

**UNITED STATES NAVY FLEET PROBLEMS AND THE DEVELOPMENT OF
CARRIER AVIATION, 1929-1933**

A Thesis

by

RYAN DAVID WADLE

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

MASTER OF ARTS

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ABSTRACT

United States Navy Fleet Problems and the Development of
Carrier Aviation, 1929-1933. (August 2005)

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The U.S. Navy first took official notice of aviation in 1910, but its development of carrier aviation lagged behind Great Britain's until the 1920s. The first American aircraft carrier, the *Langley*, commissioned in 1919, provided the Navy with a valuable platform to explore the potential uses of carrier aviation, but was usually limited to scouting and fleet air defense in the U.S. Navy's annual interwar exercises called fleet problems.

This began to change in 1929 with the introduction of the carriers *Lexington* and *Saratoga* in Fleet Problem IX. After this exercise, which included a raid by aircraft from the *Saratoga* that "destroyed" the Pacific side of the Panama Canal, the carriers were assigned a wider variety of roles over the next five years of exercises. During this time, the carriers gained their independence from the battle line, which the smaller and slower *Langley* had been unable to do. Reflecting the advanced capabilities of the new carriers, the fleet problems conducted during Admiral William Veazie Pratt's tenure as Chief of Naval Operations, 1930-1933, began to test the employment of the new carriers as the centerpiece of one of the opposing fleets within the exercises. The *Lexington* and *Saratoga* were used offensively during these exercises, employing their aircraft to sink

surface ships, though not battleships, and successfully strike targets ashore. The carriers became successful in spite of the unreliability of early 1930s carrier aircraft, particularly the torpedo bombers, that could carry heavy payloads.

Lessons learned from the *Lexington* and *Saratoga* Fleet Problems IX through XIV influenced the design of the next generation of American aircraft carriers, the *Yorktown*-class, which were authorized in 1933. These new carriers were faster and much larger than the carrier *Ranger*, commissioned in 1934 and designed before the *Lexington* and *Saratoga* began participating in the exercises. Features incorporated into the *Yorktown*-class based on operational experience included the reduced need for large surface batteries because of the use of escort vessels, the emphasis of armoring against shellfire over aerial bombs and torpedoes, and the capability to launch large numbers of aircraft quickly.

To my parents, Dave and Diane.

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Any errors within this thesis I accept as my own.

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CHAPTER I

INTRODUCTION

Beginning in 1911, the year Eugene Ely became the first pilot to fly an airplane from the deck of a ship, the U.S. Navy's interest in aviation steadily increased, and the outbreak of World War I quickened the pace of its development. Despite the growth of naval aviation, including some nascent bureaucratic support, the United States lagged behind other navies, particularly the British, in the development of naval aviation. The British, having experimented with hybrid carriers already, commissioned their first true aircraft carrier, the *Argus*, in 1918, but the United States did not allocate funds for one until 1919.

In the early 1920s, the United States Navy decided to take advantage of the annual fleet concentrations during the winter months to schedule exercises in which the lion's share of the fleet would participate. The first exercise, known as Fleet Problem I, gave birth to a series of annual exercises that continued until the eve of World War II. The early years of the Fleet Problems saw only limited participation by aircraft, primarily because naval aviation remained in its infancy and the United States possessed only one carrier, the experimental *Langley*. The commissioning of the U.S. Navy's second and third carriers, the *Lexington* and *Saratoga*, in 1927 allowed more sophisticated study of the roles that aviation could play in fleet operations. Beginning in 1929, the two new carriers, which had resulted from the Washington Naval Treaty, began participating in the annual exercises.

This study analyzes the participation of those carriers in Fleet Problems IX through XIV, which were held from 1929 to 1933. Although much has been written dealing with certain aspects of carrier operations in the Fleet Problems, particularly the impact of those fleet problems on the development of doctrine, no serious study has been made to catalogue the effects the carrier's participation in the Fleet Problems on the design of future carriers, the way aviation was reported on in the media, or the political impact of the fleet problems. The employment of the carriers and the evolution of the scenarios in Fleet Problems IX through XIV reflect the interest of naval aviators in independent, offensive carrier airpower, which was manifested in the design of the *Yorktown*-class carriers. However, the publicity stemming from these Fleet Problems failed to increase the pace of carrier construction.

By early 2005, there have been few in-depth studies of the Fleet Problems, or at least studies that look outward from the problems. The only previous study of the Fleet Problems, Francis L. Keith's 1974 master's thesis, "United States Navy Task Force Evolution: An Analysis of United States Fleet Problems, 1931-1934," focuses, as its title suggests, on the transition of the Navy from one structured around a single battlefleet to one composed of multiple task forces. While Keith is effective in arguing his case, his thesis fails to examine other effects the Fleet Problems had upon the navy.¹

Another master's thesis, Mark Allen Campbell's "The Influence of Air Power Upon the Battle Doctrine of the United States Navy, 1922-1941" (1991), expands Keith's work by focusing on doctrine and concludes that the navy had not only developed a task

¹ Francis Lovell Keith, "United States Navy Task Force Evolution: An Analysis of United States Fleet Problems, 1931-1934" (Master's thesis, University of Maryland, 1974).

force structure, but that it has also shifted from a battleship-oriented fleet to a balanced force structure by 1941. Campbell attaches great importance to the Fleet Problems, especially those between 1929 and 1940, which he correctly views as the Navy's most important forum for testing theories about the usage of aircraft carriers. Some technical developments are covered, as well as the naval expansion of the late 1930s and early 1940s that would have resulted, once all authorized ships entered service, in a balanced fleet with nearly equal numbers of carriers and battleships.²

Several published histories of naval aviation history discuss the Fleet Problems, but all have their limitations. Among the most noteworthy is Charles Melhorn's *Two Block Fox*, which examines the rise of naval and carrier aviation in the U.S. Navy prior to 1930. Melhorn argues that the carrier air power so successfully employed against the Japanese during World War II was developed during the interwar period. Melhorn's narrative covers much of the early years of American naval aviation in great detail, but suddenly stops following the successful assault upon the Panama Canal during Fleet Problem IX in 1929. While this exercise clearly showed the potential of carrier aviation, the ships, the aircraft, and the doctrine needed to employ them remained in their infancy, and Melhorn does not discuss subsequent developments.³

Clark Reynolds' *The Fast Carriers* acknowledges the importance of Fleet Problem IX and subsequent exercises in defining an offensive role for aircraft carriers and in highlighting the difficulties of having the carriers steam in company with the

² Mark Allen Campbell, "The Influence of Air Power Upon the Evolution of Battle Doctrine in the U.S. Navy, 1922-1941" (Master's thesis, University of Massachusetts at Boston, 1992).

³ Charles Melhorn, *Two Block Fox: The Rise of the Aircraft Carrier, 1911-1929* (Annapolis, 1974).

slower battleships. However, Reynolds' devotes less than ten percent of his nearly 500 pages to the interwar era. The bulk of his book describes how technology, the commissioning of a dozen *Essex*- and *Independence*-class carriers, and experience gained in wartime operations transformed carrier task forces from small, vulnerable formations into large, powerful strike forces by 1943.⁴

A more recent publication, *American and British Aircraft Carrier Development, 1919-1941*, a collaborative effort between Norman Friedman, Thomas C. Hone, and Mark Mandeles, analyzes how the U.S. Navy first caught up with, then surpassed, Great Britain to become the leader in carrier aviation by the start of World War II. Focusing on institutional developments, the authors conclude that the key components of American success were the interactions between the Bureau of Aeronautics, the Naval War College, and fleet exercises, particularly the Fleet Problems.⁵

Geoffrey Till's article, "Adopting the Aircraft Carrier: The British, American, and Japanese Case Studies," in Allan Millett and Williamson Murray's *Military Innovation in the Interwar Period* focuses upon the British experience, with the other two nations used as counterpoints. He argues that, technically and administratively, a firm foundation developed for American carrier aviation during the interwar period, and that the United States viewed carriers as a means to protect the fleet against air attack during a hypothetical Pacific campaign. Though he acknowledges the simulated carrier strikes on

⁴ Clark Reynolds, *The Fast Carriers: The Forging of an Air Navy* (New York, 1968).

⁵ Norman Friedman, Thomas C. Hone, and Mark Mandeles, *American and British Aircraft Carrier Development, 1919-1941* (Annapolis, 1999).

the Panama Canal in 1929 and Pearl Harbor in 1932, Till argues that carrier vulnerabilities prevented the formation of carrier task forces in the 1930s.⁶

Thomas Wildenberg's *Destined for Glory* traces the development of one form of carrier aviation, that of dive-bombing, that culminated in the stunning success at Midway in 1942. The book describes of naval aviation's development in the interwar period, with exercises, aircraft development, and doctrinal evolution. As such, it describes several Fleet Problems, but gives most only given cursory examinations.⁷

Wildenberg and Reynolds have also written biographies of two pioneer naval aviators that also cover certain aspects of the Fleet Problems. Wildenberg's *All the Factors of Victory: Admiral Joseph Mason Reeves and the Origins of Carrier Airpower* examines the Fleet Problems Reeves participated in, with special attention devoted to Reeves' role in Fleet Problem IX. Reynolds' biography, *Admiral John H. Towers: The Struggle for Naval Air Supremacy*, discusses Towers' participation in the exercises, particularly Grand Joint Exercise 4 and Fleet Problem XIII in 1932. Both books are excellent studies of the men and interwar naval aviation as a whole, but are hampered by the fact that neither man participated in all of the 1929-1933 Fleet Problems.⁸

⁶ Geoffrey Till, "Adopting the Aircraft Carrier: The British, American, and Japanese Case Studies," in *Military Innovation in the Interwar Period*, eds. Allan R. Millett and Williamson Murray (New York, 1996), 191-226.

⁷ Thomas Wildenberg, *Destined for Glory: Dive Bombing, Midway, and the Evolution of Carrier Air Power* (Annapolis, 1998).

⁸ Thomas Wildenberg, *All the Factors of Victory: Admiral Joseph Mason Reeves and the Origins of Carrier Air Power* (Washington, 2003); Clark Reynolds, *Admiral John H. Towers: The Struggle for Naval Air Supremacy* (Annapolis, 1991).

While all of these works provide valuable insight into limited aspects of the Fleet Problems, the Fleet Problems themselves are not the focus of any of studies, and those that do focus on the exercises are too narrowly focused on doctrine.

The most important primary source material are reproduced in the microfilm series *Records Relating to United States Navy Fleet Problems 1923-1941*, which contains a variety of documents culled from several different National Archives record groups. The Reports to the Commander-In-Chief, U.S. Fleet (CINCUS) are of particular importance because they include descriptions of the scenarios and force structures heading into each problem, narratives of the actual exercise, and critiques of the methods and forces involved following the problem's conclusion.

The *Annual Reports of Fleets and Task Forces of the US Navy, 1920-1941* were examined to determine how the commanders of the fleet, the Battle Force, and Scouting Force evaluated the value of air operations in their reports. *Records of the Joint Board, 1903-1947* provided some information on joint exercises between the Army and Navy.

Record Group 80 at the National Archives, which contains the textual records for the Navy Department, gave insight to General Board decisions during the period, particularly serials discussing a specific issue. Supplementing these records is Record Group 8 from the Naval Historical Collection at the Naval War College in Newport, Rhode Island, Intelligence and Technical Archives, 1885-1982, which includes significant information about Grand Joint Exercise 4, and the personal paper collections of William Pratt and Harry Yarnell, two of the key participants in the exercises from 1929 to 1933.

To gauge the political importance of the Fleet Problems, pertinent volumes of *The Congressional Record* were used to analyze how the Fleet Problems were cited in Congressional debates. Contemporary newspapers and professional journals, such as the U.S. Naval Institute *Proceedings* and the *New York Times*, were consulted to measure the publicity afforded the Fleet Problems.

CHAPTER II

NAVAL AVIATION, 1910-1928

Despite the success of the Wright brothers and other aviation pioneers, it was not until 1908 that the U.S. Navy took any official interest in aviation. This is somewhat understandable, given the unreliable engines and short flight times of the aircraft in existence at the time. However, it would still take two more years for the navy to gain any practical experience with aircraft.

In late 1910 the Navy finally began to take steps to harness aviation for its purposes. On 14 November, Eugene Ely, a test pilot for Glenn Curtiss, took to the air from a temporary wooden platform placed upon the bow of the cruiser *Birmingham*. Curtiss had feared what a failed attempt might do to his efforts to sell aircraft to the military, but the flight was not a failure, nor was it a rallying point to force the military into giving aviation massive support. Two months later, on 18 January 1911, Ely made a second flight in which he landed, and then took off again, from the deck of the armored cruiser *Pennsylvania*. By 4 March the navy was interested enough in the potential of aviation that it allocated \$25,000 for the purchase of naval aircraft. In another sign of the importance accorded aviation, Captain Washington Irving Chambers, who had been informally working to further aviation for the much of 1910, was given a place in the Bureau of Navigation.¹

Following Ely's successful test flights, the next period of aviation dealt primarily with the training of the first navy fliers, beginning in 1911 at San Diego and Annapolis

¹ Archibald Turnbull and Clifford L. Lord, *History of United States Naval Aviation* (New York, 1972), 15.

and continuing over the next two years at those locations, as well as at Hammondsport, New York, the site of Glenn Curtiss' aviation school and test center. Among these early aviators was John H. Towers, who would reach the rank of admiral and hold several key positions during his storied career.²

During this period, Admiral Bradley Fiske, a noted advocate of naval reforms and a brilliant technical innovator in naval gunnery, pushed a plan in 1911 to defend the Philippines with torpedo planes. Not surprisingly, Fiske's superiors quickly shelved the plan. Despite the rebuff, the quest to create a workable torpedo plane would occupy much of Fiske's time in later years.³

The next leaps forward occurred in 1914. Early that year, the old battleship *Mississippi*, with Lieutenant Commander Henry Mustin in command, was chosen to become the first test ship for aviation operations in the fleet. Mustin would take the ship to the new naval station created specifically for flight training at Pensacola, Florida. In April, as a flotilla under the command of Rear Admiral William S. Sims was visiting the station, orders were received to take aircraft to Tampico, Mexico, and the *Mississippi* was ordered to Vera Cruz. Soon after its arrival off Vera Cruz on 24 April, a plane was launched to scout the harbor, marking the first time an American aircraft flew during a combat situation. Further flights from both detachments were uneventful, and the *Mississippi* left Mexican waters to return to Pensacola on 13 June with all its aircraft.⁴

² Clark Reynolds, *Admiral John H. Towers: The Struggle for Naval Air Supremacy* (Annapolis, 1991), 33-44.

³ Paolo E. Coletta, *Admiral Bradley Fiske and the American Navy* (Lawrence, 1979), 94-95.

⁴ George Van Deurs, *Wings for the Fleet: A Narrative of Naval Aviation's Early Development* (Annapolis, 1966), 108-111.

On the administrative side, Chambers had repeatedly requested, without success, the creation of an Office of Aeronautics, and thus he was still functioning with little more than the meager support he received when he took his post. Fiske apparently concluded that Chambers was not a strong enough advocate for naval aviation, and engineered his replacement in December 1913 by Captain Mark Bristol. Fiske apparently assumed that Bristol's expertise with ordinance might be of value to aviation, but Bristol's record appears to have been mixed. While Chambers had only flown briefly, he had sought to gain the ear of the pilots and tried to view their concerns from their vantage point. On the other hand, Bristol assumed that detachment would be the most suitable approach to his job, and often times ignored the wishes, or even sound practical experience, of the pilots. For instance, Bristol appears to have been quite unresponsive for a time to the pilots' requests to replace their pusher aircraft with tractor-type engines, with the delay leading to the deaths of several naval aviators. However, Bristol did attempt to gain a much larger and more permanent foothold for aviation within the bureaucracy, if for no other reason than for personal advancement. Ultimately, the infancy of the technology, when combined with a change in the naval hierarchy, dashed Bristol's hopes, and he lacked the charisma of later aviation leaders like William Moffett to combat the changes.⁵

During these early years of naval aviation, the lack of a solid institutional base proved to be a problem for those attempting to advance the cause of aviation. Fiske,

⁵ The views on Bristol are decidedly mixed. For a negative appraisal, see George Van Deurs' *Wings for the Fleet*. A more positive, and perhaps more objective account since Van Deurs was a former aviator himself, is Clifford L. Lord and Archibald Turnbull's *History of United States Naval Aviation; Captain Mark Bristol to Cmdr. Henry C. Mustin*, 16 April 1915, box 6, Henry C. Mustin Papers, (Library of Congress, Washington D.C.). The exact quote from the pusher, tractor debate is "I hope you will not use up too much time on arguments in regard to tractors and pushers, because arguments not based on facts and evidence will waste your time and mine. As far as I can find out from all information abroad, the tractor is doomed for military purposes."

though an aviation advocate, had little difficulty usurping the limited authority that Chambers had possessed. Though Bristol had assumed the title of Director of Naval Aeronautics, aviation was still not entirely autonomous from the bureaus that dominated the naval bureaucracy. The lack of a solid footing left aviation quite susceptible to personal whims and biases, as in the case of Admiral William S. Benson, the first Chief of Naval Operations.

Benson, a captain, was selected ahead of numerous admirals, including Fiske, to become the first Chief of Naval Operations (CNO) in 1916 because Fiske, who had occupied the predecessor post of Aid for Operations, had run afoul of Secretary of the Navy Josephus Daniels too many times. Creation of the CNO position was intended to bring order to the naval bureaucracy and to alleviate the concerns of many in the navy that its seventy year old bureau structure was inadequate to plan for and eventually to fight a successful conflict.

Benson's record during aviation's formative years is decidedly mixed. Though his biographer claims he was interested in aviation, his contemporaries did not always share that sentiment. Aviation's institutional support was degraded under Benson when Bristol's post as Director of Naval Aeronautics was eliminated, and Bristol's role as Commander, Air Service, became more of an operational position aboard the battleship *North Carolina*, which had replaced the *Mississippi* as the aviation vessel. Even a report from the General Board critical of the navy stance towards aviation did not greatly alter the situation. In defense of Benson, naval aviation would expand rapidly on his watch

during World War I, and he also fought postwar attempts to create an independent, unified air service.⁶

Before the United States entered the war, Towers and other aviators served as attachés and reported to officials in Washington that European aircraft designs were far superior to those in America. In 1916 naval aviation received a substantial funding increase, though not as large as many hoped because Secretary of the Navy Josephus Daniels sought from Congress far less than had been requested by uniformed members of the navy. American entry into the war in April 1917 finally spurred the sort of expansion that aviation advocates had wanted for some time. Training and procurement were stepped up immensely, to the point that over 37,000 officers and men trained as pilots or technicians during the war.⁷

The first detachment of planes and pilots arrived in France in June 1917 under Lieutenant Ken Whiting. Over the next year, the buildup of aviation units in Northern Europe and Italy continued, but the desire to train more pilots and difficulties in determining the proper placement and role of aircraft combined delayed their combat debut so that it was not until the last few months of the war that these aviation units finally saw service. Attacks against various land targets, conducted primarily by Marine

⁶ Mary Klachko, *Admiral William Shepherd Benson* (Annapolis, 1987), 44-46; John Fass Morton: *Mustin: A Naval Family of the Twentieth Century* (Annapolis, 2003), 81, 105-106. This transfer was especially difficult for Mustin given the cold relations between him and Bristol stemming from Bristol's seeming inability to properly provide for the needs of the Pensacola station; Turnbull and Lord, *History of United States Naval Aviation*, 64; Klachko, *Admiral William Shepherd Benson*, 167.

⁷ Turnbull and Lord, *History of United States Naval Aviation*, 147.

aviators, as well as 25 attacks against submarines by patrol aircraft, were the primary areas of American naval aviation combat during the war.⁸

During and immediately after World War I, numerous hearings were held before the General Board regarding the status and potential of naval aviation. Most leading naval aviators, including Mustin, Whiting, and Towers, testified before the board, whose members appear to have been skeptical of those who believed that aviation held promise not just in a support role but also as another means of attack against an opposing force. Whatever differences may have existed between the General Board and naval aviators on the proper role of aircraft carriers did not prevent the Board from recommending the conversion of the collier *Jupiter* in April 1919.⁹

The immediate postwar period was dominated by the efforts of Brigadier General William Mitchell to establish air service independent from the army and the navy. An attempt was made to obtain congressional support for an independent air force in December 1918, but it failed. Mitchell, upon his return from Europe in early 1919, intensified his own lobbying efforts, even to the point of saying that navies would become obsolete in the face of overwhelming airpower. During the next two years, Mitchell and his supporters' calls for an independent air service never abated, and Mitchell himself also appeared during the 1919 General Board hearings.

In the midst of the controversy concerning aviation, the Navy had decided to expend the old battleship *Indiana* in tests designed to simulate air attacks upon

⁸ *Ibid.*, 119-141.

⁹ Perhaps the most notable instance of this came during the 1922 hearings, in which the Board was skeptical, almost hostile, to the idea of a carrier as an independent strike weapon. See *Proceedings and Hearings of the General Board, 1900-1950* (microfilm, 28 reels, National Archives, 1987), reel 16, volume 2, pp 26-52; *Ibid.*, reel 14, volume 2, p. 26.

compartmented warships. The tests upon the *Indiana* involved dropping dummy bombs by aircraft, and then placing explosive charges simulating bomb explosions on and near the ship. The navy, which conducted the tests between 14 October and 1 November 1920, sought to keep the trials secret, but photos of damage to the *Indiana* caused by the explosive charges leaked to the public. Mitchell exploited the situation by stating in Congressional testimony in early 1921 that, “We can tell you definitely now that we can either destroy or sink any ship in existence today.”¹⁰

The flurry of controversy resulting from Mitchell’s appearances before Congress led Secretary of the Navy Daniels on 1 March to order new bombing tests be carried out on the old battleship *Iowa* and several former German warships, including the battleship *Ostfriesland*, the cruiser *Frankfurt*, the destroyer *G-102*, and three U-Boats. The U-Boats were the first vessels sunk in the tests, which began on 20 June 1921. Navy aircraft participated in the tests on the *Iowa* on 29 June that involved an aerial search for the battleship, which was rigged with a radio-control system allowing it to move, and aerial attacks were launched using dummy bombs. On 13 July, Mitchell led an attack on the *G-102*, sinking it in twenty minutes. On 18 July the *Frankfurt* sank after attacks by both army and navy planes. For the tests on the *Ostfriesland*, Mitchell ignored the prearranged rules, which provided for an assessment of damage in between attacks and sank the former German battleship with 1,000 and 2,000-pound bombs on 20-21 July 1921. The tests on the German ships were hardly conclusive, given that the vessels had no means to defend themselves, no escort, no damage control crews, and were at anchor in clear

¹⁰ Charles Melhorn, *Two Block Fox: The Rise of the Aircraft Carrier, 1911-1929* (Annapolis, 1974), 60-62. Quote is from p. 61.

weather. Mitchell conducted similar tests against the retired battleship *Alabama* two months later. Mitchell's campaign received major publicity from the bombing tests, but the Navy strengthened its campaign to retain control of naval aviation by establishing the Bureau of Aeronautics during the same time as the tests were being conducted.¹¹

Ironically, Mitchell's quest to form a unified air service spurred the navy's top commanders to finally push for a permanent aviation bureau within the navy. As Charles Melhorn argues, those in the Navy who may have seen little potential in aviation's future strongly resented an outsider attempting to take control of a portion of their service even more than they may have resented upstart fliers pushing for weapon systems of limited power.¹² Thus, Mitchell's efforts finally united a substantial portion of the navy's senior officers behind the creation of an independent bureau on 10 July 1921. There would be occasional efforts to create an independent air service, but the idea lay largely dormant for two decades following Mitchell's court martial in 1926.

