capability to expand greatly due to the lack of cruisers in the Navy. Carney's memorandum highlighted this perspective when he said, —We do not know how the next war will shape up, but we do know that the destroyer will be required to do some kind of screening, whether it be screening the Fleet, screening convoys, or anti-aircraft

[187]The Navy needed destroyers for the role they played in WW I, convoy escort, most likely in the Atlantic, and the role they would most likely play in the Pacific, escort to the battle line of battleships and aircraft carriers (anti-submarine screen and anti-aircraft screen). The Navy had a two ocean requirement, but very different requirements in each ocean.

[188]Memorandum from CNO to the General Board, 30 July 1941, 1-5. The strategic importance of submarines was displayed in the building priority, as well as the primary counter to the submarine, the destroyer.

[189]Letter from the General Board to the CNO, 9 September 1941, 1. Although the tonnage of these 80 destroyers was not listed, it can be assumed, based on the 22 April 1940 serial, that they were the 2100-ton type of large destroyer.

screening, and as long as there is necessity for a Fleet, we must build destroyers capable of performing their Fleet tasks."[190]

In December 1939, the Board held a hearing on a new type of destroyer meant to accompany large capital ships, namely battleships and aircraft carriers. The design specifications presented to the Board a much larger destroyer than any previously discussed or built. This class of destroyer would be over 400 feet long, have a beam over 40 feet, have a fully loaded speed of over 40 kts, and a full load displacement of approximately 3300 tons, but would be in the 2100 ton class of destroyers. The armament increase included eight double purpose 5" guns, two 1.1 pounder 4-barrel anti-aircraft guns, forward and aft, and two quintuple torpedo tubes on centerline. The design called for a flush deck ship enabling the crew to reach all areas of the ship from the inside, instead of having to transit outside the skin of the ship. Additional armor protection was added to the decking over the machinery spaces and around the pilothouse. High freeboard forward would allow the crew to use the #1 gun and remain relatively free of water. The stability problems plaguing the 1500-ton and 1850-ton destroyers would not be a problem with this much larger destroyer. One drawback of the increased length was the increased turning circle, a problem experienced by all U.S. destroyers when compared to those of Great Britain.[191] This design became the *Fletcher*-class destroyers, named for

---

[190]GBH, 4 May 1939; HBGB 1917-50, year 1939, roll 24, vol. 1, 63. Memorandum, 2 May 1939, "Suggested Reduction in the Power of Destroyer Main Propulsion Plants with Attendant Reduction in Speed." Destroyers would perform Fleet and anti-aircraft screening in the Pacific and convoy screening in the Atlantic in WW II.

[191]GBH, 11 December 1939; HBGB 1917-50, year 1939, roll 24, vol. 2, 460-465. Recall from chapters 3 and 4 that a larger turning circle prevented the destroyer from being able to reengage a submerged submarine with depth charges.

Admiral Friday Fletcher and not his more famous nephew, Admiral Frank Jack Fletcher, who commanded at the Coral Sea, Midway, and during the early days at Guadalcanal.[192]

The *Fletchers* were the first U.S. destroyers freed of treaty restrictions since WW I. And the design harkened back to the pre-WW I flush deck destroyers too. Similar to those earlier flush deckers, the *Fletcher*-class suffered in a decline in seaworthiness when compared to the previous forecastle types built throughout the 1930s. For armament, these destroyers were the only destroyers to possess the full complement of five 5" guns and ten torpedo tubes until 1945. The *Fletcher*-class possessed both Bofors and Oerlikon anti-aircraft guns, as well as depth charges, however, they were originally designed and commissioned with 1.1 pounds and .50 caliber machine guns. The *Fletcher* was not given the hedgehog, but did have depth charge tracks at the stern and throwers up front. [193]

The only shortcoming of the General Board during this timeframe was the failure in design specifications to prevent the instability problems facing the 1500-ton, 1850-ton, and 2100-ton destroyers. The tendency of the Navy to keep adding significant topside weight to the destroyer caused all destroyer classes to have stability issues with the center of gravity being too high in the ship. The resultant decrease in speed was due to the added

[192]Historians often forget that Frank Jack Fletcher was in command at Midway until AFTER the sinking of the first three big Japanese carriers, after which he turned over tactical control of the battle to Rear Admiral Raymond Spruance.

[193]Friedman, 111-113. Recall the earlier discussions on the sacrifice of guns and torpedo tubes for increased stability. The hedgehog was capable of putting out as many as 24 depth charges in a pattern around the ship.

topside weight and need for fixed ballast to offset that topside weight, in order to lower the center of gravity, which improved stability.[194]

Conclusions

The General Board's interest in destroyers increased dramatically during the timeframe from 1933 to the entry of the U.S. into WW II, as shown by seventeen hearings just on destroyers, as compared to the timeframe 1922-1932, where the Board held six hearings exclusively on destroyers. President Roosevelt removed the budgets constraints imposed by Congress throughout the 1920s along with a Democratically controlled Congress trying to pull the U.S. out of the worldwide economic depression. Even so, lingering isolationists in Congress still constrained construction, but not nearly so much as they had done with the pacifist presidents, such as Herbert Hoover. The U.S. started to actually build to treaty limits in the 1930s. Although naval arms limitation largely failed once Japan pulled out of the treaty system, the U.S. continued to abide by the spirit of the treaty limitations of 1922, 1930, and 1936. The strive toward a Navy ~~–s~~econd to none" no longer drove the U.S. and General Board, who looked more towards a balanced fleet approach to fight a potential conflict on two oceans. The Board still needed to prioritize building efforts, as the shipyards could only handle so many ships at one time. As war raged across Europe from 1939 to 1941, the U.S. Navy gradually reassumed the missions that had characterized most of its action in WW I, that of convoy escort and anti-submarine warfare. However, submarines were not the only threat to

[194]Ballast was additional weight to the bottom of the ship to add stability. The Navy was forced to add between 40-80 tons of ballast to correct stability problems in these destroyers.

convoys as aircraft capabilities and missions brought the need for increased armament to counter the growing air threat.

The destroyers of the U.S. continued to grow larger, from roughly 1000-tons in WW I to over 2000-tons leading into WW II. However, the problems that plagued U.S. destroyers in WW I, namely stability, continued to be problematic, as the destroyers grew larger and the missions expanded. The lack of cruiser numbers in the Navy forced the Board and naval leaders to look at another platform to fill that void, and the solution was reflected in the 1850 to 2000-ton destroyers. Unfortunately, the larger destroyer could not perform all the missions as well as a cruiser could and many in the Navy thought that its size limited its usefulness as a destroyer. The growing threat of aircraft to ships forced a dramatic change in armament for the destroyer in the 1930s. The destroyer's primary mission used to be to attack the enemy's battle line with torpedoes, but as the destroyer assumed more missions, the Board and other Navy leaders began to deemphasize the need for torpedoes, often neglecting this mission and opting for more guns, both single and double purpose, at the expense of the torpedo. The destroyer's future mission was envisioned to be that of a standard destroyer, to attack the enemy's battle line, but also to screen battleships and aircraft carriers from both the submarine and growing air threat.

The Navy and General Board never seemed to fully grasp the concept of the destroyer leader and more often used the larger destroyer as just that, a larger and roomier destroyer with a large complement of weapons onboard, instead of using the larger destroyer as a flagship from which to lead other destroyers from. This was in contrast to

the Japanese who developed their light cruisers into true command and control ships to lead destroyer squadrons.[195]

The large number of destroyers produced from 1934 to 1941 allowed the U.S. to supplement and replace all of the aging *Wickes*- and *Clemson*-class WW I era destroyers with larger, more modern, and more effective platforms. Centerline armament and larger guns, 5" instead of 4", as well as increased torpedo tubes and depth charge throwers increased the offensive and defensive capabilities of the newer destroyers. The threat posed by aircraft forced the Navy to adopt the double purpose gun, which generally required fire directors to be more effective, both of which added weight to the destroyer.

The Board, looking to the future, recommended building several new classes of destroyers, both standard destroyers and the destroyer or flotilla leader. However, like many foreign navies that had ~~"l~~eaders", the Navy tended to look at the initial larger destroyers as just that, a larger destroyer and not as a platform from which to lead a squadron or flotilla from. The leaders the U.S. Navy built did not have the extra signal bridge, plotting room, or enhanced communications required of a leader.

The mistakes the Board made in this period were to continue modifying destroyers throughout the building process, which ended up making several different variants of the 1500-ton class of destroyer, all of which had stability issues, the same as the WW I era destroyers. The Navy and the Board failed to implement the destroyer leader changes as recommended from the hearings in the late 1920s and ended up with a

[195]Kaigun, Peattie and Evans, 223. Recall the early destroyer leader hearings from 1920. Some Board members advocated using the light cruiser to lead destroyers instead of building the destroyer leader.

larger destroyer that really did not have the required capabilities necessary for a commander to lead a squadron or flotilla.

CHAPTER 6

CONCLUSIONS

The evidence strongly suggests that the General Board exerted a positive influence on Interwar Period destroyer design. U.S. destroyers made significant advances from WW I to WW II, including speed, armament, radius of action, habitability, all of which improved mission capabilities. While a certain level of advancement over twenty-four years was expected, progress being primary evolutionary in nature, the Navy went from a destroyer force that was successful in WW I, modernized and updated those designs and came up with a class of destroyers (the *Fletcher*-class) that was very successful in fighting across the expanses of both the Atlantic and Pacific Oceans.

There were some Board actions that can be regarded as questionable. The Navy, at the end of WW I, had the largest and most modern force of destroyers in the world. However, the Board recommended building the *Clemson*-class, despite known deficiencies in speed, a quality vital to the mission and survival of destroyers in conflict. Subsequently, budget constraints, the Interwar Period arms limitation conferences and naval treaties, and feelings tending toward isolationism led to the overall neglect of the modernization of the Navy into the 1930s, and destroyers in particular. The Board understood the need for bigger, more modern destroyers, including destroyer leaders, but failed to properly rank destroyers and destroyer leaders high enough for funding under the onerous fiscal constraints throughout the 1920s. This resulted in all of the WW I era destroyers being overage and obsolete in the face of new technology and design, and service life. According to the Washington and London Naval Treaties of 1922 and 1930, respectively, all U.S. destroyers, except for five, would reach the end of their service

lives within two to three years of each other by 1936. However, none of the Board's questionable decisions prevented the U.S from fielding a very capable destroyer, the *Fletcher* class, near the start of WW II.

A good way to view the General Board was as a collegial-process and forum for the most influential surface warfare and destroyer experts the Navy had at that time. Using this example, there was no doubt that the Board was successful in creating the premier destroyer of WW II, the *Fletcher* and its derivatives, the *Allen M. Sumner*- and *Gearing*-classes. The Board possessed no legal powers within the Navy, but held the key to determining destroyer design and total numbers desired in a balanced fleet. The Board seemed extremely willing to augment itself with subject matter experts, as it saw fit, to achieve knowledge and understanding of the issues and problems facing destroyer design.

The Board's decisions on design had the greatest influence on the destroyer's speed, radius of action (cruising radius), armament, habitability, and improvement of mission capabilities. From WW I era destroyers to the *Fletcher*-class of WW II, the destroyers of the U.S. Navy maintained or improved their speed, with one exception, the *Clemson*-class built after the end of WW I. Even though destroyers nearly doubled in tonnage during the Interwar Period, they maintained the high speed necessary to carry out their primary mission of attacking the enemy's battle line with torpedoes, along with a variety of secondary and tertiary missions that required high speeds.

The fortification clause of the Washington Treaty of 1922 forced the General Board to place greater design emphasis on radius of action, the ability to cruise great distances at moderate speeds between 12 to 20 kts. The fortification clause prohibited the U.S. from fortifying or building new bases in the Pacific from which to receive fuel from,

thus the requirement for larger fuel capacity and more efficient engines. In addition, the destroyers needed to be able to fuel at sea to extend their cruising range. The longer cruising radius and ability to fuel at sea enabled the destroyer force to operate across great distances and still have the ability to engage an enemy without it being necessary to have to pull into port to refuel.

The destroyer's armament continued to improve across the Interwar Period. Destroyer guns increased from the smaller, single mount 4" guns of the WW I destroyers to the larger 5" dual mounted guns of the WW II destroyers. Additionally, the threat posed by aircraft forced the increase in destroyer armament, including the movement toward double purpose guns capable of engaging both surface and air targets, as well as the use of anti-aircraft only guns, such as the Bofors and Oerlikons of the late 1930s. This armament change to the destroyers allowed the destroyers to assume additional missions, that of an anti-aircraft screening ship for both battleships and aircraft carriers. Advances in torpedo technology allowed for a multi-speed and multi-range torpedo to be used to engage both near and far targets, from larger numbers of torpedo tubes placed on the centerline of the ship. The destroyer's tubes went from triple mounts mounted on the wings to quintuple mounts mounted on the centerline. This change in location allowed the destroyers to engage more targets on either side of the ship instead of having to turn the ship to use the torpedoes on the other side.

The habitability increased as the destroyer's size increased throughout the Interwar Period. This thesis included protection of the crew with habitability issues. The Board alternated between adding more protection for certain areas of the destroyer, depending on topside weight allowances and stability issues, and taking that protection

away due to the weight issues affecting stability. Destroyer's received additional armor plating on vital areas of the ship, predominantly over engine spaces, on the pilothouses, and for the gun and torpedo crews.

The Board's decisions on design improved the destroyer's speed, radius of action (cruising radius), armament, and habitability all led to the improved mission capabilities of the destroyer. The increases in destroyer armament and radius of action allowed the Navy to use the destroyer to partially supplement the lack of light cruiser numbers hampering the Navy, as well as to take on the mission of anti-air screening ships protecting the Navy's high value capital ships, namely battleships and aircraft carriers. The speed of the destroyers allowed them to be able to keep up with the faster battleships and aircraft carriers, thus providing both an anti-submarine and anti-air capability.

The one design factor that took up the majority of the Board's time was the planning and development of the variety of armament necessary to fulfill all of the missions that a destroyer might have in the next conflict. Following WW I and throughout the 1920s, the Board sought to increase the size of the armament on the destroyer, but did not have the money to modernize the armament or build new destroyers to test their capabilities out with the Fleet. As the rest of other naval powers continued to build and modernize their destroyer forces, the U.S. did not. In fact, the U.S. failed to build or lay down any new destroyers from 1922 to 1933, thus leaving the U.S. Navy with aging and obsolescent destroyers in the face of the larger and more heavily gunned modern destroyers of Great Britain, France, Italy, and Japan. The Board was presented evidence of the efficacy of a centerline gun and torpedo arrangement during the

1920s and implemented those changes, with some variation on torpedo tube location, in the designs approved by the Board for the larger 1500-ton and later classes.

The Board made a positive impact to improving speed, radius of action, armament, habitability, and mission capabilties in the Interwar Period. However, the Board fluctuated on the number of torpedoes and placement on destroyers throughout the design process, from triple tubes located on the wings to a combination of centerline and wing torpedo tubes, to possibly not having torpedoes on some destroyers at all. However, the mission of attacking the enemy's battle line remained in the Board's mindset throughout the design process and eventually won out, despite the fact that in WW I, the destroyers never performed this particular mission. The improvement in all areas was significant to the success of the destroyer force in WW II and ultimately culminated in the *Fletcher*-class, the premier U.S. destroyer of WW II. The Board's decisions and recommendations for improvements were directly responsible for most of the advances in destroyer capabilities.

