PACIFIC SUBMARINES: THE FORGING OF UNDERWATER FLEETS IN THE UNITED STATES AND IMPERIAL JAPAN, 1921-1945

by

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AUTHOR'S INTRODUCTION

The research and writing of a Master's thesis is an important milestone in the academic training of a young graduate student. It marks the final test in which the candidate demonstrates talents and skills developed by long hours of classroom and individual study. For the aspiring historian the years have witnessed dedication in learning the vast storehouse of knowledge found in the literature of the student's specialization. However there must come a time in the graduate student's professional training when the books are set aside and "history" is actually experienced in a deeply personal way. Such an event took place in the life of the author at the Ft. Riley, Kansas Post Cemetery.

On 30 June 1986, a brief but formal military ceremony took place at the 1st "Big Red One" Infantry Division's cemetery in which the remains of three buried Imperial Japanese Navy sailors were returned to the Japanese Government for disinterment, cremation, and restoration to their families and homeland.[1] Of special interest to the author was the branch of service within the Imperial Navy in which these three men served their country: submarines. All three sailors were members of the crew of the 988-ton submarine RO-61 during World War II. RO-61 began the war as one of three boats assigned to the 26th Submarine Division, a

member of the 7th Submarine Squadron, Fourth Fleet stationed in the Japanese Mandate Islands of the central Pacific. The submarine participated in the second assault upon Wake Island in late December 1941 and later assisted other boats of 7th Squadron in unsuccessfully defending the Marshall and Gilbert Islands from hit-and-run U.S. carrier raids in early February 1942.

On 14 July 1942, four days after the reorganization of the Combined Fleet following the disastrous Midway battle, RO-61 and six other submarines comprising the 26th and 33rd Submarine Divisions were reassigned to the Fifth Fleet based at Kiska in the captured Aleutians.[2] According to the post-war Joint Army-Navy Assessment Committee study on Japanese naval and merchant shipping losses, RO-61 was attacked and sunk on 31 August 1942 by U.S. land-based aircraft and surface craft at 52°36'N latitude and 173°57'W longitude, somewhere in the vicinity south of the central Aleutian chain off the coast of Alaska. Further investigation reveals that RO-61's last battle began earlier in the day when it successfully sank the U.S. seaplane tender CASCO, anchored inside Nazan Bay, Atka Island. Judging from the ranks of the three seamen--a chief gunner's mate, a warrant officer, and a "private" (seaman) first class--and the fact that they were apparently the sole survivors of the 60-man crew suggests the submarine was cruising on the surface with the three sailors standing

lookout or manning the single 3-inch/76mm deck gun when attacked and sunk by the combined efforts of naval aircraft and the destroyer REID. No doubt RO-61's captain desparately tried to make good his boat's escape by utilizing its 16-knot maximum surface speed, while at the same time insuring the batteries were fully charged in anticipation of continuing the battle beneath the ocean's waves. In any case, the three survivors were captured and interned for the war's duration in a prisoner of war encampment somewhere in Colorado. However the three sailors died in a Denver hospital on 29 October 1944 and were buried at Camp Carson (now Ft. Carson), Colorado until moved to the Ft. Riley Post Cemetery as part of a U.S. Army effort to consolidate prisoner of war remains in a single location on 23 January 1946.

A curious feature in this story is the apparent coincidence in the date of death for all three sailors; over two years after their capture. Why the same date? Quiet investigation soon turned up a possible solution to this vexing question. Speaking off the record, a member of the public affairs office at Ft. Riley indicated the three men were shot as they attacked a camp guard.[3] Later, in casual conversation with the mortician retained by the Japanese Government to supervise the disinterment, cremation, and delivery of the ashes to the Consulate General in Kansas City, the author learned the three submariners had indeed died as a result of

gunshot wounds.[4] These tidbits of information suggest the three survivors of RO-61 died as a result of either a failed escape attempt or perhaps in retaliating against a tyrannical camp guard. Whatever the cause which ended in death for the RO-61 trio, 41 years of peace and friendship between the United States and Japan could not--and should not--be allowed to interfere with judicious diplomacy.

But the story did not end with the deaths of three Japanese prisoners of war in a Denver hospital. In 1963 a member of Japan's Self-Defense Force, studying at Ft. Leavenworth's Command and General Staff College, discovered the tombstones of the RO-61 trio and launched a twenty-three year effort to return their remains home. Armed with information supplied by the Department of the Army, the Japanese Ministry of Health and Welfare successfully tracked down surviving family members of the RO-61 trio, all of whom joyfully requested the return of their loved ones. Thus after forty-four years of exile in a foreign land, the RO-61 trio were at last going home.

This entire episode will be remembered as another footnote in the history of the Second World War. But to the author it will always hold special emotional meaning because on 30 June 1986, military history came "alive" in the life of this apprentice military historian.

Therefore, because of the author's four-year residency

in Japan as the son of Baptist missionaries, the numerous trips "home", and the consequent deep emotional ties with that ancient Oriental land, I respectfully dedicate this Master's thesis in memory of Chief Gunner's Mate Kazunori Makino, Warrant Officer Saburo Nakagawa, and "Private" (Seaman) First Class Sadamu Okada. These three submariners represent the thousands of officers and men on both sides who fought valiantly aboard submarines during the Pacific War between the United States of America and Imperial Japan. It is appropriate that the RO-61 trio open the study which follows.

NOTES

[1] Most of the information in this introduction is taken from a press release issued on 24 June 1986 by the Consolate General of Japan in Kansas City, Missouri. Additional information may be found in newspaper articles of the Manhattan Mercury (Manhattan, Kansas) for 27 June and 1 July 1986.

[2] RO-61's war record and statistical data is compiled from: Dorr Carpenter and Norman Polmar, Submarines of the Imperial Japanese Navy (Annapolis, MD: Naval Institute Press, 1986), pp. 12, 17, 27-28, 121-22; Erminio Bagnasco, Submarines of World War Two (1973; reprint ed., Annapolis, MD: Naval Institute Press, 1985), p. 180; Anthony J. Watts, Japanese Warships of World War II (London: Ian Allen, 1966), pp. 165-167, 380; and Joint Army-Navy Assessment Committee, Japanese Naval and Merchant Shipping Losses During World War II by all Causes (Washington, D.C.: GPO, 1947), p. 3.

[3] In respect of the Army official's delicate position, the individual's identity shall remain anonymous.

[4] Conversation between the author and Bill Yorgensen of Cowan-Edwards-Yorgensen Funeral Home, Manhattan, Kansas on 30 June 1986.

SUBMARINE WARFARE AND NAVAL ARMS LIMITATION, 1921-1936

In time, the first half of the twentieth century will be most remembered as a period in which two global wars were fought. The first of these conflicts, "The Great War," or World War I, was largely limited to the European Continent, whereas World War II was truly global in character. Ironically the seeds of strife resulting in World War II were sown in the disrupted economies and societies and poorly constructed armistace of the First, "the war to end all wars". However it would be incorrect to consider World War II as a single conflict. In reality that event can be divided into two separate but related wars. The European Theater was for the most part a continuation of World War I with the addition of technological improvements in weaponry and military science. Like its predecessor, the battlefields were primarily on land, although an equally violent war of attrition was waged once more for control of the Atlantic Ocean.

The Pacific Theater was an entirely different struggle characterized by the embattled forces fighting one another largely in a maritime environment. The Pacific War between Japan and the United States was heavily influenced by the outcome of World War I but it would be wrong to conclude that, like the war in Europe, the second conflict was a continuation

of the first. The Pacific War was above all else a fight between two nations--the United States and Imperial Japan--even though the struggle eventually included a coalition of nations against the lone Axis combatant.