The first chief of the new Bureau of Aeronautics, Rear Admiral William A. Moffett, actually began serving as the aviation adviser within the Office of the CNO four months prior to the bureau's creation. Though Moffett was a relative latecomer to aviation, he quickly became a tireless advocate for all forms of naval aviation, including carrier aviation. Moffett proved so successful that he was reappointed to head the Bureau twice before his premature death in the crash of the airship *Akron* in 1933 that brought his stellar career to an end.

¹¹ *Ibid.*, 63, 70-72; Turnbull and Lord, *History of United States Naval Aviation*, 193, 201.

¹² Melhorn, *Two Block Fox*, 56-57.

Although the new bureau wielded much more power than its predecessors, the Bureau of Aeronautics still did not have the total control over all aviation matters that its advocates had hoped for. For instance, the Bureau of Navigation still exerted some influence over personnel matters in naval aviation, and other bureaus affected the procurement of such essential components of air warfare as ordinance and radios. As John Towers protested to the Morrow Board in 1925, “Officers seem to feel that the Bureau is in a position of being burdened with complete responsibility without complete authority.”¹³

In November 1921, deliberations concerning naval disarmament began at the Washington Conference. Moffett, as a part of a subcommittee devoted to aircraft matters, persuaded the delegates to resist proposed limitations on aircraft development. Initially, the proposed limits for aircraft carrier tonnage were set at 80,000 tons while abiding to the 5:5:3 ratio agreed upon for American, British, and Japanese capital ships. Pressure from the British delegation and his own naval advisors forced Secretary of State Charles Evans Hughes to raise the carrier tonnage limit to 135,000 tons. All three of the major naval powers could convert two battlecruisers slated for scrapping into aircraft carriers, with the two American conversions eventually materializing as the *Lexington* and *Saratoga*. Although the delegates agreed upon a 27,000-ton limit for each carrier, the American naval advisors successfully raised the limit on carrier conversions to 33,000 tons, as well as adding a clause allowing for an additional 3,000 tons of modifications for existing vessels that kept the two American conversions within treaty limits.

¹³ Testimony Before Coolidge Aircraft Board, 16 Oct. 1925, box 8, John H. Towers Papers (Library of Congress, Washington D.C.).

Clearly, carrier aviation benefited from the conference by ultimately receiving the pair of battlecruiser conversions. Additionally, Mark Allen Campbell argues that the Five-Power Naval Treaty and subsequent naval limitations treaties indirectly benefited carrier aviation by retarding battleship development for 15 years, which freed up funds for carriers and aircraft. Regardless of the benefits received, the treaty limits upon aircraft carriers seriously impacted the development of carrier aviation for the remainder of the interwar period.¹⁴

For all of the gains, in terms of the practical experience in designing, constructing, and operating naval aircraft, as well as the growth of naval aviation as a legitimate arm of the U.S. Navy, it was not until the late 1920s that several important steps were taken that would ensure naval aviation's place within the navy.

Perhaps the most important institutional change was brought about by the Morrow Board's recommendations of November 1925. The Morrow Board, chaired by Dwight Morrow, had been created by President Calvin Coolidge to examine the whole of military aviation, and, due to its mostly civilian makeup, promised to be a Board with little bias toward either the Army or the Navy. In the end, the Morrow Board came down firmly on the side of fostering aviation growth and issued many key recommendations. Once Congress acted upon these recommendations, naval aviation's future was secured.

Perhaps the most prominent of these was the creation of a construction program of 1,000 aircraft to be completed by 1931. This program, while a great boost to naval aviation, led to some later confusion as to whether the 1,000-plane limit was intended as

¹⁴ William Trimble, *Admiral William A. Moffett: Architect of Naval Aviation* (Washington, 1994), 93-96; Mark Allen Campbell, "The Influence of Air Power Upon the Evolution of Battle Doctrine in the U.S. Navy, 1922-1941" (Master's thesis, University of Massachusetts at Boston, 1992), 34-37.

an upper limit for all naval aircraft. In 1934, Congress cleared up this confusion by appropriating funds for a total of 1,650 aircraft.¹⁵

Another key change was the passage of a law providing that all aircraft carriers, seaplane tenders, and aviation shore stations must be commanded by aviators. This action opened career paths for aviators to reach positions of command equal to those of surface warfare officers who at the time dominated the upper command structure of the navy.¹⁶

Following the release of the Morrow Board's findings, the Navy formed the Taylor Board and ordered its members to make recommendations concerning use of the funds appropriated by Congress in the Naval Aviation Expansion Act of 1926. Under the leadership of Rear Admiral Montgomery M. Taylor, the board recommended the construction of additional aircraft carriers and the procurement of specialized aircraft types rather than attempting to combine functions in aircraft that could potentially be satisfactory at none of its intended roles.¹⁷

During this same period, Joseph Reeves, a respected naval officer for nearly three decades, joined naval aviation. His exact reasons for entering aviation at the age of 53 are not entirely clear, and his prior experience with aviation was less than that of other senior officers, but he would become one of the leading figures of naval aviation over the next several years. Reeves' point of entry was the aviation observer course that Moffett had designed with mid and senior-level naval officers in mind. Rather than having to go

¹⁵ Turnbull and Lord, *History of United States Naval Aviation*, 285.

¹⁶ Norman Friedman, Thomas C. Hone, and Mark Mandeles, *American and British Aircraft Carrier Development, 1919-1941* (Annapolis, 1999), 145-147.

¹⁷ *Ibid.*, 249-260.

through the full training process of a new pilot, which was difficult even for men half Reeves' age, the observer course was much shorter and much less grueling.

From 1925 to 1928, Reeves' focus in his duties as Commander, Aircraft Squadrons, Battle Fleet, was the *Langley*, it being the end result of the conversion of the collier *Jupiter*. Though the carrier had been engaged in flight operations for the three years since commissioning, it was Reeves who made the first real efforts to integrate the operations of the *Langley* with those of the rest of the fleet. When he first observed them, Reeves felt that the operations on the *Langley* lacked discipline and would require a number of changes before the ship could become a functional fighting unit. The Morrow Board was meeting at this time and both General Mitchell and his supporters in Congress were questioning the ability of the navy to develop adequately the potential of aviation. Reeves created what became known as the "Thousand and One Questions" which asked questions covering a wide array of topics concerning carrier operations. It was felt that these questions must be answered before the ship and its complement would be ready to function with the fleet.¹⁸

The primary way Reeves sought to change the *Langley* from a laboratory to a warship was by dramatically increasing the carrier's complement of aircraft, which had usually around six to eight aircraft, and by increasing the rate of takeoffs and landings from the *Langley*'s flight deck. In his efforts to do so, he found himself at odds with other aviators, Towers among them, who objected to the increased takeoff and landing rates

¹⁸ Adolphus Andrews, "An Admiral With Wings: The Career of Admiral Joseph Mason Reeves" (Bachelor's thesis, Princeton, 1943), 54; Thomas Wildenberg has described the tempo of operations on the *Langley* as "lackadaisical." See Thomas Wildenberg, *Destined for Glory: Dive Bombing, Midway, and the Evolution of Carrier Air Power* (Annapolis, 1998), 4; Thomas Wildenberg, *All the Factors of Victory: Admiral Joseph Mason Reeves and the Origins of Carrier Air Power* (Washington, 2003), 126-127.

due to safety concerns. However, Reeves overrode those concerns, and within a year, the *Langley* routinely carried 20 aircraft or more. By June 1927, Reeves believed that the *Langley* might be able to carry as many as 48 aircraft in case of war. These dramatic increases in aircraft handling capacity were brought about by increased efficiency from the deck crew in between aircraft launches and landings resulting from the use of a “deck park,” i.e., using moving aircraft to a section of the deck not needed for takeoffs and landings rather than taking time to lower them to the hanger deck.” Several minutes between takeoffs or landings meant that even a carrier like *Langley* with only a minimal aircraft complement could sometimes require a half hour or more to land its air group. Rather than spending the time to land each aircraft on deck and then lower it to the hangar, the planes would be placed on the forward portions of the flight deck while the remaining aircraft landed. This advance led to the regular placement of significant portions of a carrier’s aircraft upon the flight deck.¹⁹

Even before the Navy had experience operating the *Lexington* and *Saratoga*, the two carriers that were constructed on the hulls of battlecruisers that entered service in late 1927, the characteristics of the *Ranger*, the first American carrier designed for that purpose from the hull up, were agreed upon. The plans for the *Ranger* were influenced by experiences gained operating the *Langley* and by a series of tactical simulations conducted by the Naval War College in the mid-1920s. From those simulations, the Naval War College concluded that the ability to get the largest number of aircraft into the

¹⁹ Eugene E. Wilson to Miles DuVal, 10 January 1969, box 1, Papers of Commander Eugene E. Wilson (Operational Archives Branch, Naval Historical Center, Washington D.C.). Wilson, who served as Reeves’s chief of staff, discussed his role of having to deflect criticism by Towers and others away from Reeves; Friedman, Hone, and Mandeles, *American and British Aircraft Carrier Development, 1919-1941*, 45; *Ibid.*, 42.

air in the shortest amount of time would determine the success of an operation. There was also the common fear of placing too many eggs in one basket, which is what concentrating a fleet's entire air strength in one or two large carriers rather than four smaller ones, had the potential to do. Since the *Lexington* and *Saratoga* took up nearly half the 135,000 tons for carriers allowed for the U.S. Navy under the Washington Treaty, this meant that smaller, more efficient platforms would be needed to provide the maximum number of carriers. Hence, it appeared wiser to build several small carriers—the *Ranger* displaced 13,800 tons—rather than construct a smaller number of larger carriers the size of the 33,000-ton *Saratoga* and *Lexington*. Once all three carriers entered service, operational experience would eventually alter this position.²⁰

Thus, at the time of the introduction of the *Lexington* and *Saratoga* to the fleet in 1928, naval aviation had gained a solid footing within the navy. Even though the United States lagged behind other nations, such as Great Britain, during World War I and its immediate aftermath, the lost ground was quickly made up during the 1920s. Though the U.S. Navy's carrier fleet was still embryonic and entirely dependant upon the limited *Langley*, some key institutional and operational hurdles had been overcome by 1929. While its existence was no longer in doubt, the precise role or roles that aviation would play in naval warfare remained to be determined. Key to determining the role of aviation were the naval exercises and Fleet Problems of the inner war period, particularly Fleet Problems IX through XIV conducted from 1929 to 1933.

²⁰ *Ibid.*, 44.

CHAPTER III

PREVIOUS EXERCISES, 1889-1928

While practicing and drilling had long been a part of naval training, exercises for the modern United States Navy did not begin until 1889, when, in order to prepare the navy for the transition from wind propulsion to steam, the navy's most modern vessels were combined into a single squadron. The Squadron of Evolution, as it was known, comprised the "ABC" protected cruisers, *Atlanta*, *Boston*, and *Chicago*, along with the smaller gunboat *Yorktown*. The largest and most powerful ship in the squadron was its flagship, the *Chicago*, which displaced about 4,500 tons but had both armament and armor that were unimpressive when measured by the current standards of European fleets. The relative weakness of the squadron was readily apparent when, during its first cruise, the Squadron visited eleven major European ports between December 1889 and the spring of 1890.

Though the tour was probably the most impressive display of American naval power since the Civil War, the squadron's commander, Rear Admiral John Walker, seemed to be well aware of the qualitative disparity of his ships in relation to those of the European fleets. Walker noted in a letter to the Navy Department following mechanical troubles in the *Yorktown* that, "I should hesitate to go to a foreign yard or ship and disclose to foreign mechanics this wretched job as a specimen of American work." Following the conclusion of this European cruise, the Squadron returned home by way of

South America and continued to cruise as a single unit until 1892 when the ships were incorporated into the North Atlantic Squadron.¹

The most important function of the squadron was to instruct American sailors in the art of formation steaming and other essential drills, all of which were practiced as the squadron moved from port to port.² These skills would be essential as the United States transitioned away from its traditional *guerre de course* strategy of commercial raiding and protection and towards a *guerre de escadre* strategy emphasizing fleet engagements. Yet there was a public relations angle to the visits, designed both to convince the American public that a stronger navy was needed, and also to send the message to European nations that American naval power was on the ascent.

The Squadron of Evolution existed during a time of great naval expansion, both in the United States and abroad. Also, much like the later Fleet Problems, the Squadron of Evolution represented serious attempts by the Navy to learn the proper usage, tactically and technically, of new ship designs. However, since the U.S. Navy had failed to keep technological pace with European navies following the Civil War, the Americans had a long way to go to catch up with other navies. In addition to the aforementioned construction of the “ABC” cruisers, appropriations were made in 1886 for the first American battleships, the *Maine* and the *Texas*, both of which were commissioned in the early 1890s.

¹ Walker to Secretary of the Navy, 28 Dec. 1889, Letters Sent to Navy Department from Squadron of Evolution, entry 29, RG 313 (National Archives, Washington D.C.), p. 39; Daniel H. Wicks, “First Cruise of the Squadron of Evolution,” *Military Affairs*, 44 (April 1980), 68.

² Walker to Secretary of the Navy, 2 Jan. 1890, Letters Sent to Navy Department from Squadron of Evolution, p. 60; *Ibid.*, 3 March 1890, p. 100; *Ibid.*, 105.

The spur to these developments was the rise of a navalist movement comprising commissioned naval officers and influential civilian leaders. The intellectual leaders of the movement were Commodore Stephen B. Luce and Captain Alfred Thayer Mahan. Both men had come of age in a post-Civil War naval establishment that had seen rapid European naval expansion while the United States Navy had become increasingly budget-conscious and technologically ossified. However, between the two men's efforts at naval (and self) promotion, greater attention from influential Americans both in and out of politics resulted from their efforts. The attention reached a fevered pitch following the 1890 publication of Alfred Thayer Mahan's *The Influence of Sea Power Upon History 1660-1783*, in which he chronicled the rise of British sea power, followed by a series of journal articles in which he advocated the expansion of American sea power. The naval buildup in the United States would prove advantageous during the Spanish-American War when the more modern American squadrons vanquished the inferior Spanish squadrons in the Philippines and Cuba and ensured American victory in the conflict.

Between the Spanish-American War and World War I, perhaps the most important exercise conducted by the U.S. Navy was the winter maneuvers of 1902 and 1903. Unlike the prior Squadron of Evolution and most of the later Fleet Problems, this round of exercises was notable not for technological integration but for intended political impact. The maneuvers were conducted in the eastern Caribbean Sea in response to the blockade of Venezuela by Britain, Germany, and Italy following that Caribbean country's inability to pay its foreign debts. Though quite small, the blockading fleet of only 14 European ships still represented a serious challenge to American dominance in the

Western Hemisphere in the eyes of President Theodore Roosevelt. Much as the later Fleet Problems would do on a regular basis, the 1902/1903 maneuvers were notable for involving the lion's share of the US Navy in commission and ready for sea at the time. In total, 54 ships participated in the maneuvers, and, as an added measure by President Roosevelt indicating the importance he attached to the situation, the fleet was placed under the command of the famed Admiral George Dewey.³

American naval leaders had recently begun developing a number of war plans and these exercises were, in effect, a test of Plan Black. The plan assumed that, in the event of hostilities, Germany would attempt to seize a base in the Caribbean, probably either Cuba or Puerto Rico, and then use that base to harass American commerce, as well as to attack American coastal cities. In response to a war with Germany, the American fleet was to reinforce Puerto Rico and then conduct a search for any approaching German fleet. A Naval War College search problem had been devised to determine the feasibility of search operations in the north Atlantic.

During the search problem, the North Atlantic Squadron under Rear Admiral F. J. Higginson was to prevent the Black fleet under Rear Admiral George M. Sumner from reaching a major Caribbean port. Ships began to gather in Puerto Rico during the last week of November, and the problem began on 4 December. Admiral Sumner decided to divide his ships into two groups, with the slowest four vessels approaching Mayaguez, Puerto Rico, from the south, while the remainder of the fleet approached from the north.

³ Ronald Spector, *Admiral of the New Empire*, (Columbia, South Carolina, 1988), 141.

Sumner's plan proved effective, and both elements of his fleet managed to elude detection by the Blue fleet and reached anchor at Mayaguez on 9 December.⁴

Dewey did not join the fleet until 8 December, one day before the completion of the search problem. He was present for the maneuvers that were conducted off the coast of Puerto Rico until 20 December in which the reconstituted fleet practiced landings on the Puerto Rican coast. The fleet was dispersed over Christmas, but reorganized for a final week of tactical drills that ended on 5 January 1903.⁵

Roosevelt would later claim that he sent an ultimatum to the German ambassador during the maneuvers, though the existence of such an ultimatum is still a matter of historical debate. Dewey believed the presence of his fleet had intimidated Germany into backing away from the crisis, which ended in January 1903. According to George Baer, the end of the crisis resulted more from Germany's isolation following British withdrawal due to some concessions by Venezuela than from the American naval maneuvers. In any case, soon after the conclusion of the exercises, Admiral Dewey called for further American naval expansion and requested 48 new battleships at a rate of four per year to be constructed as a part of the "General Naval Scheme." Congress did not fund such an ambitious building program but by 1905 had authorized construction of 10 battleships and 21 smaller warships.⁶

⁴ General Board No. 277, 22 July 1922, box 163, RG 80 (National Archives, Washington D.C.), pp 1-11.

⁵ Seward Livermore, "Theodore Roosevelt, the American Navy, and the Venezuelan Crisis of 1902-1903," *The American Historical Review*, 51 (April 1946), 462.

⁶ George Baer, *One Hundred Years of Sea Power*, (Stanford, 1993), 39; Spector, *Admiral of the New Empire*, 144; Holger Herwig, *Politics of Frustration* (Chicago, 1971), 81.

The most important result of the 1902/1903 maneuvers was the change in American deployment patterns. Though the fleet had become more concentrated during the previous decade, it was still based upon squadron detachments that harkened back to the days of sail. Following the exercises, the squadron system remained, but all battleships, even those in the Pacific, were consolidated into the North Atlantic Fleet in order to facilitate better training. This was a response to comments like those of Commander Nathan Sargent, an aide to Admiral Dewey, who stated that, "...the formations, both in line and in column, were ragged, distance and guide being badly kept, speed not well regulated and turns unskillfully executed."⁷

There were regular naval exercises leading up to and following American involvement in World War I, but none reached the level of importance that previous or later exercises achieved. However, it was during this period that aviation began to make appearances during fleet maneuvers. The first such exercise where aviation participated occurred in January 1913. The General Board had recommended that the infant aviation force travel with the fleet during its annual trip southward into warmer waters. The first use of naval aircraft in a scouting role occurred on 6 March 1913 when Lieutenant John Towers used one of the aircraft to scout an "enemy" battleship formation. Unfortunately, the wireless transmitter that Towers had installed aboard the aircraft failed to work, so the fleet did not receive his warnings. Other tests during these maneuvers included practice bombing runs, aerial photography, and sightings of submerged submarines. In an effort to

⁷ Spector, *Admiral of the New Empire*, 144; Quoted from *Ibid.*, 144 and Kenneth J. Hagan, *This People's Navy* (New York, 1991), 238.

stimulate interest in naval aviation among officers, several officers flew as passengers in the planes. Thus, the first operations of aircraft with the fleet proved a success.⁸

The other significant prewar interaction between the fleet and aviation occurred in the spring of 1916 when the *North Carolina*, which was the ship assigned to transport and test aircraft operations at the time, joined the fleet off Guantanamo for a round of exercises. Mock air attacks and reconnaissance missions were practiced, and some efforts were made to develop a doctrine for aerial spotting of battleship gunfire. Technical problems with the aircraft engines, radios, and the *North Carolina*'s catapult plagued air operations throughout the exercises. The procedures to accomplish the various tasks were also found to be wanting. In comparison to the positive experiences during the 1913 exercises and the 1914 deployment of the four aircraft of the navy's 1st and 2nd Aero Sections to Mexico, during which they flew reconnaissance missions over occupied Vera Cruz, this exercise was not nearly as successful for aviation.⁹

Aviation did not become a permanent fixture in naval exercises until after World War I, when it was integrated into the Fleet Problems of the interwar era. In the years following the war, exercises were held during the "concentration" period when both the Atlantic and Pacific Fleets would train together during the winter months, usually in the Caribbean or near Panama. After the change in fleet organization from the Atlantic and Pacific Fleets to the Battle Fleet and Scouting Fleet arrangement in late 1922, the concentrations and exercises were formalized as the Fleet Problem system. The Battle

⁸ John Fass Morton, *Mustin: A Naval Family of the Twentieth Century* (Annapolis, 2003), 75; Archibald D. Turnbull and Clifford L. Lord, *History of United States Naval Aviation*, (New York, 1972), 25; George van Deurs, *Wings for the Fleet*, (Annapolis, 1966), 81-82.

⁹ Van Deurs: *Wings for the Fleet*, 137-138; Turnbull and Lord, *History of United States Naval Aviation*, 59-60.