Secondary Questions

How well did the destroyer Navy perform in WW I in comparison to WW II? The U.S. Navy sank one German U-boat in the 19 months of WW I, whereas they sank a Japanese midget-submarine on 7 December 1941, prior to the attack on Pearl Harbor, equaling the total from all of WW I. The destroyer performed admirably in convoy duty in the Atlantic, similar to its actions in WW I, and performed a variety of new missions in the Pacific against the Japanese, including anti-air (radar picket ship) and anti-submarine screen for the battle line, early warning to the Fleet, picked up downed aviators,

torpedoed friendly vessels to prevent capture and utilization by the enemy, gunfire support vessels for amphibious landings, and fighter direction. [196]

How many tons of shipping were sunk after escorted convoy operations started in 1917? The tons of shipping sunk by U-boats went down dramatically after convoy operations were instituted in mid-1917. U-boats sank over 881,027 tons in April 1917, prior to the convoy system being instituted, and ended December 1917 with approximately 399,212 tons sunk, a greater than 50 percent decrease in eight months of convoying merchant vessels. By October 1918, just one month before the end of WW I, U-boats only sank 118,559 tons.[197] In WW II, the British instituted the convoy system immediately (actually just prior to the outbreak of war), but failed to make mandatory convoys for ships sailing at greater than 15 kts or less than 9 kts.[198]

What other factors influenced destroyer design during the Interwar Period? The General Board obviously had the largest influence on destroyer design in the Interwar Period, but it was not the only entity to influence destroyers. In addition to the Board, the building and modernizing of foreign destroyers had a tremendous impact on the Board and their recommendations throughout the 1920s and 1930s, especially the centerline arrangement of armament, size and number of both guns and torpedoes, and radius of action. The treaty's implemented throughout the Interwar Period had a limiting effect on

---

[196]Friedman, 176, 203. Osborne, 96-101.

[197]Terraine, 766-768. In WW II, success against the U-boat did not happen until 1943, when U-boats sank less than half of the tonnage that they had sunk in 1942, 7,790,697 tons in 1942 verses 3,220,137 tons in 1943.

[198]Terraine, 244. By the end of 1939, out of 5,756 ships which had sailed in convoy, the U-boats had only succeeded in sinking four.

destroyer size and armament, as well as radius of action due to the Washington Naval Treaty's fortification clause. The Naval War College and their war games influenced speed, armament, and radius of action through realistic examination of Fleet actions against enemy battle fleets. Similar to the war games played by the Naval War College, the Fleet Problems ran by the Navy throughout the Interwar Period provided realistic training and recommendations on destroyer missions and tactics.

Were there any design decisions that the Board did not recommend that could have increased its war fighting capabilities? The Board failed to properly emphasize the potential capabilities of the fish hydrophone and ASDIC (or SONAR) throughout most of the 1920s and RADAR in the late 1930s. Recall that the British used the fish hydrophone to potentially locate submerged submarines. Two of the new destroyer missions in the 1930s were anti-submarine and anti-air screening for the Fleet, which would have benefited greatly in its warfighting capabilities had the Board better emphasized both SONAR and RADAR.

Were there any design decisions that the Board did recommend, but were not implemented? The Board recommended multiple changes to the destroyer leader, but these were not implemented in the original and subsequent destroyer leaders. The Board recommended a squadron or flotilla commander signal bridge, additional plotting room to direct the other destroyers of the squadron or flotilla, and the additional communications required to direct those destroyers. Additionally, the Board recommended the Navy build the leader to be used as a leader and not just another large destroyer, but that was what the Navy received when they failed to properly implement the changes recommended by the Board.

Other Observations

While not one of the factors that this thesis examined, total displacement provided a unique insight into Interwar destroyer development. Displacement gradually increased in U.S. and foreign destroyers from 1000-ton flush-deckers of WW I to the greater than 2000-ton *Fletcher*-class of WW II, effectively doubling in size. Treaty obligations limited the tonnage, gun size, and numbers throughout the Interwar Period until 1936, when Japan withdrew from the treaty system. From 1933 to the beginning of WW II, destroyers increased in complexity, which led the Board to try to simplify the destroyer design the Navy wished to mass-produce for WW II. The Board was warned about making the destroyers too large, leaving the Navy with a hybrid ship that was not quite a destroyer and not quite a cruiser. The rise in tonnage was largely due to the Board ensuring that U.S. destroyers had the ability to engage those destroyers of foreign navy's. However, the increase in armament and topside weights caused the destroyers built throughout the 1930s to have the same stability issues as those of WW I vintage. Stability issues required the Board to compromise on desired armament or to increase fixed ballast in the keel of the destroyers to offset the higher center of gravity forced by larger and more numerous guns, torpedoes, and depth charges.

The Board possessed the ability to bring the most relevant subject matter experts together to make better and more informed decisions. The Board received firsthand accounts on destroyer operations from experienced offiers, as well as the most up-to-date, relevant information on a topic by bringing together the best surface warfare officers of the day and allowing them to directly influence design decisions.

While the Board's primary concern was ship design, they often discussed and recommended naval policy and strategy to the Secretary of the Navy and Chief of Naval Operations. The Board discussed using destroyers to perform a variety of missions, including attacking the enemy's battle line with torpedoes, escorting convoys to protect them from both surface raiders and submarines, and provide both an anti-submarine and anti-air screen for the Navy's battleships and aircraft carriers. The Training and War Plans Division were at most Board discussions on destroyers and likely made their way to the CNO's office and possibly influenced strategy.

The depth of material discussed by the Board, inconjunction with the Board transcripts, were a great source for understanding the discussions that shaped destroyer design and decisions. The transcripts were very detailed and a great primary source for research. The transcripts contained the reasoning behind most of the design choices and recommendations forwarded by the Board, in addition to good insight into strategy, policy and relationships in the Navy.

Areas for Continued Analysis and Research

The problems with stability throughout all the destroyers, from WW I to WW II, affected speed, radius of action, and armament on destroyers. This thesis concluded that the Board had little opportunity to prevent the issues with instability, but did their best to present options and recommendations to fix those stability problems, including the removal of armament and the inclusion of fixed ballast. This conclusion was reached after reviewing many of the Board's transcripts and secondary sources on stability issues with destroyers. Because of the magnitude of the problems, additional research should be done to more definitively determine the Board's role to correct those stability

deficiencies. An alternate approach to answer the question of stability would involve researching the Board members' and subject matter experts' previous assignments to see if they were attached to organizations, such as Bureau of Construction and Repair, that may have had additional information not present at Board hearings.

The Bureaus contributed significantly to Interwar destroyer design and the Board's decision making process. Further research to examine the relationships between the Board and the Bureaus should be investigated. The relationship between the General Board and the Naval War College should be examined further.

Final Thoughts

The Board made significant contributions and exhibited strong influences on destroyer design in the Interwar Period, even with limited resources and fiscal constraints imposed by Congress. While it would seem natural to conclude that budgetary constraints to modernize older destroyers or build new destroyers, as well as treaty limitations, would cause the Board to be less innovative and exert less influence on destroyer design, the opposite was true. Limited fiscal resources and treaty constraints forced the Board to develop new and innovative solutions to continue the advancement of destroyer design in the Interwar Period. The Board had a positive impact on most destroyer characteristics and specifically the areas examined by this thesis.

GLOSSARY

Armament. The types and size of all weaponry and how the pieces were mounted.

Armor. Side armor, deck armor, barbette armor, and turret protection are listed in measurements of inches.

Complement. The number of officers and Sailors who crewed the vessel.

Dates of construction. Includes the dates when construction began and the dates when a ship or class was either launched or completed.

Displacement. In most cases, the tonnage of a vessel is the standard displacement, meaning the weight of the ship when fully equipped but without fuel.

Freeboard. The height of the deck above the water level.

Hull dimensions. The measurement of a hull's length, beam, and draft in feet and inches.

Interwar Period. The period following WW I and prior to the entry of the U.S. into WW II (11 November 1918 to 7 December 1941).

Knot. A unit of speed equal to one nautical mile per hour or about 1.15 statute miles per hour.

Machinery. The propulsion plant.

Nautical mile. One nautical mile is 2,000 yards or 1,852 meters. Additionally, it is a unit of length, used in both sea and air navigation, based on the length of one minute of arc of a great circle.

Speed. Maximum speed of the ship or class.

Submarine. A vessel that can be submerged and navigated underneath the surface of the water.

Type and significance. A brief statement concerning the type and importance of the ship or class of a vessel.

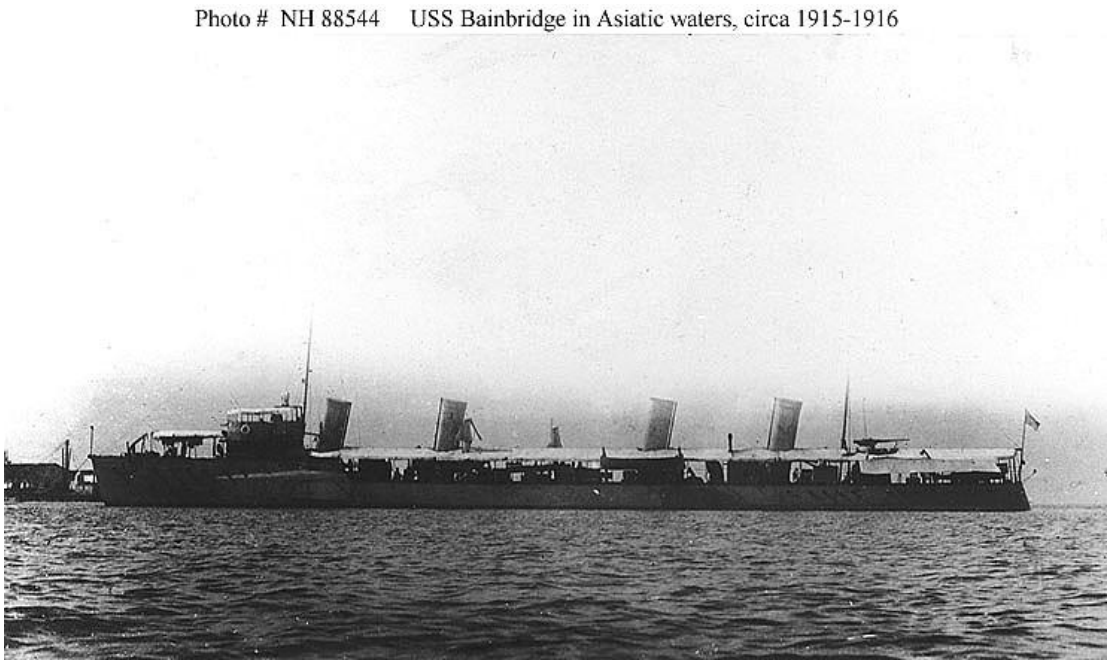
U-boat. A submarine of the German Navy.

Units. In the case of a class of ships, all vessels are named.

APPENDIX A

FIGURES AND GRAPHS

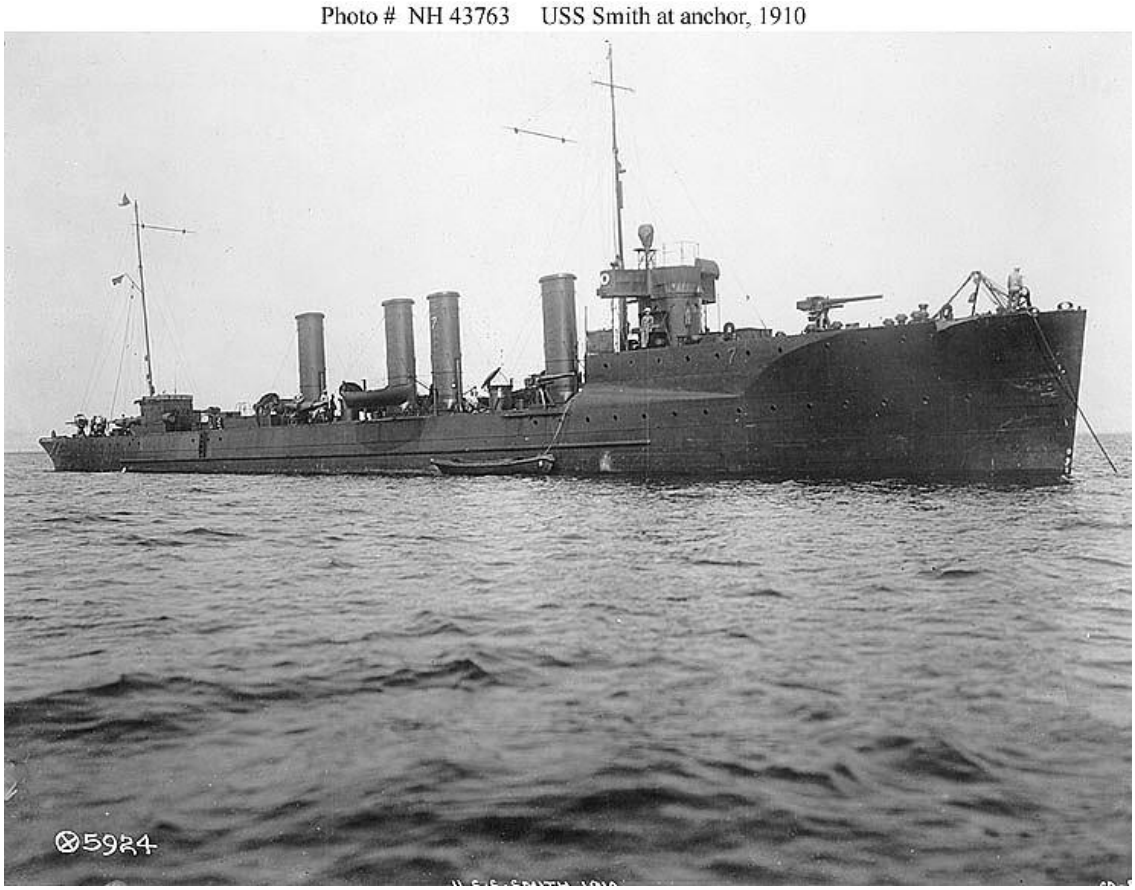
USS *Farragut* (TB-11)
Source: Navsource.org, ―Destroyers,‖ http://www.navsource.org/archives/05/tb/05031105.jpg (accessed 12 December 2010).



USS *Bainbridge* (DD-1)
Source: Navsource.org, ―Destroyers," http://www.navsource.org/archives/05/0500107.jpg (accessed 12 December 2010).

USS *Bainbridge* Ship Information	
Ship Type	*Bainbridge*-class
LengthxBeamxDraft	250 feet by 23 feet, 7 inches by 6 feet 6 inches
Displacement	420 tons
Engine Type	Triple-expansion
Maximum Speed	29 kts
Guns	Two 3-inch guns, Five 6-pounder weapons
Torpedo Tubes	Two 18-inch torpedo tubes

Source: Eric W. Osborne, *Destroyers: An Illustrated History of Their Impact* (Santa Barbara, CA: ABC-CLIO, Inc., 2005), 45.

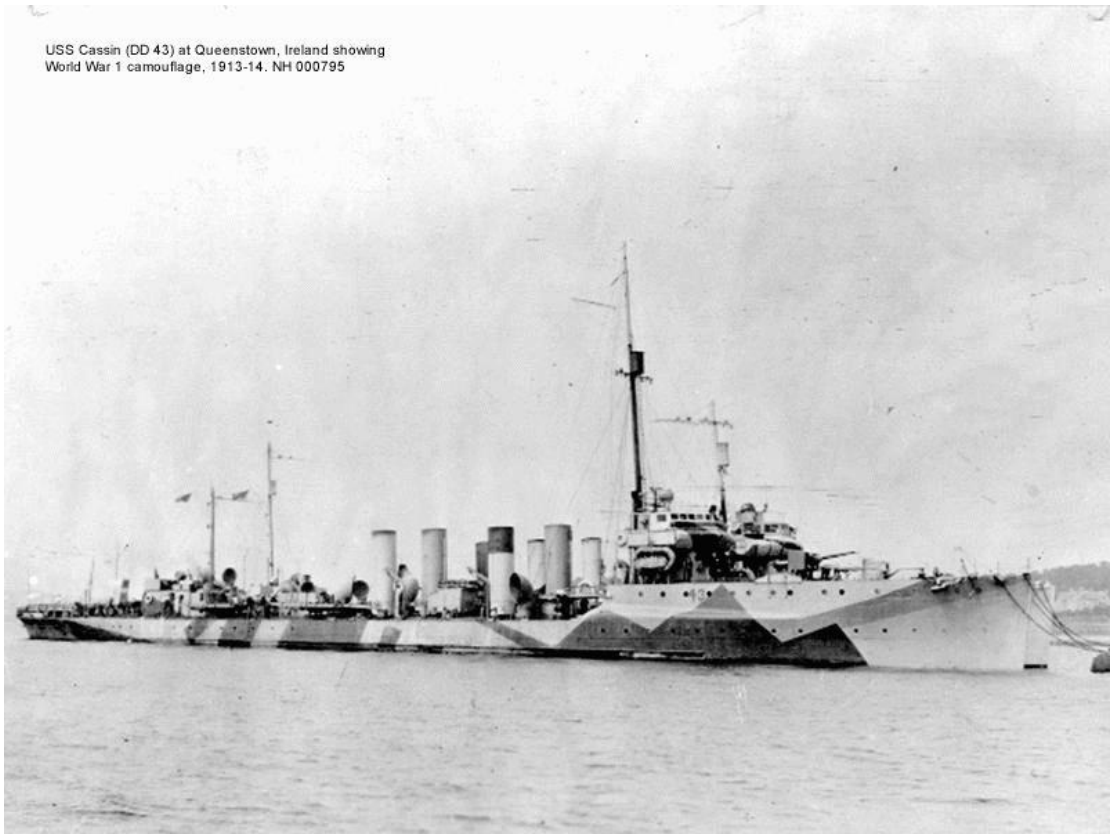


USS *Smith* (DD-17)

Source: Navsource.org, ―Destroyers," http://www.navsource.org/archives/05/0501702.jpg (accessed 16 December 2010).