The elements of the Pacific War (1941-1945) were established in the mid-nineteenth century when the young, aggressive United States looked westward across the Pacific Ocean towards the Asian mainland, particularly China.[1] At first, commerce and trade with the Orient were America's motivation. This economic thrust was strengthened in 1867 with the purchase from Imperial Russia of the vast, untamed territory of Alaska and the annexation of the Midway Islands in the central North Pacific. These preliminary territorial holdings were enlarged in 1898 when the United States waged a brief, but successful, war against the aging and enfeebled Spanish Empire. In seizing Spanish colonial possessions in the Philippines and Guam, the United States established its authority and influence in the eastern Pacific.

At the same time an Asian military power was emerging from relative obscurity. Feudal Japan had been forcibly introduced to the West in 1853-54 with the arrival of the famous Black Ships commanded by Commodore Matthew C. Perry off the northeast coast of Asia and ending centuries of self-imposed isolation on the Japanese archipelago. Quickly realizing the technological disparity between the West and

themselves, the Japanese set about transforming their society from its feudal past into the industrial future. The success of this conversion was soon made apparent by its military victories over much stronger opponents in wars with China (1894-95) and Russia (1904-05).

The United States initially viewed Japan's growing military power with favor. It represented a counterweight to the imperial ambitions of Russia and Germany in the Far East. This balance of power was further enhanced when Japan signed the Anglo-Japanese Treaty of Alliance with Great Britain on 30 January 1902. However U.S. approval turned quickly into concern after Japan's decisive defeat of the Russian Fleet at Tsushima and subsequent victory in the Russo-Japanese War dramatically altered the Pacific balance of power. American apprehension increased as a result of the heated naval arms race in Europe between Britain and Germany. When both European naval powers withdrew their warships to Continental waters, the Anglo-Japanese Alliance gave Japan the freedom to pursue its own territorial ambitions in the Far East without fear of direct or immediate European intervention.

After Europe went to war in August 1914 the U.S.-Japan rivalry in the Pacific intensified. World War I presented the Japanese with a golden opportunity to increase their power and influence in the region while at the same time providing the legal authority under the Alliance to seize

German possessions on the Chinese mainland and in the central Pacific.

Across the ocean, the American voter perceived that naval strength would be a critical element in the postwar world. Thus concern over Japan's aggressive movements into the central Pacific, coupled with a potential naval threat posed by the victor in Europe and observation of warfare's violent cause-and-effect nature, resulted in popular support for the Naval Act of 1916, which called for construction of the largest and most powerful fleet in the world. In effect, a new naval power had entered the world stage.

As the guns of August fell silent across the Western Front, it quickly became apparent that the Great War had altered the shape of international seapower.[2] The stability and hegemony fostered by the Royal Navy's century-long Pax Britannica was over as a result of technological improvements in naval science and the rise of naval powers in the United States and Japan, countries well beyond the European chokepoints. Wartime construction had greatly increased the fleets of all three postwar maritime powers. Although Britain still retained superiority over the other two separately, the Royal Navy could no longer maintain absolute sway everywhere on the high seas. All three navies were individually strong enough to dominate the seas in their respective regions: Great Britain in European waters, the United States in the

western Atlantic, Caribbean, and eastern Pacific, and Japan in the distant western Pacific. However, the financial burden was too great to build overwhelming naval superiority in order to defeat any one of the other fleets in its home waters. Compounding the problem, all three naval powers had colonies and commercial interests within the spheres of influence of the others: the U.S. with its Pacific island possessions, Britain and its world wide empire, and Japanese immigration into the western United States.

The events which led to the outbreak of World War I strongly indicated that a strictly military solution to a nation's problems was no longer possible or desirable because of the tremendous financial burdens or in terms of human costs. First, any new arms race risked either war or fiscal insolvency as witnessed by the Anglo-German naval arms race in the years before the war. Second, a naval arms race between two of the three postwar naval powers would no doubt stimulate construction in the third in order to maintain a position of rough parity. Third, a fiercely competitive mentality implied a direct military challenge and threat to the other powers. Finally, national tradition, pride, and prestige galvanized demands for a naval buildup.

Prospects of a new naval arms race developed quickly after World War I. For a short time Great Britain, financially exhausted by the war, stopped construction of capital ships

altogether. However the British soon became alarmed at the United States' increased building as a result of the Naval Act of 1916. British fears of a new arms race were partially alleviated in 1919 when the U.S. divided its fleet between the Atlantic and Pacific Oceans. Now the Japanese quickly realized they faced an immediate naval rival. As a result Japan launched new building programs at a time when the British were financially unable to compete.

This potentially explosive situation continued until 1921, by which time the naval budgets of all three powers had become alarmingly expensive. The public in all three nations yearned for immediate reductions in the inflated armaments budgets widely seen as a repetition of the mistake which contributed to the beginning of World War I. There was popular disillusionment with warfare as an end in itself thus creating an atmosphere in all three nations making a disarmament conference possible.

On 12 November 1921, the Conference on the Limitation of Armaments convened in Washington, D.C. The two goals of the conference were to seek an across-the-board limitation on all land and naval armaments and to end the squabbling over colonial possessions in the Far East. As a result, however, of French opposition to any discussion of land-based armamants, the meeting quickly turned towards naval armaments.[3]

After lengthy and complex negotiations, the conference reached agreement among the five major powers (the United States, Great Britain, Japan, France, and Italy) to limit the displacement size and number of the most powerful and expensive warship category: the capital ship, a term describing both the all big-gunned and heavily armored battleship and the fledgling aircraft carrier. The Five-Power Treaty placed maximum limits on the total tonnage each nation could maintain, a maximum tonnage limit on individual ship and gun caliber size, and a ten-year construction holiday in which no new capital shipping would be built. Unfortunately the conference failed to arrive at agreements limiting other warship categories as well; and therein lay the chief weakness of the Five-Power Treaty.[4]

One author has suggested the principal failure of the Washington Naval Conference was in the delegates' inability to limit the construction of submarines.[5] This issue, he argued, was the vital element in obtaining an agreement on all other warship classes. The very fact that some countries, most notably France, considered the submarine an important warship category weakened the overall effect of the limitations process by acknowledging the existence of disagreement on the value of battleships and aircraft carriers as the backbone of naval power. In other words, now that capital ships were subject to limitations in size and number, the

failure to reach mutual agreement on secondary warship classes served only to increase their relative importance within the respective fleets. In essence, the treaty controlling submarine warfare, the Treaty Regarding the Use of Submarines and Noxious Gases in Warfare, was enforceable only through the whims of world public opinion. Thus without specific restrictions on the smaller warships, the Washington Naval Conference succeeded in reducing one naval arms race while giving impetus to another.

Great Britain, the U.S., Japan, France, and Italy all approached the submarine question from radically different positions.[6] Britain alone favored the total abolition of the submarine as a legitimate weapon of war as a result of its recent near-disastrous experience against German U-boats. The United States on the other hand opposed abolition despite strong domestic sentiment to do so primarily because the Navy's governing body, the General Board, envisioned the submarine as "an inexpensive means of defending outlying island possessions."[7] France supported the U.S. position since the submarine promised to break any British blockade of the Continent and threaten its long-standing naval hegemony. Italy tacitly followed the French lead based on regional considerations in the Mediterranean Sea where France and Britain maintained powerful fleets. Japan supported the submarine as well because it believed that as

a weapon of attrition, the submarine would be useful in weakening an enemy fleet as it crossed the Pacific Ocean and as a blockade breaker in defense of its newly acquired insular possessions.

Discussion of submarines began when U.S. Secretary of State Charles Evans Hughes proposed that both Britain and the United States limit their submarine fleets to a maximum of 90,000 tons while Japan would be permitted 54,000 tons.[8] In the event that any of the conferees' submarine fleet tonnage exceeded the maximum proposals as of 11 November 1921, they would not be required to scrap the excess until replacement vessels were built. At that time all new construction would be limited by the proposed limits. Other exemptions included the completion as scheduled of boats with keels laid before 11 November and the restriction of new construction to replacement vessels only during the building holiday unless a nation had not yet reached its allowable maximum.