Fleet, composed of the newest battleships and all aircraft carriers, was stationed in the Pacific, and the Scouting Fleet, composed mostly of older battleships, was stationed in the Atlantic.¹⁰

The Fleet Problems became the most comprehensive and constant of the various interwar exercise systems, and at least one was held every year from 1923 onwards. Only the Grand Joint Exercises conducted in cooperation with the Army were nearly as large or complex, but this system came to a halt, with one major exception, after 1925. In total, twenty-one Fleet Problems were held, with Fleet Problem XXII being canceled in 1941 due to the hostile international situation. Though many other exercises were staged during the interwar period with army cooperation, the Fleet Problems were more important for the Navy because they allowed the Navy to test both strategic and tactical applications of naval power under a wide variety of scenarios. The Scouting Fleet and the Battle Fleet usually comprised the opposing fleets, one being the friendly Blue Fleet and the other being the hostile Black Fleet; with transfers between the two forces taking place to achieve the desired mix of forces. During the 1920s, defense of the Panama Canal Zone was a frequent basis for many of the Fleet Problems. Thus, many Fleet Problems were held off the western coast of Central America or in the Caribbean, although the eastern Pacific waters between Hawaii and California eventually became a frequented location.

In fact, a simulated attack and defense upon the Panama Canal was the scenario for Fleet Problem I. Since the *Langley* was not yet ready to participate in exercises, the

¹⁰ Francis L. Keith. "Steps Toward Naval Readiness: An Examination of United States Fleet Problems 1923-1930." Unpublished paper. University of Maryland, 1976, p. 2.

battleships *Oklahoma* and *New York* were designated as “constructive” carriers. A single floatplane from each of the battleships represented the entire air groups that would later be carried by the *Lexington* and *Saratoga*. The strikes upon the Gatun Dam spillway by the floatplanes were judged to be successful, but it was difficult for anyone in the Navy or the other services to take the strikes seriously. One reason for this was the fact that seaplanes possessed a much larger radius of action than did any carrier aircraft at the time, and this would remain true of all carrier-borne attack aircraft until the eve of World War II. Another reason was the simple fact that a single floatplane is unlikely to elicit the same response from the defending forces that a flight of attack aircraft would. The lack of a concerted response by defenders in response to “constructive” air attacks was a problem that would be repeated during Fleet Problem IX several years later. However, it was important that a recommendation was made following the exercise to speed up the acquisition of aircraft carriers, specifically a “large and fast vessel.”¹¹

Fleet Problem II was the first problem the *Langley* was present for, although it did not participate in the problem itself. Instead, officers aboard the ship observed the exercise so that the Navy could determine the best way for it to participate in future Problems. Though not assigned to either fleet, the *Langley* sent a formation of aircraft over the Isthmus to photograph installations, and several aircraft simulated a torpedo attack upon the harbor at Porto Bello. This demonstration was supposed to illustrate the vulnerability of ships in a confined harbor to air attack, but senior naval leaders do not

¹¹ “U.S. Fleet Problem I, February 1923, Report of the Commander in Chief,” *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941* (microfilm, 36 reels, National Archives, 1974) reel 1, 140.

appear to have been impressed by the attack and the *Langley*'s presence was barely mentioned in the post-exercise critique.¹²

Overall, the *Langley*'s career in the early Fleet Problems was undistinguished. The carrier was frequently assigned to scout and provide air protection to the fleet during the exercises. The *Langley* even had difficulties accomplishing those missions since it could only steam at 16 knots, which was slower than even the battle line could travel. Thus, the carrier often had to leave the formation to launch aircraft in support of its mission. Even after Rear Admiral Joseph Reeves worked to increase the *Langley*'s air complement to 36, the relative lack of aircraft meant that the carrier, by necessity, was limited to the basic protection role that conservative naval officers envisioned for aircraft carriers. The navy simply did not possess enough carrier-borne aircraft to pose a significant threat to an enemy fleet or to accomplish a wide variety of missions. The *Langley*'s limitations in aircraft complement and speed also meant that even if its commanding officer or other carrier advocates chose to devise aggressive or independent missions, its handicaps would almost certainly prevent it from carrying out those missions. Thus, the role played by the *Langley* in the early fleet problems served to reinforce the views of anyone unconvinced of the importance of carriers in future naval conflicts.

In light of its early service, the *Langley* could be seen as the forerunner to the escort carriers that would prove vital for convoy protection duties during World War II, a fact not lost upon the navy. As early as 1928, Admiral Moffett saw the value of

¹² Rear Admiral Jackson R. Tate, "We Rode the Covered Wagon," in *The Golden Age Remembered*, ed. E.T. Woolridge (Annapolis, 1998), 74-75.

converting merchant ships into aviation vessels similar to the *Langley* as an efficient and effective means to, "...offer very serious menace to subsurface and surface craft."¹³

One of the few instances of the *Langley* overcoming its handicaps occurred in a joint Army-Navy exercise held immediately before Fleet Problem VII in early March 1927. The carrier, which was under the command of Admiral Reeves, was to support a naval attack upon the Panama Canal's Pacific defenses. Rather than merely accepting the standard role of fleet air defense and artillery spotting for the *Langley* and its aircraft, Reeves used his aircraft to escort and assist a strike by amphibious aircraft against Army airfields. Bad weather and aircraft problems limited the size of the strike, but in the eyes of the umpires evaluating the exercise, it succeeded in eliminating the Army aircraft tasked with defending the Pacific side of the canal. According to Thomas Wildenberg, Reeves' superiors attached a great deal of importance to the tempo of the *Langley*'s air operations since twenty aircraft had been launched in ten minutes.¹⁴ Later that month, during the course of Fleet Problem VII, Reeves launched an air attack upon enemy destroyers, but the aggressive nature of these two strikes were the exception and not the rule to the *Langley*'s career in the Fleet Problems.

Typical of the *Langley*'s experiences were those of Fleet Problem VIII, held in April 1928. Both the *Lexington* and *Saratoga* were still working up to join the fleet at that time, and *Langley*, the only aviation vessel, was assigned to scout for the Black Fleet as it attempted to launch an invasion of Hawaii. The exercise was uneventful for the *Langley*,

¹³ Chief of the Bureau of Aeronautics to the Secretary of the Navy, 31 July 1928, box 191, RG 80 (National Archives, Washington D.C.), 7.

¹⁴ Thomas Wildenberg, *All the Factors of Victory: Admiral Joseph Mason Reeves and the Origins of Carrier Air Power* (Washington, 2003), 146.

though the carrier did launch a surprise air raid upon Pearl Harbor on 16 May following Fleet Problem VIII's conclusion.¹⁵

A month later, in June 1928, the *Lexington* reached Hawaii, took on board part of the *Langley*'s air group, and made a high-speed run to the West Coast with Reeves aboard. While significant for being the first operations for the new carriers, the drills conducted during this brief cruise back to California could only hint at the capabilities of the *Lexington* and *Saratoga*. The addition of the new carriers to the fleet would allow much wider experimentation with cooperation of aircraft and naval vessels and Fleet Problems IX through XIV would provide the opportunity to showcase the abilities of large fleet carriers.

¹⁵ *Ibid.*, 160.

CHAPTER IV

“WE HAVE GONE FAR, YET WE HAVE FAR TO GO”¹: FLEET PROBLEM IX

Fleet Problem IX has become a benchmark for those discussing the development of naval aviation, and, more specifically, the aircraft carrier. From the moment the exercise was conducted in January 1929, it received a great deal of publicity and has been cited by historians as evidence of the sophistication that American carrier doctrine achieved before the start of World War II. The intent of Fleet Problem IX was to provide the military with ideas as to how to defend the Panama Canal from a concerted naval and aerial attack, as well as to provide the fleet with operational experience in areas like scouting and convoy escort. Though these goals were reached, the exercise’s major contribution was to demonstrate the potential of independent carrier air strikes. The exercise would also become fodder for numerous mainstream press articles and cited to gain larger appropriations for naval construction.²

However, a closer examination of the exercise reveals that for all the promise that carrier aviation showed during the exercise, there still remained major problems that had to be overcome for the carrier to become a viable weapon system. The most important of these problems were the technical limitations of early carrier aircraft and determining the proper number and composition of a carrier’s escort vessels during combat operations.

¹ “US Fleet Problem IX, January 1929, Report of the Commander In Chief,” *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941* (microfilm, 36 reels, National Archives, 1974) reel 12, 29.

² Historians who have dwelled upon Fleet Problem IX’s significance include Archibald D. Turnbull and Clifford L. Lord, *History of United States Naval Aviation*, (New York, 1972), 271-272, Charles Melhorn, *Two-Block Fox: The Rise of the Aircraft Carrier, 1911-1929*, (Annapolis, 1974), George Baer, *One Hundred Years of Sea Power*, (Stanford, 1993), 141-142, Thomas Wildenberg, *All the Factors of Victory* (Washington, 2003), 1-10; “Report of the Commander In Chief,” *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941*, reel 12, 5.

There is also some justification for the navy's reluctance to label the exercise, as well as the two new aircraft carriers, as an unqualified success. The conservatism of the navy can perhaps be best expressed by the closing sentence of Commander-in-Chief, United States Fleet (CinCUS) Admiral Harold Wiley's comments in the final report on Fleet Problem IX, in which he stated, "While aviation has found its place in the fleet, and the importance of its role remained unquestioned, there is no analysis of Fleet Problem IX fairly made which fails to point to the battleship as the final arbiter of naval destiny."³

Fleet Problem IX's scenario, which was an attack upon the Panama Canal, was definitely not new to the Navy. In May 1913, even before completion of the canal, the Joint Army-Navy Board recommended that exercises be held to determine the best means of defending the waterway. Fleet Problems I and III had both dealt with scenarios involving a seaborne attack upon canal installations. Rear Admiral Joseph Reeves, the commander of the air forces for the Black Fleet, had participated in two previous simulated attacks upon the canal. While the seacoast could be defended in part by the extensive coastal fortifications erected during the 1920s, aerial defense was another matter. There were extensive debates in the military as to the best locations to place the various air installations in the Canal Zone, with the ability of aircraft stationed at them to react quickly to an attack being one criterion. The difficulties of aerial defense of the canal were realized at least as early as 1920 when Captain George C. Day, the commanding officer of the *USS Pennsylvania*, wrote a letter to Captain Thomas Craven, who was the Director of Naval Aviation. In his letter, Captain Day stated that he expected a combatant at the outset of hostilities to "... raid by fast surface craft or by air plane

³ *Ibid.*, p. 29.

carriers with the object of temporarily disabling the canal and thereby dividing our naval force.’⁴

Both the *Lexington* and the *Saratoga* had joined the fleet in the spring of 1928. Thus, in Fleet Problem IX, for the first time, both the attacking and defending fleets could include aircraft carriers. During the initial planning for the exercise, it was intended for the *Langley* to participate in the exercise with its new brethren. However, excessive delays in completing its scheduled overhaul prevented the ship from participating, and the seaplane tender *Aroostook* took its place.

In Fleet Problem IX the Battle Fleet, commanded by Vice Admiral William V. Pratt, took the role of Black. Pratt’s forces included three battleship divisions, three destroyer divisions, two destroyer squadrons, several submarines, various vessels of the fleet train, and a squadron of minesweepers. Most importantly, *Saratoga* and the tender *Aroostook* serving as a substitute for the *Langley* remained under Pratt’s control. In addition to these vessels, the Black Fleet included 116 aircraft carried aboard *Saratoga*, *Aroostook*, and the various surface vessels that carried floatplanes. Additionally, in order to make up for the *Langley*’s absence, its entire complement of aircraft was transferred to the *Saratoga* in order to allow the pilots to still receive the necessary training and experience, thus further bolstering the carrier’s complement up to 87 aircraft.⁵

⁴ Senior Member, Joint Board to the Secretary of War, 6 May 1913, *Records of the Joint Board, 1903-1947* (microfilm, 21 reels, National Archives, 1987), reel 12; Wildenberg, *All the Factors of Victory*, 20; Captain George C. Day to Captain Thomas Craven, 20 Sept. 1920, *Records of the Joint Board, 1903-1947*, reel 12.

⁵ “Report of the Commander in Chief,” *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941*, reel 12, p. 11.

The Blue Fleet, commanded by Vice Admiral Montgomery M. Taylor, was composed largely of the Scouting Fleet plus the *Lexington* and several local units, including land-based aviation squadrons and minesweepers. Between the normal complement of 63 aircraft normally carried by the *Lexington*, as well as the various floatplanes and land-based aircraft, Taylor's forces possessed a total of 145 aircraft.⁶

During the preparatory work for the exercise, Reeves submitted a plan calling for the *Saratoga*, along with its attending escort vessels, to make a wide detour far to the south before launching its air squadrons. Reeves believed that such a detour would give his forces the element of surprise and to greatly reduce the chances of detection by Blue's scouts. However, the plans submitted to Pratt made no mention whatsoever of this proposed maneuver. Reeves presented this plan to Pratt just before the Black Fleet left port, and Pratt immediately adopted it.⁷

He put Reeves' plan into effect on 22 January, some three days before the official start of the exercise. At this point the *Saratoga*, escorted by the light cruiser *Omaha*, separated from the rest of the Striking Force and began a high speed run to the south. After launching air strikes against on the canal locks, the two ships intended to rendezvous with the rest of the Black Fleet Striking Force on 26 January so that they could provide that squadron with protection from possible attack by Blue Fleet aircraft and battleships. While the *Saratoga* swung southward in an arc, the remainder of the

⁶ *Ibid.*, 11.

⁷ Eugene Wilson, "The Navy's First Carrier Task Force," U.S. Naval Institute *Proceedings*, 76 (Feb. 1950), 165.

Black Fleet continued on course towards Panama.⁸

The third and final portion of Pratt's forces, the Support Fleet, contained Battleship Division Four, as well as the *Aroostook* and the fleet's replenishment vessels. A position far to the west of the Striking Force on 26 January was the designated launching point for the *Aroostook*'s own aerial attack upon the canal locks, with the *Aroostook*'s single seaplane being tasked with the destruction of the Atlantic-side locks of the canal. In an element that greatly enhanced the element of surprise for the *Aroostook*'s attack, Blue forces were never properly notified that the tender was to act as a substitute for the *Langley*, and that its single seaplane represented the 24 aircraft the *Langley* normally carried. To further enhance the chances of a successful mission, the *Aroostook* was not held to the same safety standards that led the *Saratoga* to launch its air strikes upon the canal locks much closer inshore. In fact, the *Aroostook*'s seaplane launched from a point over 150 miles from the coast with the intention that the seaplane was conducting a one-way mission.

By the time the exercise officially started, at 0001 hours on 25 January, the Black Fleet was already well dispersed with its ships proceeding to the locations from which they were to launch their designated attacks. Later that day, the *Saratoga*, having detoured as far south as the Galapagos Islands, finally changed its course and began a speed run to the north in preparation for the next day's attack. Reeves' daring run to the south, despite its brilliance, had been at least partially anticipated by the Blue Fleet. Admiral Taylor sent out two groups of destroyers, one to scout the western sea approaches to Panama, and the other group to scout the southern approaches, including

⁸ *Ibid.*, 166.

the direction from which *Saratoga* would advance upon the Canal Zone. One of these southern scouts, the destroyer *Breck*, made the first contact with the *Saratoga* at 1613 on 25 January. Rather strangely, the *Breck* seems to have believed that the carrier it had found was the *Lexington*, and not the *Saratoga*. Thus, according to Captain Eugene E. Wilson, Reeves' chief of staff, the *Saratoga* signaled the *Breck* to take station astern of it, whereupon the *Saratoga* opened fire on the destroyer and the umpire ruled that the destroyer had been sunk.⁹

With this ruling, the *Breck* became a non-factor for the remainder of the exercise, though it had managed to send off a message of its findings that the Blue light cruiser *Detroit* intercepted. At 1810 and 1922, the *Detroit* exchanged shots with the *Saratoga* and its escort, and found itself in the rare situation of engaging in a surface duel with an aircraft carrier that possessing larger artillery than its own. Though the *Detroit* came to share the same fate as the *Breck* and ruled sunk, it continued shadowing the *Saratoga* and reported the carrier's position to the rest of Blue Fleet. Though the *Saratoga*'s detour was no longer a surprise, the fact that only a destroyer and a light cruiser had found it by this point could still be considered a success. To their credit, Reeves and Wilson correctly assumed that the ship they feared most in the Blue Fleet, the *Lexington*, would not guard the southern approaches itself. No appreciable Blue force lay between the *Saratoga* and

⁹ *Ibid.*, 167.

the launching point.¹⁰

While the *Saratoga* survived the first day of the exercise, the *Lexington* was not so lucky. Though not in a position to intercept the *Saratoga*, the *Lexington* was itself far south of the canal by the afternoon of the 25th. An error on the part of other Blue vessels shadowing the battleships of Black's striking force allowed the captain of the *Lexington* to believe that Black's battleships were 17 miles more distant than was actually the case. Thus, the *Lexington* received quite a shock when it emerged from a squall at 1218 within the firing ranges of Black's battleships. The carrier's scouts had not deployed, and by the time the enemy battleships were sighted, it was far too late for the carrier to use its 12-knot speed advantage over the battleships to flee the scene. The umpire ruled the *Lexington* sunk though, in order to allow the ship to continue to participate and allow its crew to gain valuable operational experience, the only penalty assessed was a reduction of its top speed to 18 knots. Most importantly, the umpire's penalty allowed it to continue conducting flight operations.¹¹

Before dawn on the 26th, the *Saratoga* finally reached its designated launching point, and at 0430 its aircraft began to fill the skies. By 0458, the *Saratoga* completed launching its strike force of 83 aircraft, which was the largest single air strike launched from a single carrier deck in history up to that time. What Reeves knew was that a race was on: the *Saratoga*'s aircraft had to be in the sky and proceeding towards an attack

¹⁰ "Report of the Commander in Chief," *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941*, reel 12, pp 129-130; Wilson, who wrote his memoirs after World War II, mistakenly placed Ernest J. King in command of the *Lexington*, and claimed that King's staff officers would be too intimidated by him to suggest a possible detour by the *Saratoga*. In fact, King did not take command of the *Lexington* until 1930. See Eugene Wilson, *Slipstream: Autobiography of an Air Craftsman* (New York, 1950), 141.

¹¹ "Report of the Commander in Chief," *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941*, reel 12, p. 57.

upon the canal before the *Saratoga* could be attacked or the fighter defenses of the Canal locks could react. The objectives of the attacks were the Miraflores and Pedro Miguel locks on the Pacific side of the canal. The Blue commander made the task of *Saratoga*'s planes much easier since he had not sent out aerial patrols. The four groups of planes that *Saratoga* launched were judged to have succeeded in their mission and both sets of locks targeted were ruled destroyed.¹²

Though the raid succeeded, the *Saratoga* itself suffered a trying morning. At 0625, the carrier spotted three battleships that its captain believed to be part of the Black battleship force that *Saratoga* planned to rendezvous with that morning. Instead, they were battleships from the Blue Fleet that promptly opened fire on the carrier. Navigational errors on the part of Black Fleet's battleships prevented them from rendezvousing with the *Saratoga*, leaving the carrier exposed to surface attack. The Blue battleships sank the *Saratoga*, but as in the case of the *Lexington*, the umpires allowed the carrier to continue participating in the exercise without serious penalty. Later that morning, at 0740, a group of aircraft from the *Lexington* located and attacked the *Saratoga*. Given that the *Saratoga* had no fighter patrol aloft at the time of the attack, and it was just beginning to recover its air group, it was ruled that it would have been at least badly damaged by the attack. Reeves argued that the last attack and subsequent "damage" to the *Saratoga* would not have occurred in wartime. "Had it been a real action, of course I could have used the *Saratoga*'s superior speed to run away and avoid action, simply paying the price of planes and pilots for the serious damage to the canal locks such a raid

¹² Lewis Freeman, "Commander's Story of *Saratoga*'s Raid," *New York Times*, 19 Feb. 1929, 14; "Report of the Commander in Chief," *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941*, reel 12, p. 72.

must inflict,” he explained, but it was a training exercise in which according maximum safety for the aircraft involved led the *Saratoga* to remain in the best position to recover them irregardless of the danger to the ship itself.¹³

Nearly simultaneous with the *Saratoga*'s attack, the *Aroostook*'s seaplane lumbered into the sky for its own raid. No real attempt was made to stop the seaplane's attack on the Gatun locks on the Atlantic-end of the canal, and after an attack judged as successful, the seaplane landed, as per orders, at the Army airstrip at Coco Solo. Though miscommunication between the Blue Force Commander and his subordinates contributed to the surprise of the attack, as well as the unthreatening appearance of a single naval floatplane, this attack could be interpreted to be a demonstration of the value that a surprise carrier raid could have upon the enemy. However, much like the *Saratoga*, the *Aroostook* encountered difficulties with Blue surface vessels. When the ship left the remainder of the Support Force to search for a floatplane missing from the battleship *Idaho*, it was sunk at 1722 on the 26th by the light cruiser *Marblehead*.¹⁴

Later that day, the status of all vessels was restored to full working order so that the two fleets could proceed to the next phase of the exercise, which was for a general engagement. The two forces participated in a brief truce for rest during the afternoon, in which at times vessels from the two forces often traveled together.

The engagement of 27 January started before dawn as battleships from both sides began dueling at long ranges. The Black Fleet gradually gained the upper hand in the

¹³ *Ibid.*, 9; *Ibid.*, 72; Freeman, “Commander’s Story of Saratoga’s Raid,” 14.

¹⁴ Ship Observer Black to Support Group Observer and Air Squadrons Observer, 27 Jan. 1929, “Report of the Commander in Chief,” *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941*, reel 12, enclosure J, p. 6.

battle as its ships possessed longer-ranged weapons than those of the Blue Fleet. During the day, the *Saratoga*'s role diminished to a support role for the battleship operations, though it fought several air attacks launched against it, some of them by army planes from the bases ashore. Despite the length and severity of the engagements during this day, nothing as groundbreaking as the previous day's operations occurred, though some lessons were learned. Air attacks upon the *Saratoga* by the *Lexington*'s air group merely reinforced the difficulties in stopping concerted air attacks, and proved to harbingers of the next two Fleet Problems.

A great deal of media coverage was devoted to the exercise, which concluded on 28 January. Most was positive, though it is difficult to assess the impact that coverage had on public or congressional opinion. The *New York Times* assigned a special correspondent, Lewis Freeman, to cover the exercise, and he published several stories about it. As some measure of the quality of Freeman's coverage, the Secretary of the Navy described it as "unusually accurate." A 1930 *Times* article speculated about the future of the battleship, and used information about several naval exercises, including Fleet Problem IX, and statements from Eugene Wilson, who had since retired from the navy, as the basis for such claims. Despite the enthusiasm over the exploits of the carriers, it was stated that, "... the battleship is not obsolete so long as the enemy is building battleships, for the aircraft adherents do not claim they can put the dreadnought out of action."¹⁵

¹⁵ "Secretary's Notes." U.S. Naval Institute *Proceedings*, 55 (May 1929), 475; Lauren D. Lyman, "Planes Change Ship Role." *New York Times*, 1 June 1930, section 9, 1.