USS *Smith* Ship Information	
Ship Type	*Smith*-class
LengthxBeamxDraft	293 feet, 8 inches by 26 feet by 8 feet
Displacement	700 tons
Engine Type	Turbine engines
Maximum Speed	28 kts
Guns	Five 3-inch guns
Torpedo Tubes	Three 18-inch torpedo tubes

Source: Eric W. Osborne, *Destroyers: An Illustrated History of Their Impact* (Santa Barbara, CA: ABC-CLIO, Inc., 2005), 46. Note: First destroyers with turbine engines.



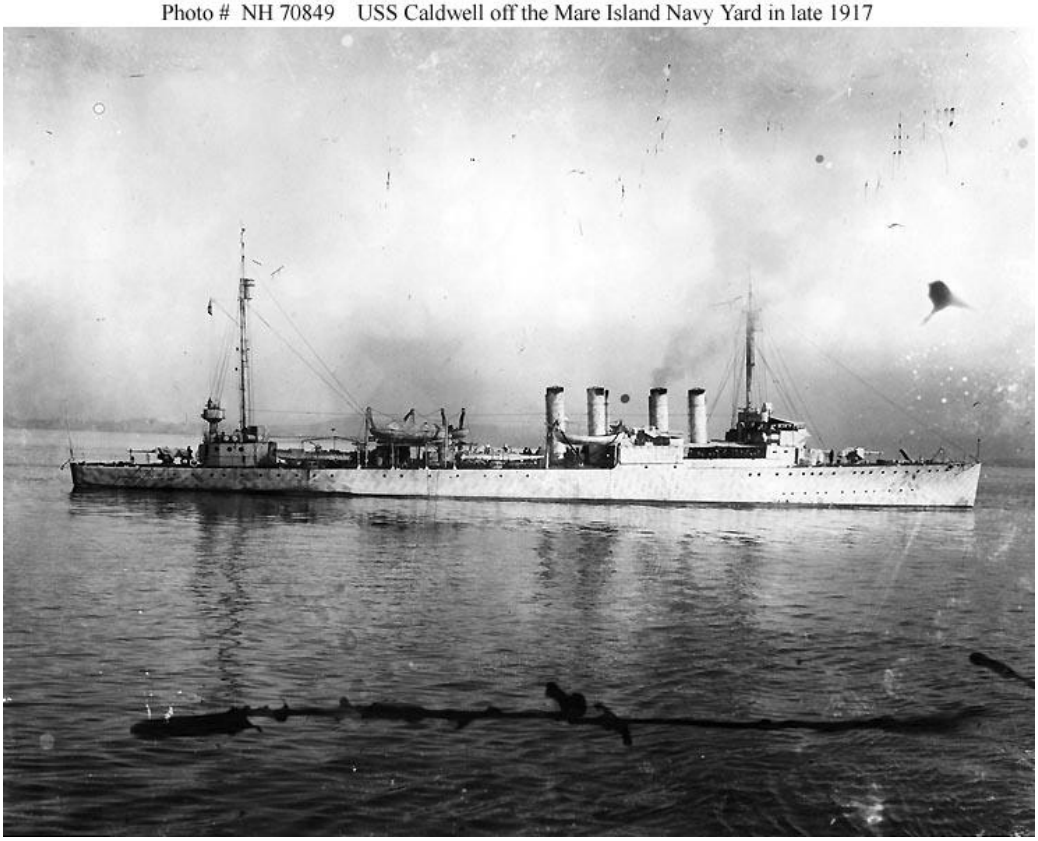
USS *Cassin* (DD-43)

Source: Navsource.org, ―Destroyers," http://www.navsource.org/archives/05/0504301.jpg (accessed 16 December 2010).

USS *Cassin* Ship Information	
Ship Type	*Cassin*-class
LengthxBeamxDraft	305 feet, 5 inches by 30 feet, 2 inches by 9 feet, 3 inches
Displacement	1010 tons
Engine Type	Turbine engines
Maximum Speed	28 kts
Guns	Four 4-inch guns
Torpedo Tubes	Eight 18-inch torpedo tubes

Source: Eric W. Osborne, *Destroyers: An Illustrated History of Their Impact* (Santa Barbara, CA: ABC-CLIO, Inc., 2005), 46. Note: Most heavily armed destroyer to date. To stay at sea for the longest time possible, *Cassin*-class destroyers were equipped with reciprocating engines for cruising and turbines when it was necessary to attain ships maximum speed of 29 kts. The *Cassin*-class, and those similar to it, represent the culmination of a tremendous effort to make destroyers more seaworthy vessels, capable of extended operations at sea with battle fleets.

Photo # NH 70849 USS Caldwell off the Mare Island Navy Yard in late 1917

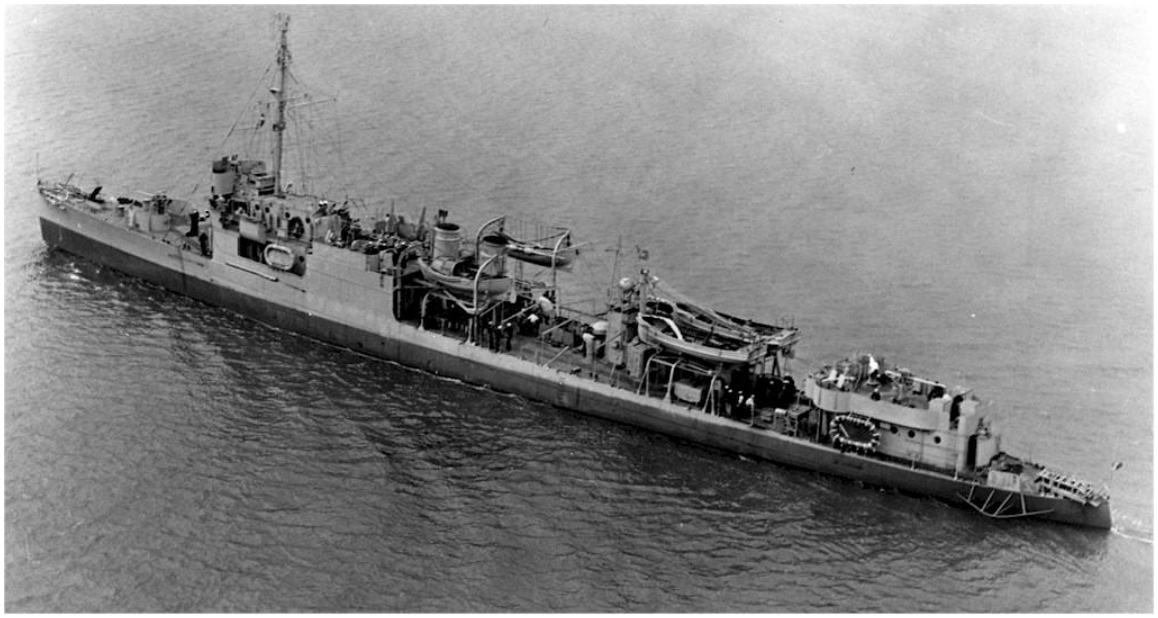


USS *Caldwell* (DD-69)

Source: Navsource.org, ―Destroyers," http://www.navsource.org/archives/05/0506907.jpg (accessed 16 December 2010).

USS *Caldwell* Ship Information	
Ship Type	*Caldwell*-class
LengthxBeamxDraft	315feet, 7 inches by 30 feet, 6 inches by 8 feet
Displacement	1,120 tons
Engine type	Turbines
Maximum speed	30 kts
Guns	Four 4-inch guns and two 1-pound guns
Torpedo Tubes	Twelve 21-inch torpedo tubes

Source: Eric W. Osborne, *Destroyers: An Illustrated History of Their Impact* (Santa Barbara, CA: ABC-CLIO, Inc., 2005), 46.



USS *Clemson* (DD-186)
Source: Navsource.org, ―Destroyers," http://www.navsource.org/archives/05/0518604.jpg (accessed 16 December 2010).

USS *Clemson* Ship Information	
Ship Type	*Clemson*-class
LengthxBeamxDraft	314 feet, 5 inches by 31 feet, 8 inches by 9 feet, 10 inches
Displacement	1,215 tons
Engine type	Turbines
Maximum speed	28 kts
Guns	Four 4-inch/.50 caliber and one 3-inch/.23 caliber AA
Torpedo Tubes	Twelve 21-inch torpedo tubes

Source: Eric W. Osborne, *Destroyers: An Illustrated History of Their Impact* (Santa Barbara, CA: ABC-CLIO, Inc., 2005), 215. Note: Basic repeat of *Wickes*-class, with 35 percent more fuel capacity to improve endurance; designed radius of action was 4900nm at 15 kts.

APPENDIX B

ADDITIONAL GENERAL BOARD EXCERPTS, MEMORANDA, AND OTHER PERTINENT INFORMATION

Great Britain's General Naval Plans, Plans for Naval Operations, and the Convoy System were stated. The following paragraphs encompass some excerpts from the Plans for Naval Operations.

The main fleet was withdrawn from continuous service underway and placed in a base adequately protected from submarines. The heavier cruisers were withdrawn from scouting work and their place taken by light cruisers and destroyers.

The fleet is ready and anxious to fight a major action,[199] but the danger from submarines is so great that it is only sent to sea when the German fleet is out or thought to be coming out.

The convoy system was developed with the hope of reducing the submarine sinkings. By concentrating the shipping into convoys it was hoped to reduce the chances of the submarines sighting merchant vessels; to guard against raiders by ocean escorts; and to guard against submarines by destroyer escort within the submarine danger zone.

The most successful operations against enemy submarines have been carried out by British submarines and decoy ships. The submarine vs. submarine will probably prove effective in the future, tho the German submarines, due to the excellence of the optical instruments, have a decided advantage and undoubtedly sink more British boats than are lost by themselves. However, this system has proved quite successful and is being

[199]Mahan's theory of fleet engagements (decisive engagements) is prevalent throughout all the navies of the world, not commerce raiding.

pursued as vigorously as possible. The decoy ship has accounted for more submarines than any other measure. However, the enemy submarines are becoming very wary and it is doubtful if in the future they will obtain such good results.

~~"~~Hunting groups" of destroyers carrying kite balloons have also been in operation and it is felt that the development of this lan may, during the summer months especially, yield valuable results.

The submarine is by far the most serious menace to ultimate Allied victory. At the present rate of destruction of 500,000 tons of shipping a month, it is estimated that by October 1918 the Allies will be constructing shipping at a rate which will be above the losses. This does not necessarily mean a victory, for if the war goes on that length of time without the suppression of the submarine the restriction upon food and fuel are more than apt to reduce the will to win of the population of Italy, France and Great Britain to such an extent as to force these Governments into a compromise peace.

It seems essential that operations to reduce the efficiency of the submarine must be devised. The German nation is basing its hope of victory on the success of the submarine. A powerful offensive against this type will effectually raise the morale of the Allies and lower that of the Central Powers.

The season of the year is not propitious for offensive operations against submarines so at present all energies must be bent to operations in defense of commerce. The following are some excerpts from the Convoy System.

The principal anti-submarine effort is today being exerted in escorting convoys through the submarine danger zones in the Atlantic and North Sea and Channel. A convoy system will soon be in operation in the Mediterranean.

The reduction in the percent of losses of vessels in convoy has given rise to hopes that the adoption of the convoy system by all ocean going vessels will reduce the submarine menace below the danger point.

Such an assumption is dangerous without more experience than has been had as yet, and as the convoy system has only been in operation during the fair weather of summer the difficulties attendant upon operations in the gales of winter and the fogs of fall and spring must be carefully considered.

The convoy system is strategically defensive though tactically offensive . . . Convoy operations cannot win the war. They may, if successful, prevent defeat.

Unless the Navy can unmistakably check the submarine menace the war is apt to be decided by political or labor conditions.

National morale is today the vital point, and the effect on allied morale of a successful check to the submarine would be to raise it beyond any possibility of breaking. Likewise this would so reduce Germany's chance of winning the war that the morale of the Central powers would break without a doubt.

The convoy system requires the assembly of from 15 to 20 vessels. Most convoys are run on 8 day schedules. Assuming that on the average there is a delay of two days in and two days out in a round trip, and that the average time for a round trip is 50 days, it will be seen at once that this is equivalent to a reduction in shipping of 8 percent. In addition to this there is the congestion of ports due to arrival and departure of large groups of ships practically simultaneously, which reduces the rapidity of discharge and loading.

In order to make up for the loss in tonnage due to controlled sailings, it is necessary to attain the highest efficiency of employment of all ocean going merchant tonnage. The order to accomplish this it is essential that all merchant shipping be controlled as to route, ports, and cargo by the Government, and that the Government representatives co-ordinate their efforts with the corresponding representatives of the Allies.

An instance will indicate where the savings can be made. There are about forty ships a month trading from the Southeast Coast of South America direct to the United States. Most of these ships are American or neutrals operating on an American tune charter. This trade is no doubt profitable but it is doubtful if it is essential to the conduct of the war.

The United States and the Allies must consider carefully what peace time trade can be dispensed with to meet the very serious shipping situation now before us.

The efficient employment of such shipping as is available for the transportation of materials essential to the conduct of the war offers one of the most promising fields for reducing the actual shortage of shipping.

The following are excerpts from the British Future Naval Policy.

The suppression of the enemy submarine will assure the winning of the war. Great Britain can not by itself establish and maintain the barrage and patrol as planned; it is up to us to assure its efficiency by exerting our utmost power.

Work should be pushed to a maximum degree on all destroyers which have been started.[200]

[200]GBH 16 October 1917; HBGB 1917-50, roll 1, year 1917, 418-426. This highlights the urgency and need for destroyers in the theater to counter the U-boat threat wreaking havoc on merchant shipping that was supplying the Allied effort in Europe.

APPENDIX C

NAVAL TREATY EXCERPTS OF INTERWAR PERIOD

WASHINGTON NAVAL TREATY of 1922

From: Papers Relating to the Foreign Relations of the United States: 1922, Vol. 1, pp. 247-266.

Treaty Series NO. 671

CONFERENCE ON THE LIMITATION OF ARMAMENT,

WASHINGTON, NOVEMBER 12 1921-FEBRUARY 6, 1922.

Treaty Between the United States of America, the British Empire, France, Italy, and Japan, Signed at Washington, February 6, 1922. [41]

The United States of America, the British Empire, France, Italy and Japan:

Desiring to contribute to the maintenance of the general peace, and to reduce the burdens of competition in armament;

In English and French; French text not printed. Ratification advised by the Senate, Mar. 29, 1922; ratified by the President, June 9, 1923; ratifications deposited with the Government of the United States, Aug. 17, 1923; proclaimed, Aug. 21, 1923.

Have resolved, with a view to accomplishing these purposes, to conclude a treaty to limit their respective naval armament, and to that end have appointed as their Plenipotentiaries;

CHAPTER I.-GENERAL PROVISIONS RELATING TO THE LIMITATION OF NAVAL ARMAMENT

Article I

The Contracting Powers agree to limit their respective naval armament as provided in the present Treaty.

Article II

The Contracting Powers may retain respectively the capital ships which are specified in Chapter II, Part 1. On the coming into force of the present Treaty, but subject to the following provisions of this Article, all other capital ships, built or building, of the United

States, the British Empire and Japan shall be disposed of as prescribed in Chapter II, Part 2.