Hughes proposed that replacement vessels not be built until twelve years after existing submarines had been constructed and that a replacement keel should not be laid until the older boat had reached age eleven. In addition, older vessels would be required to be scrapped within three months of the date of completion of its replacement. If construction delays were encountered in building the replacement, scrapping would have to take place within four

years of laying the keel.

Britain and France hotly debated the issue of abolishing submarines.[9] Hughes tried to work out a quiet understanding which would alleviate British concern over French intransigence. He believed the latter's stubborn position would force the break-up of the entire conference. Accordingly, the American secretary recommended to Britain's Lord A. J. Balfour two changes in the form of lower tonnage allowances and the formulation of rules for submarine use in time of war. Balfour rejected these suggestions because the British public supported abolition. Instead, he applied pressure on the pro-submarine delegates by publicly arguing that submarine warfare itself was immoral. Another member of the British delegation, Lord Lee of Fareham, First Lord of the Admiralty, added his own voice to Balfour's argument with a public attack on an article written by a French naval officer which supported developing the submarine as a means of breaking British naval power.

The Franco-British dispute as well as the conference's general inability to agree on the question of submarine abolition or numerical limitation quickly poisoned the diplomatic atmosphere. A way out of the dilemma appeared when a member of the United States' delegation, Senator and former Secretary of State and of War Elihu Root, suggested that a set of rules be developed to govern the use of

submarines in time of war. Almost immediately Japan, France, and Italy raised questions about the disposition of Q-ships--warships disguised as merchant vessels but specifically designed to attack submarines--and the manner in which these vessels would be tolerated if submarines were required to identify and board all victims prior to sinking them.[10]

An advisory committee to the U.S. delegation formulated the American stance on submarine warfare in a report presented on 1 December 1921.[11] Hughes read the report to the other conference delegations which emphasized the need for rules controlling acceptable conduct in submarine warfare and yet arguing that the vessel was a legitimate weapons platform. He began by tracing the evolution of submarine warfare during World War I. Hughes revealed that "unlimited warfare," that is, attacking merchant shipping without warning or attempt to rescue survivors had not been limited to submarines alone. All naval vessels were expected to follow the traditional rule which required that a suspected enemy ship be boarded and, if possible, seized by a prize crew and sailed to a friendly or neutral port. The modern submarine could not carry out this practice because of its limited space for the extra manpower to man prize crews and house the captured passengers and crews of hostile vessels. Furthermore, surfaced submarines were extremely vulnerable to naval gunfire

from illegal Q-ships while exercising the right of visitation. Submarine commanders were thus predisposed to sink targets without warning. In response to this sinister policy, merchant vessels began arming themselves against submarine attack (in itself a violation of the rules of conduct) and both hunter and hunted soon practised a policy of sink-on-sight. Hughes concluded that new rules governing the conduct of submarine warfare were needed, otherwise naval warfare would become even more brutal.

However Secretary Hughes noted that when a submarine attacked a surface warship, no warning would be needed or expected. In this observation the report recognized the fact that "the submarine has come to stay." Ironically, the committee piously reaffirmed America's repugnance for the World War I practice of submarine warfare in words that would one day return to haunt it: "The United States would never desire its Navy to undertake unlimited submarine warfare. In fact, the spirit of fair play of the people would bring about the downfall of the administration which attempted to sanction its use."[12]

Hughes argued against abolition of the submarine for two reasons. On the strategic level, the submarine was considered useful in defending distant American possessions until the entire fleet could arrive en masse. Closer to home, submarines could protect the U.S. coastline from

surprise attack or enemy raids. Submarine development also made sound fiscal sense. Not only were these warships cheaper to build, they could also fulfill the traditional role of the cruiser in reconnaissance. In short a large submarine fleet provided an inexpensive means to wage war at sea: "The cost per annum of maintaing 100,000 tons of submarines fully manned and ready is about $30,000,000."[13]

The report finished with the recommendations that the practice of unlimited submarine warfare be outlawed and the right of visitation and search be the same as that observed by surface warships. Furthermore, it stated that there should be no limitations on the size of the individual submarine boat.

Japan was also interested in establishing rules of conduct rather than abolition of the submarine. On 22 December 1921, Masanao Hanihara, Vice-Minister for Foreign Affairs and a member of the Japanese delegation agreed with a British statement that "the sinking of merchant vessels without proper warning had no justification whatever" and called for rules to limit such action.[14] Hanihara did take exception to the British view of submarines as illegitimate defensive weapons, but after referring to the popular conception of the submarine as a malevolent, predatory warship hidden beneath the ocean waves and striking defenseless merchant targets without warning, he asserted that the

submarine had legitimate uses, such as coastal defense in the role of "movable mines." He also argued that the labeling of submarines as an "illegitimate weapon" was unfounded since "any weapon might become illegitimate if used without restriction." Therefore Japan considered the submarine as an effective and economical warship but in need of a common standard governing its operational use.[15]

The next week Elihu Root submitted his resolution proposals for the use of submarine warships in time of war to the general conference:

> I. The signatory powers, desiring to make more effective the rules adopted by civilized nations for the protection of the lives of neutrals and noncombatants at sea in time of war, declare that among those rules the following are to be deemed an established part of international law:
>
> 1. A merchant vessel must be ordered to stop for visit and search to determine its character before it can be captured.
>
> A merchant vessel must not be attacked unless it refuse to stop for visit and search after warning.
>
> A merchant vessel must not be destroyed unless the crew and passengers have been first placed in safety.
>
> 2. Belligerent submarines are not under any circumstances exempt from the universal rules above stated; and if a submarine can not capture a merchant vessel in conformity with these rules the existing law of nations requires it to desist from attack and from capture and to permit the merchant vessel to proceed unmolested.
>
> The signatory powers invite the adherence of all other civilized powers to the foregoing statement of established law to the end that there may be clear public under-

> standing throughout the world of the standards of conduct by which the public opinion of the world is to pass judgement upon future belligerents.
>
> II. The signatory powers recognize the practical impossibility of using submarines as commerce destroyers without violating the requirements universally accepted by civilized nations for the protection of the lives of neutrals and noncombatants, and to the end that the prohibition of such use shall be universally accepted as part of the law of nations, they declare their assent to such prohibition and invite all other nations to adhere thereto.
>
> III. The signatory powers, desiring to insure the enforcement of the humane rules declared by them with respect to the prohibition of the use of submarines in warfare, further declare that any person in the service of any of the powers adopting these rules who shall violate any of the rules thus adopted, whether or not such person is under orders of a governmental superior, shall be deemed to have violated the laws of war, and shall be liable to trial and punishment as if for an act of piracy, and may be brought to trial before the civil or military authorities of any such powers within the jurisdiction of which he may be found.[16]

The conference accepted the Root proposals although it debated at considerable length about Article III's characterizing violating crews and their boat skippers as pirates.

Thus the Washington Naval Conference addressed the issue of submarine warfare in the shadow of recent combat and entertained proposals for outlawing this warship, limiting the tonnage each nation could maintain, and the individual unit size. But the only agreement it could reach was the rather idealistic but entirely impractical and anachronistic one of retaining established rulse governing

the use of the submarine in time of war.[17]

The delegates' attempt at reducing the horrendous impact of submarine warfare was commendable but unfortunately doomed to failure, for within the agreement were planted the seeds of its destruction. By restricting submarine warfare to an observance of conventional rules with regard to merchant shipping, such a standard imposed an "either/or" choice upon the submarine's tactical employment: following the rules endangered the vessel and its crew to almost certain destruction while disregarding them made the submariners pirates and criminals. This dilemma forced boat commanders and their superiors on shore to choose between adherence to the treaty, thereby completely abandoning the submarine's role as a commerce raider, or wholesale violation of the rules. In short, the treaty effectively neutralized the submarine as efficiently as outlawing it. This choice between extremes tipped the scales in favor of unlimited submarine warfare and consequently the very barbarization of naval warfare the treaty was supposed to prevent.[18]

What were the results of the Washington Naval Conference?[19] Japan emerged with many advantages, notwithstanding the views to the contrary of its more militant military and political leaders, Of major importance was the conference's failure to reach an agreement limiting the number of second-

ary naval warships such as cruisers, destroyers, and submarines. This fact, together with the restrictions on capital shipping, meant that huge financial resources were now free to build more of the lesser warship classifications. As a result there developed a "balanced fleet" concept in which each navy's fleet strength would be tailormade to meet its respective missions and strategies.