The media attention attracted by Fleet Problem IX fit well into Admiral Moffett's constant efforts to keep naval aviation in the limelight. Among these public relations ventures were attempts to break speed records by naval aircraft, as well as promotional visits to major cities by various units, including carriers and airships, throughout the 1920s.¹⁶ The publicity given these activities was useful to Admiral Moffett in his personal political struggles against foes and in his campaign to secure appropriations for naval aviation from Congress. Throughout much of early 1929, Moffett also waged a battle to secure re-appointment under the incoming Hoover administration. The campaign ultimately proved successful, and the Hoover administration retained Moffett's services.

Fleet Problem IX also attracted a great deal of attention within naval circles. The Naval Institute's *Proceedings* published portions of Freeman's articles from the *New York Times*, as well as some original articles, many of which focused upon the actions of the *Saratoga*. An article by Admiral Reeves entitled "Aviation in the Fleet" described the roles played by aircraft. Though Reeves briefly outlined the spotting and scouting performed by carrier aircraft, he focused mostly upon the offensive roles for carriers, using the *Saratoga*'s strike on the canal to demonstrate this ability. Rather than supplanting battleship artillery, Reeves advocated a more complementary relationship between carrier air power and battleships. Reeves concluded the article by stating that:

Our efforts in the past have been crowned with a certain amount of success, but every success has only indicated new possibilities of the employment of aircraft in fleet operations and has emphasized the vital importance of continuous operating with the fleet the maximum number of aircraft that can be carried on our surface vessels.¹⁷

¹⁶ William Trimble, *Admiral William A. Moffett* (Washington, 1994), 124-127.

¹⁷ Rear Admiral J. M. Reeves, "Aviation in the Fleet," U.S. Naval Institute *Proceedings*, 55 (Oct. 1929), 868; *Ibid.*, 869.

In another article, “Some Aspects of Carrier and Cruiser Design,” Lieutenant Commander Forrest Sherman, a future Chief of Naval Operations, also advocated an offensive role for carrier air power. Sherman, much like Reeves, believed that an aircraft carrier required several escorting vessels for its protection. He also believed that delivering air attacks upon the main body of the enemy fleet was an important function for carriers, stating that, “The *Saratoga* and *Lexington* with their high sustained speed, heavy batteries, and enormous airplane capacity are well suited to this employment.” Sherman also anticipated the later cleavages in American carrier designs by calling for “air force,” “battle line,” and “scouting” carriers, plus what he called “carrier cruisers,” a type of vessel that mated a carrier deck with a heavy cruiser hull. Such ships would be armed with several 8-inch guns, but would only carry 30 to 40 aircraft. Sherman’s descriptions place the *Lexington* and *Saratoga* as the air force carriers, which were to be the largest and more capable ships, while the design he advocates as a battle line carrier fits the *Ranger*.¹⁸

Given the fact that all three carriers that participated in the exercise were ruled sunk, with the *Saratoga* receiving this judgment multiple times, it is not hard to see why some in the Navy were unwilling to believe that carriers would supplant battleships as the Navy’s preeminent capital ship. What the exercise demonstrated to Reeves was that carriers required a cruiser and destroyer screen for proper defense from air and surface threats. That the threat of surface attack had to be countered by escort vessels rather than by the carrier’s own weapons was made clear when it was discovered that the recoil

¹⁸ Lieutenant Commander Forrest Sherman, “Some Aspects of Carrier Design.” U.S. Naval Institute *Proceedings*, 56 (Nov. 1930), 998; *Ibid.*, 1002; *Ibid.*, 999.

caused by firing the carrier's main battery of eight-inch guns could seriously damage aircraft on the flight and hanger decks. It is not clear whether the potential for such damage was realized during Fleet Problem IX, but a 1935 proposal to remove the guns was based, in part, on a desire to avoid potential damage to aircraft by those guns.¹⁹

It was also clear that a carrier's air group could not provide adequate defense because, while the ordnance carried by those aircraft could destroy other carriers and lighter vessels, they could not inflict serious damage on more heavily armored cruisers and battleships. Air launched torpedoes might provide a way to attack the more thinly armored portions of battleships, but the torpedo bomber of the day, the T4M, was a very slow aircraft, and torpedoes air-dropped by the T4M were quite fragile. The inability of carrier aircraft to carry heavy bombs to attack capital ships, combined with the relatively short range of these aircraft, meant that much of the promise that carriers held was still just that: promise.²⁰

Though skepticism of carrier air power remained following Fleet Problem IX, the exercise taught the navy many lessons, not the least of which was the value of the greater integration of carriers into the fleet as a whole. Much of this can be attributed to the fact that the *Lexington* and *Saratoga* had the capability, in terms of size, aircraft complement, and speed to make a contribution to the fleet that the valuable, but smaller and slower, *Langley* had previously been unable to provide. The *Saratoga*'s greater capability

¹⁹ Norman Friedman, *US Aircraft Carriers: An Illustrated Design History* (Annapolis, 1983), 49-50.

²⁰ Norman Friedman, Thomas C. Hone, and Mark Mandeles, *American and British Aircraft Carrier Development* (Annapolis, 1999), 63; Thomas Wildenberg, *Destined for Glory: Dive Bombing, Midway, and the Evolution of Carrier Air Power* (Annapolis, 1998), 104.

allowed it to execute the kind of independent attack that would become a hallmark of World War II carrier tactics.

Fleet Problem IX also influenced the design of the next class of aircraft carriers. Before the conduct of Fleet Problem IX many naval officers believed that the *Lexington* and *Saratoga* were too large to function efficiently. The design process for what would become the U.S. Navy's next carrier, the USS *Ranger* was already well underway and the belief that smaller carriers possessed more utility held sway in its design. The *Ranger* was well under 100 feet shorter than its immediate predecessors, with a nominal displacement of 16,578 tons. More importantly, its maximum complement of aircraft was 25 percent smaller than that which could be carried on the *Lexington* and *Saratoga*, though in actual practice the *Ranger* often carried as many aircraft as its predecessors. The *Ranger*'s top speed, which was highly critical in the days before the advent of effective catapults, was only 29.5 knots. The slower top speed meant longer takeoff runs for aircraft, as well as increased difficulty maintaining formation with the fleet when the carrier needed to launch aircraft. The low top speed of the *Ranger*, in combination with its limited aircraft complement, would relegate it to operations in European waters during World War II, and it was destined never to serve alongside the large fleet carriers that succeeded it in the Pacific Theater.

Although the strikes by the *Saratoga* on the canal would have been far more difficult for the *Ranger* to carry out, the recommendations contained in the CinCUS report after Fleet Problem IX called for the continued building of smaller carriers. The inability of the two large carriers to evade destruction during Fleet Problem IX posed a problem for the Navy because the two ships represented the lion's share of American

carrier aviation. In early 1929, the desirability of having the air force spread across multiple vessels outweighed the increased offensive capability that could be gained by combining aircraft on larger, but fewer, carriers. This opinion would change over the next two years.²¹

There were other lessons drawn from the experiences of Fleet Problem IX. The difficulties experienced by *Saratoga* and *Lexington* in handling aircraft led Captain John Halligan, the *Saratoga*'s commanding officer, to suggest to Reeves that a third elevator should be added to the two already called for in the design of *Ranger*. This would "expedite" the positioning of aircraft during flight operations, and the requested change was eventually incorporated into the *Ranger*'s design.²²

Fleet Problem IX also influenced the composition of a carrier's escort vessels. Reeves found the *Omaha* to be inadequate as a carrier escort, because a foul keel limited the cruiser's speed to 25 knots making it impossible for it to keep pace with the *Saratoga*, which had a top speed of 33 knots. Reeves also advanced the idea that the best formation for a carrier would be amid a screen of cruisers and destroyers, thus providing the carrier with a means of defense from surface and submarine attack during combat situations and allowing for carrier operations independent of most of the fleet. Pratt supported this suggestion, and included it in his own remarks on the exercise in the CinCUS's report. In

²¹ "Report of the Commander in Chief," *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941*, reel 12, p. 36.

²² Captain Saratoga to Commander Aircraft Squadrons, Battle Fleet, 2 Feb 1929, box 80, RG 80 (National Archives, Washington D.C.), 3.

the following exercises, this suggestion by Reeves was taken seriously, thus leading to the birth of carrier task forces.²³

One potential hurdle of carrier escorting duties, namely the limited the fuel capacities of potential escorting vessels, was rectified following Fleet Problem IX. The shortcomings of the *Omaha* and the inability of the destroyers to keep pace with the *Saratoga* during its end-around had highlighted the need for improved refueling capabilities. Admiral Pratt recommended that the *Lexington* and *Saratoga* undergo modifications so that they could take advantage of the high capacity of the carrier's bunkers and refuel their escorts at sea. Apparently this modification was carried out in the latter half of 1930, too late for Fleet Problems X and XI, but the change would be quite useful during Fleet Problem XII and beyond.²⁴

Following Fleet Problem IX, Moffett and Captain John Towers cited the success of carriers in Fleet Problem IX in testimony before the House Naval Affairs Committee to persuade Congress to authorize the funding for the desired five carriers of the *Ranger*-class being requested. This appropriation was a part of the so-called "cruiser bill" that called for the construction of 25 cruisers and 5 aircraft carriers. However, Congress had whittled the requests down considerably to 15 cruisers and a single carrier. When Senator Hiram Bingham attempted to add funding for an additional two carriers to the bill, he cited the sinking of the *Lexington* to justify the additional appropriation, arguing that the

²³ Freeman, "Commander's Story of Saratoga's Raid," 14; Black Remarks, Critique of Fleet Problem IX, "Report of the Commander in Chief," *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941*, reel 12, p. 42; "Report of the Commander in Chief," *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941*, reel 12, p. 107.

²⁴ Robert C. Stern, *The Lexington Class Carriers* (Annapolis, 1993), 73; Thomas Wildenberg, *Gray Steel and Black Oil* (Annapolis, 1996), 41-44.

aircraft of the fleet needed to be dispersed among more ships to lessen the impact of the loss of one or two carriers. In support of his argument, Bingham cited a one-year old statement from the Chief of Naval Operations, Admiral Charles F. Hughes, in which Hughes stated, “Aircraft carriers are becoming each year more necessary for fleet efficiency. Our present effective strength consists of only two units, the *Saratoga* and *Lexington*, and the loss of one of these units would reduce our carrier force by 50 percent.” Despite the simple truth behind Hughes’ statement, Senator Bingham’s efforts ultimately met with failure. The *Ranger* itself was built, but no additional units of the class ever received funding.²⁵

The 15 cruisers provided for in the legislation, which became two *Portland*-class heavy cruisers, seven *New Orleans*-class heavy cruisers, five *Brooklyn*-class light cruisers, and the heavy cruiser *Wichita*, comprised the backbone of the U.S. Navy’s cruiser fleet at the start of World War II, and provided escort for early US carrier operations in the Pacific. Due to the complaints leveled by the participants of Fleet Problem IX concerning the dearth of cruisers in the navy, the so called “cruiser bill” measure helped make up that shortfall. Valuable as the cruisers provided for in 1929 might eventually prove to be, Navy officials did not consider them to be adequate in number. The need for additional cruisers highlighted by Fleet Problem IX was reflected in the contents of a General Board document concerning the 1931 Building Program:

Every war game, whether played at the War College or carried out in practice on the high seas, and a study of our extensive trade routes, emphasizes the need for an increased number of vessels of the cruiser type. The number called for is the result of the conclusions of the CINC afloat and the GB, as representing the

²⁵ Clark G. Reynolds. *Admiral John H. Towers and the Struggle for Naval Air Supremacy* (Annapolis, 1991), 223; *Congressional Record*, 70 Cong., 2 session, 4 Feb. 1929, pp. 2756-2758.

country's needs and is based upon the experiences of war and annual post-war combined fleet war games and maneuvers.²⁶

FP IX had less impact on the defense of the Panama Canal, which was the main focus of the operation. No changes were made with regard to coastal artillery, but anti-aircraft defense did improve. During Fleet Problem IX fire from anti-aircraft batteries had failed to defend the canal locks, but these must have been improved significantly because the anti-aircraft defenses were judged as having successfully defended canal installations in local exercises in 1933, save for the areas around Gatun. Following the 1933 exercises, plans were laid for the installation of torpedo nets to protect the Gatun Spillway and Gatun Locks in 1934. A shortage of materials with which to construct the nets allowed for a more thorough analysis of the nets, resulting in the conclusion that the nets proposed for the locks would be ineffective because an aircraft could still drop a torpedo between the net and the locks, though the ones planned to protect the spillway were judged adequate and thus installed. It would appear that serious efforts to bolster other canal defenses were not revived until 1939.²⁷

The lack of action concerning defense of the Panama Canal may be traced to the problems of inter-service rivalry and, thus, with regard to its main focus, Fleet Problem IX may be judged a failure. On the other hand, it proved to be of greater benefit to the Navy. Though the outcome of Fleet Problem IX, at least for the carriers, was mixed, there

²⁶ Norman Friedman, *U.S. Cruisers: An Illustrated Design History* (Annapolis, 1984), 139, 183; "Report of the Commander in Chief," *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941*, reel 12, p. 36; General Board Serial 1415, "Naval Building Program, FY1931," 4 April 1929, box 62, RG 80 (National Archives, Washington D.C.), p. 11.

²⁷ Memo to Senior Army Member Joint Planning Committee, 18 Dec. 1933, *Records of the Joint Board, 1903-1947* (microfilm, 21 reels, National Archives, 1987), reel 12; Joint Board Serial 551, "Torpedo Nets and Boom in Gatun Lake for Defense of Panama Canal," 24 May 1934, *Records of the Joint Board, 1903-1947*, reel 12; Stetson Conn, et al, *Guarding the United States and its Outposts* (Washington, 1964), 303.

were several positive effects on naval aviation. Beginning with this exercise, the two new carriers began to occupy a regular place in the Fleet Problems, and undertook remarkably prescient operations during these exercises. Admiral Pratt seems to have come away from the Problem with a stronger faith in air power, and though this faith would be tested in later problems, the *Lexington* and *Saratoga* were often the centerpieces of the operational units of fleets participating in the Fleet Problems during Pratt's term as Chief of Naval Operations. While some officers of the Navy, especially members of the so-called "Gun Club" of surface warfare officers, remained skeptical about the role to be played by aviation, Fleet Problem IX did succeed in raising the status of naval aviation through much positive publicity. The navy still committed itself in the immediate aftermath of Fleet Problem IX to the smaller *Ranger* design for future carriers, but, fortunately, only one such ship was ever built. As the technology matured, particularly for aircraft, it allowed some of the doctrinal lessons learned in Fleet Problem IX and other exercises to be employed in future carrier operations, particularly Grand Joint Exercise 4 and Fleet Problem XIV.

CHAPTER V

CARRIERS IN A FLEET ACTION: FLEET PROBLEMS X AND XI

Following Fleet Problem IX, the two new carriers, *Lexington* and *Saratoga*, became fixtures in the next several exercises. Not until Fleet Problem XVI would the participation of another carrier, the *Ranger*, allow for a wider base of experimentation in carrier operations. Yet, despite only having the two fleet carriers and the obsolescent *Langley* with which to operate, the Fleet Problems still demonstrated an interest by the Navy in assessing the capabilities and best uses of carrier air power. The missions assigned to the carriers in Fleet Problems X and XI allowed for a greater degree of independence for the carriers than had previously been seen in the Fleet Problems, but was in many ways only an outgrowth of the role previously filled solely by the *Langley*. Though surface fleet engagements similar to those seen in earlier problems dominated the 1930 exercises, the presence of the new carriers affected the outcome of Fleet Problems X and XI.

In 1930, for the only time other than 1924, two fleet problems were held during the same year. The first, Fleet Problem X, was staged in the western portions of the Caribbean Sea. In its scenario a Black coalition of nations had allied with South American nations and islands in the southern Caribbean in a war against the United States and its allies in Central America and the northeastern Caribbean. Losses in the conflict had reduced the naval strengths of the two combatants to roughly equivalent levels. The Blue fleet represented American naval forces in the Pacific, which had heretofore been unable to reinforce the battered units in the Atlantic. In order to simulate this in the

exercise, the Blue fleet was to begin the exercise from Colon on Panama's eastern/northern coast.¹

The mission for the Blue fleet, under the command of Admiral Louis Nulton, was to restore American naval supremacy in the Caribbean by eliminating the Black forces in the region, while Vice Admiral William C. Cole's Black fleet was to prevent this from taking place. The distribution of carriers in the exercise was similar to that attempted during Fleet Problem IX with Blue receiving the *Saratoga* and the *Langley*, and Black the *Lexington*.²

Neither force commander made carriers the focus of offensive efforts during the planning phases, but both recognized, as had been prophesied in many board maneuvers at the Naval War College, that control of the air was vital for fleet success since the victor could launch airstrikes at will upon the enemy and allow for unimpeded aerial spotting of the battleships' artillery fire. The orders written by Admiral Nulton for the "Air Force," as the *Saratoga* and *Langley* were called for the exercise, were quite succinct: "When *Lexington* is located attack *Lexington*." While Cole's orders were not nearly so blunt, the *Lexington*'s primary task was to locate the *Langley* and *Saratoga*.³

The key difference between the two fleets was in the placement of their carriers. The *Saratoga* and *Langley* steamed as a part of Blue's Main Body, which comprised most Blue vessels, save for submarines and auxiliaries. On the other hand, the *Lexington*

¹ "U.S. Fleet Problem X, March 1930, Report of the Commander In Chief," *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941* (microfilm, 36 reels, National Archives, 1974) reel 13, p. 2.

² *Ibid.*, pp 2-3.

³ Norman Friedman, Thomas C. Hone, and Mark Mandeles, *American and British Aircraft Carrier Development* (Annapolis, 1999), 34; "Report of the Commander in Chief," *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941*, reel 13, p. 7; *Ibid.*, p. 19.

scouted ahead of Black's main body for most of the exercise as part of the Carrier Group, which also included several destroyers. The positioning of the carriers in the exercise would be the difference between success and failure for the opposing fleets.⁴

On the eve of the exercise, a change was made to the airgroups participating in the problem. By mutual decision of fleet commanders on both sides, the torpedo planes were not allowed to participate due to their unreliable engines. The absence of the torpedo planes meant that the carriers were unable to launch any effective strikes against opposing capital ships, carriers excluded. The Martin T4M torpedo bomber remained in service despite the Navy's dissatisfaction with the aircraft, and its successors, the Great Lakes TG-1(1928) and TG-2(1930) included only slight modifications from the original T4M. Continued problems with all three models, when combined with the poor technical state of American aerial dropped torpedoes in the early 1930s, meant that the carriers would rarely have the means to successfully attack battleships in the other problems in the early 1930s. Even the bomber and fighter aircraft in use during the period were much closer in capability to World War I aircraft than to those of early World War II. When the technical limits of the aircraft combined with the artificial limits imposed by the navy to reduce the safety risk during exercises, the aircraft were woefully inadequate for accomplishing the missions required of them.⁵

⁴ *Ibid.*, p. 17.

⁵ The designation change from T4M to TG-1 and TG-2 resulted from the sale Martin's Cleveland plant to the Great Lakes Company. See Gordon Swanborough and Peter M. Bowers, *United States Navy Aircraft Since 1911* (New York, 1968), 292; "Report of the Commander in Chief," *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941*, reel 13, p. 1; Thomas Wildenberg, *Destined for Glory: Dive Bombing, Midway, and the Evolution of Carrier Air Power* (Annapolis, 1998), 84, 100-105.

Fleet Problem X began at noon on 10 March 1930 with Blue units preparing to leave Colon and Black units just to the north of Hispaniola. As the Blue fleet sailed to the northeast at about 13 knots, poor weather prevented the *Saratoga* and *Langley* from launching scout planes. The same weather conditions also hampered scouting operations from the *Lexington* as it steamed ahead of the Black main body with several destroyers in an attempt to find the Blue fleet. The poor weather continued into the next day, and while the aircraft on the Blue carriers were still prevented from flying, four groups of scouts launched from the *Lexington* because Black commanders deemed the weather risks manageable. The *Lexington*'s scouts failed to locate the Blue fleet in the course of their search. The courses of the Black scouting group and the Blue main body nearly brought the two fleets into contact, but, due to the poor weather and inability to scout effectively, the opposing fleets reversed course because both commanders had no information on what lay ahead of their fleets.⁶

On 12 March, the improving weather allowed the *Saratoga* and *Langley* to finally launch scout planes, 68 total, as the Blue fleet resumed its northeasterly course. The aircraft failed to locate any "enemy" warships, but a light cruiser, the *Memphis*, reported sighting the *Lexington*. A futile chase ensued, for the *Lexington* was actually 120 miles away engaging in its own scouting operations. Unlike the previous two days the *Lexington* held its position rather than advancing, thus preventing an encounter from developing between the Blue and Black fleets. Further scouting operations from both

⁶ "Report of the Commander in Chief," *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941*, reel 13, pp 30-35.

fleets on 13 March also failed to produce any meaningful contact between the two forces.⁷

Finally, contact was made on Friday, 14 March. During the night, the *Lexington* rendezvoused with the Black main body, taking a position well to the east of the battleships, while the *Langley* and *Saratoga* lay in between the main bodies of both fleets. All three carriers launched scout planes at dawn, but the Blue fleet scouts returned to the carriers due to poor weather conditions. The same conditions did not hamper the *Lexington*'s scouts, who made a dive-bombing attack upon the *Saratoga* at 0815, rendering its forward flight deck inoperable. About 15 minutes later, 40 more aircraft from the *Lexington* attacked the *Saratoga*, *Langley*, and a Blue light cruiser, destroying the flight decks of both carriers and sinking the cruiser. Black cruisers engaged the *Langley* soon after the air attacks, and though the carrier was not sunk, it was judged by the umpires to be so severely damaged as to render it virtually useless for the remainder of the exercise. Other air attacks from the *Lexington* made at about the same time as those upon the carriers focused upon the Blue battle line, damaging several battleships. Thus, the first meaningful contacts between the opposing air forces ended with a resounding victory for Black, which gained total air superiority over Blue in a less than an hour.⁸

As the morning progressed, aircraft from the *Lexington* continued to attack Blue cruisers, but the exercise became largely a surface duel between the opposing battleship forces later dubbed by the *New York Times* as the "Battle of Navassa." Black, having

⁷ *Ibid.*, pp 35-42.