In addition to the capital ships specified in Chapter II, Part 1, the United States may complete and retain two ships of the *West Virginia* class now under construction. On the completion of these two ships, the *North Dakota* and *Delaware*, shall be disposed of as prescribed in Chapter II, Part 2.

The British Empire may, in accordance with the replacement table in Chapter II, Part 3, construct two new capital ships not exceeding 35,000 tons (35,560 metric tons) standard displacement each. On the completion of the said two ships the *Thunderer*, *King George V*, *Ajax* and *Centurion* shall be disposed of as prescribed in Chapter II, Part 2.

Article III

Subject to the provisions of Article II, the Contracting Powers shall abandon their respective capital ship building programs, and no new capital ships shall be constructed or acquired by any of the Contracting Powers except replacement tonnage which may be constructed or acquired as specified in Chapter II, Part 3.

Ships which are replaced in accordance with Chapter II, Part 3, shall be disposed of as prescribed in Part 2 of that Chapter.

Article IV

The total capital ship replacement tonnage of each of the Contracting Powers shall not exceed in standard displacement, for the United States 525,000 tons (533,400 metric tons); for the British Empire 525,000 tons (533,400 metric tons); for France 175,000 tons (177,800 metric tons); for Italy 175,000 tons (177,800 metric tons); for Japan 315,000 tons (320,040 metric tons).

Article V

No capital ship exceeding 35,000 tons (35,560 metric tons) standard displacement shall be acquired by, or constructed by, for, or within the jurisdiction of, any of the Contracting Powers.

Article VI

No capital ship of any of the Contracting Powers shall carry a gun with a caliber in excess of 16 inches (406 millimetres).

Article VII

The total tonnage for aircraft carriers of each of the Contracting Powers shall not exceed in standard displacement, for the United States 135,000 tons (137,160 metric tons); for the British Empire 135,000 tons (137,160 metric tons); for France 60,000 tons (60,960 metric tons); for Italy 60,000 tons (60,960 metric tons); for Japan 81,000 tons (82,296 metric tons).

Article VIII

The replacement of aircraft carriers shall be effected only as prescribed in Chapter II, Part 3, provided, however, that all aircraft carrier tonnage in existence or building on November 12, 1921, shall be considered experimental, and may be replaced, within the total tonnage limit prescribed in Article VII, without regard to its age.

Article IX

No aircraft carrier exceeding 27,000 tons (27,432 metric tons) standard displacement shall be acquired by, or constructed by, for or within the jurisdiction of, any of the Contracting Powers.

However, any of the Contracting Powers may, provided that its total tonnage allowance of aircraft carriers is not thereby exceeded, build not more than two aircraft carriers, each of a tonnage of not more than 33,000 tons (33,528 metric tons) standard displacement, and in order to effect economy any of the Contracting Powers may use for this purpose any two of their ships, whether constructed or in course of construction, which would otherwise be scrapped under the provisions of Article II. The armament of any aircraft carriers exceeding 27,000 tons (27,432 metric tons) standard displacement shall be in accordance with the requirements of Article X, except that the total number of guns to be carried in case any of such guns be of a caliber exceeding 6 inches (152 millimetres), except anti-aircraft guns and guns not exceeding 5 inches (127 millimetres), shall not exceed eight.

Article X

No aircraft carrier of any of the Contracting Powers shall carry a gun with a caliber in excess of 8 inches (203 millimetres). Without prejudice to the provisions of Article IX, if the armament carried includes guns exceeding 6 inches (152 millimetres) in caliber the total number of guns carried, except anti-aircraft guns and guns not exceeding 5 inches (127 millimetres), shall not exceed ten. If alternatively the armament contains no guns exceeding 6 inches (152 millimetres) in caliber, the number of guns is not limited. In either case the number of anti-aircraft guns and of guns not exceeding 5 inches (127 millimetres) is not limited.

Article XI

No vessel of war exceeding 10,000 tons (10,160 metric tons) standard displacement, other than a capital ship or aircraft carrier, shall be acquired by, or constructed by, for, or within the jurisdiction of, any of the Contracting Powers. Vessels not specifically built as fighting ships nor taken in time of peace under government control for fighting purposes, which are employed on fleet duties or as troop transports or in some other way for the purpose of assisting in the prosecution of hostilities otherwise than as fighting ships, shall not be within the limitations of this Article.

Article XII

No vessel of war of any of the Contracting Powers, hereafter laid down, other than a capital ship, shall carry a gun with a caliber in excess of 8 inches (203 millimetres).

Article XIII

Except as provided in Article IX, no ship designated in the present Treaty to be scrapped may be reconverted into a vessel of war.

Article XIV

No preparations shall be made in merchant ships in time of peace for the installation of warlike armaments for the purpose of converting such ships into vessels of war, other than the necessary stiffening of decks for the mounting of guns not exceeding 6 inch (152 millimetres) caliber.

Article XV

No vessel of war constructed within the jurisdiction of any of the Contracting Powers for a non-Contracting Power shall exceed the limitations as to displacement and armament prescribed by the present Treaty for vessels of a similar type which may be constructed by or for any of the Contracting Powers; provided, however, that the displacement for aircraft carriers constructed for a non-Contracting Power shall in no case exceed 27,000 tons (27,432 metric tons) standard displacement.

Article XVI

If the construction of any vessel of war for a non-Contracting Power is undertaken within the jurisdiction of any of the Contracting Powers, such Power shall promptly inform the other Contracting Powers of the date of the signing of the contract and the date on which the keel of the ship is laid; and shall also communicate to them the particulars relating to the ship prescribed in Chapter II, Part 3, Section I (b), (4) and (5).

Article XVII

In the event of a Contracting Power being engaged in war, such Power shall not use as a vessel of war any vessel of war which may be under construction within its jurisdiction for any other Power, or which may have been constructed within its jurisdiction for another Power and not delivered.

Article XVIII

Each of the Contracting Powers undertakes not to dispose by gift, sale or any mode of transfer of any vessel of war in such a manner that such vessel may become a vessel of war in the Navy of any foreign Power.

Article XIX

The United States, the British Empire and Japan agree that the status quo at the time of the signing of the present Treaty, with regard to fortifications and naval bases, shall be maintained in their respective territories and possessions specified hereunder:

(1) The insular possessions which the United States now holds or may hereafter acquire in the Pacific Ocean, except (a) those adjacent to the coast of the United States, Alaska

and the Panama Canal Zone, not including the Aleutian Islands, and (b) the Hawaiian Islands;

(2) Hong Kong and the insular possessions which the British Empire now holds or may hereafter acquire in the Pacific Ocean, east of the meridian of 110° east longitude, except (a) those adjacent to the coast of Canada, (b) the Commonwealth of Australia and its Territories, and (c) New Zealand;

(3) The following insular territories and possessions of Japan in the Pacific Ocean, to wit: the Kurile Islands, the Bonin Islands, Amami-Oshima, the Loochoo Islands, Formosa and the Pescadores, and any insular territories or possessions in the Pacific Ocean which Japan may hereafter acquire.

The maintenance of the status quo under the foregoing provisions implies that no new fortifications or naval bases shall be established in the territories and possessions specified; that no measures shall be taken to increase the existing naval facilities for the repair and maintenance of naval forces, and that no increase shall be made in the coast defences of the territories and possessions above specified. This restriction, however, does not preclude such repair and replacement of worn-out weapons and equipment as is customary in naval and military establishments in time of peace.

Article XX

The rules for determining tonnage displacement prescribed in Chapter II, Part 4, shall apply to the ships of each of the Contracting Powers.

CHAPTER II.-RULES RELATING TO THE EXECUTION OF THE TREATY-DEFINITION OF TERMS

PART 2.-Rules for Scrapping Vessels of War

The following rules shall be observed for the scrapping of vessels of war which are to be disposed of in accordance with Articles II and III.

I. A vessel to be scrapped must be placed in such condition that it cannot be put to combatant use.

II. This result must be finally effected in any one of the following ways:

(a) Permanent sinking of the vessel;

(b) Breaking the vessel up. This shall always involve the destruction or removal

of all machinery, boilers and armour,and all deck, side and bottom plating;

(c) Converting the vessel to target use exclusively. In such case all the provisions of paragraph III of this Part, except sub-paragraph (6), in so far as may be necessary to enable the ship to be used as a mobile target, and except sub-paragraph (7), must be previously complied with. Not more than one capital ship may be retained for this purpose at one time by any of the Contracting Powers.

(d) Of the capital ships which would otherwise be scrapped under the present Treaty in or after the year 1931, France and Italy may each retain two sea-going vessels for training purposes exclusively, that is, as gunnery or torpedo schools. The two vessels retained by France shall be of the *Jean Bart* class, and of those retained by Italy one shall be the *Dante Alighieri*, the other of the *Giulio Cesare* class. On retaining these ships for the purpose above stated, France and Italy respectively undertake to remove and destroy their conning-towers, and not to use the said ships as vessels of war.

III. (a) Subject to the special exceptions contained in Article IX, when a vessel is due for scrapping, the first stage of scrapping, which consists in rendering a ship incapable of further warlike service, shall be immediately undertaken.

(b) A vessel shall be considered incapable of further warlike service when there shall have been removed and landed, or else destroyed in the ship:

(1) All guns and essential portions of guns, fire-control tops and revolving parts of all barbettes and turrets;

(2) All machinery for working hydraulic or electric mountings;

(3) All fire-control instruments and range-finders;

(4) All ammunition, explosives and mines;

(5) All torpedoes, warheads and torpedo tubes;

(6) All wireless telegraphy installations;

(7) The conning tower and all side armour, or alternatively all main propelling machinery; and

(8) All landing and flying-off platforms and all other aviation accessories.

IV. The periods in which scrapping of vessels is to be effected are as follows:

(a) In the case of vessels to be scrapped under the first paragraph of Article II, the work of rendering the vessels incapable of further warlike service, in accordance with paragraph III of this Part, shall be completed within six months from the coming into force of the present Treaty, and the scrapping shall be finally effected within eighteen months from such coming into force.

(b) In the case of vessels to be scrapped under the second and third paragraphs of Article II, or under Article III, the work of rendering the vessel incapable of further warlike service in accordance with paragraph III of this Part shall be commenced not later than the date of completion of its successor, and shall be finished within six months from the date of such completion. The vessel shall be finally scrapped, in accordance with paragraph II of this Part, within eighteen months from the date of completion of its successor. If, however, the completion of the new vessel be delayed, then the work of rendering the old vessel incapable of further war-like service in accordance with paragraph III of this Part shall be commenced within four years from the laying of the keel of the new vessel, and shall be finished within six months from the date on which such work was commenced, and the old vessel shall be finally scrapped in accordance

with paragraph II of this Part within eighteen months from the date when the work of rendering it incapable of further warlike service was commenced.

PART 3.-*Replacement*

The replacement of capital ships and aircraft carriers shall take place according to the rules in Section I and the tables in Section II of this Part.

SECTION I.-RULES FOR REPLACEMENT

(a) Capital ships and aircraft carriers twenty years after the date of their completion may, except as otherwise provided in Article VIII and in the tables in Section II of this Part, be replaced by new construction, but within the limits prescribed in Article IV and Article VII. The keels of such new construction may, except as otherwise provided in Article VIII and in the tables in Section II of this Part, be laid down not earlier than seventeen years from the date of completion of the tonnage to be replaced, provided, however, that no capital ship tonnage, with the exception of the ships referred to in the third paragraph of Article II, and the replacement tonnage specifically mentioned in Section II of this Part, shall be laid down until ten years from November 12, 1921.

(b) Each of the Contracting Powers shall communicate promptly to each of the other Contracting Powers the following information:

(1) The names of the capital ships and aircraft carriers to be replaced by new construction;
(2) The date of governmental authorization of replacement tonnage;
(3) The date of laying the keels of replacement tonnage;
(4) The standard displacement in tons and metric tons of each new ship to be laid down, and the principal dimensions, namely, length at waterline, extreme beam at or below waterline, mean draft at standard displacement;
(5) The date of completion of each new ship and its standard displacement in tons and metric tons, and the principal dimensions, namely, length at waterline, extreme beam at or below waterline, mean draft at standard displacement, at time of completion

(c) In case of loss or accidental destruction of capital ships or aircraft carriers, they may immediately be replaced by new construction subject to the tonnage limits prescribed in Articles IV and VII and in conformity with the other provisions of the present Treaty, the regular replacement program being deemed to be advanced to that extent.

(d) No retained capital ships or aircraft carriers shall be reconstructed except for the purpose of providing means of defense against air and submarine attack, and subject to the following rules: The Contracting Powers may, for that purpose, equip existing tonnage with bulge or blister or anti-air attack deck protection, providing the increase of displacement thus effected does not exceed 3,000 tons (3,048 metric tons) displacement for each ship. No alterations in side armor, in caliber, number or general type of mounting of main armament shall be permitted except:

(1) in the case of France and Italy, which countries within the limits allowed for bulge may increase their armor protection and the caliber of the guns now carried on their existing capital ships so as not to exceed 16 inches (406 millimeters) and
(2) the British Empire shall be permitted to complete, in the case of the *Renown*, the alterations to armor that have already been commenced but temporarily suspended.

PART 4.-*Definitions*

For the purposes of the present Treaty, the following expressions are to be understood in the sense defined in this Part.

CAPITAL SHIP

A capital ship, in the case of ships hereafter built, is defined as a vessel of war, not an aircraft carrier, whose displacement exceeds 10,000 tons (10,160 metric tons) standard displacement, or which carries a gun with a caliber exceeding 8 inches (203 millimetres).

AIRCRAFT CARRIER

An aircraft carrier is defined as a vessel of war with a displacement in excess of 10,000 tons (10,160 metric tons) standard displacement designed for the specific and exclusive purpose of carrying aircraft. It must be so constructed that aircraft can be launched there from and landed there on, and not designed and constructed for carrying a more powerful armament than that allowed to it under Article IX or Article X as the case may be.

STANDARD DISPLACEMENT

The standard displacement of a ship is the displacement of the ship complete, fully manned, engined, and equipped ready for sea, including all armament and ammunition, equipment, outfit, provisions and fresh water for crew, miscellaneous stores and implements of every description that are intended to be carried in war, but without fuel or reserve feed water on board.

The word "ton" in the present Treaty, except in the expression "metric tons", shall be understood to mean the ton of 2240 pounds (1016 kilos).

Vessels now completed shall retain their present ratings of displacement tonnage in accordance with their national system of measurement. However, a Power expressing displacement in metric tons shall be considered for the application of the present Treaty as owning only the equivalent displacement in tons of 2240 pounds.

A vessel completed hereafter shall be rated at its displacement tonnage when in the standard condition defined herein.

CHAPTER III.-MISCELLANEOUS PROVISIONS

Article XXI

If during the term of the present Treaty the requirements of the national security of any Contracting Power in respect of naval defence are, in the opinion of that Power, materially affected by any change of circumstances, the Contracting Powers will, at the request of such Power, meet in conference with a view to the reconsideration of the provisions of the Treaty and its amendment by mutual agreement.

In view of possible technical and scientific developments, the United States, after consultation with the other Contracting Powers, shall arrange for a conference of all the Contracting Powers which shall convene as soon as possible after the expiration of eight years from the coming into force of the present Treaty to consider what changes, if any, in the Treaty may be necessary to meet such developments.

Article XXII

Whenever any Contracting Power shall become engaged in a war which in its opinion affects the naval defence of its national security, such Power may after notice to the other Contracting Powers suspend for the period of hostilities its obligations under the present Treaty other than those under Articles XIII and XVII, provided that such Power shall notify the other Contracting Powers that the emergency is of such a character as to require such suspension.

The remaining Contracting Powers shall in such case consult together with a view to agreement as to what temporary modifications if any should be made in the Treaty as between themselves. Should such consultation not produce agreement, duly made in

accordance with the constitutional methods of the respective Powers, any one of said Contracting Powers may, by giving notice to the other Contracting Powers, suspend for the period of hostilities its obligations under the present Treaty, other than those under Articles XIII and XVII.

On the cessation of hostilities the Contracting Powers will meet in conference to consider what modifications, if any, should be made in the provisions of the present Treaty.