Japan also gained an enormous advantage in America's concession not to fortify its Pacific Ocean territories. The price of this agreement, however, was the dissolution of Japan's deeply cherished Alliance with Great Britain and, in Japanese eyes, a measure of international respect, prestige, and acceptance as a formidable world power. Nevertheless, Japan now dominated the western Pacific region with little fear of European or American interference. In effect, the United States agreed to a shift in the regional balance of power since, without fortified naval bases in the Philippines or Guam, the U.S. Navy would be hard pressed to cross the Pacific Ocean and defeat Japan's waiting battleline.

Finally, after the conference ended, the U.S. Congress exhibited reluctance to allocate funds needed to expand the fleet up to treaty limits. This tacit abdication by the United States of its negotiated position handed Japan the materiel advantages previously denied at the bargaining table.

One writer has observed that a major weakness of the

Washington Naval Conference was the absence of any enforcement provisions.[20] Not only was compliance based on an honor system impossible to verify, but the naval restrictions limited virtually all unilateral movements to enforce the agreements. Such a predicament could only foster suspicion and ill will should any of the signatories even give the appearance of violating any or all of the agreements.

During the immediate post-conference period, relations between the United States and Japan were further strained in a number of ways. One area of friction involved the economic competition for China's vast potential consumer market. This economic rivalry originated in Japan's and America's economic expansion during the lucrative World War I years. Japan desperately needed China's raw materials and consumer market for its finished goods. Not only were these needed in order to sustain its own economic growth, but also in order to avoid the social problems associated with mass unemployment. The United States likewise desired Chinese trade as an outlet for its own manufactured goods.[21]

Racial prejudice against Orientals in the western United States provided another source of increasing tensions. In 1922 and 1923, the Supreme Court issued a series of rulings which denied Japanese immigrants the legal right to become naturalized citizens and defined them as racially nonwhite people. These decisions outraged popular sentiment in Japan

and effectively nullified the good will which had been created by the outpouring of American aid following the disastrous 1923 Great Kanto Earthquake. To add insult to injury, in 1924 the Congress passed the Johnson Immigration Act dramatically reducing the number of Orientals allowed into the country.

The anti-Oriental legislation created a war scare in the Far East in 1924 and 1925. The U.S. Navy responded in 1925 with the first of a series of annual naval maneuvers in the Pacific, a not-so-veiled threat directed against Japan. Certainly the Japanese concluded as much, and, as a result, became the first of the Washington signatories to exploit the treaty loopholes by increasing construction of non-capital warships. Tension increased even more as a result of Washington's and Tokyo's inability to verify each other's compliance with the non-fortification clauses of the Four-Power Treaty. One scholar of the interwar treaty period noted that during the 1920s "the military services in both Japan and America were pursuing legitimate and necessary improvements in their war-fighting capabilities in case the treaty failed." Consequently there was chronic "tension between the arms limitation regime and the function of the military establishments [which] was a constantly destabilizing dilemma in Japanese-American relations."[22]

One further cause of the deteriorating relations be-

tween Japan and the U.S. was a serious economic dislocation in Japan as a result of an anti-Japanese economic boycott in China during the mid-1920s which shifted the balance of political power away from moderates and towards radical, anti-treaty elements. In addition, the standard of living declined in rural Japan, a region from which the Army officer corps largely came, and this drove a wedge between them and moderate politicians. As the domestic economy continued to decline, unemployment rose dramatically and created a climate of social unrest directed against the government's ineffective policies. Finally, in the late 1920s the Great Depression began to impose its terrible burden upon the Japanese people as it did around the world. As Western governments quickly built walls of protective tariffs around their own economies, the economy in Japan--a nation heavily dependent upon trade for survival--tumbled even more. As an indirect consequence of the Depression, the Japanese increased their construction of secondary naval shipping. On the one hand, the government desired to save the shipbuilding industry and its supporting trades from decimation caused by a complete building halt. On the other hand, an enlargement in the cruiser and submarine fleets were considered necessary to offset the reduced size of the main battlefleet.[23]

All the Washington Naval Conference signatories recognized the need to bring secondary warships into the arms

limitation process because they had failed to agree on their reduction, and as a result, a cruiser building race between Japan and Great Britain began in the post-conference period. The U.S. did not participate in this buildup in its early stages because of congressional reluctance to appropriate money for new ship construction. On 19 February 1927, President Calvin Coolidge invited the participants of the Washington Naval Conference to meet in Geneva, Switzerland and discuss limiting non-capital shipping, with special attention given to both heavy and light cruiser classes.[24] Italy declined to attend the conference because of its tense relations with France; and France refused to come unless the agenda included a comprehensive discussion of land and air forces as well as naval disarmament. Only the "big three"--Great Britain, the U.S., and Japan--came to Geneva.

The Geneva Naval Conference began on 20 June 1927. Naval professionals were heavily represented in their respective delegations. Almost immediately Britain and the U.S. began feuding over the question of reducing the size of cruiser fleets, a dispute, giving Japan the opportunity to act as peacemaker by mediating the quarrel. This Anglo-American squabble contributed to the conference's overall failure to reach any agreement limiting secondary warships.

Since the Geneva Naval Conference concentrated almost exclusively upon heavy and light cruisers, little discussion

ever took place on other warship classes, such as submarines. The failure to hold significant discussion may have been the result of the fact that too many naval officers served in the delicate role of diplomats. International diplomacy is founded upon an atmosphere of give-and-take, and naval officers, by reason of their training and experience, were not always mindful of the need for compromise. Although the participants exhibited a marked unwillingness to compromise their national interests, one historian has suggested that the main problem at Geneva was a failure to address the political problems which made a disarmament agreement impossible to reach: "Armament is merely an instrument of foreign policy, and any attempt to regulate weapons independent of their reason for existing was doomed from the start."[25]

A third major naval arms limitation meeting opened in London on 21 January 1930. Its goal was to continue the reduction process begun in Washington in 1921-22 by regulating smaller warship classes and by discussing an extension of the construction freeze on capital ships. Those represented in London included the five original Washington signatories as well as the dominions of the British Empire: Australia, Canada, India, the Irish Free State, New Zealand, and the Union of South Africa.

As at Geneva in 1927, conferees were mainly interested

in the cruiser. The United States wanted to include cruisers in the 10:6 ratio agreed to at Washington.[26] Japan opposed this favoring instead a 10:7 ratio which was more suitable to its defense needs and its naval superiority in the Pacific. Japan's insistence upon a 70% ratio was founded upon a common strategic perception during the interwar period to the effect that any fleet crossing an ocean in order to engage any enemy fleet required a minimum strength of 70% of that of its adversary.[27] The U.S.'s David A. Reed and Japan's Tsuneo Matsudaira, in quiet discussions, reached a compromise solution whereby Japan would accept the 10:6 ratio provided the United States did not build beyond the 10:7 ratio before the next scheduled disarmament conference in 1936.[28]

The London Naval Conference also devoted much time to the issue of submarines. At the earlier Washington conference the United States had opposed the British move to abolish this warship altogether. But eight years later the American attitude had changed sharply, Washington supported a renewed British effort to outlaw the submarine and there were two major reasons for this reversal.[29] First, the American public considered submarine warfare barbaric, a legacy of wartime propaganda. Second, many Navy officers believed a reduction in the submarine fleets of other nations, particularly Japan's, would translate into greater naval strength in the American battleline. Furthermore, the Navy became

increasingly alarmed at the submarine construction schedules of the Washington signatories. During the period 1922-29, France built 42 submarines, Japan 35, Italy 28, Britain 14, and the U.S. only three. To a lesser extent, submarine opponents argued that modern boats were becoming increasingly expensive to build and their presence necessitated additional funding for anti-submarine weaponry and ships at a time of budgetary restraint.