⁸ *Ibid.*, pp 43-44.

gained air superiority for its spotter planes, initially had the advantage over Blue, but the final tallies showed that Black's battle line was only slightly less damaged than Blue's.⁹

In the critique after the exercise, one suggestion later put to use was to segregate the fleet's airgroup, with one carrier having all the fighters and scouts, and the other carrier deploying the bombers and torpedo planes. This suggestion would later be tested during Grand Joint Exercise 4 in 1932.¹⁰

A major issue in the critique that followed Fleet Problem X involved carrier vulnerability. The Commander, Aircraft Squadrons for Black, Rear Admiral Henry V. Butler, noted that, "Opposing carriers within a strategical area are like blindfolded men armed with daggers in a ring. There is apt to be sudden destruction to one or both. If the bandage over the eyes is removed the other is doomed." While future critiques of carrier vulnerability were not described as dramatically, the fact remained that carrier vulnerability to air attack, first seen in Problem IX, had no easy solution in the early 1930s. The most common U.S. Navy attempt to deal with the issue, as seen in Fleet Problem X as well as many later exercises, revolved around aggressive operations to locate and disable enemy carriers by attacking first. Only with the advent of radar and fighter control techniques in the early part of World War II could a carrier's aircraft reliably defend the ship from air attack. Until then, the vulnerability of the carrier was

⁹ "American Fleets Fight Deadly Battle; Call Truce to Decide War Game Off Haiti." *New York Times*, 16 March 1930, p. 16; "Report of the Commander in Chief," *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941*, reel 13, pp 53, 56-59.

¹⁰ *Ibid.*, p. 65.

taken as a given.¹¹

One remedy to carrier vulnerability was to allow carriers and their escorts to steam independently of the rest of the fleet. Black had allowed its carriers such freedom by including the *Lexington* in what Admiral Pratt, now the Commander-in-Chief, U.S. Fleet, termed an “offensive scouting” force. He further elaborated that, “A fast group, composed as this one was [of a carrier and a screen of destroyers], has all the elements for conducting a wide search; speed, if necessary, to retire before superior strength; and the weapons [presumably by means of air attack] to inflict a very severe blow on any suitable objectives found – enemy carriers or battleships.” In an apparent nod to Reeves’ end-run with the *Saratoga* the previous year, Pratt said that, “The aggressive use of aircraft to gain superiority over the enemy prior to the main engagement appears sound, provided one’s own security is not entirely neglected. Aircraft carriers engaged in such operations are less likely to be located by the enemy than if they are tied to a cruising disposition with a more or less passive task of awaiting to defend the fleet when it is attacked.”¹²

Following Fleet Problem X, the participating naval units dispersed throughout numerous Caribbean ports to prepare for Fleet Problem XI. The scenario for the second exercise called for a simulated fleet mobilization from a peacetime state of readiness. The force compositions resembled those in Fleet Problem X, only this time the roles were reversed. For Problem XI, Vice Admiral Cole commanded the Blue Fleet, with the

¹¹ *Ibid.*, p. 66; Henry Dater, “Tactical Use of Air Power in World War II: The Navy Experience,” *Military Affairs*, 12 (Winter 1950), 193-194.

¹² “Report of the Commander in Chief,” *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941*, reel 13, p. 67.

Lexington again under his command, while Vice Admiral Lucious Bostwick commanded the Black Fleet, which included the *Saratoga* and *Langley*.¹³

For the problem, which was again set during a war that had already been under way for several months, the larger islands in the central Caribbean and the various Central American countries were to be allied with Blue, with South American countries and islands in the southern Caribbean allied with Black. Additionally, the Black fleet was presumed to have already established an advanced base in Trinidad. To further complicate the problem, the scenario stated that an armistice had been in effect for the two weeks prior to the start of the problem, and that this armistice had led to the dispersal of naval units in several Caribbean ports, with the *Lexington* at St. Thomas in the Virgin Islands. The Black carrier *Saratoga* began the problem in Barbados and the *Langley* at Trinidad.¹⁴

Both fleets sortied from their ports at the designated starting time at 0800 on 14 April and steamed for Jamaica because both fleet commanders believed it a key location to exercise control over the Caribbean. The Blue fleet sailed westward along the northern coast of Hispaniola, while the ships of the Black fleet sailed to the west from their bases in the southern Caribbean. As the two forces continued heading for Jamaica into the second day, the *Saratoga* intercepted radio bearings thought to originate from the *Lexington*, though the carriers were too far apart for their planes to reach each other. Later that day, following radio transmissions in the clear to find missing scout planes, the

¹³ "U.S. Fleet Problem XI, April 1930, Report of the Commander In Chief," *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941* (microfilm, 36 reels, National Archives, 1974) reel 13, p. 1.

¹⁴ *Ibid.*, pp 2, 4-5.

Saratoga detached from the scouting line and head south to evade possible detection by Blue forces.¹⁵

On the night of 15 April, the *Lexington* became the centerpiece of the Carrier Group, which also contained four cruisers and four destroyers, which was ordered to conduct scouting operations towards the southeast ahead of the main body of the Black fleet. Meanwhile, the *Saratoga*, which had rejoined the Blue fleet during the night, resumed its position just behind the scouting line of light cruisers ahead of the Black fleet. The scouting operations on 16 April from both carriers were unsuccessful, with one group of scouts returning to the *Lexington* prematurely due to rain.¹⁶

At 1616 on April 16, the *Detroit*, one of the light cruisers accompanying the *Lexington*, reported a contact with a Black cruiser, which turned out to be the *Raleigh*, one of the *Saratoga*'s escorts. Poor visibility led to a confused engagement primarily among the scouting line cruisers in which several vessels never made contact with the enemy. The poor visibility also meant that the aircraft on the two carriers played no part in the battle, which remained largely a gunnery duel between the light cruisers. At the end of the engagement umpires ruled that a cruiser in each fleet had been destroyed.¹⁷

Following the battle, both carriers retired from the area, with the *Richmond* attempting a fruitless pursuit of the *Lexington* that was broken off in the darkness. For some idea of the importance accorded the aircraft carriers by commanders in these exercises, the Black destroyer *Decatur* passed up an ideal chance to torpedo the Blue

¹⁵ *Ibid.*, p. 20.

¹⁶ *Ibid.*, pp 22, 25-26.

¹⁷ *Ibid.*, pp 28-30

light cruiser *Cincinnati* during the night because its captain did not want to risk depleting his supply of torpedoes to the point that he would not have enough to left to attack the *Lexington*, if such an opportunity arose.¹⁸

The following morning, 17 April, the *Lexington*'s position was still to the west of Hispaniola, with the *Saratoga* to the south of her. During the morning, the *Lexington*'s scout planes failed to locate the *Saratoga*, but they did locate two of the three Black submarines, sinking one. The *Saratoga* also launched scouts that morning, and from intercepted radio transmissions located the *Lexington* at 0655 from radio bearings. Following the discovery, two groups of aircraft were launched at 0800 and 0942, with the latter group attacking the *Lexington* at 1045. Encountering no opposition from the *Lexington*'s fighter patrol or anti-aircraft batteries, the scouts pressed in for the attack, but the ruling handed down by the observer was only a 15-minute damage penalty for the *Lexington*'s flight deck. An hour later, an entire squadron of aircraft from the *Saratoga* executed another attack upon the *Lexington*, this time earning credit for the destruction of 15 aircraft and forcing a one-hour penalty upon the flight deck. Once the Chief Observer learned of the attack, the penalty was increased to 24 hours, but the *Lexington* did not receive word of this decision until nearly nightfall. By then its captain had launched two air attacks on Blue, neither of which was successful. The exercise would end before the *Lexington* could resume aerial operations, thus potentially leaving the Black fleet with air superiority for the remainder of the exercise.¹⁹

¹⁸ *Ibid.*, pp 30, 33-34.

¹⁹ *Ibid.*, pp 36, 40; *Ibid.*, pp 37, 41.

Meanwhile, the *Saratoga* and its cruiser companions fended off an attack by Blue cruisers at 1108. The two scouting lines had again made contact, but this time aircraft played a key role in the engagement. At 1130, *Saratoga* launched a group of fighters and scouts to join other aircraft already airborne in a strike against the Black cruisers. As a result of the aerial attacks, three Black cruisers were judged to have suffered damage, though at the cost of the Blue cruiser *Trenton*, which had been ruled sunk by gunfire during the encounter. To keep the carrier out of danger, the *Saratoga* withdrew to the south during the battle.²⁰

During the night of 18 April, the *Saratoga*, again steering northward, came under fire at 0430 from a group of battleships believed to be the Blue main body. The battleships were actually from the Black main body, and twelve minutes elapsed before either party realized that the other was part of the Black fleet. The confusion that shrouded the incident continued for five hours before the Chief Observer learned of the mishap and ruled the *Saratoga* sunk, though at the post-exercise critique the Black Main Body Observer pointed out that the battleship fire on the *Saratoga* likely would not have occurred in wartime since the silhouettes of the *Lexington*-class carriers were quite distinctive from any foreign carriers in service at the time.²¹

Before assessment of its damage penalty, aircraft from the *Saratoga* made several attacks on the morning of 18 April upon Blue submarines and surface forces. Operations from the *Langley* were limited to protection of spotting planes during the battleship

²⁰ *Ibid.*, pp 42-45.

²¹ *Ibid.*, pp 48-49.

engagement. This battle served as the climax to Fleet Problem XI, which ended in late morning.²²

In the critique following Fleet Problem XI, Vice Admiral Cole and Rear Admiral Butler made the most insightful comments. Admiral Cole delineated some of the threats a carrier group, which he assumed to be comprised of one carrier, four cruisers, and two destroyer divisions, could fall prey to. However, if these threats proved manageable, he stated,

... then possibilities lie before us in the employment of this group in distant operations for information; in exercising partial control of the sea before complete control is established, in tactical scouting, in whittling down the enemy's strength, and possibly in other ways we do not now visualize. This question is of highest importance for study and exercise in the Fleet.²³

Admiral Cole's final statement would prove prescient as future Fleet Problems, beginning with Problem XII, became centered on these early carrier groups.

Admiral Butler echoed Cole's sentiments by calling for the formation of "... semi-permanent task groups, each consisting of one large aircraft carrier, a division of cruisers, and a division of destroyers. Train them together in frequent exercises." This observation aside, most of his comments related to increased efficiency of scouting operations by increasing the size of scouting squadrons, developing a new scout plane, and increasing the numbers of radios among carrier aircraft.²⁴

As these two exercises were being conducted, the London Naval Conference was underway. Most of the controversy at the conference had to do with cruiser tonnage

²² *Ibid.*, p. 63.

²³ *Ibid.*, p. 66.

²⁴ *Ibid.*, p. 76.

allotments among the various naval powers, though the proceedings would also affect carrier aviation. Before the conference, Admiral Moffett unsuccessfully proposed that the delegation, of which he was a member, should push to have the *Lexington* and *Saratoga* re-classified as experimental carriers. During the conference, a British proposal called for a reduction in carrier tonnage to 100,000 tons. As it turned out, Moffett successfully managed to keep carrier tonnage at 135,000 tons, as well as pushing through a proposal to devote portions of cruiser tonnage for “flying deck cruisers.” Ships of this type were to be frequently discussed for the next three years before the Navy shelved plans to build any such hybrid vessels.²⁵

The exercises of 1930 further integrated carrier air power into the U.S. Navy. While the carriers did not achieve same level of prominence they had displayed in Fleet Problem IX, partly because the navy allowed only scant media coverage, the 1930 exercises succeeded at furthering the doctrinal evolution towards independent carrier task forces. Additionally, Admiral Moffett succeeded in his efforts to prevent any current or future reduction in American carrier strength. With Admiral Pratt’s accession to the post of Chief of Naval Operations in late 1930, the chance for carriers to assume a central position in the Fleet Problems would soon be at hand.

²⁵ William Trimble, *Admiral William A. Moffett: Architect of Naval Aviation* (Washington, 1994), 213, 216-220.

CHAPTER VI

“MOST INTERESTING STUDY”¹: FLEET PROBLEM XII

Of the Fleet Problems that marked the beginning of the fast carrier era for the U.S. Navy, perhaps the most fascinating was Fleet Problem XII. Certainly other Problems, such as IX, were influential and controversial for their inclusion of independent carrier operations, but the media and Congress saw XII as an attempt to solve the “carrier versus battleship” debate. Despite the hope that officers, such as Admiral Reeves, might have had for the carrier’s success in the exercise, the results of Fleet Problem XII would favor the battleships. A more careful analysis reveals that some naval officers realized the importance of a strong air component for the fleet’s success, regardless of whatever shortcomings still existed in the carriers or their aircraft, because of this exercise.

The scenario for Problem XII pitted Black, a Pacific naval power, against Blue, the United States, whose options were limited by the existence of Brown, a European nation, which might potentially favor either Black or Blue. Thus, Blue had to keep most of its battle fleet on the East Coast to counter any potential threat posed by Brown. Black’s mission was to seize or destroy the Panama Canal, as well as a theoretical canal in Nicaragua that was operational but was still bereft of significant defenses.

The defending Blue Fleet, under the command of Vice Admiral Arthur Willard, included the *Lexington* and *Saratoga*, the battleship *Arkansas*, several cruisers and destroyers, the airship *Los Angeles*, and the seaplane tender *Wright*. Admiral Reeves, who

¹ Testimony Before Coolidge Aircraft Board, 16 Oct. 1925, box 8, John H. Towers Papers (Library of Congress, Washington D.C.), p. 7.

had missed the previous year's exercises due to a shore assignment, commanded Carrier Division Two comprising the *Lexington* and *Saratoga*. The aggressor Black fleet commanded by Admiral Frank Schofield contained the majority of the U.S. Navy's battleship strength with the *Langley* as Black's sole means of air support.²

Recognizing that *Lexington* and *Saratoga* would be incapable of engaging Black's battleship forces directly with any hope of victory, Willard decided to dispatch Reeves and his carriers to strike at Black's fleet train in the hope that this would halt the Black advance upon the two canals. Reeves, who operated with a great deal of autonomy throughout the exercise, deployed his carriers in separate task forces, with himself in the *Saratoga* off the Nicaraguan coast and ordering the *Lexington* under Captain Ernest King to defend Panama. Meanwhile, Admiral Schofield had divided his Black forces into two parts, with the Port Culebra force designated to assault the Nicaraguan canal, and the Bahia Honda force to attack the Panama Canal.³

Only a few hours into the problem, which began on 16 February 1931, Admiral Reeves ordered King and the *Lexington* to reconnoiter the Galapagos Islands. Apparently, Reeves feared that Black might launch an attack from that direction as he had during Fleet Problem IX. On 18 February King proceeded to the southwest as ordered and sent one of his escorting light cruisers, the *Milwaukee*, ahead of the remainder of his force to scout the islands using its floatplane. Having been satisfied that no enemy ships were in

² "U.S. Fleet Problem XII, February 1931, Report of the Commander In Chief," *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941* (microfilm, 36 reels, National Archives, 1974) reel 13, pp 1-2.

³ *Ibid.*, pp 9-15; *Ibid.*, pp 6-9.

the vicinity, the *Lexington* turned northward, but the carrier was now out of position to attack the Black Bahia Honda force until the next day.⁴

Meanwhile, far to the north, Reeves placed *Saratoga* behind a scouting line of cruisers in a formation resembling the “offensive screening” force first used by the Black fleet in Fleet Problem X. As Reeves’ Blue carrier division steamed westward, the Black Port Culebra force advanced to the northeast on Blue’s southern flank, meaning Reeves’ movements during these first two days of the problem took his fleet behind the advancing Black convoy. Once recognizing this, Admiral Reeves turned his force to the east on the afternoon of 18 February.⁵

At 1010 on the 19th, seaplanes from the tender *Wright* located the Bahia Honda convoy. Three hours later the airship *Los Angeles* also found the Bahia Honda force and reported its location before being ruled destroyed by gunfire from the Black warships. At 1520, the *Lexington* finally steamed into range and launched a force of 33 aircraft in response to these contact reports. Its pilots soon discovered that the Black force was 75 miles away, not 40 miles, on a slightly different bearing than previously reported. Despite the erroneous position report the *Lexington*’s aircraft managed to attack the *Langley* late in the afternoon.⁶

The scout bombers in the attack force returned to the carrier safely in daylight, but the unexpected difference in distance and miscommunication over the *Lexington*’s

⁴ “Report of the Commander in Chief,” *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941*, reel 13, pp 20-21; Thomas Wildenberg, *All the Factors of Victory* (Washington, 2003), 219.

⁵ “Report of the Commander in Chief,” *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941*, reel 13, p. 25.

⁶ *Ibid.*, p. 28.

expected position meant that the remaining aircraft, including some ever-troublesome Martin/Great Lakes torpedo bombers, could not make it back to the *Lexington* before the sun set shortly after 1800 and thus were forced to make night carrier landings, among the first of their kind. Captain King, fearing the loss of the aircraft, ordered the carrier's lights turned on so that the pilots could find it in the darkness. Fortunately for the pilots, as well as King's career, all aircraft returned to the carrier safely, allowing it to retire to the east during the night.⁷

Meanwhile, the *Saratoga* tracked the efforts of several Blue vessels tailing the Port Culebra convoy during the night, and by the morning of 19 February was positioned due west of the Black convoy. Unfortunately for the carrier, the Port Culebra convoy had nearly reached its final destination by this time, thus giving the *Saratoga* little time to halt the advance. The *Saratoga* launched an attack force of 62 aircraft even before its scouts, which had launched at dawn, found the Black force. When the scouts failed to find the Port Culebra convoy, the attack force returned to the carrier for refueling, wasting even more valuable time. Finally, at 1100, the attack force launched again after receiving confirmation of the Black position. The *Saratoga*'s aircraft attacked the convoy successfully, but records are unclear as to the exact damage caused by the attack. One of the torpedo squadrons sent out as part of the attack force returned to the carrier nearly two hours late, preventing the *Saratoga* from launching a follow-up strike that day. The *Saratoga* launched more air attacks the next morning, 20 February, but operations for

⁷ *Ibid.*, p. 28; Thomas Buell, *Master of Sea Power: Fleet Admiral Ernest J. King* (Boston, 1980), 73.

both fleets off Nicaragua ceased at 1000 after the arrival of the Black convoy at Port Culebra.⁸

The *Lexington* continued to operate against the Bahia Honda convoy on 20 February, launching an air attack against it that morning, but the record is again thin as to the damage caused or losses in aircraft suffered. At 1120, the Black cruiser *Pensacola* sighted the *Lexington*, and King responded by launching 13 aircraft to attack the cruiser. Meanwhile, the *Lexington*'s plane guard destroyers and the light cruiser *Cincinnati* sprang to the carrier's defense, with the destroyers promptly laying a smoke screen. The combined efforts of the aircraft and the *Lexington*'s escorts sank the *Pensacola*, but at the cost of the *Cincinnati*. That afternoon flights of 26 and 27 aircraft, respectively, launched from the *Lexington* against the Bahia Honda convoy at 1417 and 1455 failed in their last ditch efforts to stop the Black convoy before the problem was terminated at 1800.⁹

The greatest handicap upon the carrier operations Fleet Problem XII stemmed from the scenario itself. Blue could not concentrate its air power effectively since both canals required protection, and a single carrier stood little chance of stopping a large, well-defended surface force. Despite the failure of the Blue carriers to stop the Black advance, imbalanced fleets would become commonplace as parts of Fleet Problem scenarios during Admiral Pratt's tenure as Chief of Naval Operations, which had begun in late 1930. Beginning with Fleet Problem XII, the remaining exercises of Pratt's term featured imbalanced fleets, and only in Fleet Problem XIII would the *Lexington* and *Saratoga* be divided among opposing fleets.

⁸ "Report of the Commander in Chief," *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941*, reel 13, pp 29-32.

⁹ *Ibid.*, pp 32-33.

Throughout Problem XII, both the *Lexington* and *Saratoga* operated at or near their maximum speeds, which clearly helped protect themselves against surface attacks like those that had damaged both carriers in previous exercises. This was especially true for the *Lexington* during its engagement with the *Pensacola* on the final day of the exercise. The exercise demonstrated that the carriers could be difficult beasts to trap and kill when they sailed at high speed and took evasive action, but the cost of this maneuvering was high in terms of fuel consumed. By the end of the exercise the carriers had consumed nearly two thirds of their fuel and there were no nearby sources of replenishment. Thus, despite the newly developed abilities of carriers to refuel their escorts, the operations of the carriers remained limited by their dependence upon a logistical tail.

Though one might expect Reeves to be disappointed with the results of Fleet Problem XII, he did see some positives in the carriers' performance. At the critique, Reeves stated that:

In general terms I believe the results of this problem clearly and conclusively show that the air force cannot stop the advance of battleships and prevent them from carrying out landing operations, that battleships and air force are mutually dependent, that battleships and air force operating together mutually increase the effectiveness of each other, that the air force directly affects battleship design in the matter of maximum gun range by making gun fire effective at long ranges by means of aircraft spotting. Twice in Problem Twelve the BLUE carriers would have been destroyed by BLACK battle ship gun fire had BLACK possessed an air force adequate for controlling his gun fire.¹⁰

Reeves' career record clearly shows greater interest in practical experience with carrier aviation rather than becoming a shrill, Billy Mitchell-esque advocate for carrier aviation or even a slick, bureaucratic manipulator like Admiral Moffett. Reeves' comments, while

¹⁰ *Ibid.*, pp 35-36.

acknowledging the failure of the carriers, demonstrate that he believed that the carriers and battleships had become dependent upon each other to reach their maximum effectiveness.