Article XXIII

The present Treaty shall remain in force until December 31st, 1936, and in case none of the Contracting Powers shall have given notice two years before that date of its intention to terminate the treaty, it shall continue in force until the expiration of two years from the date on which notice of termination shall be given by one of the Contracting Powers, whereupon the Treaty shall terminate as regards all the Contracting Powers. Such notice shall be communicated in writing to the Government of the United States, which shall immediately transmit a certified copy of the notification to the other Powers and inform them of the date on which it was received. The notice shall be deemed to have been given and shall take effect on that date. In the event of notice of termination being given by the Government of the United States, such notice shall be given to the diplomatic representatives at Washington of the other Contracting Powers, and the notice shall be deemed to have been given and shall take effect on the date of the communication made to the said diplomatic representatives.

Within one year of the date on which a notice of termination by any Power has taken effect, all the Contracting Powers shall meet in conference.

Article XXIV

The present Treaty shall be ratified by the Contracting Powers in accordance with their respective constitutional methods and shall take effect on the date of the deposit of all the ratifications, which shall take place at Washington as soon as possible. The Government of the United States will transmit to the other Contracting Powers a certified copy of the *procès-verbal* of the deposit of ratifications.

The present Treaty, of which the French and English texts are both authentic, shall remain deposited in the archives of the Government of the United States, and duly certified copies thereof shall be transmitted by that Government to the other Contracting Powers.

DONE at the City of Washington the sixth day of February, One Thousand Nine Hundred and Twenty-Two.

Source: "Conference on the Limitation of Armament," http://www.ibiblio.org/pha/pre-war/1922/nav_lim.html (accessed on 9 January 2011).

LONDON CONFERENCE of 1930

INTERNATIONAL TREATY FOR THE LIMITATION AND REDUCTION OF NAVAL ARMAMENT

The President of the United States of America, the President of the French Republic, His Majesty the King of Great Britain, Ireland and the British Dominion beyond the Seas, Emperor of India, His Majesty the King of Italy, and His Majesty the Emperor of Japan,

DESIRING to prevent the dangers and reduce the burdens inherent in competitive armaments, and

DESIRING to carry forward the work begun by the Washington Naval Conference and to facilitate the progressive realization of general limitation and reduction of armaments,

HAVE RESOLVED to conclude a Treaty for the limitation and reduction of naval armaments and have accordingly appointed as their Plenipotentiaries:

[Names of plenipotentiaries omitted.]

Who, having communicated to one another their full powers, found in good and due form, have agreed as follows:

PART I

Article 1

The High Contracting Parties agree not to exercise their rights to lay down the keels of capital ship replacement tonnage during the years 1931-1936 inclusive as provided in Chapter II, Part 3, of the Treaty for the Limitation of Naval Armament signed between them at Washington on 6 February 1922 and referred to in the present Treaty as the Washington Treaty.

This provision is without prejudice to the disposition relating to the replacement of ships accidentally lost or destroyed contained in Chapter II, Part 3, Section I, paragraph (c) of the said Treaty.

France and Italy may, however, build the replacement tonnage which they were entitled to lay down in 1927 and 1929 in accordance with the provisions of the said Treaty.

Article 2

(a) Subject to the provisions of subparagraph (b), the above ships, unless converted to target use exclusively in accordance with Chapter II, Part 2, paragraph II(c) of the Washington Treaty, shall be scrapped in the following manner:

One of the ships to be scrapped by the United States, and two of those to be scrapped by the United Kingdom shall be rendered unfit for warlike service, in accordance with Chapter II, Part 2, paragraph III(b) of the Washington Treaty, within twelve months from the coming into force of the present Treaty. These ships shall be finally scrapped, in accordance with paragraph II(a) or (b) of the said Part 2, within twenty-four months from the said coming into force. In the case of the second of the ships to be scrapped by the United States, and of the third and fourth of the ships to be scrapped by the United Kingdom, the said periods shall be eighteen and thirty months respectively from the coming into force of the present Treaty.

These ships shall be reduced to the condition prescribed in Section V of Annex II to Part II of the present Treaty. The work of reducing these vessels to the required condition shall begin, in the case of the United States and the United Kingdom within twelve months, and in the case of Japan within eighteen months from the coming into force of the present Treaty; the work shall be completed within six months of the expiration of the abovementioned periods.

Any of these ships which are not retained for training purposes shall be rendered unfit for warlike service within eighteen months, and finally scrapped within thirty months, of the coming into force of the present Treaty.

2. Subject to any disposal of capital ships which might be necessitated, in accordance with the Washington Treaty, by the building by France or Italy of the replacement tonnage referred to in Article 1 of the present Treaty, all existing capital ships mentioned in Chapter II, Part 3, Section II of the Washington Treaty and not designated above to be disposed of may be retained during the term of the present Treaty.

3. The right of replacement is not lost by delay in laying down replacement tonnage, and the old vessel may be retained until replaced even though due for scrapping under Chapter II, Part 3, Section II of the Washington Treaty.

Article 3

1. For the purposes of the Washington Treaty, the definition of an aircraft carrier given in Chapter II, Part 4, of the said Treaty is hereby replaced by the following definition:

The expression "aircraft carrier" includes any surface vessel of war, whatever its displacement, designed for the specific and exclusive purpose of carrying aircraft and so constructed that aircraft can be launched therefrom and landed thereon.

2. The fitting of a landing-on or flying-off platform or deck on a capital ship, cruiser or destroyer, provided such vessel was not designed or adapted exclusively as an aircraft carrier, shall not cause any vessel so fitted to be charged against or classified in the category of aircraft carriers.

3. No capital ship in existence on 1 April 1930 shall be fitted with a landing-on platform or deck.

Article 4

1. No aircraft carrier of 10,000 tons (10,160 metric tons) or less standard displacement mounting a gun above 6.1 inch (155 mm) caliber shall be acquired by or constructed by or for any of the High Contracting Parties.

2. As from the coming into force of the present Treaty in respect of all the High Contracting Parties, no aircraft carrier of 10,000 tons (10,160 metric tons) or less standard displacement mounting a gun above 6.1 inch (155 mm) caliber shall be constructed within the jurisdiction of any of the High Contracting Parties.

Article 5

An aircraft carrier must not be designed and constructed for carrying a more powerful armament than that authorised by Article IX or Article X of the Washington Treaty, or by Article 4 of the present Treaty, as the case may be.

Wherever in the said Articles IX and X the caliber of 6 inches (152 mm) is mentioned, the caliber of 6.1 inches (155 mm) is substituted therefor.

PART II

Article 6

1. The rules for determining standard displacement prescribed in Chapter II, Part 4 of the Washington Treaty shall apply to all surface vessels of war of each of the High Contracting Parties.

2. The standard displacement of a submarine is the surface displacement of the vessel complete (exclusive of the water in non-watertight structure) fully manned, engined, and equipped ready for sea, including all armament and ammunition, equipment, outfit, provisions for crew, miscellaneous stores, and implements of every description that are

intended to be carried in war, but without fuel, lubricating oil, fresh water or ballast water of any kind on board.

3. Each naval combatant vessel shall be rated at its displacement tonnage when in the standard condition. The word "ton" except in the expression "metric tons", shall be understood to be the ton of 2,240 pounds (1,016 kg).

Article 7

1. No submarine the standard displacement of which exceeds 2,000 tons (2,032 metric tons) or with a gun above 5.1 inch (130 mm) caliber shall be acquired by or constructed by or for any of the High Contracting Parties.

2. Each of the High Contracting Parties may, however, retain, build or acquire a maximum number of three submarines of a standard displacement not exceeding 2,800 tons (2,845 metric tons); these submarines may carry guns not above 6.1 inch (155 mm) caliber. Within this number, France may retain one unit, already launched, of 2,880 tons (2,926 metric tons), with guns the caliber of which is 8 inches (203 mm).

3. The High Contracting Parties may retain the submarines which they possessed on 1 April 1930 having a standard displacement not in excess of 2,000 tons (2,032 metric tons) and armed with guns above 5.1 inch (130 mm) caliber.

4. As from the coming into force of the present Treaty in respect of all the High Contracting Parties, no submarine the standard displacement of which exceeds 2,000 tons (2,032 metric tons) or with a gun above 5.1 inch (130 mm) caliber shall be constructed within the jurisdiction of any of the High Contracting Parties, except as provided in paragraph 2 of this Article.

Article 8

Subject to any special agreements which may submit them to limitation, the following vessels are exempt from limitation:

(a) Naval surface combatant vessels of 600 tons (610 metric tons) standard displacement and under;

(b) Naval surface combatant vessels exceeding 600 tons (610 metric tons), but not exceeding 2,000 tons (2,032 metric tons) standard displacement, provided they have none of the following characteristics:

(1) Mount a gun above 6.1 inch (155 mm) caliber;

(2) Mount more than four guns above 3 inch (76 mm) caliber;

(3) Are designed or fitted to launch torpedoes;

(4) Are designed for a speed greater than twenty knots.

(c) Naval surface vessels not specifically built as fighting ships which are employed on fleet duties or as troop transports or in some other way than as fighting ships, provided they have none of the following characteristics:

(1) Mount a gun above 6.1 inch (155 mm) caliber;

(2) Mount more than four guns above 3 inch (76 mm) caliber;

(3) Are designed or fitted to launch torpedoes:

(4) Are designed for a speed greater than twenty knots;

(5) Are protected by armour plate;

(6) Are designed or fitted to launch mines;

(7) Are fitted to receive aircraft on board from the air;

(8) Mount more than one aircraft-launching apparatus on the centre line; or two, one on each broadside;

(9) If fitted with any means of launching aircraft into the air, are designed or adapted to operate at sea more than three aircraft.

Article 9

The rules as to replacement contained in Annex I to this Part II are applicable to vessels of war not exceeding 10,000 tons (10,160 metric tons) standard displacement, with the exception of aircraft carriers, whose replacement is governed by the provisions of the Washington Treaty.

Article 10

Within one month after the date of laying down and the date of completion respectively of each vessel of war, other than capital ships, aircraft carriers and the vessels exempt from limitation under Article 8, laid down or completed by or for them after the coming

into force of the present Treaty, the High Contracting Parties shall communicate to each of the other High Contracting Parties the information detailed below:

(a) The date of laying the keel and the following particulars:

Classification of the vessel;

Standard displacement in tons and metric tons;

Principal dimensions, namely: length at water-line, extreme beam at or below water-line;

Mean draft at standard displacement;

Caliber of the largest gun.

(b) The date of completion together with the foregoing particulars relating to the vessel at that date.

The information to be given in the case of capital ships and aircraft carriers is governed by the Washington Treaty.

Article 11

Subject to the provisions of Article 2 of the present Treaty, the rules for disposal contained in Annex II to this Part II shall be applied to all vessels of war to be disposed of under the said Treaty, and to aircraft carriers as defined in Article 3.

Article 12

1. Subject to any supplementary agreements which may modify, as between the High Contracting Parties concerned, the lists in Annex III to this Part II, the special vessels shown therein may be retained and their tonnage shall not be included in the tonnage subject to limitation.

2. Any other vessel constructed, adapted or acquired to serve the purposes for which these special vessels are retained shall be charged against the tonnage of the appropriate combatant category, according to the characteristics of the vessel, unless such vessel conforms to the characteristics of vessels exempt from limitation under Article 8.

Article 13

Existing ships of various types, which, prior to 1 April 1930, have been used as stationary training establishments or hulks, may be retained in a non-seagoing condition.

ANNEX I

RULES FOR REPLACEMENT

Section I

Except as provided in Section III of this Annex and Part III of the present Treaty, a vessel shall not be replaced before it becomes "over-age". A vessel shall be deemed to be "over-age" when the following number of years have elapsed since the date of its completion:

(a) For a surface vessel exceeding 3,000 tons (3,048 metric tons) but not exceeding 10,000 tons (10,160 metric tons) standard displacement:

(i) If laid down before 1 January 1920: 16 years;

(ii) If laid down after 31 December 1919: 20 years.

(b) For a surface vessel not exceeding 3,000 tons (3,048 metric tons) standard displacement:

(i) If laid down before 1 January 1921: 12 years;

(ii) If laid down after 31 December 1920: 16 years.

(c) For a submarine: 13 years.

The keels of replacement tonnage shall not be laid down more than three years before the year in which the vessel to be replaced becomes "over-age"; but this period is reduced to two years in the case of any replacement surface vessel not exceeding 3,000 tons (3,048 metric tons) standards displacement.

The right of replacement is not lost by delay in laying down replacement tonnage.

Section II

Except as otherwise provided in the present Treaty, the vessel or vessels, whose retention would cause the maximum tonnage permitted in the category to be exceeded, shall, on the completion or acquisition of replacement tonnage, be disposed of in accordance with Annex II to this Part II.

Section III

In the event of loss or accidental destruction a vessel may be immediately replaced.

PART III

The President of the United States of America, His Majesty the King of Great Britain, Ireland and the British Dominions beyond the Seas, Emperor of India, and His Majesty the Emperor of Japan, have agreed as between themselves to the provisions of this Part III:

Article 14

The naval combatant vessels of the United States, the British Commonwealth of Nations and Japan, other than capital ships, aircraft carriers and all vessels exempt from limitation under Article 8, shall be limited during the term of the present Treaty as provided in this Part III, and, in the case of special vessels, as provided in Article 12.

Article 15

For the purpose of this Part III the definition of the cruiser and destroyer categories shall be as follows:

Cruisers

Surface vessels of war, other than capital ships or aircraft carriers, the standard displacement of which exceeds 1,850 tons (1,880 metric tons), or with a gun above 5.1 inch (130 mm) caliber.

The cruiser category is divided into two sub-categories, as follows:

(a) Cruisers carrying a gun above 6.1 inch (155 mm) caliber;

(b) Cruisers carrying a gun not above 6.1 inch (155 mm) caliber.

Destroyers

Surface vessels of war the standard displacement of which does not exceed 1,850 tons (1,880 metric tons), and with a gun not above 5.1 inch (130 mm) caliber.

Article 16

1. The completed tonnage in the cruiser, destroyer and submarine categories which is not to be exceeded on 31December 1936 is given in the following table:

2. Vessels which cause the total tonnage in any category to exceed the figures given in the foregoing table shall be disposed of gradually during the period ending on 31 December 1936.

3. The maximum number of cruisers of sub-category (a) shall be as follows: for the United States, eighteen; for the British Commonwealth of Nations, fifteen; for Japan, twelve.

4. In the destroyer category not more than sixteen percent of the allowed total tonnage shall be employed in vessels of over 1,500 tons (1,524 metric tons) standard displacement. Destroyers completed or under construction on 1 April 1930 in excess of this percentage may be retained, but no other destroyers exceeding 1,500 tons (1,524 metric tons) standard displacement shall be constructed or acquired until a reduction to such sixteen percent has been effected.

5. Not more than twenty-five percent of the allowed total tonnage in the cruiser category may be fitted with a landing-on platform or deck for aircraft.

6. It is understood that the submarines referred to in paragraphs 2 and 3 of Article 7 will be counted as part of the total submarine tonnage of the High Contracting Party concerned.

7. The tonnage of any vessels retained under Article 13 or disposed of in accordance with Annex II to Part II of the present Treaty shall not be included in the tonnage subject to limitation.

Article 17

A transfer not exceeding ten percent of the allowed total tonnage of the category or sub-category into which the transfer is to be made shall be permitted between cruisers of sub-category (b) and destroyers.

Article 18

The United States contemplates the completion by 1935 of fifteen cruisers of sub-category (a) of an aggregate tonnage of 150,000 tons (152,400 metric tons). For each of the three remaining cruisers of sub-category (a) which it is entitled to construct the United States may elect to substitute 15,166 tons (15,409 metric tons) of cruisers of sub-category (b). In case the United States shall construct one or more of such three remaining cruisers of sub-category (a), the sixteenth unit will not be laid down before 1933 and will not be completed before 1936; the seventeenth will not be laid down before 1934 and will not be completed before 1937; the eighteenth will not be laid down before 1935 and will not be completed before 1938.

Article 19

Except as provided in Article 20, the tonnage laid down in any category subject to limitation in accordance with Article 16 shall not exceed the amount necessary to reach the maximum allowed tonnage of the category, or to replace vessels that become "over-age" before 31 December 1936. Nevertheless, replacement tonnage may be laid down for cruisers and submarines that become "over-age" in 1937, 1938 and 1939, and for destroyers that become "over-age" in 1937 and 1938.