Accordingly, after preliminary discussions with both Britain and Japan, the chairman of the U.S. delegation and Secretary of State, Henry L. Stimson, submitted comprehensive proposals to the conference. In terms of submarine warships, Stimson stated that should the conference ultimately decide to retain this category, both the United States and Great Britain should be permitted a total of 60,000 tons while Japan should keep 40,000 tons.[30] Furthermore, existing submarines and those already under construction would be allowed provided their inclusion did not exceed the suggested maximum tonnage. Stimson also proposed a moratorium on submarine building until 31 December 1936. In closing his remarks, the Secretary of State suggested that submarines be required to function under the same rules of warfare with regard to hostile merchant vessels as those governing surface warships.

A few days later, Stimson further clarified the U.S.

stance on submarines in a telegram to the State Department.[31] While the United States favored an acceptance of the lowest possible tonnage allowances, the government would agree to outright abolition provided all five maritime powers adopted such a position. Once again Stimson emphasized that submarine operations against merchant shipping should be regulated by the accepted rules of engagement applied to surface warships, with utmost importance being given to the safety of passengers and crew.

Discussion of submarines continued until mid-March when the delegates agreed to raise the individual boat tonnage from 1,800 tons to a maximum of 2,000 tons. At the same time, the U.S. accepted Japan's argument for additional tonnage by increasing its submarine fleet to 52,700 tons, or parity with the United States.[32]

On 10 April 1930 Stimson sent a telegram to the Acting Secretary of State in which he notified the U.S. Government that an agreement between the United States, Japan, and Britain had been reached on a "skeleton of proposed five-power treaty." Part II of this tentative accord addressed the issue of defining "the rules of international law as to the use of submarines."[33] Stimson noted that Japan had abandoned attempts to shift tonnage allowances from destroyers to submarines. Instead, the Japanese accepted submarine parity with the United States and Britain at 52,700 tons.

However exceptions were permitted the Japanese in the form of early scrapping and replacement of some warships, including submarines, in order to keep the domestic shipyards active. This provision stipulated that the final limitation tonnage figures were not to be exceeded.

The London Naval Conference ended on 22 April with the signing of the treaty document by all participants. It would remain in force until the last day of 1936. The treaty also specified that a new conference should begin in 1935 to replace the treaty before it expired. However the agreement reached in London did not enjoy universal popularity. Japan's support of the treaty created a domestic political crisis in which moderate politicians and naval leaders began losing dominance of and influence over government policy to more militant politicized elements in the military. In a vain effort to beat back this assault, the moderates made concessions to the radicals through pledges to develop air power for use in the Mandated Islands in order to offset the smaller submarine force decreed by the treaty and to intensify training aboard treaty-regulated warships in order to increase the fighting quality of both crews and vessels.

Among U.S. Navy officers, there was dislike for the treaty because it lowered the fleet's capability to project offensive power across the Pacific and to defeat the Japanese in the event of war. But it must be noted that one positive

outcome of the London treaty which had far-reaching results was in the reduction of the post-World War I Anglo-American naval rivalry and the shaping of a foundation for future cooperation.[34]

The interwar attempt to limit the pressures of a dangerous naval arms race began to fall apart in the years after 1930. Many factors contributed to this deterioration. Economically, the need to reduce government expenditures on naval arms was no longer the opporessive fiscal threat that it had been in the early 1920s. In fact, as a result of the worldwide depression, governments soon realized that arms purchases stimulated employment which in turn relieved potentially explosive domestic outbursts. Furthermore, the technology of war itself had changed the possibilities available to defense strategists. Throughout the 1930s, two weapons platforms--the airplane and the submarine--continued by trial and error, success and failure, the evolutionary process of development and acquired an increasing standard of mechanical reliability and technological feasibility for fulfilling the dreams of strategic prophets. In so doing the airplane and the submarine threatened to undermine and even abolish the traditional foundation of naval power: the capital ship. Finally, Japanese-American relations became increasingly strained during the 1930s as a result of the rise of a militaristic and belligerent government in Japan.

Japanese aggression in Manchuria (1931), war with China (1937), and hostilities with the Soviet Union (1938-39) poisoned bilateral relations and encouraged new U.S. naval construction up to treaty limits.

The deathblow to the naval arms limitation process came on 19 December 1934 when Japan denounced the Washington and London naval treaties and gave the required two years notice of abrogation. As provided by the Washington treaty, all signatories would gather together within one year to hammer out a new treaty system. On 9 December 1935, the eleven delegations assembled once again in London for the Second London Naval Conference, the principal focus of which was Japan's desire for parity in all naval categories with both the United States and Britain. The English-speaking powers refused Japan's demand for equality and on 15 January 1936, the Japanese delegation withdrew from the conference.

Although a new treaty agreement was reached in London and signed on 25 March 1936, the document itself was meaningless in the absence of a Japanese signature. The interwar naval limitation period was over. Later in the year, however, a move was made to renew the spirit of the treaty period and its attempt to civilize the nature of submarine warfare. The clauses of the 1930 London treaty prohibiting unrestricted submarine warfare against commercial shipping were made into a special Protocol shortly before the treaty's expiration.

The Protocol was ratified by the governments of Great Britain, the United States, Japan, France, and Italy and acceded to by Germany and the Soviet Union. By the outbreak of war in 1939, more than 40 nations had either officially sanctioned or informally subscribed to the Protocol. Looking back on this attempt to soften the destructive magnitude of naval warfare through a common acknowledgement of "rules" by which it could be fought, one eminent naval historian commented: "the value of those signatures may be regarded as justification for cynicism about attempts to 'humanize' war."[35]

Cynicism aside, whether justified by later events or not, the major naval powers of the interwar period attempted to address the awesome reality that modern warfare had acquired a brutal life of its own and a voracious appetite for consuming the treasuries, resources, and populations of the combatants. The diplomats attempted to control the beast, while simultaneously pushing forward their national interests and ambitions, by regulating the status quo around a conference table. The fact that they eventually proved unsuccessful was due more to the changing nature of people in positions of power and events which had originally supported the arms limitation process. However during the same period, naval professionals continued to develop and evaluate those aspects of naval power not specifically addressed at the conference table. Coupled with technolog-

ical improvements was the need to formulate practical, winning strategies for their employment should diplomacy give way to combat as the arbiter of international relations. In this process, the submarine continued to make its presence felt.

NOTES

[1] Raymond G. O'Connor, Perilous Equilibrium: The United States and the London Naval Conference of 1930 (1962; reprint ed., New York: Greenwood Press, 1969), pp. 1-5.

[2] Harold Sprout and Margaret Sprout, Toward a New Order of Sea Power: American Naval Policy and the World Scene, 1918-1922 (1943; reprint ed., New York: Greenwood Press, 1969), pp. 47-48.

[3] O'Connor, p. 5.

[4] The Five-Power Treaty also forbade new fortifications and naval bases in the Pacific Ocean territories of the United States, Great Britain, and Japan. Three other treaties were signed in Washington as well: (1) The Treaty Regarding the Use of Submarines and Noxious Gases, which outlawed unrestricted submarine warfare and poison gases. (2) The Four-Power Treaty, signed by the U.S., Britain, Japan, and France, abrogated the Anglo-Japanese Alliance. (3) The Nine-Power Treaty (U.S., Britain, Japan, France, Italy, China, the Netherlands, Belgium, and Portugal) reaffirmed the territorial integrity of China. The full texts of the treaties may be found in U.S. Cong., Senate, Conference on the Limitation of Armament, Senate Documents, vol. 10, no. 126, 67th Cong., 2nd sess., (Washington, D.C.: GPO, 1922), pp. 871-901.