Admiral Pratt's reaction to Fleet Problem was similar to that of Reeves. Pratt, not known as a particularly outspoken advocate for carrier aviation, had testified during Billy Mitchell's court martial proceedings to rebut Mitchell and Admiral William Sims' claims that Naval War College war games had proven that battleships were obsolete. The results of Problem IX certainly opened his eyes to the potential of carrier air power, and he cited the events of that exercise during a speech Pratt gave at the Naval War College in August 1929. In the speech, he chided some in the naval establishment by saying that, "... the naval point of view is so generally fixed upon the idea of the battleship as the striking arm that it was not entirely ready to accept the idea that the real striking force may, if the situation demands it, consist almost entirely of an air force properly supported."¹¹

Pratt's support for carrier aviation may not have been as deep as the Naval War College speech might indicate. During the extreme budget cuts in the early years of the Depression, Pratt supported efforts to place the *Saratoga* and *Lexington* in a rotating reserve system whereby one carrier was in commission while the other would be temporarily decommissioned. Opposition from numerous quarters, particularly the General Board, put a stop to any such scheme on the basis that little savings would be realized because of the costs associated with decommissioning and re-commissioning vessels. The scheme fit into a broader trend where Pratt would support policies unpopular

¹¹ Norman Friedman, Thomas C. Hone, and Mark Mandeles, *American and British Aircraft Carrier Development* (Annapolis, 1999), 41; Admiral William Pratt, "Aspects of Higher Command," speech, 29 Aug. 1930, box 8, Papers of William Veazie Pratt (Naval War College Library, Newport, Rhode Island), p. 7.

in naval circles, such as the 1922 and 1930 naval limitations treaties, for the sake of aligning himself more closely to overall government policy.¹²

In the critique following Fleet Problem XII, Pratt stated, "...that the battleship is still the backbone of the Fleet." Pratt saw that the Blue fleet could effectively locate enemy forces for much of the problem, but was wholly incapable of delivering enough firepower to halt the Black advance. Underneath the rhetoric, Pratt still appeared to hold carrier aviation's value in high regard. Though Pratt acknowledged the fact that the Black fleet had reached its objectives during the exercise, he concluded that Black's effectiveness was "handicapped" by the lack of air support throughout the exercise.¹³ Regardless of Pratt's exact stance on the matter, the next two Fleet Problems during his term as the Chief of Naval Operations continued testing the value of independent carrier operations.

The media coverage for Fleet Problem XII compared with that of Fleet Problem IX in terms of scope, and at least one article recounting the events in the exercise rated a placement on the front page. Hanson Baldwin, the Pulitzer Prize-winning columnist, covered the exercise for the *New York Times*. Not surprisingly, the media coverage for the exercise focused on the "battleship versus carrier" controversy much more than any participating naval officers during or after the exercise. One headline nearly six weeks before the start of the exercise read "Major Aircraft Test in Coming War Games." The apparent success of the Blue Fleet in their attacks on Black garnered a front-page story,

¹² Gerald Wheeler, *Admiral William Veazie Pratt, U.S. Navy: A Sailor's Life* (Washington, 1974), 342, 355.

¹³ "Report of the Commander in Chief," *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941*, reel 13, p. 35.

“Planes Save Panama From ‘Enemy’ Attack In Naval War Game,” in which Baldwin described the aerial attacks upon the Black fleet as “another feather in the cap of aviation” and “a symbol of the new era of naval warfare.” Later articles tempered Baldwin’s optimism, as it became known that Black successfully reached both objectives, with one later headline reading “Battleship Stands as Navy’s Backbone.” Within this article, Baldwin wrote:

Despite the advance in aerial warfare and the splendid performance of the flying fleet in the war problem just concluded, naval officers pointed out that the heavily armored, powerfully gunned battleship, the only man of war able to take as well as give punishment, is still the backbone of the fleet and promises to remain so for years to come, unless it is abolished in all navies by international agreement.¹⁴

Fleet Problem XII also became fodder for Congressional debates concerning naval appropriations. Soon after the exercise, Pratt and Reeves reported to Representative Fred Britten, the Chairman of the Naval Affairs Committee, who later declared that, “It is interesting to note that even the aviation enthusiasts of the navy now admit the superiority of the battleships.”¹⁵

A debate on the floors of Congress occurred on the same day as Britten’s statement to the *Times* over the authorization for reconstructing the three *New Mexico*-class battleships. Britten cited the success of the battleships in Fleet Problem XII as justification for the expense during the heated proceedings. Fiorello LaGuardia leveled a particularly wild accusation towards the navy and its motives behind choosing Fleet Problem XII’s scenario:

¹⁴ “Canal Zone Will Learn Full Power of Naval Aviation,” *New York Times*, 4 Jan. 1931, sec. 9, p. 6; Hanson Baldwin, “Planes Save Panama From Enemy Attack in Naval War Game,” *New York Times*, 21 Feb. 1931, p. 1; Hanson Baldwin, “Battleship Stands as Navy Backbone,” *New York Times*, 23 Feb. 1931, p. 3.

¹⁵ Hanson Baldwin, “Value of Battleship Proved,” *New York Times*, 27 Feb. 1931, p. 9.

It has been stated, not by legislators but by the best naval experts in the world, that it is expected never again to build a battleship, as these battleships pass out; and yet at the last moment this appeal is staged in a manner as only the navy can do it. The Navy has the best publicity department of any concern in this country. They have an unofficial report of the referees telling us that the Black Fleet seized Panama and established a base there. What did they do? They put all the [battle]ships in the Black Fleet and they put one [battle]ship and aviation in the Blue Fleet.

.... and if this were an appropriation for naval aviation, the other fleet would have suffered the same kind of defeat. This is not the first time the Navy has pulled something like this at the psychological moment. They are very ingenious down at the Navy Department.¹⁶

In spite of LaGuardia's accusations, the measure passed and all three *New Mexico*-class underwent modification during the early 1930s.¹⁷

It should also be remembered that carrier against battleship engagements during World War II in open waters did not point to aerial supremacy until the latter years of the conflict. For instance, the sinking of the *Bismarck* could only have occurred because of a single Swordfish torpedo plane striking the battleship's rudder, but gunfire and torpedoes from British battleships and cruisers were still required to sink the German battleship.

The fear of surface attacks clearly guided the actions of some American naval commanders in the Pacific, particularly those of Admiral Raymond Spruance during the Battle of Midway.¹⁸

Engagements resembling that created for Fleet Problem XII were somewhat rare during World War II. Had Spruance and Yamamoto been eager to continue the fighting around Midway following the destruction of the Japanese carriers, this certainly would

¹⁶ *Congressional Record*, 71 Cong., 3 sess., 26 Feb. 1931, p. 6182.

¹⁷ Norman Friedman, *United States Battleships: An Illustrated Design History* (Annapolis, 1985), 200-203.

¹⁸ Thomas Buell, *The Quiet Warrior: A Biography of Admiral Raymond A. Spruance* (Boston, 1974), 140.

have resembled Fleet Problem XII. The carrier raids upon Taranto in 1940 and Pearl Harbor in 1941 certainly demonstrated the power of carrier attacks upon battleships, but are more attributable to the poor states of readiness in both the Italian and American fleets.

One clear example of a carrier against battleship engagement occurred in June 1940. During the British withdrawal from Norway, the German battlecruisers *Scharnhorst* and *Gneisenau* surprised and sank the carrier *Glorious*. The carrier had no aircraft operating at the time and the two escorting destroyers steamed far ahead of the carrier, creating a situation at the time of the attack reminiscent of those encountered by American carriers in the Fleet Problems. Yet, despite the caveats, this early war engagement demonstrated the continued vulnerabilities of carriers to attacks from surface vessels. Not until the appearance of the massive air armadas of the U.S. Navy's Fast Carrier Task Force was this debate clearly resolved in favor of carrier air power.¹⁹

Perhaps the biggest change to result from Fleet Problem XII came in the design of new aircraft carriers. The last two years of operating experience, the Fleet Problems included, demonstrated the value of the *Lexington*-class carriers and their abilities to operate independently of the fleet. Beginning in March 1931, a design study examined the most effective ways to distribute the remaining 55,200 tons allowed under the Washington treaty, and the study recommended the construction of three 18,400-ton carriers later that spring. However, Pratt reasoned that pairs of carriers of similar characteristics made more sense, proposing instead two 20,000-ton carriers and a single 15,200-ton carrier comparable to the *Ranger*. Following hearings during the summer, the

¹⁹ John Winton, *Carrier Glorious: The Life and Death of an Aircraft Carrier* (London, 1986), 164.

General Board endorsed Pratt's scheme that fall, stating, "... it is believed that no carrier of less than 18,000 tons, approximately, can be given the necessary speed and protection to make it well suited for all the duties required of carriers."²⁰

Although carrier aviation could have suffered a setback following Fleet Problem XII, one was not forthcoming. Though likely disappointed with the results of the exercise, Pratt and Reeves called for a more balanced and complementary fleet operations afterwards. Carrier aviation had not lost its standing, and its work over the previous few years was rewarded, in one sense, by the change in carrier designs that came later that year. 1931 was a good year for carrier aviation, and the carriers would have more chances to prove themselves in the next two years as the Fleet Problems continued to have imbalanced forces.

²⁰ Norman Friedman, *United States Aircraft Carriers: An Illustrated Design History* (Annapolis, 1983), 79-80; Wheeler, *Admiral William Veazie Pratt*, 333; General Board Serial 1533, "Design of Future Aircraft Carriers," 7 Oct. 1931, General Records of the Department of the Navy, RG 80 (National Archives, Washington, D.C.), p. 4.

CHAPTER VII

PRICELESS ASSETS IN WAR: GRAND JOINT EXERCISE 4 AND FLEET

PROBLEM XIII

Fleet Problem IX demonstrated that carriers could be effectively used as platforms from which to strike high value targets ashore, in that case the Panama Canal. Despite this, the use of carriers returned, in the next three fleet problems, to scouting for the main battle fleet with an emphasis placed on integrating the operations of the new carriers into those of the fleet as a whole. Thus the scenarios that guided Fleet Problems X-XII, while allowing for the testing of many worthwhile developments in carrier operations, particularly the granting to the carriers of a certain degree of independence from the remainder of the fleet, did not provide carrier aircraft with an opportunity to deliver a knockout blow against a target ashore similar to the one they delivered against the Panama Canal in Problem IX. Naval aviators did get the opportunity to demonstrate their capabilities in a different context in 1932, i.e., in Grand Joint Exercise 4 (GJE 4). Both GJE4 and Fleet Problem XIII, held immediately after GJE4, focused on different aspects of expeditionary warfare, but the operations of the carriers would impact both exercises.

The Army-Navy Grand Joint Exercises were usually held in conjunction with the Navy's fleet problems. In 1923, the same year as Fleet Problem I, the army and navy staged a Combined Exercise in the Panama Canal Zone. The following year, Fleet Problem III, also called Joint-Army and Navy Problem Two, again tested the vulnerability of the canal. The *Langley* participated in this exercise, protecting the Black Fleet as it sailed from a hypothetical starting point in the Azores and launching air attacks

with its meager air group on the Gatun Locks. Following this exercise, the Joint Board created guidelines dividing joint exercises into two categories, with the moniker “Grand Joint Exercise” being applied only to those exercises where one or all of the major U.S. Fleet commands (Scouting Fleet, Battle Fleet, etc.) participated.¹

The *Langley* participated in Grand Joint Exercise 3 in 1925 as part of the Blue fleet tasked with the invasion of Hawaii. However, the umpires grounded its aircraft for the entire exercise, forcing the Marines to conduct landing operations without air cover. The Navy later charged that the Army forced the aircraft grounded to promote land-based aircraft’s ability to provide coastal defense.²

For the next seven years, no other Grand Joint Exercises were held. In 1926, the Joint Board decided to not hold a Grand Joint Exercise during the winter of 1927 because the fleet concentration would be in Panama, and the first two major joint exercises had recently been held there. Reasons of cost, scheduling, and a lack of variety in potential targets likely prevented the scheduling of a Grand Joint Exercise for the next five years, although minor joint exercises were held frequently during this period. Finally, in December 1930, the Joint Board called for a Grand Joint exercise to be held in Hawaii in February 1932.³

¹ “Combined Exercises in Panama Canal Zone, 1923,” 31 March 1923, *Records of the Joint Board, 1903-1947* (microfilm, 21 reels, National Archives, 1987), reel 15; “Remarks by Captain S.H.R. Doyle,” 14 Jan 1924, *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941*, reel 2, p. 1-4; “Regulations for Joint Army and Navy Exercises,” 15 Aug. 1924, *Records of the Joint Board, 1903-1947* (microfilm, 21 reels, National Archives, 1987), reel 15.

² Leo J. Daugherty III, “Away All Boats: The Army -Navy Maneuvers of 1925,” *Joint Force Quarterly*, 20 (Autumn/Winter 1999), 110-112.

³ “Joint Army and Navy Exercises, 1926-1927,” 14 Jan. 1926, *Records of the Joint Board, 1903-1947* (microfilm, 21 reels, National Archives, 1987), reel 15; “Report of the Chief Umpires, Grand Joint Exercise No. 4,” 9 June 1932, *Ibid.*

The scenario for GJE4 pitted the United States against a coalition of Pacific and Atlantic nations. During the conflict, American naval forces achieved victory over Black naval forces in the Atlantic, forcing their retreat, but as the combat raged in the Atlantic, a member of the Black coalition in the Pacific invaded the Hawaiian Islands, then withdrew westward, leaving behind a garrison of 18,000 men, numerous aircraft, and 15 submarines to defend the islands. The Blue (U.S.) Fleet, under the command of Admiral Richard Leigh, was to retake the islands through amphibious landings. Leigh divided his forces into multiple parts, with the carriers *Lexington* and *Saratoga* and seven destroyers comprising the Advanced Raiding Force under Rear Admiral Harry Yarnell. The carriers had the responsibility of reducing the defenses of Oahu and attaining air superiority before the landings occurred.⁴

The Advance Raiding Force sailed from the West Coast on 1 February, and, as it continued westward, the two carriers used their refueling capabilities developed after Fleet Problem IX to top off the bunkers of the escorting destroyers on 5 February. The course of Yarnell's force took it to the north of Molokai, and, by the morning of 7 February, the two carriers reached the first designated launching point about 40 miles northeast of Oahu. There, despite rough seas, high weather, and overcast weather, the carriers launched their planes.⁵

For this exercise, the carriers experimented with a different deployment scheme for their aircraft. At the suggestion of Captain John Towers, who served as Admiral

⁴ "Grand Joint Army and Navy Exercise, Hawaii, February 1932," 24 April 1931, *Ibid.*; Commander Aircraft, Battle Force to Commander Battle Force, "Operations of the Blue Air Force in Grand Joint Exercise 4," 27 Feb. 1932, box 61, RG 8, Naval Historical Collection, (Naval War College Library, Newport, R.I.), pp 1-2.

⁵ *Ibid.*, pp 2-5.

Yarnell's chief of staff, planes were divided into homogeneous air groups, with most of the *Saratoga's* 97 aircraft being fighters, while the *Lexington* carried 58 bombing and torpedo aircraft. This arrangement did not assign all the striking power to the *Lexington* since the fighters carried by the *Saratoga*, many of which were Boeing F4Bs, could deliver up to 200 pounds of bombs. Towers believed that such a deployment would allow for quicker response times because the carriers would not have to rearrange aircraft if a particular type were required for a mission. On the negative side, this also meant that a single well-placed strike by enemy forces could cripple entire portions of the naval air force. This was readily apparent to members of the naval hierarchy, who viewed the standard mixed aircraft complements as a "lesser evil" than the potential problems that could arise from such strikes. While the division of aircraft would not hinder the carriers' operations during the exercise, the Navy's fears combined with the inability to amass multiple carrier task forces due to a scarcity of available units shelved the idea for future exercises.⁶

At 0530, both carriers began launching aircraft as a part of Raid Plan No. One. The 150 attacking aircraft struck their targets between 0600 and 0700. Those from the *Saratoga's* focused their attacks on aircraft and anti-aircraft defenses at Wheeler Field, the main Army airbase on the island, with a smaller number of planes hitting Luke Field and Rodgers Airport, and a few making strafing runs on Ford Island in Pearl Harbor before returning to the carrier. Meanwhile, the *Lexington's* aircraft attacked various

⁶ Clark Reynolds, *Admiral John H. Towers: The Struggle for Naval Air Supremacy* (Annapolis, 1991), 237; "Estimate of the Situation, Plans and orders by Commander Blue Force," *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941* (microfilm, 36 reels, National Archives, 1974) reel 14, Appendix I, p. 3; CINCUS to CNO, 11 July 1932, box 159, RG 80 (National Archives, Washington D.C.), p. 1.

installations at Schofield Barracks, including an ammunition depot and a chemical depot. Aircraft from both carriers also conducted scouting missions, including photographic reconnaissance of airfields and conditions at the landing beaches. Umpires assessed the attacking force with 26 aircraft losses, though more than half of these were “replaced” by 8 February.⁷

During GJE4, much as during Fleet Problem IX, the carriers still proved vulnerable during flight operations. A Black submarine, the *S-42*, sighted the *Saratoga* at a range of 2800 yards while the carrier’s aircraft were aloft. At 0725, during landing operations, the submarine launched torpedoes at the *Saratoga*, with the carrier receiving a 19 percent damage penalty from the umpire, representing significant damage, but not enough to force cessation of flight operations.⁸

After recovering their aircraft on the 7th, the *Lexington* and *Saratoga* retired to the northward, then reversed to a southerly course that took them through the Kauai Channel to a refueling point well to the south of Oahu. During the night, a pair of destroyers left the Advanced Raiding Force temporarily to conduct a bombardment of Hanapepe Field on Kauai. On the afternoon of 8 February, the carriers split into two formations, with the *Lexington* and one destroyer moving south to evade contact with enemy forces, and the *Saratoga* and the remaining destroyers heading northward to attack Oahu.⁹

⁷ Operation Order No. 1, memo, 25 Jan. 1932, entry 70, box 1, RG 72 (National Archives, Washington, D.C.), Annex 1, pp 1-2; ComAirRon to ComBatFor, 27 Feb. 1932, box 61, Naval Historical Collection, pp 5-8.

⁸ *Ibid.*, p. 5.

⁹ *Ibid.*, pp 8-9.

At 0515 on 9 February, the *Saratoga* launched a strike force of 51 attack aircraft escorted by 16 fighters. Some of the aircraft attacked Black submarines off Diamond Head, but most aircraft attacked ground targets, primarily in the area of Waimanalo, or scouted more potential landing beaches. A total of 10 aircraft were judged lost on these missions.¹⁰

At 0605 on 10 February, the reconstituted Advanced Raiding Force launched 96 aircraft for further strikes from a point southwest of Oahu. Soon after the departure of the aircraft, a group of Black aircraft attacked both carriers, hitting the *Saratoga* with a 2,000-pound bomb that rendered its flight deck inoperable for the remainder of the exercise. Both sides suffered heavy aircraft losses during the attacks upon the carriers and the concurrent Blue attacks upon ground targets on Oahu. Fortunately for Blue, the *Saratoga*'s remaining aircraft were allowed to transfer to the *Lexington*, leaving a total of 52 operable aircraft.¹¹

On 11 February, the two carriers split again with the *Lexington* taking up a position north of Oahu to cover the landings of troops near Kahuku Point, while the *Saratoga* steamed to Lahaina Roads, a point off the northwest coast of Maui, for repairs. Black aircraft attacked the *Saratoga* again while in transit, bringing its total damage to 70 percent. The *Saratoga* got some measure of revenge upon reaching Lahaina by fueling a group of seaplanes that eventually sank several submarines and bombed railroad junctions on Oahu.¹²

¹⁰ *Ibid.*, pp 9-11.

¹¹ *Ibid.*, pp 11-12.

¹² *Ibid.*, pp 12,14.

Meanwhile, the *Lexington* had considerable success supporting landing operations on 12 February. The remaining Blue forces, which had seized Hilo on the Big Island on 7 February and Lahaina Roads on Maui three days later, finally arrived to land Blue ground forces on Oahu's west coast that morning. Forty-eight of *Lexington's* aircraft flew missions laying smoke over the landings beaches, photographing enemy positions, and attacking roads and rail lines, as well as aircraft on the ground at Ewa Field. By the end of the exercise at 1630 on 12 February, only 23 aircraft remained flyable aboard the *Lexington* out of the 155 on it and the *Saratoga* at the start of the exercise.¹³

Grover Loening, an early aeronautical specialist known for developing the widely used Loening Amphibian, observed the entire exercise from aboard the *Saratoga*. In an article written after the end of the exercise, Loening showered praise upon the performance of the *Lexington* and *Saratoga*, which he called "...without doubt the greatest mechanical advancements of the day." Loening was particularly impressed by the mobility of the carriers, which he touted as a potentially "priceless asset in war." He also praised the efforts of aviators on both sides of the exercise, especially those aboard the two carriers.¹⁴

Loening expressed frustration in concerning the penalties assessed during the exercise. He believed that the attacks on 7 February would have destroyed all Army aircraft on Oahu, and that the umpire's failure to assess such a penalty led to the unfair near-sinking of the *Saratoga* on 10 February. Yarnell concurred with Loening in his post-

¹³ "Report of the Chief Umpires, Grand Joint Exercise No. 4," 9 June 1932, *Records of the Joint Board, 1903-1947* (microfilm, 21 reels, National Archives, 1987), reel 15, pp 6-8; ComAirRon to ComBatFor, 27 Feb. 1932, box 61, Naval Historical Collection, pp 13-14.

¹⁴ Grover Loening, "Almost Half Way Home," 12 Feb. 1932, box 9, Papers of Admiral Harry E. Yarnell (Operational Archives Branch, Naval Historical Center, Washington, D.C.), p. 1.

exercise report, in which he catalogued the numerous Army aircraft estimated to have been destroyed in the attacks. The controversy over the penalties also stemmed from Army complaints about the “legality” of attacking on a Sunday morning.¹⁵

Though the strikes upon Oahu’s airfields and military facilities were impressive, some officers questioned the ways in which the carriers were employed. Admiral Frank Schofield, the Chief Umpire, believed both sides wasted aircraft by not conserving them for the landing operations. He also pointed out the limitations imposed on the Blue carrier aircraft since safety requirements forced their launching from closer inshore than would occur in wartime. Believing air superiority vital for landings, and that carriers would be mauled “in the face of strong defensive aviation,” Schofield suggested that initial landing operations should have as their target the capture of an airfield that could be used by land-based aircraft to support subsequent landing operations. Though not explicitly stated, it is possible that Schofield thought the risk of carrier-supported landings too great because there were so few carriers in service.¹⁶

Admiral Yarnell also had concerns with the mission assigned to the carriers. He regarded the air attacks on Oahu as a success, regardless of the penalties rendered upon the *Saratoga*, but was uneasy with the assigning of the carriers to the task of attacking shore defenses. Due to a scarcity of carriers, he felt that they were too valuable to use for such missions “when other means are available.” Instead, Yarnell, like Schofield, envisioned operations against lesser-defended outlying islands in order to acquire enough

¹⁵ *Ibid.*, p. 2; ComAirRon to ComBatFor, 27 Feb. 1932, box 61, Naval Historical Collection, pp 15-16; Thomas Wildenberg, *Destined for Glory: Dive Bombing, Midway, and the Evolution of Carrier Air Power* (Annapolis, 1998), 96.