Article 20

Notwithstanding the rules for replacement contained in Annex I to Part II:

(c) In addition to replacing destroyers becoming "over-age" before 31 December 1936, Japan may lay down, in each of the years 1935 and 1936, not more than 5,200 tons (5,283 metric tons) to replace part of the vessels that become "over-age" in 1938 and 1939.

(d) Japan may anticipate replacement during the term of the present Treaty by laying down not more than 19,200 tons (19,507 metric tons) of submarine tonnage, of which not more than 12,000 tons (12,192 metric tons) shall be completed by 31 December 1936.

Article 21

If, during the term of the present Treaty, the requirements of the national security of any High Contracting Party in respect of vessels of war limited by Part III of the present Treaty are in the opinion of that Party materially affected by new construction of any Power other than those who have joined in Part III of this Treaty, that High Contracting Party will notify the other Parties to Part III as to the increase required to be made in its own tonnages within one or more of the categories of such vessels of war, specifying particularly the proposed increases and the reasons therefor, and shall be entitled to make such increase. Thereupon the other Parties to Part III of this Treaty shall be entitled to make a proportionate increase in the category or categories specified; and the said other Parties shall promptly advise with each other through diplomatic channels as to the situation thus presented.

PART IV

Article 22

The following are accepted as established rules of International Law:

(1) In their action with regard to merchant ships, submarines must conform to the rules of International Law to which surface vessels are subject.

(2) In particular, except in the case of persistent refusal to stop on being duly summoned, or of active resistance to visit or search, a warship, whether surface vessel or submarine, may not sink or render incapable of navigation a merchant vessel without having first placed passengers, crew and ship's papers in a place of safety. For this purpose the ship's boats are not regarded as a place of safety unless the safety of the passengers and crew is assured, in the existing sea and weather conditions, by the proximity of land, or the presence of another vessel which is in a position to take them on board.

The High Contracting Parties invite all other Powers to express their assent to the above rules.

PART V

Article 23

The present Treaty shall remain in force until 31 December 1936, subject to the following exceptions:

(1) Part IV shall remain in force without limit of time;

(2) The provisions of Articles 3, 4 and 5, and of Article 11 and Annex II to Part II so far as they relate to aircraft carriers, shall remain in force for the same period as the Washington Treaty.

Unless the High Contracting Parties should agree otherwise by reason of a more general agreement limiting naval armaments, to which they all become parties, they shall meet in conference in 1935 to frame a new treaty to replace and to carry out the purposes of the present Treaty, it being understood that none of the provisions of the present Treaty shall prejudice the attitude of any of the High Contracting Parties at the conference agreed to.

Article 24

1. The present Treaty shall be ratified by the High Contracting Parties in accordance with their respective constitutional methods and the ratifications shall be deposited at London as soon as possible. Certified copies of all the *procès-verbaux* of the deposit of ratifications will be transmitted to the Governments of all the High Contracting Parties.

2. As soon as the ratifications of the United States of America, of His Majesty the King of Great Britain, Ireland and the British Dominions beyond the Seas, Emperor of India, in respect of each and all of the Members of the British Commonwealth of Nations as enumerated in the preamble of the present Treaty, and of His Majesty the Emperor of Japan have been deposited, the Treaty shall come into force in respect of the said High Contracting Parties.

3. On the date of the coming into force referred to in the preceding paragraph, Parts I, II, IV and V of the present Treaty will come into force in respect of the French Republic and the Kingdom of Italy if their ratifications have been deposited at that date; otherwise these Parts will come into force in respect of each of those Powers on the deposit of its ratification.

4. The rights and obligations resulting from Part III of the present Treaty are limited to the High Contracting Parties mentioned in paragraph 2 of this Article. The High Contracting Parties will agree as to the date on which, and the conditions under which, the obligations assumed under the said Part III by the High Contracting Parties mentioned in paragraph 2 of this Article will bind them in relation to France and Italy; such agreement will determine at the same time the corresponding obligations of France and Italy in relation to the other High Contracting Parties.

Article 25

After the deposit of the ratifications of all the High Contracting Parties, His Majesty's Government in the United Kingdom of Great Britain and Northern Ireland will communicate the provisions inserted in Part IV of the present Treaty to all Powers which are not signatories of the said Treaty, inviting them to accede thereto definitely and without limit of time.

Such accession shall be effected by a declaration addressed to His Majesty's Government in the United Kingdom of Great Britain and Northern Ireland.

Article 26

The present Treaty, of which the French and English texts are both authentic, shall remain deposited in the archives of His Majesty's Government in the United Kingdom of Great Britain and Northern Ireland. Duly certified copies thereof shall be transmitted to the Governments of all the High Contracting Parties.

DONE at London, the twenty-second day of April, nineteen hundred and thirty.

[Signatures omitted.]

And the respective ratifications of the said Treaty having been carefully compared and found to be in due form, the said deposit in accordance with the provisions of Article 24(1) of the Treaty took place this day in the customary form.

The representative of the United States of America declared that the instrument of ratification of the United States of America was deposited subject to the distinct and explicit understandings set forth in the resolution of 21 July 1930 of the Senate of the United States of America advising and consenting to ratification, that there are no secret

files, documents, letters, understandings or agreements which in any way, directly or indirectly, modify, change, add to, or take from any of the stipulations, agreements or statements in said Treaty; and that, excepting the agreement brought about through the exchange of notes between the Governments of the United States, Great Britain and Japan, having reference to Article 19, there is no agreement, secret or otherwise, expressed or implied, between any of the parties to said Treaty as to any construction that shall hereafter be given to any statement or provision contained therein.

IN WITNESS WHEREOF they have signed this *procès-verbal*, and have affixed thereto their seals.

DONE at London, the 27th day of October, 1930.

[Signatures omitted.]

Exchange of Notes between the Government of the United States of America and the Government of Japan regarding the Interpretation of Article 19 of the London Naval Treaty of 22 April 1930

Source: London Conference of 1930, "International Treaty for the Limitation and Reduction of Naval Armament," http://www.navweaps.com/index_tech/ tech-089_London_Treaty_1930.htm (accessed on 16 January 2011).

LONDON CONFERENCE of 1936

TREATY FOR THE LIMITATION OF NAVAL ARMAMENT

The President of the United States of America, the President of the French Republic and His Majesty the King of Great Britain, Ireland and the British Dominions beyond the Seas, Emperor of India;

DESIRING to reduce the burdens and prevent the dangers inherent in competition in naval armament;

DESIRING, in view of the forthcoming expiration of the Treaty for the Limitation of Naval Armament signed at Washington on 6 February 1922 and of the Treaty for the Limitation and Reduction of Naval Armament signed in London on 22 April 1930 (save for Part IV thereof), to make provision for the limitation of naval armament, and for the exchange of information concerning naval construction;

PART I

DEFINITIONS

Article 1

For the purposes of the present Treaty, the following expressions are to be understood in the sense hereafter defined.

A. STANDARD DISPLACEMENT

(1) The standard displacement of a surface vessel is the displacement of the vessel, complete, fully manned, engined, and equipped ready for sea, including all armament and ammunition, equipment, outfit, provisions and fresh water for crew, miscellaneous stores and implements of every description that are intended to be carried in war, but without fuel or reserve feed water on board.

(2) The standard displacement of a submarine is the surface displacement of the vessel complete (exclusive of the water in non-watertight structure), full manned, engined and equipped ready for sea, including all armament and ammunition, equipment, outfit, provisions for crew, miscellaneous stores and implements of every description that are intended to be carried in war, but without fuel, lubricating oil, fresh water or ballast water of any kind on board.

(3) The word "ton" except in the expression "metric tons" denotes the ton of 2,240 lb. (1,016 kilos).

B. CATEGORIES

(1) *Capital ships* are surface vessels of war belonging to one of the two following sub-categories:

(a) Surface vessels of war, other than aircraft-carriers, auxiliary vessels, or capital ships of sub-category (b), the standard displacement of which exceeds 10,000 tons (10,160 metric tons) or which carry a gun with a caliber exceeding 8 in. (203 mm.);

(b) Surface vessels of war, other than aircraft-carriers, the standard displacement of which does not exceed 8,000 tons (8,128 metric tons) and which carry a gun with a caliber exceeding 8 in. (203 mm.).

(2) *Aircraft-carriers* are surface vessels of war, whatever their displacement, designed or adapted primarily for the purpose of carrying and operating aircraft at sea. The fitting of a landing-on or flying-off deck on any vessel of war, provided such vessel has not been designed or adapted primarily for the purpose of carrying and operating aircraft at sea, shall not cause any vessel so fitted to be classified in the category of aircraft-carriers.

The category of aircraft-carriers is divided into two sub-categories as follows:

(a) Vessels fitted with a flight deck, from which aircraft can take off, or on which aircraft can land from the air;

(b) Vessels not fitted with a flight deck as described in (a) above.

(3) *Light surface vessels* are surface vessels of war other than aircraft-carriers, minor war vessels or auxiliary vessels, the standard displacement of which exceeds 100 tons (102 metric tons) and does not exceed 10,000 tons (10,160 metric tons), and which do not carry a gun with a caliber exceeding 8 in. (203 mm.).

The category of light surface vessels is divided into three sub-categories as follows:

(a) Vessels which carry a gun with a caliber exceeding 6.1 in. (155 mm.);

(b) Vessels which do not carry a gun with a caliber exceeding 6.1 in. (155 mm.) and the standard displacement of which exceeds 3,000 tons (3,048 metric tons);

(c) Vessels which do not carry a gun with a caliber exceeding 6.1 in. (155 mm.) and the standard displacement of which does not exceed 3,000 tons (3,048 metric tons).

(4) *Submarines* are all vessels designed to operate below the surface of the sea.

(5) *Minor war vessels* are surface vessels of war, other than auxiliary vessels, the standard displacement of which exceeds 100 tons (102 metric tons) and does not exceed 2,000 tons (2,032 metric tons), provided they have none of the following characteristics:

(a) Mount a gun with a caliber exceeding 6.1 in. (155 mm.);

(b) Are designed or fitted to launch torpedoes;

(c) Are designed for a speed greater than twenty knots.

(6) *Auxiliary vessels* are naval surface vessels the standard displacement of which exceeds 100 tons (102 metric tons), which are normally employed on fleet duties or as troop transports, or in some other way than as fighting ships, and which are not specifically built as fighting ships, provided they have none of the following characteristics:

(a) Mount a gun with a caliber exceeding 6.1 in. (155 mm.);

(b) Mount more than eight guns with a caliber exceeding 3 in. (76 mm.);

(c) Are designed or fitted to launch torpedoes;

(d) Are designed for protection by armour plate;

(e) Are designed for a speed greater than twenty-eight knots;

(f) Are designed or adapted primarily for operating aircraft at sea;

(g) Mount more than two aircraft-launching apparatus.

(7) *Small craft* are naval surface vessels the standard displacement of which does not exceed 100 tons (102 metric tons).

C. OVER AGE

Vessels of the following categories and sub-categories shall be deemed to be "over-age" when the undermentioned number of years have elapsed since completion:

(a) Capital ships 26 years

(b) Aircraft carriers 20 years

(c) Light surface vessels, sub-categories (a) and (b):

(i) If laid down before 1 January 1920 16 years

(ii) If laid down after 31 December 1919 20 years

(d) Light surface vessels, sub-category (c) 16 years

(e) Submarines 13 years

PART II

LIMITATION

Article 2

After the date of the coming into force of the present Treaty, no vessel exceeding the limitations as to displacement or armament prescribed by this Part of the present Treaty shall be acquired by any High Contracting Party or constructed by, for or within the jurisdiction of any High Contracting Party.

Article 3

No vessel which at the date of the coming into force of the present Treaty carries guns with a caliber exceeding the limits prescribed by this Part of the present Treaty shall, if reconstructed or modernised, be rearmed with guns of a greater caliber than those previously carried by her.

Article 4

(1) No capital ship shall exceed 35,000 tons (35,560 metric tons) standard displacement.

(2) No capital ship shall carry a gun with a caliber exceeding 14 in. (356 mm.); provided however that if any of the Parties to the Treaty for the Limitation of Naval Armament signed at Washington on 6 February 1922, should fail to enter into an agreement to conform to this provision prior to the date of the coming into force of the present Treaty, but in any case not later than 1 April 1937, the maximum caliber of gun carried by capital ships shall be 16 in. (406 mm.).

(3) No capital ship of sub-category (a), the standard displacement of which is less than 17,500 tons (17,780 metric tons), shall be laid down or acquired prior to 1 January 1943.

(4) No capital ship, the main armament of which consists of guns of less than 10 in. (254 mm.) caliber, shall be laid down or acquired prior to 1 January 1943.

Article 5

(1) No aircraft-carrier shall exceed 23,000 tons (23,368 metric tons) standard displacement or carry a gun with a caliber exceeding 6.1 in. (155 mm.).

(2) If the armament of any aircraft-carrier includes guns exceeding 5.25 in. (134 mm.) in caliber, the total number of guns carried which exceed that caliber shall not be more than ten.

Article 6

(1) No light surface vessel of sub-category (b) exceeding 8,000 tons (8,128 metric tons) standard displacement, and no light surface vessel of sub-category (a) shall be laid down or acquired prior to 1 January 1943.

(2) Notwithstanding the provisions of paragraph (1) above, if the requirements of the national security of any High Contracting Party are, in his opinion, materially affected by the actual or authorised amount of construction by any Power of light surface vessels of sub-category (b), or of light surface vessels not conforming to the restrictions of paragraph (1) above, such High Contracting Party shall, upon notifying the other High Contracting Parties of his intentions and the reasons therefor, have the right to lay down or acquire light surface vessels of sub-categories (a) and (b) of any standard displacement up to 10,000 tons (10,160 metric tons) subject to the observance of the provisions of Part III of the present Treaty. Each of the other High Contracting Parties shall thereupon be entitled to exercise the same right.

(3) It is understood that the provisions of paragraph (1) above constitute no undertaking expressed or implied to continue the restrictions therein prescribed after the year 1942.

Article 7

No submarine shall exceed 2,000 tons (2,032 metric tons) standard displacement or carry a gun exceeding 5.1 in. (130 mm.) in caliber.

Article 8

Every vessel shall be rated at its standard displacement, as defined in Article 1A of the present Treaty.

Article 9

No preparations shall be made in merchant ships in time of peace for the installation of warlike armaments for the purpose of converting such ships into vessels of war, other than the necessary stiffening of decks for the mounting of guns not exceeding 6.1 in. (155 mm.) in caliber.

Article 10

Vessels which were laid down before the date of the coming into force of the present Treaty, the standard displacement or armament of which exceeds the limitations or restrictions prescribed in this Part of the present Treaty for their category or sub-category, or vessels which before that date were converted to target use exclusively or retained exclusively for experimental or training purposes under the provisions of previous treaties, shall retain the category or designation which applied to them before the said date.

PART III

ADVANCE NOTIFICATION AND EXCHANGE OF INFORMATION

Article 11

(1) Each of the High Contracting Parties shall communicate every year to each of the other High Contracting Parties information, as hereinafter provided, regarding his annual programme for the construction and acquisition of all vessels of the categories and sub-categories mentioned in Article 12(a), whether or not the vessels concerned are constructed within his own jurisdiction, and periodical information giving details of such vessels and of any alterations to vessels of the said categories or sub-categories already completed.

(2) For the purposes of this and the succeeding Parts of the present Treaty, information shall be deemed to have reached a High Contracting Party on the date upon which such information is communicated to his diplomatic representatives accredited to the High Contracting Party by whom the information is given.

(3) This information shall be treated as confidential until published by the High Contracting Party supplying it.

Article 12

The information to be furnished under the preceding Article in respect of vessels constructed by or for a High Contracting Party shall be given as follows; and so as to reach all the other High Contracting Parties within the periods or at the times mentioned:

(a) Within the first four months of each calendar year, the Annual Programme of construction of all vessels of the following categories and sub-categories, stating the number of vessels of each category or sub-category and, for each vessel, the caliber of the largest gun. The categories and sub-categories in question are:

Capital ships:

sub-category (a)

sub-category (b)

Aircraft-carriers:

sub-category (a)

sub-category (b)

Light surface vessels:

sub-category (a)

sub-category (b)

sub-category (c)

Submarines.