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[6] Roger Dingman, Power in the Pacific: The Origins of Naval Arms Limitation, 1914-1922 (Chicago: The University of Chicago Press, 1976), pp. 206-09.

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[11] Conference on the Limitation of Armament, pp. 273-77.

[12] Conference on the Limitation of Armament, p. 276.

[13] Conference on the Limitation of Armament, p. 276.

[14] Conference on the Limitation of Armament, pp. 271-72.

[15] Conference on the Limitation of Armament, pp. 271-72.

[16] Conference on the Limitation of Armament, pp. 321-22.

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[18] J. E. Talbott, "Weapons Development, War Planning and Policy: The US Navy and the Submarine, 1917-1941," Naval War College Review 37, no. 3 (May-June 1984): 53-71.

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[21] Robert A. Hoover, Arms Control: The Interwar Naval Limitations Agreements (Denver: University of Denver, 1980), pp. 39-48.

[22] Hoover, p. 47.

[23] Hector C. Bywater, "Japan: A Sequel to the Washington Conference," United States Naval Institute Proceedings 49, no. 243 (May 1923): 813.

[24] O'Connor, pp. 11-19.

[25] O'Connor, p. 19.

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[27] Toshiyuki Yokoi, "Thoughts on Japan's Naval Defeat," United States Naval Institute Proceedings 86, no. 692 (October 1960): 71.

[28] Spector, p. 41.

[29] Richard Dean Burns, "Regulating Submarine Warfare, 1921-1941: A Case Study in Arms Control and Limited War," Military Affairs, 35 (April 1971): 57-58.

[30] U.S., Department of State, Washington, Foreign Relations of the United States, 1930, Vol. I (Washington, D.C.: GPO, 1945), p. 15.

[31] Foreign Relations, 1930, Vol. I, p. 20.

[32] Foreign Relations, 1930, Vol. I, p. 61.

[33] Foreign Relations, 1930, Vol. I, p. 106.

[34] Hoover, pp. 95-98.

[35] Stephen Roskill, Naval Policy Between the Wars: The Period of Reluctant Rearmament, 1930-1939 (London: Collins, 1976), p. 320.

SUBMARINE WARFARE AND THE INTERWAR STRATEGY DEBATE

While the politicians and their military advisers spent the interwar period haggling with one another at the series of naval limitations and disarmament conferences, other members of the naval profession debated issues of Pacific Ocean grand strategy and what types of warships would be needed for military victory in the event war broke out between the United States and Japan. The question of submarine development was influenced during the interwar period by the limits of contemporary technological understanding and invention. As is frequently the case in modern warfare, the theories of strategic thinkers sometimes outdistanced the existing level of technological capability and thus unfairly discredited a weapons system before it has been developed into maturity. As the weaknesses of the Washington Naval Conference became apparent to the United States and Japan, a seemingly inevitable drift towards military confrontation and war encouraged naval strategic thought towards winning such a conflict and the development and acquisition of warships able to fulfill the strategists' expectations.

The Imperial Japanese Navy began considering the possibility of war with the United States as early as 1907. In

that year, discussions on imperial defense policy and a principle of operations concluded that in any future fight with America the Navy would assume the strategic defensive and entice the enemy fleet across the Pacific Ocean where it would be destroyed in a climactic battle with the Japanese Fleet.[1] This initial policy was revised on three occasions in order to meet the changing requirements of international relations and military technology: near the end of World War I, immediately following the Washington Naval Conference in 1922, and in 1936 as the capital ship construction moratorium approached expiration.

With the first revision in 1917, Japan's basic naval strategy against the U.S. Fleet was stated more clearly in its "Procedure of Operation":

> In the outset of a war, the Navy will gain control over the United States fleet in the Orient, and at the same time destroy the enemy's naval bases in Luzon and Guam in co-operation with the Army. The Navy will try to reduce gradually the force of the enemy fleet units in transit and destroy them totally with our capital fleet units, seizing an opportunity when the main body of the enemy fleet proceeds toward the Orient.[2]

In essence, Japanese naval strategists assumed the U.S. would attack Japan directly with its own battleline early in any future conflict. This assumption suggested using selected naval units to intercept the American fleet as it crossed the vast Pacific and weaken its fighting strength by attrition prior to engaging the Imperial Navy's battleline some-

where in the western Pacific.

The first priority of the "interception operational procedure" was the destruction of the American Asiatic Fleet and its supporting bases at Guam and the Philippines early in the war. At the same time, Japan's submarine fleet would be dispatched to intercept and shadow the U.S. fleet on its trans-Pacific voyage and reduce its fighting power by repeated attacks. Japan's battle plan was enhanced by the geographical fact that the most direct route the Americans could take to relieve enemy pressure against Guam and the Philippines lay through the Japanese-controlled Mandated Islands.* Once within range, it would be subjected to continuous and coordinated assaults by both Japanese land-based and carrier-based naval aircraft. Finally, the Japanese war scenario called for fast surface elements of the Combined Fleet to add their weight to the steady destruction of the U.S. Fleet in a night attack utilizing naval gunfire and torpedoes. This clash would be followed the next morning by the coup de grace administered by the now concentrated and untouched Japanese battleline.

Attendant to the debate over the proper naval strategy

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*Following World War I the League of Nations granted Japan the mandate over former German insular possessions in the Pacific Ocean north of the equator. These were the Marshall, Mariana, and Caroline islands groups.

Japan should employ against the United States was the issue of what kind of fleet would be needed to successfully implement that strategy. This question was not unreasonable since it is much like the hand inside of and giving substance to a glove. Vice Admiral Shigeyoshi Inoue expressed his views on a future Japan-U.S. conflict in his "Modern Military Procurement Planning." Admiral Inoue reasoned that Japan would never be able to defeat the United States since the latter's territory could not be entirely occupied nor could its capital city be captured by Imperial forces. Moreover, America's operational military forces could not be completely destroyed if they chose to refuse battle; and they were supported by a vast population and industrial infrastructure located on territory unreachable to Japan. Even an attempt to impose a naval blockade against the United States was impossible because of the abundant natural resources contained within the nation's borders, the length and remoteness from Japan of the enemy's coastlines, and the obvious fact that America was both a continental as well as a naval power and could therefore acquire its needs from throughout the Western Hemisphere.

Inoue reversed his argument to show that it did not necessarily apply to Japan. On the contrary, the U.S. was able to conquer all Japanese territory, including the national capital Tokyo. The U.S. could destory Japan's

operational military forces and impose an effective maritime blockade against the Japanese Home Islands. Furthermore, the Americans were technologically capable of sustaining such a naval blockade even at the end of a lengthy trans-Pacific supplyline. Admiral Inoue warned his countrymen that a "great revolution in naval strategy" had taken place with the development of the airplane and submarine which dramatically changed the face of naval warfare.

Accordingly, Inoue offered some predictions as to the nature of a future war between Japan and the U.S., predictions which later proved to be unnervingly accurate. First, the Japanese admiral saw American submarines and aircraft endangering Japan's maritime lifeline: "The securing of sea routes will be one of the most important operations in a war between the United States and Japan." Instead of anticipating a Mahanian battle between capital ships, Inoue saw a struggle for control of Japan's island bases in the Mandates, the Philippines, and throughout the Empire itself "the importance of which is equal to that of the decisive battles between fleets of capital ships in the old days." Although Inoue envisioned that Japan would quickly obtain regional hegemony because of its possession of the Pacific insular land masses, he cautioned that "the meaning of control of the sea is not as absolute in the days of the submarine as it was in the old days." He advised that a more effective use for Japan's

submarines would be to employ them offensively against American sea lines of communication in the Western Hemisphere rather than in locating, shadowing, and attacking the westward-bound enemy fleet.[3] Presumably, Inoue based this last argument upon two factors: his dim view of Japanese submarine doctrine and its reliance on boats technologically unable to keep up with the faster surface warships; and the realization that the conventional wisdom was throwing Japan's underwater force against American naval strength rather than against the more vulnerable merchant marine.