¹⁶ “Report of the Chief Umpires, Grand Joint Exercise No. 4,” 9 June 1932, *Records of the Joint Board, 1903-1947* (microfilm, 21 reels, National Archives, 1987), reel 15, pp 9-10.

airbases for land-based aircraft to accomplish the same tasks, though he did not elaborate further on working out the logistical feasibility of such a plan. Yarnell stated in a letter to Admiral William Sims, long since retired, that, “I am of the opinion that no fleet, however strong it might be in surface forces, could risk a descent on any enemy coast unless it were in possession of an air force (carrier-based) greatly superior to that which the enemy could put in action against it.” Yarnell’s uneasiness with a strike role against land targets would be expressed again following Fleet Problem XIV in 1933.¹⁷

In his critique following the exercise, Rear Admiral Harris Laning, the President of the Naval War College and an umpire for the exercise, also noted the mobility of the carriers and his belief that such mobility gives naval airpower the initiative over land-based airpower. However, he questioned the usage of the two carriers against the land-based targets when the enemy fleet, albeit a small one, still defended the area. Laning believed that had a strategy focusing upon eliminating all Black naval units been in place, Black aircraft could have been lured from their bases to defend their fleet and destroyed in aerial battles by Blue aircraft. Such statements are surprising, given that Fleet Problems IX, X, and XI had already demonstrated the extreme vulnerability of the carriers to air attack. With the ability of the carriers and their escorts to outrun submarines and most surface ships, it would seem more logical to exploit their mobility as they did during GJE4 and to eliminate the biggest threat to their survival: land-based aircraft.¹⁸

¹⁷ ComAirRon to ComBatFor, 27 Feb. 1932, box 61, Naval Historical Collection, p. 16; Yarnell to Sims, 9 April 1932, box 14, Papers of Admiral Harry E. Yarnell (Operational Archives Branch, Naval Historical Center, Washington, D.C.).

¹⁸ CINCUS to et. al., 20 Feb. 1932, box 61, Naval Historical Collection, p. 1.

It is curious that Black did not put more effort into scouting the approaches to Oahu in the days leading up to the Blue carrier attacks. In a memo written nearly a year before GJE4, in March 1931, combined “sea-air” attack was already considered the most likely form of attack on the Hawaiian Islands. Despite this warning, the Navy successfully launched carrier raids on Oahu in GJE4 and in 1938 as a part of Fleet Problem XIX. The men in charge of defending of Oahu in 1941, Admiral Husband E. Kimmel and Lieutenant General Walter C. Short, also failed to implement the scouting measures necessary to ensure the security of the island from carrier attack, contributing to the success of the Imperial Japanese Navy’s attack on Pearl Harbor.¹⁹

Of the early fleet carrier exercises, GJE4 was the most successful exercise for carrier operations, even though Fleet Problem IX’s influence appears to have been considerably greater. In GJE4 the carriers received significant damage, such as that suffered by the *Saratoga* by air and submarine attacks and the mauling of both carriers’ air groups, but they accomplished their mission and survived the exercise. Absent a serious threat from Black naval forces, Blues carriers were able to launch numerous attacks upon Oahu from several different directions over the course of six days. The use of carrier task forces to neutralize enemy air power on the eve of landings would become quite common during the latter phases of the Pacific War, though roles assigned to the *Lexington*’s air group during the landing phases of the exercise —laying smoke, aerial reconnaissance, and strikes against enemy transportation facilities—were indicative of

¹⁹ “Local Joint Planning Committee to Commandant, 14th Naval District and Commanding General, Hawaiian Department,” 4 May 1932, *Records of the Joint Board, 1903-1947* (microfilm, 21 reels, National Archives, 1987), reel 3, enclosure A, reference A, p. 1; Thomas Buell, *Master of Sea Power: A Biography of Fleet Admiral Ernest J. King* (Boston, 1980), 102; Gordon W. Prange, *At Dawn We Slept: The Untold Story of Pearl Harbor* (Viking, 1991), 409-410.

the neglect of the U.S. armed services in developing close air support doctrine until World War II was upon them.²⁰

Following GJE4, the fleet stayed in Hawaii to prepare for Fleet Problem XIII in March 1932. Fleet Problem XIII combined elements of the fleet engagements in Fleet Problems X and XI and featured the heavily skewed fleets that comprised those in Fleet Problem XII. In Fleet Problem XIII, the *Lexington* and *Saratoga* were divided amongst the combatants, but otherwise the scenario, which Admiral Pratt created, resembled that of Fleet Problem XII since all of the battleships would be assigned to the Blue fleet.²¹

The geographic scenario for Fleet Problem XIII placed the United States in the western Pacific with Hawaii representing an eastern American outpost, and Puget Sound, San Francisco Bay, and Magdalena Bay on Mexico's Baja Peninsula representing a chain of Black atolls. In the scenario, operations were set to begin two months after the outbreak of war, with the Blue forces attempting to seize one of the atolls and transform it into an advanced base for further operations against Black territory. Naturally, the Black mission was to frustrate the Blue advance using aerial attacks and surface engagements, when practicable.²²

²⁰ Richard B. Muller, "Close Air Support: The German, British, and American Experiences, 1918-1941," in *Military Innovation in the Interwar Period*, eds. Allan R. Millett and Williamson Murray (New York, 1996), 144-190.

²¹ Initially, it was proposed labeling GJE4 as Fleet Problem XIII, with an elaborate scenario stemming from it to become Fleet Problem XIV. Admiral Pratt, dissatisfied with the proposed scenarios, instead left GJE4 the same and put forth the scenario that formed the basis for Fleet Problem XIII. See Ingersoll to Poteat, 16 June 1931, *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941* (microfilm, 36 reels, National Archives, 1974) reel 14.

²² "U.S. Fleet Problem XIII, March 1932, Report of the Commander In Chief," *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941* (microfilm, 36 reels, National Archives, 1974) reel 14, p. 2.

Blue forces, under the command of Admiral Richard Leigh, included nine battleships, the *Saratoga*, and a host of smaller vessels. The plan called for Blue warships to approach California from the southeast steaming together in a concentrated formation, and then to veer northward towards Puget Sound once the destroyers had been fully fueled by Blue's auxiliary vessels. After the fleet changed course, an Offensive Screen force under Rear Admiral Joel Pringle comprising the *Saratoga*, three battleships, and several destroyers would take station ahead of the main body and engage any potential Black attack forces.²³

Vice Admiral Arthur Willard commanded the Black forces, which were comprised primarily of the Scouting Force, as well as both the *Lexington* and the *Langley*. Though not represented by actual ships in the problem, Black possessed a battleship force, albeit one inferior in strength to Blue's. Willard divided his fleet into several parts, with the *Lexington* forming the centerpiece of the Striking Group under Vice Admiral William Standley tasked with intercepting the Blue fleet. Meanwhile, the Atoll Guard force, which included the *Langley*, would patrol a line stretching from Magdalena Bay to Puget Sound.²⁴

The problem began on 8 March. As Blue forces assembled at Lahaina Roads, a line of Black submarines took up station to the east of the Hawaiian chain and attempted to monitor Blue's progress while the bulk of Black's forces remained on the southern California coast. Despite several attacks launched by Blue aircraft based in Hawaii, the submarines located the Blue forces at Lahaina on 9 March. On 10 March Black

²³ *Ibid.*, pp 4-5.

²⁴ *Ibid.*, pp 5-6.

submarines sighted the Blue fleet leaving Lahaina waters and radioed the information back to the Black fleet. Both fleets advanced towards each other for the next three days, with Blue forces sinking Black submarines on 10 March, 12 March and 13 March.²⁵

Significant contact between the two fleets finally came on 14 March. At 0830 aircraft from the *Saratoga*, now part of Blue's Offensive Screen, sighted three cruisers in the Black scouting line. A few hours later, aircraft from both the *Lexington*, stationed 75 miles behind the Black scouting line, and *Saratoga* attacked the other carrier nearly simultaneously. In the umpire's assessment of this engagement, the *Saratoga* got the better end since it suffered only 25 percent damage, while the *Lexington* suffered 38 percent damage. Because of the confusion stemming from several aircraft sitting on the *Lexington's* deck at the time of the attack, the umpires assessed the penalties arbitrarily rather than by the official maneuver rules, angering Captain Fred McCrary, the *Saratoga's* commanding officer, who felt his aviators had inflicted more significant damage on the *Lexington*.²⁶

As the day progressed the two advance forces occasionally exchanged fire throughout the day as Black cruisers tracked the Blue Offensive Screen, and aircraft from the *Saratoga* scored 64 percent damage on the cruiser *Trenton*. As night fell, the Black cruisers, which had become scattered during the day, concentrated and tracked the Blue Offensive Screen northeastward.²⁷

²⁵ *Ibid.*, pp 6-7.

²⁶ *Ibid.*, p. 7; *Ibid.*, p. 26.

²⁷ *Ibid.*, p. 7.

On the morning of 15 March, Black's cruisers paid a heavy price for continuing to track the Blue Offensive Screen. Aircraft from the *Saratoga* sank the *Marblehead* and *Salt Lake City* and severely damaged the *Louisville*. However, these attacks proved to be the last that aircraft from the *Saratoga* would make during the problem. Captain King had taken the *Lexington* away from the Blue formation during the night, making a run to the north and then west with the hope of locating the *Saratoga*. His search paid off and, as the *Saratoga*'s aircraft landed just before dusk on the 15th, planes from the *Lexington* attacked and scored 49 percent damage on the carrier. During the night, the Black scouting line, as well as some destroyers, attacked the Blue Offensive Screen and delivered the *coup de grace* to the *Saratoga* with torpedo fire.²⁸

As the remainder of the problem progressed, the *Lexington* took station as part of Black's scouting lines. On 16 March its aircraft inflicted significant damage on the *Pennsylvania*. Black forces had been ordered to protect San Francisco on 17 March while Blue forces, rather than continuing for Puget Sound, instead steamed towards Magdalena Bay. The two fleets became so widely separated by 18 March that the Chief Umpire terminated the exercise at 2000 because the two fleets could not make contact again before the scheduled termination time.²⁹

Unlike the other problems from this period, Fleet Problem XIII was not the subject of detailed analysis immediately after the exercise, though many officers praised the exercise in their reports. In his report, Captain King stated that:

²⁸ *Ibid.*, p. 8. ; Thomas Wildenberg, *Destined for Glory: Dive Bombing, Midway, and the Evolution of Carrier Air Power* (Annapolis, 1998), 97-98; "Report of the Commander in Chief," *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941*, reel 14, p. 8.

²⁹ *Ibid.*, pp 8-9.

In closing, I wish to say that I was a party to the first strategical problem the navy ever held, around [Puerto] Rico and Culebra just thirty years ago this winter. I have been a party to most of the Fleet Problems held since and I think that this problem in its wide scope and by reasons of its nature has been one of the most interesting and most profitable exercises in which the fleet has ever engaged.³⁰

Based on the results of the exercise, both Admiral Standley and Admiral Yarnell pleaded for further carrier construction, with Yarnell estimating that six to eight total carriers would be needed to conduct a campaign in the Pacific. Though short of units, Yarnell recognized the growing power of carrier aircraft when he stated that, “If Pringle had, [sic] had another carrier, the enemy cruiser force would have been practically annihilated.” Previous problems had taken place in much more confined spaces, but the increasing importance of air power combined with the vast spaces of a potential Pacific campaign highlighted the need for carriers more than ever.³¹

The success of concentrated carrier air power in GJE4 probably made the carrier shortage of Fleet Problem XIII appear even more acute. In a memo written to the Chief of Naval Operations in June 1932, Yarnell recommended that “carriers should operate in company.” This recommendation was contained in a broader series of recommendations, which included one saying that the Navy should avoid depending on single carriers fulfill all the aerial requirements for a given mission. In a separate memo written a few days later, Admiral McNamee recommended that, “...the *Saratoga* and *Lexington*, with their squadrons, should normally be used as a striking force.” These conclusions likely helped

³⁰ *Ibid.*, p. 17.

³¹ *Ibid.*, pp 15, 32; Yarnell to Rear Admiral J.K. Taussig, 27 May 1932, box 14, The Papers of Admiral Harry E. Yarnell (Operational Archives Branch, Naval Historical Center, Washington D.C.).

reverse a decision to station the *Lexington* in the Atlantic with the Scouting Force, and it returned to service with the Battle Force in the Pacific by the end of the year.³²

The defense of the carriers was also mentioned frequently in the post-exercise reports. Admiral Yarnell noted the similarities between this and previous problems where the destruction of the enemy carrier became the priority for each fleet. Admiral Standley, in his plea for carrier construction, called for smaller carriers to alleviate the risks of having just one carrier perform all aviation roles for a fleet. Carrier escorts were frequent topics, with Captain McCrary advocating against further use of battleships as carrier escorts.³³

The media reported that GJE 4 and Fleet Problem XIII were intended to influence Japanese foreign policy. During the spring of 1932, international attention focused upon the Japanese seizure of Manchuria that began with its invasion of the territory in September 1931. Increasingly frustrated by Japan's refusal to withdraw from the area, Secretary of State Henry Stimson suggested to President Hoover that portions of the Asiatic Fleet be sent to Shanghai as a demonstration of American resolve. Hoover rejected the advice but allowed the naval exercises to proceed as previously planned. Some members of the media did not think that the timing of the maneuvers in Hawaii was a coincidence. An ominous article that appeared in the *New York Times* just before the Battle Force sailed for Hawaiian waters on 30 January denied any change in plans had been made as a result of the crisis, yet included a statement from Admiral Leigh stating

³² Yarnell to Pratt, memo, 27 June 1932, box 159, RG 80 (National Archives, Washington, D.C.); Leigh to Pratt, memo, 1 July 1932, box 159, RG 80 (National Archives, Washington, D.C.); Reynolds, *Admiral John H. Towers*, 243.

³³ "Report of the Commander in Chief," *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941*, reel 14, p. 33; *Ibid.*, p. 15; *Ibid.*, pp 21, 23, 26.

that the fleet would be “fully prepared for any contingency.” Unlike the 1902/1903 maneuvers that King alluded to, after which Theodore Roosevelt claimed to have sent an ultimatum to Germany during the maneuvers that forced their withdrawal from the Venezuelan crisis, the 1932 exercises had no effect upon the outcome of the Manchurian crisis, which continued on for some time afterwards.³⁴

The level of media exposure of these exercises compared with that of Fleet Problems IX and XII, but positive headlines about carrier aviation were not followed immediately by articles proclaiming battleship superiority as they had been in the past. For instance, one paragraph heading recounting the final days of GJE4 stated “Air Corps Proves Worth.” During Fleet Problem XIII, again covered by Hanson Baldwin, one dramatic headline stated “Black Carrier Planes ‘Sink’ Carrier *Saratoga*,” while another article reported, “Planes Again Bomb Battleships.” Baldwin, who described Fleet Problem XIII as “Mobility Pitted Against Power,” shared the sentiments of the naval officers by proclaiming Fleet Problem XIII as the “Greatest Manoeuvre Problem in the History of the Service.”³⁵

Indeed the *Lexington* and *Saratoga* did enjoy greater success than in any previous exercises and thus merited the positive press coverage that they received, though neither the exercises nor the attention focused on the carriers had any immediate impact, i.e., no major appropriations or significant design changes emanated directly from these two

³⁴ Armin Rappaport, *Henry L. Stimson and Japan, 1931-1933*, Chicago, 1963, 119-120; “Our Fleet is Ready for Far East Call,” *New York Times*, 30 Jan. 1932, p. 2; George Baer, *One Hundred Years of Sea Power*, (Stanford, 1993), 38.

³⁵ “Manoeuvres Close With Blues Ahead,” *New York Times*, 14 Feb. 1932, p. 6; Hanson Baldwin, “Black Planes Sink Carrier *Saratoga*,” *New York Times*, 18 March 1932, p. 7; Hanson Baldwin, “Blue Fleet Sinks Seven Destroyers,” *New York Times*, 19 March 1932, p. 5; Hanson Baldwin, “Cruiser Strafed in First Battle,” *New York Times*, 16 March 1932, p. 6; Hanson Baldwin, “Fleet Foes Head for Port Reunited,” *New York Times*, 20 March 1932, p. 27.

exercises. Much of this can be explained by the unwillingness of the Hoover Administration to spend valuable Depression-era funds upon the Navy. However, the successor administration of Franklin Roosevelt, a noted navalist, would not have such qualms.

CHAPTER VIII

FAILURES AND REWARDS: FLEET PROBLEM XIV

Fleet Problem XIV was the last Fleet Problem during Admiral Pratt's tenure as Chief of Naval Operations, as well as the final traditional Fleet Problem conducted before the commissioning of the *Ranger*, the U.S. Navy's fourth carrier. In Fleet Problem XIV, as in some of the most recent exercises, both of the Navy's fleet carriers, the *Saratoga* and the *Lexington*, would be the centerpieces of one of the participating fleets. The scenario for the exercise anticipated their aircraft launching strikes against positions on the West Coast of the United States, but poor planning by the Black fleet commander limited their impact. In spite of the failure of carrier aviation to perform as well as its promoters hoped in Fleet Problem XIV, the new Roosevelt administration authorized further carrier construction, thus laying the foundation of American carrier air power in the early years of World War II.

Initially, as the Navy planned Fleet Problem XIV, some question existed as to whether the concentration should take place off the Pacific coast of the United States or further south off Panama. Admiral Pratt ordered scenarios developed for each location before scheduling considerations led to the decision to hold the exercise off California, Oregon, and Washington. Unfortunately, a plan to have the U.S. Army participate in the exercise fell through for financial reasons, meaning that Fleet Problem XIV would be unable to properly test the coastal defenses in California. Regardless, Admiral Pratt had again created a scenario requiring the use of independent carrier forces in a Fleet Problem

since the Black fleet, which included the two fleet carriers, would not have any battleships.¹

Fleet Problem XIV's scenario hypothesized an imminent war between Blue, the United States, and Black, a Pacific nation. Admiral Luke McNamee commanded the Blue Fleet, which was composed of the U.S. Battle Force, minus the *Lexington* and *Saratoga*. Under plans for the exercise, the Blue Fleet would remain on the West Coast and await constructive reinforcements from the Scouting Force, which was usually stationed in the Atlantic. Meanwhile, a Black naval force under Vice Admiral Frank H. Clark, comprising the *Lexington* and *Saratoga*, heavy cruisers, destroyers, and auxiliary vessels was presumed to have left its homeland in January with its ultimate destination unknown to Blue. Black's orders were to conduct raids upon the West Coast, specifically Puget Sound, San Francisco, and the San Pedro-San Diego area, before the expected arrival of the Scouting Force from the Atlantic on 18 February.²

Admiral McNamee made the two California locales the focal points for his Blue fleet's defensive efforts, which called for the establishment of picket lines of cruisers and destroyers 100 and 125 miles out to sea, respectively, with an inner picket line of battleships available to respond to any potential threat. The group assigned to defend San Francisco also received the *Langley* under Rear Admiral Frank Halligan as its air

¹ Chief of Naval Operations to Commander Battle Force, 5 July 1932, *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941* (microfilm, 36 reels, National Archives, 1974) reel 15; Commander in Chief, U.S. Fleet to Chief of Naval Operations, 18 Nov. 1932, letter, *ibid.*

² "U.S. Fleet Problem XIV, March 1933, Report of the Commander In Chief," *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941* (microfilm, 36 reels, National Archives, 1974) reel 15, pp 1-2.

detachment. In addition, Blue also had several squadrons of land-based aircraft at all three expected target areas.³

The Northern Carrier Group comprising the *Lexington* and three heavy cruisers under the command of Vice Admiral William H. Standley planned to attack the San Francisco area on 16 February, and then attack the Puget Sound area on the following day, or as soon as conditions permitted. Meanwhile the Southern Carrier Group, which included the *Saratoga* and three heavy cruisers, commanded by Rear Admiral Yarnell was to attack only the San Pedro area on 16 February since the San Diego area, with stronger defenses, was deemed too dangerous for the force to approach. Following the attacks, the *Saratoga* was to steam out to sea in a northwesterly direction until it reached a position from which its planes could attack San Francisco on 17 February. Thus, the attack plan anticipated the Black fleet moving well away from the San Pedro area by 18 February, the expected arrival date of Blue's reinforcements.⁴

In the planning stages, Admiral Clark assigned the destroyers to protection of the Support Force rather than to escorting the carriers. This left only cruisers to accompany the carriers, and, being less maneuverable than destroyers, the cruisers could not steam as close to the carriers during flight operations as the smaller destroyers, and thus they could not respond as quickly to rescue any pilots whose planes crashed during take off and landing operations. In addition to the safety risk, the use of the cruisers as plane guards could potentially downgrade the quality of protection they could provide the carrier. Clark based his decision on the limited fuel capacity of the destroyers, feeling that their

³ *Ibid.*, pp 5-7.

⁴ *Ibid.*, pp 8-11.

need to refuel would slow the carriers and perhaps cost them the element of surprise before they launched their air attacks. Rear Admiral Thomas J. Senn, the Fleet Umpire for Blue, later stated that the fuel situation should have been constructively modified so that the destroyers could have accompanied the carriers. The decision by Admiral Clark to remove the destroyers from the carrier groups, when combined with communication breakdowns over the course of the exercise, would prove disastrous for the *Lexington*.⁵

The carrier groups began the problem in Hawaiian waters, with the Northern Carrier Group several hundred miles to the north of Oahu, while the Southern Carrier Group and the Support Group that contained Black's destroyers and tankers, began well to the South. Both carrier groups steamed eastward uneventfully for the first four days of the problem, which began on 10 February, because the rules of the exercise prevented Blue forces in Hawaii from tracking either carrier group at the start of the problem.⁶

The Northern Carrier Group veered northward on the night of the 14th after sighting lights, and at 0230 on the 15th, the *Louisville*, one of the *Lexington*'s escorting cruisers, reported sighting a destroyer and intercepting an apparent contact report that forced the entire formation to increase speed and to take evasive action by increasing speed and zigzagging until daylight. Later that afternoon, a patrol plane from the *Lexington* reported sighting smoke emanating from a surfaced submarine. In all three cases, the apparent sightings later proved erroneous, but caused a change in the group's formation in which all three cruisers took station ahead of the *Lexington*. Worsening

⁵ *Ibid.*, section 3, p. 6; *Ibid.*, section 3, p. 17.