(b) Not less than four months before the date of the laying of the keel, the following particulars in respect of each such vessel:

Name of designation;

Category and sub-category;

Standard displacement in tons and metric tons;

Length at waterline at standard displacement;

Extreme beam at or below waterline at standard displacement;

Mean draught at standard displacement;

Designed horse-power;

Designed speed;

Type of machinery;

Type of fuel;

Number and caliber of all guns of 3 in. (76 mm.) caliber and above;

Approximate number of guns of less than 3 in. (76 mm.) caliber;

Number of torpedo tubes;

Whether designed to lay mines;

Approximate number of aircraft for which provision is to be made.

(c) As soon as possible after the laying-down of the keel of each such vessel, the date on which it was laid.

(d) Within one month after the date of completion of each such vessel, the date of completion together with all the particulars specified in paragraph (b) above relating to the vessel on completion.

(e) Annually during the month of January, in respect of vessels belonging to the categories and sub-categories mentioned in paragraph (a) above:

(i) Information as to any important alterations which it may have proved necessary to make during the preceding year in vessels under construction, in so far as these alterations affect the particulars mentioned in paragraph (b) above.

(ii) Information as to any important alterations made during the preceding year in vessels previously completed, in so far as these alterations affect the particulars mentioned in paragraph (b) above.

(iii) Information concerning vessels which may have been scrapped or otherwise disposed of during the preceding year. If such vessels are not scrapped, sufficient information shall be given to enable their new status and condition to be determined.

(f) Not less than four months before undertaking such alterations as would cause a completed vessel to come within one of the categories or sub-categories mentioned in paragraph (a) above, or such alterations as would cause a vessel to change from one to

another of the said categories or sub-categories: information as to her intended characteristics as specified in paragraph (b) above.

Article 13

No vessel coming within the categories or sub-categories mentioned in Article 12(a) shall be laid down by any High Contracting Party until after the expiration of a period of four months both from the date on which the Annual Programme in which the vessel is included, and from the date on which the particulars in respect of that vessel prescribed by Article 12(b), have reached all the other High Contracting Parties.

Article 14

If a High Contracting Party intends to acquire a completed or partially completed vessel coming within the categories or sub-categories mentioned in Article 12(a), that vessel shall be declared at the same time and in the same manner as the vessels included in the Annual Programme prescribed in the said Article. No such vessel shall be acquired until after the expiration of a period of four months from the date on which such declaration has reached all the other High Contracting Parties. The particulars mentioned in Article 12(b), together with the date on which the keel was laid, shall be furnished in respect of such vessel so as to reach all the other High Contracting Parties within one month after the date on which the contract for the acquisition of the vessel was signed. The particulars mentioned inn Article 12(d), (e) and (f) shall be given as therein prescribed.

Article 15

At the time of communicating the Annual Programme prescribed by Article 12(a), each High Contracting Party shall inform all the other High Contracting Parties of all vessels included in his previous Annual Programmes and declarations that have not yet been laid down or acquired, but which it is the intention to lay down or acquire during the period covered by the first mentioned Annual Programme.

Article 16

If, before the keel of any vessel coming within the categories or sub-categories mentioned in Article 12(a) is laid, any important modification is made in the particulars regarding her which have been communicated under Article 12(b), information concerning this modification shall be given, and the laying of the keel shall be deferred until at least four months after this information has reached all the other High Contracting Parties.

Article 17

No High Contracting Party shall lay down or acquire any vessel of the categories or sub-categories mentioned in Article 12(a), which has not previously been included in his

Annual Programme of construction or declaration of acquisition for the current year or in any earlier Annual Programme or declaration.

Article 18

If the construction, modernisation or reconstruction of any vessel coming within the categories or sub-categories mentioned in Article 12(a), which is for the order of a Power not a party to the present Treaty, is undertaken within the jurisdiction of any High Contracting Party, he shall promptly inform all the other High Contracting Parties of the date of the signing of the contract and shall also give as soon as possible in respect of the vessel all the information mentioned in Article 12(b), (c) and (d).

Article 19

Each High Contracting Party shall give lists of all his minor war vessels and auxiliary vessels with their characteristics, as enumerated in Article 12(b), and information as to the particular service for which they are intended, so as to reach all the other High Contracting Parties within one month after the date of the coming into force of the present Treaty; and, so as to reach all the other High Contracting Parties within the month of January in each subsequent year, any amendments in the lists and changes in the information.

Article 20

Each of the High Contracting Parties shall communicate to each of the other High Contracting Parties, so as to reach the latter within one month after the date of the coming into force of the present Treaty, particulars, as mentioned in Article 12(b), of all vessels of the categories or sub-categories mentioned in Article 12(a), which are then under construction for him, whether or not such vessels are being constructed within his own jurisdiction, together with similar particulars relating to any such vessels then under construction within his own jurisdiction for a Power not a party to the present Treaty.

Article 21

(1) At the time of communicating his initial Annual Programme of construction and declaration of acquisition, each High Contracting Party shall inform each of the other High Contracting Parties of any vessels of the categories or sub-categories mentioned in Article 12(a) which have been previously authorised and which it is the intention to lay down or acquire during the period covered by the said Programme.

(2) Nothing in this Part of the present Treaty shall prevent any High Contracting Party from laying down or acquiring, at any time during the four months following the date of the coming into force of the Treaty, any vessel included, or to be included, in his initial Annual Programme of construction or declaration of acquisition, or previously

authorised, provided that the information prescribed by Article 12(b) concerning each vessel shall be communicated so as to reach all the other High Contracting Parties within one month after the date of the coming into force of the present Treaty.

(3) If the present Treaty should not come into force before 1 May 1937, the initial Annual Programme of construction and declaration of acquisition, to be communicated under Articles 12(a) and 14 shall reach all the other High Contracting Parties within one month after the date of the coming into force of the present Treaty.

PART IV

GENERAL AND SAFEGUARDING CLAUSES

Article 22

No High Contracting Party shall, by gift, sale or any mode of transfer, dispose of any of his surface vessels of war or submarines in such a manner that such vessel may become a surface vessel of war or a submarine in any foreign navy. This provision shall not apply to auxiliary vessels.

Article 23

(1) Nothing in the present Treaty shall prejudice the right of any High Contracting Party, in the event of loss or accidental destruction of a vessel, before the vessel in question has become over-age, to replace such vessel by a vessel of the same category or sub-category as soon as the particulars of the new vessel mentioned in Article 12(b) shall have reached all the other High Contracting Parties.

(2) The provisions of the preceding paragraph shall also govern the immediate replacement, in such circumstances, of a light surface vessel of sub-category (b) exceeding 8,000 tons (8,128 metric tons) standard displacement, or of a light surface vessel of sub-category (a), before the vessel in question has become over-age, by a light surface vessel of the same sub-category of any standard displacement up to 10,000 tons (10,160 metric tons).

Article 24

(1) If any High Contracting Party should become engaged in war, such High Contracting Party may, if he considers the naval requirements of his defence are materially affected, suspend, in so far as he is concerned, any or all of the obligations of the present Treaty, provided that he shall promptly notify the other High Contracting Parties that the circumstances require such suspension, and shall specify the obligations it is considered necessary to suspend.

(2) The other High Contracting Parties shall in such case promptly consult together, and shall examine the situation thus presented with a view to agreeing as to the obligations of the present Treaty, if any, which each of the said High Contracting Parties may suspend. Should such consultation not produce agreement, any of the said High Contracting Parties may suspend, in so far as he is concerned, any or all of the obligations of the present Treaty, provided that he shall promptly give notice to the other High Contracting Parties of the obligations which it is considered necessary to suspend.

(3) On the cessation of hostilities, the High Contracting Parties shall consult together with a view to fixing a date upon which the obligations of the Treaty which have been suspended shall again become operative, and to agreeing upon any amendments in the present Treaty which may be considered necessary.

Article 25

(1) In the event of any vessel not in conformity with the limitations and restrictions as to standard displacement and armament prescribed by Articles 4, 5 and 7 of the present Treaty being authorised, constructed or acquired by a Power not a party to the present Treaty, each High Contracting Party reserves the right to depart if, and to the extent to which, he considers such departures necessary in order to meet the requirements of his national security;

(a) During the remaining period of the Treaty, from the limitations and restrictions of Articles 3, 4, 5, 6(1) and 7, and

(b) During the current year, from his Annual Programmes of construction and declarations of acquisition.

This right shall be exercised in accordance with the following provisions:

(2) Any High Contracting Party who considers it necessary that such right should be exercised, shall notify the other High Contracting Parties to that effect, stating precisely the nature and extent of the proposed departures and the reasons therefor.

(3) The High Contracting Parties shall thereupon consult together and endeavour to reach an agreement with a view to reducing to a minimum the extent of the departures which may be made.

(4) On the expiration of a period of three months from the date of the first of any notifications which may have been given under paragraph (2) above, each of the High Contracting Parties shall, subject to any agreement which may have been reached to the contrary, be entitled to depart during the remaining period of the present Treaty from the limitations and restrictions prescribed in Articles 3, 4, 5, 6(1) and 7 thereof.

(5) On the expiration of the period mentioned in the preceding paragraph, any High Contracting Party shall be at liberty, subject to any agreement which may have been reached during the consultations provided for in paragraph (3) above, and on informing all the other High Contracting Parties, to depart from his Annual Programmes of construction and declarations of acquisition and to alter the characteristics of any vessels building or which have already appeared in his Programmes or declarations.

(6) In such event, no delay in the acquisition, the laying of the keel, or the altering of any vessel shall be necessary by reason of any of the provisions of Part III of the present Treaty. The particulars mentioned in Article 12(b) shall, however, be communicated to all the other High Contracting Parties before the keels of any vessels are laid. In the case of acquisition, information relating to the vessel shall be given under the provisions of Article 14.

Article 26

(1) If the requirements of the national security of any High Contracting Party should, in his opinion, be materially affected by any change of circumstances, other than those provided for in Articles 6(2), 24 and 25 of the present Treaty, such High Contracting Party shall have the right to depart for the current year from his Annual Programmes of construction and declarations of acquisition. The amount of construction by any Party to the Treaty, within the limitations and restrictions thereof, shall not, however, constitute a change of circumstances for the purposes of the present Article. The abovementioned right shall be exercised in accordance with the following provisions:

(2) Such High Contracting Party shall, if he desires to exercise the abovementioned right, notify all the other High Contracting Parties to that effect, stating in what respects he proposes to depart from his Annual Programmes of construction and declarations of acquisition, giving reasons for the proposed departure.

(3) The High Contracting Parties will thereupon consult together with a view to agreement as to whether any departures are necessary in order to meet the situation.

(4) On the expiration of a period of three months from the date of the first of any notifications which may have been given under paragraph (2) above, each of the High Contracting Parties shall, subject to any agreement which may have been reached to the contrary, be entitled to depart from his Annual Programmes of construction and declarations of acquisition, provided notice is promptly given to the other High Contracting Parties stating precisely in what respects he proposes so to depart.

(5) In such event, no delay in the acquisition, the laying of the keel, or the altering of any vessel shall be necessary by reason of any of the provisions of Part III of the present Treaty. The particulars mentioned in Article 12(b) shall, however, be communicated to all the other High Contracting Parties before the keels of any vessels are laid. In the case

of acquisition, information relating to the vessels shall be given under the provisions of Article 14.

PART V

FINAL CLAUSES

Article 27

The present Treaty shall remain in force until 31 December 1942.

Article 28

(1) His Majesty's Government in the United Kingdom of Great Britain and Northern Ireland will, during the last quarter of 1940, initiate through the diplomatic channel a consultation between the Governments of the Parties to the present Treaty with a view to holding a conference in order to frame a new treaty for the reduction and limitation of naval armament. This conference shall take place in 1941 unless the preliminary consultations should have shown that the holding of such a conference at that time would not be desirable or practicable.

(2) In the course of the consultation referred to in the preceding paragraph, views shall be exchanged in order to determine whether, in the light of the circumstances then prevailing and the experience gained in the interval in the design and construction of capital ships, it may be possible to agree upon a reduction in the standard displacement or caliber of guns of capital ships to be constructed under future annual programmes and thus, if possible, to bring about a reduction in the cost of capital ships.

Article 29

None of the provisions of the present Treaty shall constitute a precedent for any future treaty.

Article 30

(1) The present Treaty shall be ratified by the Signatory Powers in accordance with their respective constitutional methods, and the instruments of ratification shall be deposited as soon as possible with His Majesty's Government in the United Kingdom, which will transmit certified copies of all the *procès-verbaux* of the deposits of ratifications to the Governments of the said Powers and of any country on behalf of which accession has been made in accordance with the provisions of Article 31.

(2) The Treaty shall come into force on 1 January 1937, provided that by that date the instruments of ratification of all the said Powers shall have been deposited. If all the

abovementioned instruments of ratification have not been deposited by 1 January 1937, the Treaty shall come into force so soon thereafter as these are all received.

Article 31

(1) The present Treaty shall, at any time after this day's date, be open to accession on behalf of any country for which the Treaty for the Limitation and Reduction of Naval Armament was signed in London on 22 April 1930, but for which the present Treaty has not been signed. The instrument of accession shall be deposited with His Majesty's Government in the United Kingdom, which will transmit certified copies of the *procès-verbaux* of the deposit to the Governments of the Signatory Powers and of any country on behalf of which accession has been made.

(2) Accessions, if made prior to the date of the coming into force of the Treaty, shall take effect on that date. If made afterwards, they shall take effect immediately.

(3) If accession should be made after the date of the coming into force of the Treaty, the following information shall be given by the acceding Power so as to reach all the other High Contracting Parties within one month after the date of accession:

(a) The initial Annual Programme of construction and declaration of acquisition, as prescribed by Articles 12(a) and 14 relating to vessels already authorised, but not yet laid down or acquired, belonging to the categories or sub-categories mentioned in Article 12(a).

(b) A list of the vessels of the abovementioned categories or sub-categories completed or acquired after the date of the coming into force of the present Treaty, stating particulars of such vessels as specified in Article 12(b), together with similar particulars relating to any such vessels which have been constructed within the jurisdiction of the acceding Power after the date of the coming into force of the present Treaty, for a Power not a party thereto.

(c) Particulars, as specified in Article 12(b), of all vessels of the categories or sub-categories abovementioned which are then under construction for the acceding Power, whether or not such vessels are being constructed within his own jurisdiction, together with similar particulars relating to any such vessels then under construction within his jurisdiction for a Power not a party to the present Treaty.

(d) Lists of all minor war vessels and auxiliary vessels with their characteristics and information concerning them, as prescribed by Article 19.

(4) Each of the High Contracting Parties shall reciprocally furnish to the Government of any country on behalf of which accession is made after the date of the coming into force

of the present Treaty, the information specified in paragraph (3) above, so as to reach that Government within the period therein mentioned.

(5) Nothing in Part III of the present Treaty shall prevent an acceding Power from laying down or acquiring, at any time during the four months following the date of accession, any vessel included, or to be included, in his initial Annual Programme of construction or declaration of acquisition, or previously authorised, provided that the information prescribed by Article 12(b) concerning each vessel shall be communicated so as to reach all the other High Contracting Parties within one month after the date of accession.

Article 32

The present Treaty, of which the French and English texts shall both be equally authentic, shall be deposited in the Archives of his Majesty's Government in the United Kingdom of Great Britain and Northern Ireland which will transmit certified copies thereof to the Governments of the countries for which the Treaty for the Limitation and Reduction of Naval Armament was signed in London on 22 April 1930.

IN FAITH WHEREOF the abovenamed Plenipotentiaries have signed the present Treaty and have affixed thereto their seals.

DONE in London the 25th day of March, nineteen hundred and thirty-six.

[Signatures omitted.]

PROTOCOL OF SIGNATURE

At the moment of signing the Treaty bearing this day's date, the undersigned, duly authorised to that effect by their respective Governments, have agreed as follows:

1. If, before the coming into force of the abovementioned Treaty, the naval construction of any Power, or any change of circumstances, should appear likely to render undesirable the coming into force of the Treaty in its present form, the Powers on behalf of which the Treaty has been signed will consult as to whether it is desirable to modify any of its terms to meet the situation thus presented.