Admiral Inoue concluded "Modern Military Procurement Planning" with suggested recommendations on preparations the Imperial Japanese Navy should make in anticipation of hostilities with the United States. First and foremost, Inoue considered it "absolutely necessary" that Japan protect its sea routes by building the appropriate defensive naval forces. Since Japan was particularly vulnerable in this area and almost totally dependent upon sea-borne imports, he warned against a flippant attitude. "The point we must be very aware of is that we have had no experience in fighting enemies with submarines in either the Russo-Japanese War or in the China Incident (1937-present); and since we have had the good fortune never to have been attacked on the communications routes. . ., we are likely to ignore the problems involved should this come about."[4] Consequently

Inoue urged Japanese leaders to begin immediately organizing, training, and building the necessary military and naval components needed for a strategic--as opposed to tactical--defense of the western Pacific against any intrusion by enemy vessels. Such preparations could be met by a dominating air force, numerous submarine forces, convoy escorts, and "powerful mobile sea task forces." In addition, Inoue subscribed to the old adage "the best defense is a good offense" and accordingly favored a ship-building program emphasizing long-range, long-endurance submarines capable of patrolling off the United States' West Coast thus striking enemy sea transport at its source. Inoue believed Japan should acquire a specialized amphibious assault infrastructure able to quickly capture Pacific islands needed as bases for supporting the strategic defense against American forces. These insular possessions would be "of the highest importance for advancing and extending the range of our naval aircraft while hindering the operations of enemy aircraft, submarines, and naval ships."[5]

Japanese submarine doctrine for war with the U.S. originated with the Washington Naval Conference's limitation of capital ship strength to 60% that of the Americans and British. This apparent disparity in total strength, even though Japan's entire naval force was concentrated in the Pacific Ocean whereas the Americans and British were forced

by geographic and political considerations to disperse their fleets for broader coverage, fostered speculative thought on ways and means to even the score in terms of aggregate fighting power. In 1923-25, the commander of the First Submarine Squadron, Admiral Suetsugu Nobumasa, conceived a solution which he later perfected when he became Commander in Chief of the Combined Fleet in 1933. Nobumasa's idea was the "strategy of interceptive operations." In it, he proposed that submarines be used to reduce overall American Pacific naval strength by 30% through repeated attacks during the long passage across the ocean. "A decisive surface battle would then follow in or near Japan's home waters, where the proximity of shore planes, the freshness of the Combined Fleet, and the unparalleled Yamato spirit would quickly put down the aggressive American ships, just as Togo's fleet had annihilated the Russians at Tsushima."[6] Essentially the admiral's strategy of interceptive operations was a war of attrition requiring a large fleet of big (for endurance and range), fast submarines.[7]

Nobumasa recognized the value of numerous submarines wearing down the American fleet during its long voyage, but his thinking was still heavily influenced by the vision of ships-of-the-line pounding away at one another with their guns until one side emerged victorious. However during the 1930s technological improvements in weaponry gradually moved

the location of the climactic naval battle further to the east: ever increasing cruising ranges for such important participants in the coming struggle such as aircraft and naval shipping forced changes in the site of the decisive battle. Originally anticipated in home waters, by 1934 Japanese strategists expected the battle to occur along a line stretching between the Bonin and Marianas Islands. By 1940, this imaginary line had been pushed further eastward into the Marshall Islands.[8]

There were problems with Admiral Nobumasa's strategy. Naval planners and strategists faced some tough questions in the event the war did not evolve according to their expectations. For example, would the United States Navy hastily commit itself to an early, decisive naval engagement or would it wait and build up its strength before risking everything on one throw of the dice? Most chilling of all was the question of Japan's response should the U.S. decide to wage a protracted war of attrition in which the greater American industrial capacity could be brought to bear? Thoughtful Japanese leaders quickly recognized the vital importance of an overwhelming victory early in any future conflict with the United States.

American naval strategists also spent considerable time debating what role the Navy would adopt in the event of

hostilities with Japan. The battle plan that evolved was known as War Plan Orange, "orange" being the codename for Japan. Briefly, War Plan Orange envisioned the entire United States Fleet crossing the Pacific Ocean and relieving the expected sieges of naval bases at Guam and more importantly at Manila in the Philippines. From its base in the Philippines, the fleet would seek out and destroy the Japanese fleet in a textbook rendition of Mahan's decisive battle concept. However not everyone within the Navy was fully committed to the basic outline of War Plan Orange.

By the late 1930s, War Plan Orange had come under heavy criticism. Admiral Harry E. Yarnell, Commander in Chief, Asiatic Fleet in 1937-38 proposed an alternative which called for a war against the vulnerable Japanese economy by destroying its supporting maritime communications. Yarnell's idea was an adaptation of the German strategy used against Britain during World War I, a strategy which nearly succeeded. The advantage of guerre de course, the antithesis of Mahanian doctrine, lay in its reduced emphasis upon committing the entire U.S. fleet to a major battle early in a war with Japan. In addition, such a strategy would be less costly in terms of men and naval vessels damaged or destroyed since the American target would be the relatively defenseless merchant shipping rather than powerfully armed warships.

Admiral Yarnell's plan of economic warfare was given

official blessing as an alternate to War Plan Orange in January 1938 when the U.S. and Britain reached an understanding on the division of defensive responsibilities should both parties find themselves in a common war against Japan. In such an event, the United States would defend the Western Hemisphere while British forces would cover the Malay Barrier and Indian Ocean; no Japanese commerce would be allowed beyond these lines.[9]

Throughout the interwar period of naval limitations, one factor continued to destabilize Japan's ability to live up to its diplomatic obligations. This was the internal struggle for power and control within the Imperial Japanese Navy's officer corps. The bureaucratic infighting centered primarily around two factions: the Navy Ministry and the Navy General Staff.[10]

The Navy Ministry was largely an "administrative group" responsible for the housekeeping details which included budgetary matters, ship construction, weapons purchase, naval personnel, relations with the Diet (Japan's legislature) and the cabinet, and broad naval policy matters. The Navy General Staff or "command group" was limited to fleet operations and war planning. Up until the 1920s, Ministry officials held the superior position in terms of policy-making, an advantage much resented by admirals within the

General Staff. However, beginning in 1921 when Japan entered the series of disarmament conferences with the West, the internal struggle for control intensified into outright bureaucratic warfare and the gradual ascendancy of the Navy General Staff in importance and influence.

The catalyst was the Washington Naval Conference. Admirals within the Navy Ministry supported the treaty system and a policy of getting along with the two other major naval powers, Britain and the U.S. The Navy General Staff, led by Vice Chief of Staff, Admiral Kanji Kato, was vehemently opposed to any restriction upon Japan's naval power. The conflict deepened after the London Naval Conference in 1930. Supporters of the treaty system were labeled the "Treaty Faction" while its opponents became known as the "Fleet Faction". It is important to bear in mind that the conflict focused around opposition to the politically moderate naval leadership within the Ministry which was committed to the arms limitation treaty system. It would be incorrect to conclude that all treaty proponents wanted an institutionalization of Japan's naval inferiority in order to avoid war with either the British or Americans. Instead, the Treaty Faction wanted to postpone what many believed to be an inevitable clash with the English-speaking naval powers until such time as Japan's own strength had been built up to a level of superiority able to decisively defeat its enemies.

What they feared was the Fleet Faction's hot-headed behavior would precipitate a war before Japan was militarily prepared.

A third group of naval officers emerged in the mid-1930s. Their political affiliation was determined by individual inclination and experience gained during assignments overseas as "language officers, attaches, or assistant attaches."[11] These officers identified with the nations to which they had been assigned, forming an "American (or Anglo-American) faction" and the "German (later Axis) faction", further agitating the Japanese political pot.