⁶ *Ibid.*, section 2, p. 9.

weather conditions reduced visibility so much that the *Lexington* lost sight of the cruisers by 0100 on the 16th, leaving the carrier vulnerable to attack.⁷

Upon reaching the launching point alone, and with weather conditions poor enough to prevent the carrier from launching its aircraft, Standley directed the *Lexington* to steam away from the launching point temporarily to resume searching for the cruisers. A Blue destroyer sighted the *Lexington* during its fruitless search for the cruisers, which forced the carrier to attempt radio contact with its missing escorts. The carrier returned to the launching point at 0605, but, as the aircraft warmed up on the flight deck, two Blue battleships opened fire on it. Making the disaster complete, the missing Black cruisers finally stumbled into the area as the *Lexington* attempted to escape and got caught in the crossfire between the two battleships, with all three Black cruisers and the *Lexington* ruled sunk.⁸

Fortunately for Black, the Southern Carrier Group successfully evaded detection during its mission. On the afternoon of 14 February, the group changed course to the north to avoid a potential sighting by a merchant vessel, and in the process, entirely by luck, managed to steam around a line of Blue submarines stationed in its path. Upon resuming an easterly course, the group entered the Santa Barbara Channel early on 16 February, and reached the designated launching point at 0625.⁹

The *Saratoga*'s aircraft successfully attacked numerous targets in the Los Angeles area, destroying more than fifteen aircraft on the ground, most of them at a reserve base

⁷ *Ibid.*, section 2, pp 9-10.

⁸ *Ibid.*, section 2, p. 10.

⁹ *Ibid.*, section 2, p. 10.

in Long Beach. Aircraft from the carrier also attacked the seaplane tender *Gannet* and a transport, with the *Gannet* judged to be 50 percent damaged. Other aircraft struck an oil refinery in Venice, an oil field in El Segundo, and a powerhouse and docks in the Long Beach area before returning to the *Saratoga*.¹⁰

Once the strike aircraft departed the carrier, the *Saratoga* launched another group of aircraft assigned to protect the task force. These aircraft soon sighted the Blue light cruiser *Milwaukee* and the battleship *Pennsylvania* in the vicinity. Much as during past fleet problems, the *Saratoga* used its superior speed to escape potential foes, leaving its cruiser escorts to attack the Blue vessels. The carrier eventually recovered the returning strike aircraft at 0852, and the entire Southern Carrier Group spent the next three hours intermittently engaging various Black vessels, sinking two. During this time, a group of eight land-based dive-bombers attacked the *Saratoga* at 1000, destroying 20 aircraft and rendering its aft flight deck inoperable for two hours.¹¹

Despite the damage to the *Saratoga*'s from the air attack and to its escorts in the surface engagements, the Southern Carrier Group managed to escape northward, reaching the designated launching point for the San Francisco attacks off of Point Sur at 0502 on 17 February. Within an hour of its arrival, the group sighted the Blue cruiser *Richmond*, a destroyer, and the battleship *New York* at very long range, but Admiral Yarnell decided to remain in position hoping to get his aircraft aloft before being attacked by the enemy. As the *Saratoga* began launching aircraft at 0627, two seaplanes from the *Richmond* and 21 aircraft from the *Langley* attacked the *Saratoga*. The *Langley* had steamed to the

¹⁰ *Ibid.*, section 2, p. 16.

¹¹ *Ibid.*, section 2, pp 10, 12.

southeast following the destruction of the *Lexington*, reaching a point in Monterrey Bay early on the 17 March from which it launched its attack. Despite the chaos, the *Saratoga*'s aircraft successfully got airborne before the *New York* and the cruiser *Raleigh* attacked the Southern Carrier Group. During this engagement, which proved to be the finale to the exercise, the umpires ruled the attacks left *Saratoga*'s flight deck inoperable for 38 hours and that, lacking an operable ship to return to, its 36 aircraft were destroyed.¹²

The *Saratoga*'s aircraft avenged their carrier when 18 of them attacked the *Langley*, rendering its flight deck inoperable for nearly three hours, and various targets in San Francisco Bay, including Crissey Field, Hunter's Point, the San Francisco docks, and the San Andreas Reservoir.¹³

Following the exercise, several officers criticized Admiral Clark's plans for the exercise. Admiral Yarnell, Captain C. A. Blakely (*Lexington*'s commanding officer), and Admiral Richard H. Leigh, CinCUS and the Chief Umpire for the exercise, disagreed with the priorities established in Admiral Clark's plans, which called for air strikes upon land targets before enemy naval forces in the area had been neutralized. Yarnell later recommended as a part of the annual CINC Battle Force report submitted in May that, "...future problems stress naval rather than shore objectives, as more proper targets for the fleet air force."¹⁴

¹² *Ibid.*, section 2, p. 11, 14.

¹³ *Ibid.*, section 2, p. 16.

¹⁴ *Ibid.*, section 3, pp 24-25, 27; "Annual Report of the Commander-in-Chief Battle Force," *Annual Reports of Fleets and Task Forces of the US Navy, 1920-1941* (microfilm, 15 reels, National Archives, 1974) reel 8, p. 15.

Yarnell and Blakely also noted the additional risk of making attacks against land targets with aircraft that Yarnell described as “obsolescent.” While the speed of the scout planes and dive-bombers pleased Yarnell, he estimated that the carrier’s Martin/Great Lakes torpedo bombers were so slow that they added an hour to the total time the carrier’s attack force spent in the air. Though having been judged unreliable for half a decade, some of these torpedo planes would be kept in service another five years, until 1937, when Douglas TBD Devastators replaced the last TG-2s.¹⁵

Like most of the early 1930’s Fleet Problems, Fleet Problem XIV received media coverage, with Hanson Baldwin again covering the exercise for the *New York Times*. The sinking of the *Lexington* and the raid on San Francisco by the *Saratoga*’s aircraft received prominent headlines, as one would expect. However, one new aspect to the coverage of this exercise compared to previous fleet problems was a domestic security angle. An article titled “‘War’ Shows Trend of Naval Strategy” that preceded the start of Fleet Problem XIV speculated on the defensibility, or lack thereof, of the West Coast. The fact that the Army, which bore primary responsibility for coastal defense, did not participate in the exercise probably lessened the impact of the article, but the article was still important, because it was probably one of the first times that a popular publication emphasized the threats carrier-based aircraft posed to coastal areas.¹⁶

¹⁵ “Report of the Commander in Chief,” *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941*, reel 15, section 3, pp 24-25; Gordon Swanborough and Peter M. Bowers, *United States Navy Aircraft Since 1911* (New York, 1968), 292.

¹⁶ Hanson Baldwin, “Raid Hurlled Back by Defense Fleet,” *New York Times*, 17 Feb. 1933, p. 1, 20; Hanson Baldwin, “60 Enemy Planes Raid San Francisco,” *New York Times*, 18 Feb. 1933, p. 6; Hanson Baldwin, “War Shows Trend of Naval Strategy,” *New York Times*, 6 Feb. 1933, p. 8.

Fleet Problem XIV was a doctrinal disappointment and deemed a failure by many senior naval leaders. Officers, regardless of their affiliation with carrier air power, were unhappy with the planning for Fleet Problem XIV, and it may have cost Admiral Clark future commands.¹⁷ Though the *Saratoga* survived its encounters with the Blue fleet, there were precious few new lessons learned from the exercise. In many ways, Fleet Problem XIV represented a step backwards from GJE4, which had at least shed light upon the possibilities of concentrated carrier airpower and demonstrated the value of the fleet carriers' mobility. Despite the promise of carrier air power directed against shore targets shown in Fleet Problem IX and GJE4, it would appear that some aviators, like Admiral Yarnell, still felt the best arena for the carrier to make a contribution was in a fleet action. Though Yarnell complained about Clark's emphasis on shore targets in planning Fleet Problem XIV, it should be noted that the majority of the *Saratoga*'s aircraft launched on the final morning of the exercise headed for targets in San Francisco Bay, and not the several Blue surface vessels within sight of the carrier.

Several months after Fleet Problem XIV, in June 1933, authorization was finally approved for the construction of two additional carriers. Two years of design work culminated in the two carriers, later named the *Yorktown* and *Enterprise*. Several features of their design were influenced by the experiences of the *Lexington* and *Saratoga* in the fleet problems. The design of the *Yorktown*-class marked the Navy's shift away from merely maximizing the number of flight decks and towards emphasizing certain capabilities of carrier design, or, basically, the victory of quality over quantity. The

¹⁷ Clark Reynolds, *Admiral John H. Towers: The Struggle for Naval Air Supremacy* (Annapolis, 1991), 247.

Yorktown and *Enterprise*, despite being 40 percent smaller than the *Lexington* and *Saratoga* in terms of displacement, could steam as fast as and launch as many aircraft in a single strike as their predecessors. Some of the weight savings on the *Yorktown*-class carriers came from a reduced armament because the eight-inch batteries on the *Lexington* and *Saratoga* proved superfluous as the number of escort vessels increased. The new carriers' armor scheme also clearly reflected the encounters of the *Lexington* and *Saratoga* in the fleet problems with "enemy" surface ships because the side armor belts could protect the *Yorktown*-class from up to six-inch shellfire. Unlike the *Essex*-class carriers designed just prior to World War II, the *Yorktown*-class carriers lacked an armored hangar deck as protection from aircraft-dropped bombs, and their meager torpedo protection, perhaps reflecting the poor state of early-1930s torpedo bombers and aerial torpedoes, later proved inadequate during wartime. Whatever faults may have existed in the design of the *Yorktown*-class, they clearly reflected principles derived from the fleet problems, even ones later proved incorrect, and also signaled the U.S. Navy's clear interest in independent carrier air power.¹⁸

It should also be noted that the needs demonstrated in and expressed after the fleet problems had less to do with the authorization for new carriers than the change from Herbert Hoover to Franklin Roosevelt and the accompanying interests and priorities of their administrations. Under Hoover, naval strength remained well below the treaty limits, and the Depression had also led to the discussion of more draconian measures designed to balance the budget, such as the rotating reserve system for naval vessels

¹⁸ Norman Friedman, *United States Aircraft Carriers: An Illustrated Design History* (Annapolis, 1983), 83, 90-91, 392, 394.

mentioned in Chapter VI. Roosevelt was more interested in providing jobs for the unemployed and included funding for naval construction in the National Industrial Recovery Act.¹⁹

While designs for the *Yorktown* and *Enterprise* benefited the most from the carriers' operational experience, those for the *Ranger*, nearing completion by mid-1933, had also been influenced by lessons learned in the fleet problems. Its initial design originally called for a flush-deck ship since pilots believed that the large islands on the *Lexingtons* would interfere with aircraft operations, particularly during landing, by disturbing the flow of air over the deck. However, experience showed that even the massive islands of those ships did not hinder flight operations, and in fact had the advantage of providing a high perch from which to better direct aircraft movements on deck, so a small island was added to the *Ranger* in late 1932. The carrier also had its torpedo stowage removed, primarily because of the success of dive-bombing as a means of attack and continued dissatisfaction with the Martin/Great Lakes torpedo bombers. This decision would in the future prevent the *Ranger* from carrying more effective torpedo bombers, such as the TBD Devastator, when they entered service in the late 1930s. The *Ranger's* inability to support torpedo bombers was a major consideration in

¹⁹ Roosevelt had served as Assistant Secretary of the Navy under President Woodrow Wilson and had indicated a desire to expand the Navy to the size allowed under the Washington Naval Treaties, though Congress did not pass such legislation until well into his presidency. While historians have often viewed the inclusion of naval construction under the National Industrial Recovery Act as a subterfuge on the part of Roosevelt, a recent study of naval legislation shows that the individual most responsible for naval expansion was Carl Vinson, Chairman of the House Naval Affairs Committee, who consistently proposed larger building programs for the Navy than did the more cautious president. Stephen Svonavec, "Congress and the Navy: The Development of Naval Policy, 1913-1947" (Ph.D. diss., Texas A&M University, 2000). Archibald Turnbull and Clifford L. Lord, *History of United States Naval Aviation* (New York, 1972), 284-286 and David Kennedy, *Freedom From Fear: The American People in Depression and War, 1929-1945* (New York, 1999), 250-252, 389, reflect the traditional approach assigning credit for naval expansion to Roosevelt.

the decision to confine its service to the Atlantic during World War II, while the two *Lexington*-class and three *Yorktown*-class carriers (including *Hornet* commissioned 1941) formed the backbone of the U.S. Pacific Fleet until the *Essex*-class carriers began entering service in mid-1943.²⁰

While the long-term material outlook for U.S. carrier aviation improved with the two new carrier authorizations, Fleet Problem XIV demonstrated that not all hurdles had been overcome to turn the aircraft carrier into an effective weapon system. Some key concepts, such as the independence of a carrier from the main body of the fleet, had become commonplace, but technical hurdles remained for the next several years.

²⁰ Norman Friedman, *United States Aircraft Carriers: An Illustrated Design History* (Annapolis, 1983), 72-75.

CHAPTER IX

CONCLUSION

1929, the year of Fleet Problem IX, marked a turning point in the development of carrier air power. Prior to that time the roles played by aircraft carriers were limited to scouting for or protecting the Navy's surface ships. During Fleet Problem IX carriers dramatically demonstrated the potential of their aircraft to inflict serious damage on high-value targets like the Panama Canal. Previously to Fleet Problem IX, most high-ranking naval officers viewed aircraft as being of use mainly as scouts for the fleet and as spotters for the guns of the battleships. Beginning with Fleet Problem IX carrier aviation, having already been institutionally secured in the 1920s thanks to the dogged efforts of Admiral Moffett, began to secure a stronger technical and doctrinal foothold within the Navy. Although the *Lexington* and *Saratoga* would not always have the opportunity to attack shore targets, a role they excelled at, in the exercises after Fleet Problem IX, the two carriers influenced both the design of new carriers and doctrine developed for the employment of those vessels. By 1933, the year when Congress authorized the first two *Yorktown*-class carriers, the *Lexington* and *Saratoga* had operated independently of the battle line in nearly all of the exercises held since 1929. The two carriers often operated, either together or separately depending on the exercise, as an offensive weapons system, peaking in 1932 when the two carriers successfully wore down the defenses of Oahu in GJE4 and executed numerous successful attacks on enemy vessels in Fleet Problem XIII. Though Fleet Problem XIV in 1933 represented a step backwards from the successes in the 1932 exercises, and thus disappointed many in the Navy, the authorization of the two new carriers demonstrated the U.S. Navy's faith in carrier aviation.

As the Fleet Problems progressed from 1929 to 1933, the operating of the *Lexington* and *Saratoga* separate from the slower battle line became quite common. Cruising in semi-independent task forces presented new challenges, such as determining the proper composition of carrier escorts. Many different escort vessel compositions were tested during these exercises, with a combination of cruisers and destroyers found to be the most effective, but the difficulties encountered by the *Lexington* in Fleet Problem XIV show that this issue had yet to be entirely resolved by 1933. To further illustrate that the doctrinal evolution remained incomplete, the carriers would remain tied to the battle line in at least one future exercise, Fleet Problem XVIII, in 1937.¹

The lessons learned in Fleet Problems IX through XIV were reflected in the design of the *Yorktown*-class carriers. The removal of the eight-inch gun mounts and the decrease in size of ammunition bunkers required for the guns—the eight-inch batteries of the *Lexingtons* had proven to be superfluous during Fleet Problems IX-XIV, especially as more, and better, escort vessels were added to carrier task forces—freed up space in the new *Yorktown*-class carriers that could be utilized for a variety of other purposes. The armor scheme of the *Yorktown*-class, which emphasized protection against shellfire over aerial attack, also reflected the experiences of their predecessors since the *Lexingtons* had encountered “enemy” surface vessels several times in the Fleet Problems IX-XIV, with several of these encounters resulting in the carrier being ruled sunk. To be sure, numerous operating characteristics of the *Lexington*-class carriers could have been determined without the staging of a fleet problem, such as the ability of the carriers to operate aircraft

¹ Thomas Wildenberg, *Destined for Glory: Dive Bombing, Midway, and the Evolution of Carrier Air Power* (Annapolis, 1998), 163.

in poor weather. However, the fleet problems were necessary in determining the kinds of missions large aircraft carriers could accomplish in large-scale naval operations. The newer carriers would be able to carry larger air groups and launch larger single deck load strikes than their predecessors, maximizing American carrier strength while remaining within the limits of the interwar naval arms control treaties.

The deficiencies of early 1930s carrier aircraft proved to be the biggest handicap to successful carrier operations in Fleet Problems IX through XIV. The fragility and relatively short ranges of the aircraft then in service and safety concerns on the part of the Navy prevented the employment of those aircraft to their technical limits. The range of strike aircraft, particularly the Martin/Great Lakes torpedo bombers that were also the only aircraft capable of carrying large bomb payloads, contributed to the frequent encounters with enemy surface ships. The inability to carry large payloads over long distances ultimately prevented carrier aircraft from posing a serious threat to the battleship during the early 1930s. By the time of Fleet Problem XIII in 1932, carrier aircraft had improved to the point that they could “sink” carriers and cruisers, but battleships were another matter entirely. The inability to attack a large battleship force directly and cause significant damage ultimately led to the decision in Fleet Problem XII to employ planes from the Blue carriers against vessels the poorly armored ships in the Black fleet’s supply train.

Its small number of carriers, only three, limited the ways in which the Navy could employ carriers in Fleet Problems IX through XIV. This led pleas from several officers, not all of them aviators, for further carrier construction. The shortage meant that carriers, in the interests of training and operational necessity, could rarely concentrate during the

fleet problems, which also prevented the carriers from posing more of a threat to battleships. The only time both the *Lexington* and the *Saratoga* operated together in a single unit, in GJE4, they proved a smashing success, but the other exercises of the early 1930s did not afford the two carriers another opportunity to work so closely together. However, the construction of the *Yorktown* and *Enterprise* would help to rectify this situation in the latter 1930s.

Responsibility for the employment of the carriers in Fleet Problems IX through XIV was shared by many individuals. Of the Commanders, Aircraft Squadrons who participated in these exercises, Admirals Reeves and Yarnell deserve special attention. Reeves, who had already turned the obsolete *Langley* into a functioning carrier by 1929, originated the plan to strike the Panama Canal with a task force composed of only the *Saratoga* and a single escorting light cruiser. His call for the creation of an independent unit that included a carrier accompanied by cruisers and destroyers began to be implemented in the 1930 exercises. The 1932 and 1933 exercises benefited from the presence of Yarnell, whose carriers, if not for the disputed penalty against the *Lexington* in Fleet Problem XIII, might have survived all three exercises in which he participated. He also vocalized more clearly than his predecessors the biggest problems facing carrier aviation's growth in these exercises: a shortage of carriers and technically immature aircraft.

While the contributions of Reeves and Yarnell should not be undervalued, other senior officers, especially those without backgrounds in aviation, also deserve some of the credit for the advances in carrier aviation exhibited in Fleet Problems IX through XIV. After 1929, most of the admirals, including members of the surface line, who

commanded either the Blue or Black fleets allowed the commanders of the carriers in their fleets to operate independently. Some problems did arise during the experimentation process within the exercises, such as the mating of the *Saratoga* with the battleships in the Blue Offensive Screen during Fleet Problem XIII, and statements made after the exercises indicate that few of the non-aviator senior officers believed the aircraft carrier could ever supplant the battleship as the focus of fleet operations. However, the record of the 1929-1933 exercises shows that, rather than being the conservative “gun club” often referred to by historians, the officers commanding the fleets took an interest in determining the capabilities of carrier aviation, and often allowed the carriers to steam independently in a tactically, though not always a strategically aggressive posture.

Admiral William Veazie Pratt, who participated in or assessed nearly all seven of the exercises analyzed in this study, was certainly not an innovator or strong public advocate of carrier aviation, as were Reeves and Yarnell, but many of the advances made in carrier aviation could not have occurred without his support or at least approval. His acceptance of Reeves’ plan to attack the Panama Canal arguably made Fleet Problem IX the most influential American naval exercise of the 20th century. During Fleet Problem X, Pratt strongly endorsed the deployment of carriers in an “offensive screen,” which drew upon Reeves’ ideas stemming from Problem IX about carrier units. The type of carrier task force formed to provide such a screen proved to be forerunner of those widely employed in the Pacific during World War II.

Admiral Pratt’s greatest contribution to Fleet Problems XIII and XIV was his construction of the scenarios that forced fleet commanders to rely on the striking power of the large carriers as their primary offensive weapons. While much has been written

describing the effects that the Fleet Problems of the 1930s had upon various aspects of naval warfare, the impact of the scenarios chosen for an exercise, a key element, has not received much attention. During Pratt's tenure as Chief of Naval Operations, the scenarios for all three Fleet Problems employed carriers as the centerpieces of one of the opposing fleets. In the case of GJE4, the use of the two carriers in a single unit was likely at the discretion of Admiral Leigh, the Blue Fleet commander, and Yarnell. It should be noted that Joint Board records indicate no interest in holding a Grand Joint Exercise for nearly five years prior to GJE4, and that Pratt served, in his capacity as CNO, as a member of the Joint Board during the proposal and planning stages for it. While there is no documentary evidence concerning Pratt's involvement in planning Fleet Problem XII or proposing GJE4, it is clear that Pratt designed the scenarios for Fleet Problems XIII and XIV.

The extensive media coverage, as well as other forums for debating the lessons of Fleet Problems IX through XIV, such as Congress, newspapers, and magazines, probably increased the visibility of carrier aviation among the public, and the coverage became generally more positive by 1933. However, success in the fleet problems did not always translate into increased funding for development and acquisition of new aircraft, the purchase of aviation equipment, or the construction of aircraft carriers. The cost-conscious and internationalist Hoover Administration and Congress opposed significant expansion of the Navy, especially as the Depression worsened. The election of Franklin Roosevelt and a Democratic majority in Congress had more to do with the authorizations for the first two *Yorktown*-class carriers than the success of the carriers in the Fleet Problems.

For the U.S. Navy, the Fleet Problems provided the best forum for the training of officers and enlisted personnel in a combat-like setting, to test new technologies, and formulate new doctrine. The exercises also afforded the Navy a vehicle for publicity. In Fleet Problems IX through XIV, the U.S. Navy included the *Lexington* and *Saratoga* in all three of these processes for the first time. Carrier aviation made numerous gains during these exercises, and the scenarios for the Fleet Problems began to change as a result of their success. A great deal remained unresolved by 1933, but the changes in carrier design and the realizations of carrier vulnerabilities were crucial for growth in future exercises. Though made in 1929, Admiral Wiley's assessment of carrier aviation's position after Fleet Problem IX –“We have gone far, yet we have far to go”—continued to be valid in 1933.”²

² “US Fleet Problem IX, January 1929, Report of the Commander In Chief,” *Records Relating to United States Navy Fleet Problems I to XXII, 1923-1941* (microfilm, 36 reels, National Archives, 1974) reel 12, 29.

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