2. In the event of the Treaty not coming into force on 1 January 1937, the abovementioned Powers will, as a temporary measure, promptly communicate to one another, after the laying down, acquisition, or completion of any vessels in the categories or sub-categories mentioned in Article 12(a) of the Treaty, the information detailed below concerning all such vessels laid down between 1 January 1937 and the date of the coming into force of the Treaty, provided, however, that this obligation shall not continue after 1 July 1937:

Name or designation;

Classification of the vessel;

Standard displacement in tons and metric tons;

Principal dimensions at standard displacement, namely length at waterline and extreme beam at or below waterline;

Mean draught at standard displacement;

Caliber of the largest gun.

3. The present Protocol, of which the French and English texts shall both be equally authentic, shall come into force on this day's date. It shall be deposited in the archives of His Majesty's Government in the United Kingdom of Great Britain and Northern Ireland which will transmit certified copies thereof to the Governments of the countries for which the Treaty for the Limitation and Reduction of Naval Armament was signed in London on 22 April 1930.

IN FAITH WHEREOF the abovenamed Plenipotentiaries have signed the present Protocol and have affixed thereto their seals.

DONE in London the 25th day of March, nineteen hundred and thirty-six.

[Signatures omitted.]

ADDITIONAL PROTOCOL

The undersigned Plenipotentiaries express the hope that the system of Advance Notification and Exchange of Information will be continued by international agreement after the expiration of the Treaty bearing this day's date, and that it may be possible in any future Treaty to achieve some further measure of reduction in naval armament.

DONE in London the 25th day of March, nineteen hundred and thirty-six.

[Signatures omitted.]

Source: London Conference of 1935, —Treaty for the Limitation of Naval Armament, http://www.navweaps.com/index_tech/tech-089_London_Treaty_1936.htm (accessed 20 January 2011).

APPENDIX D

DESTROYER HEARINGS BEFORE THE BOARD

Year	Starting Page Numbers in Transcript or Type of Document	Hearing Topic
1917	69	Proposed new destroyers
1917	127	New destroyers
1917	154	New destroyers
1917	192	Guns on new destroyers
1917	289	Gun placement on destroyers and comparisons to British designed destroyers
1917	332	Depth charges on destroyers
1917	356	Convoy system
1917	406	Status of naval war abroad
1917	455	Offensive war against submarines
1917	467	Turning radius of destroyers and comparisons to British designed destroyers
1917	565	Speeding up of shipbuilding program
1917	686	Anti-submarine warfare
1917	712	The situation abroad
1917	725	Destroyer operations abroad
1917	775	Shipping situation
1920	325	Development of Pearl Harbor, T. H.
1920	427	Types and characteristics of surface torpedo vessels
1920	549	Characteristics of proposed large type of destroyer
1920	589	Memorandum on Flotilla Leaders (aka destroyer leaders)
1920	679	Proposed characteristics for destroyer Flotilla Leaders
1921	G.B. No.420-2 (Serial No. 1083)	Naval Policy. Building Program for the fiscal year 1923
1922	G.B. No.420-2 (Serial No. 1130)	Naval Policy. Building Program for the fiscal year 1924
1922		U.S. Naval Policy
1923	G.B. No.420-2 (Serial No. 1162)	Naval Policy. Building Program for the fiscal year 1926

1923	315	Hearing on armament of the LANGLEY, but incorporated statements on destroyer armament, specifically torpedoes and guns
1923	492	Conditions in the Far East
1924	G.B. No.420-2 (Serial No. 1251)	Naval Policy. Building Program for the fiscal year 1927
1924	52	Navy Personnel Requirements
1924	391	Expenditure of Special Appropriation
1925	1	Retention of Torpedo Tubes on Battleships
1925	17	Hammond Radio Controlled Torpedo
1925	55	Light Cruiser
1925	301	Ammunition
1925	552	Armor and Hull Strength
1926	G.B. No.420-2 (Serial No. 1338)	Construction Program of the United States Navy
1927	16	Strengthening Bottoms of Ships
1927	G.B. No.420-2 (Serial No. 1345)	Naval Policy: Building Program for fiscal year 1929
1928	97	Military Characteristics for Destroyer Leaders
1928	G.B. No.420-2 (Serial No. 1369)	Fifteen-Year Replacement Program: 1934-1948
1928	G.B. No.420-2 (Serial No. 1376)	Naval Policy: Building Program for fiscal year 1930
1929	6	Defense of Ships Against Diving Bombing Attacks by Aircraft
1929	G.B. No.420-2 (Serial No. 1415)	Naval Policy: Building Program for fiscal year 1931
1930	7	Destroyer Design: Destroyer Batteries – Double Purpose Guns for
1930	G.B. No.420-2 (Serial No. 1473)	Building Program: Fiscal Year 1932
1930	H.R. 12283	House of Representatives Bill —To authorize the construction of certain naval vessels required under the London Naval Conference, and for other purposes
1930	459	Characteristics of Destroyers and Destroyer Leaders
1930	509	Characteristics of Destroyer Leaders and Destroyers
1931	1	Destroyers – Preliminary Design
1931	25	Gun Batteries and Torpedo Batteries for Destroyers

1931	Memorandum from CNO	New Construction Program
1931	G.B. No.420-2 (Serial No. 1523)	Building Program: 1933
1931	Memorandum from CNO	Truce in Armaments
1931	670	Draft Convention for Disarmament Conference – Budgetary Expenditure
1932	1	League of Nations Security Force
1932	G.B. No.420-2 (Serial No. 1568)	Budget - 1934 (Building Program)
1932	G.B. No.420-2 (Serial No. 1578)	Revision of Building Program 1934
1932	Memorandum from CNO	New Construction-Vinson Authorization Bill
1933	Memorandum from DoN JAG	Treaty Tonnage – authority to build up to without specific legislative authorization if funds otherwise available
1933	G.B. No.420-2 (Serial No. 1629)	Proposed legislation to authorize naval construction
1933	1	Characteristics of 1500-Ton Destroyers
1933	40	Military Characteristics of 1,850-Ton Destroyers
1934	President, NWC	1935 Conference for further limitation of naval armaments
1934	G.B. No.420-2 (Serial No. 1659)	Budget – 1936 (Building Program)
1935	70	Proposed Military Characteristics of Destroyers
1935	111	Proposed Military Characteristics of Destroyers
1936	61	Destroyer Design
1937	162	Characteristics of Destroyers
1939	34	Destroyers-Recent Construction Speed
1939	258	DD409-420 – Stability Conditions
1939	280	Destroyers, DD409 Class – Stability Conditions
1939	309	DD's 421-444 – Stability Conditions
1939	460	Destroyer to Accompany Ship —X
1940	G.B. No.420-2 (Serial No. 1944)	Budget – 1940 General Board's Proposed Ten-Year Building Program

1940	287	Combined Hearing USS WYOMING – A.A. Batteries and other A.A. Defenses USS GLEAVES – Stability 1850-Ton Destroyer Leaders – Topside A.A. Protection CL's 55-67 – Use of 6"/47 Guns against Aircraft
1940	474	1200-Ton Destroyers
1941	1	Heavy Machine Guns on 1620-Ton Destroyers
1941	329	Destroyer Escorts for Great Britain
1941	363	Airplane Carriers
1941	365	Building Program – Combatant Ships, 1943
1941	430	Destroyer Design – Improvements In
1941	486	Destroyers, 2100-Ton – Improvements In
1941	Memorandum to G.B.	Priorities in 2-Ocean Navy Building Program
1941	Memorandum from CNO	Extension of Current Building Program

Source: GBH, HBGB 1917-50, Reels 16-25, years 1917-1941.

BIBLIOGRAPHY

Archival Sources

National Archives and Records Administration, Record Group 80, *The Proceedings and Hearings of the General Board of the U.S. Navy, 1900-1950* (Microfilm) located at The Combined Arms Research Library, Fort Leavenworth, KS

———. General Board Studies, 420, 420-2, 449, 438, 438-1, 438-2.

———. Chief of Naval Operations Correspondence, (Microfilm), 198-1.

———. Chief of Naval Operations Correspondence, RG80 (microfilm)

Guide to the Scholarly Resources Microfilm Edition of the Hearings before the General Board of the Navy, 1917-50. Lists specific topics and provides the year, volume, page number, and microfilm roll number for that topic., Wilmington, DE: Scholarly Resources, 1983.

Sims, William S. *The Victory at Sea.* Annapolis, MD: U.S. Naval Institute Press, 1984 (first published 1921).

Books

Evans, David C. and Peattie, Mark R. *Kaigun*. Annapolis, MD: Naval Institute Press, 1997.

Friedman, Norman. *U.S. Destroyers: An Illustrated Design History*, Revised Edition. Annapolis, MD: Naval Institute Press, 2004.

Garraty, John A., and Robert A. McCaughey. *The American Nation: A History of the United States.* New York: Harper & Row, Publishers, 1987.

Halpern, Paul G. *A Naval History of World War I.* Annapolis, MD: Naval Institute Press, 1994.

Hammond, James W. Jr. *The Treaty Navy: The Story of the US Naval Service Between the World Wars*. Victoria, BC: Wesley Press, 2001.

Hone, Thomas C., and Trent Hone. *Battle Line: The United States Navy, 1919-1939*. Annapolis, MD: Naval Institute Press, 2006.

Kuehn, John T. *Agents of Innovation: The General Board and the Design of the Fleet that Defeated the Japanese.* Annapolis, MD: Naval Institute Press, 2008.

———. "Revive the General Board of the Navy." *United States Naval Institute Proceedings* (October 2010): 66-71.

———. "The U.S. Navy General Board and Naval Arms Limitation: 1922-1937." *The Journal of Military History* 74, no. 4 (October 2010): 1129-1160.

Miller, Edward S. *War Plan Orange.* Annapolis, MD: Naval Institute Press, 1991.

Murray, Williamson, and Allan Millett. *Military Innovation in the Interwar Period*.Cambridge: Cambridge University Press, 1996.

Nofi, Albert A. *To Train the Fleet for War: The U.S. Navy Fleet Problems, 1923-1940*. Newport, RI: Naval War College Press, 2010.

Osborne, Eric W. *Destroyers: An Illustrated History of Their Impact*. Santa Barbara, CA: ABC-CLIO, Inc., 2005.

Roskill, Stephen. *Naval Policy between the Wars, Vol 1: The Period of Anglo-AmericanAntagonism, 1919-1929*. London: Collins, 1968.

Terraine, John. *Business in Great Waters: The U-Boat Wars 1916-1945*. South Yorkshire, U.K.: Pen and Sword Books Limited, 2009.

Turabian, Kate L. *A Manual for Writers.* 6th ed. Revised by. John Grossman and AliceBennett. Chicago: University of Chicago Press, 1996.

Government Documents and Studies

Naval Historical Center. *Dictionary of American Naval Fighting Ships,* Volumes 1-8. James L. Mooney, Editor. Washington, DC: U.S. Government Printing Office, 1991.

U.S. Congress. H.R. 12283, 71st Congress, 2nd Session, 9 May 1930. Washington, DC: Government Printing Office, 1930.

U.S. Government. Papers Relating to the Foreign Relations of the United States: 1922, Vol. 1: 247-266. Treaty Series No. 671. http://www.ibiblio.org/pha/pre-war/ 1922/nav_lim.html (accessed March 2011).

U.S. Senate Document No. 77. *Conference on The Limitation of Armament, Senate Document*. Washington, DC: U.S. Government Printing Office, 1921.

———. No. 126. *Conference on Limitation of Armament*. Washington, DC: Government Printing Office, 1922.

Theses and Dissertations

Kuehn, John T. "The Influence of Naval Arms Limitation on U.S. Naval Innovation During the Interwar Period, 1921-1937." Ph.D. Dissertation, Kansas State University, Manhattan, 2007.

Electronic Sources

Gustin, Emmanuel. "Weapons and Technologies: British ASV Radars." http://www.uboat.net/allies/technical/uk_radars.htm (accessed 5 March 2011).

Helgason, Gudmundur. "Allied Warships Hit during WW I." http://www.uboat.net/wwi/ ships_hit/warships.html (accessed 5 March 2011).

———. "Chart of U-boat Losses, 1939-1945." http://www.uboat.net/fates/losses/ chart.htm (accessed 15 March 2011).

———. "Convoy Routes." http://www.uboat.net/ops/convoys/routes.php (accessed 5 March 2011).

———. "Ship Losses by Month." http://www.uboat.net/allies/warships/war_losses. html (accessed 15 March 2011).

———. "The U-boats of World War One, 1914-1918." http://www.uboat.net/wwi/ boats/ (accessed 5 March 2011).

———. "U-boats Losses, 1914-1918." http://www.uboat.net/wwi/fates/losses.html (accessed 5 March 2011).

———. "Weapons and Technologies: ASDIC/Sonar." http://www.uboat.net/allies/ technical/asdic.htm (accessed 15 March 2011).

Hone, Trent. "U.S. Navy Surface Battle Doctrine and Victory in the Pacific." *Naval War College Review* 62, no. 1 (Winter 2009). http://www.usnwc.edu/getattachment/ ab5a5f1b-596e-4f95-9781-8fa1df036731/U-S--Navy-Surface-Battle-Doctrine-and-Victory-in-t (accessed 25 April 11).

Howeth, Linwood S. "Development of Underwater Sound and Detection Equipment." *History of Communications-Electronics in the United States Navy*, Chapter 25, 1963, 297-312. http://earlyradiohistory.us/1963hw26.htm (accessed 30 April 11).

Koromhas, M. S. "American Naval Preparations for Pacific War, 1931-1941, A Retrospective and Reappraisal." http://www.globalsecurity.org/military/ library/report/1995/KMS.htm (15 April 2011).

Krepinevich, Andrew. "Transforming to Victory: The U.S. Navy, Carrier Aviation, and Preparing for War in the Pacific." The Olin Institute, 2000. http://www.csbaonline.org/4publications/publibrary/A.20000000.transforming_to_vi/A.20000000.transforming_to_vi.php (accessed 2 April 2011).

Kuehn, John T. "Revive the General Board of the Navy," *U.S. Naval Institute* 136 (October 2010). http://www.usni.org/magazines/proceedings/2010-10/revive-general-board-navy-0 (accessed 10 May 2011).

———. "Terrorists and Submarines: Lessons for Afghanistan from the Antisubmarine Campaign of World War I." *JFQ* no. 58 (2010). http://www.ndupress.ndu.edu (accessed 25 April 2011).

McComb, David. W. "Introduction," Destroyer History Foundation. http://destroyerhistory.org/destroyers/index.asp?r=0&pid=2000 (accessed 20 March 2011).

Uboataces.com. "Battle of the Atlantic: America Joins the War." http://www.uboataces.com/boa-america.shtml (accessed 15 March 2011).

U.S. Department of State. Publication 1983, *Peace and War: United States Foreign Policy, 1931-1941,* "Disarmament Discussions: 1932-1934." Washington, DC: U.S. Government Printing Office 1943, 8-12. http://www.mtholyoke.edu/acad/intrel/WorldWar2/disarm.htm (accessed 5 December 2010).

INITIAL DISTRIBUTION LIST

Combined Arms Research Library
U.S. Army Command and General Staff College
250 Gibbon Ave.
Fort Leavenworth, KS 66027-2314

Defense Technical Information Center/OCA
825 John J. Kingman Rd., Suite 944
Fort Belvoir, VA 22060-6218

Naval History and Heritage Command
Department of the Navy – Naval Historical Center
805 Kidder Breese SE – Washington Navy Yard
Washington, DC 20374-5060

Naval War College
686 Cushing Road
Newport, RI 02841-1207

U.S. Naval Academy
History Department
107 Maryland Avenue
Annapolis, MD 21402

Naval Postgraduate School
Department of History
1 University Circle
Monterey, CA 93943

Dr. John T. Kuehn
DMH, USACGSC
100 Stimson Ave.
Fort Leavenworth, KS 66027-2301

Wilburn E. Meador
DMH, USACGSC
100 Stimson Ave.
Fort Leavenworth, KS 66027-2301

David W. Christie
DJIMO, USACGSC
100 Stimson Ave.
Fort Leavenworth, KS 66027-2301