The United States Navy's development of the submarine as a major warship was complicated throughout the interwar period by a variety of factors.[12] All too frequently the extant technology simply did not match theoretical applications. Moreover, the Navy General Board placed greater emphasis upon the development of naval airpower at the expense of submarines beginning in 1921. In the bureaucratic struggle, traditional acceptance of the Mahanian doctrine of decisive battle between fleets and its attendant repudiation of guerre de course as an effective naval strategy, in effect pitted "battleship admirals" against "submarine lieutenants." Finally, the American public disapproved of submarine warfare, a political fact which slowed development in spite of the military realities in the Pacific Ocean basin.

Despite the obstacles in its path, American submarine design and development did continue in the years between the two world wars. In essence the Navy required a submarine capable of fulfilling the strategic requirements of War Plan Orange. Although the defense of the Philippines was considered important, the general consensus among navy leaders was that the American colony could not remain unconquered until the fleet arrived to lift the siege, defeat the Japanese fleet, and end the war. Consequently basing facilities in the Philippines could not be depended upon to support the fleet either because they might be controlled by enemy forces or damaged in the fight for their recapture. This possibility required that all American warships, including submarines, be capable of steaming great distances from their home bases to wartime operational areas. Accordingly submarine design characteristics required a long-range endurance capability and a relatively high surface speed, otherwise too much time would be spent in transit and not at the assigned patrol station, and lengthy passages increased consumption of fuel and food stores further reducing overall patrol time on station.[13]

Likewise, Japan stressed long-range cruising ability in its submarine designs since doctrine called for an offensive use against an advancing enemy fleet in mid-ocean.[14] The

Imperial Navy adopted two World War I patterns for its underwater fleet: a fast fleet boat of British design and a very long-range German minelayer. Japanese officials did not emphasize development of medium and short-range designs since these boats were primarily for coastal defense rather than long-range interdiction, and they thought the smaller submarines could be rapidly produced during mobilization.

During the later stages of the interwar period, new strategic considerations appeared to further complicate Japanese submarine strategy. These possibilities included a wider application of the medium- and short-ranged submarines as major offensive/defensive weapons by scattering them throughout the Mandated Islands; islands through which the U.S. fleet must sail to relieve the Philippines. Japan also developed submarine capabilities as a refuelling point for long-range seaplane bombers.

Two submarine types* were designed to carry out high speed operations at great distances: the cruiser submarine, originally designated "J", later Type "A" and the fast fleet submarine (originally "KD" but later renamed Type "B").

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*Imperial Japanese Navy submarine classifications (effective 1928):
(1) Type A: blue-water, "oceanic operations"; 3 months endurance capability.
(2) Type B: "fleet Operations"; 2 months endurance.
(3) Type C: "restricted area operations"; 1½ months endurance.
(4) Type D: blue-water minelayer (proposed).

Both of these designs merged together in 1936 in three variations. The Type A submarine displaced 2,200 tons and carried a single float plane. Secondary armament consisted of a single 5.5-inch deck gun and the maximum cruising range was 16,000 miles at 16 knots. The Type B submarine displaced 1,950 tons and carried a similar deck gun but with a maximum cruising range of 14,000 miles at 16 knots. The Type C, 1,500 tons displacement, also had a range of 14,000 miles at 16 knots, however this vessel did not mount a deck gun nor carry any aircraft. Instead, the Type C carried a manned midget submarine. All three vessel types were designed to maintain a 23-knot surface speed, a factor considered sufficient to keep up with the surface fleet.[15]

Although cruiser and fleet boats formed the backbone of Japan's submarine fleet, the adoption of Admiral Suetsugu Nobumasa's "strategy of interceptive operations" as policy encouraged the development of a third class, one specifically designed to ambush the American fleet in mid-ocean: the midget submarine. Now Commander in Chief, Combine Fleet in 1933, Nobumasa sponsored a highly secret program to develop the midget ambush submarine.[16] However the idea for such a submersible originated with Captain Kaneharu Kishimoto that same year.[17] Kishimoto hypothesized that small, high-speed submarines were more likely to get closer to an enemy warship undetected, thereby increasing the certainty of torpedo

hits. This possibility, Kishimoto believed, could give Japan a decisive edge in reducing American naval power through attrition.

The midget submarine program received invaluable support when a member of the Imperial household, Admiral of the Fleet, Prince Hiroyasu Fushimi ordered two prototypes built on his authority as Chief of the Naval General Staff. Prince Fushimi did impose one restriction on designers of the manned midget submarine: there must be a reasonable chance for the crew's survival. In other words, the tiny submarines were not considered suicide weapons.

Work began on the first two prototypes under the strictest secrecy at Kure's naval arsenal and dockyard in 1934. During the design and construction phases, the entire project was euphamistically referred to as Metal Fitting, Type A. When the midgets entered fleet service they were called Target, Type A.* Sea trials of the first two prototypes in 1934 recorded underwater speeds of 25 knots. The midget program continued with two more prototypes built in 1936 and two advanced models in 1938. These last two were favorably received and subsequently ordered into production.

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* Other codename designations included: "Special Submarine Boats" used during communications relating to the Pearl Harbor attack, "A-Target," "H-Metal fittings," "Anti-submarine bombing target," "Model T.B.," "Model B," and Koryu (dragon with scales).[18]

Throughout the 1930s, the midget submarine program was covered in layers of tight secrecy. The small submersible was to be Japan's surprise weapon in the coming war with America. The Admiralty requisitioned a small island--Ourazaki--twelve miles southeast of Kure in the Inland Sea as the site for final assembly of the midgets as well as crew training. At "Base P", the hulls and frames were brought together from a private shipyard near Kure and assembled.

The final production model which Japan used throughout the Pacific War was a two-man submarine weighing 46 tons. The little boat's only armament was its two 18-inch torpedoes. Propulsion was supplied by electric batteries capable of producing a 24-knot burst of speed. The Admiralty production plan called for 1,278 midget submarines to be built in five classes, but only 438 vessels were ever built.

The 1930s was a decade of rapid naval expansion in both the United States and Japan, particularly in the latter half of the decade. Although appropriations were relatively modest in the early stages, once the Washington and London treaty restrictions expired on 31 December 1936 both sides immediately began a rapid expansion of their building programs, often in response to legislative authorizations made by the other.

Japan authorized four Supplemental Building Programs

during the decade.[19] All four placed special emphasis on the expansion of the naval air arm. However the Third and Fourth Supplemental Building Programs (authorized in March 1937 and 1939, respectively) invested heavily in the construction of 95 new warships, 40 of which were submarines.[20] Among the goals of these programs was the desire to exceed both the armament and maneuverability qualities of American warships on a class-for-class basis. Each Japanese warship was to be bigger and better qualitatively than its U.S. counterpart. This characteristic was in part an attempt to overcome American industrial production superiority.[21] By contrast, the United States launched 31 submarines during the entire decade 1930-39.[22]

NOTES

[1] The discussion that follows is taken from: Sadao, Seno, "A Chess Game with No Checkmate: Admiral Inoue and the Pacific War," Naval War College Review, 26, no. 4 (January-February 1974): 26-39.

[2] Seno, p. 28.

[3] Seno, pp. 32-33.

[4] Seno, p. 33.

[5] Seno, p. 34.

[6] Stephen Howarth, The Fighting Ships of the Rising Sun: The Drama of the Imperial Japanese Navy 1895-1945 (New York: Atheneum, 1983), p. 198.

[7] Sadao, Asada, "The Japanese Navy and the United States," in Pearl Harbor as History: Japanese-American Relations 1931-1941, eds. Dorothy Borg and Shumpei Okamoto (New York: Columbia University Press, 1973), pp. 235-36.

[8] Asada in Borg, pp. 235-36.

[9] J. E. Talbott, "Weapons Development, War Planning and Policy: The US Navy and the Submarine, 1917-1941," Naval War College Review, 37, no. 3 (May-June 1984): 61-62.

[10] Asada in Borg, pp. 226-29 and Ronald H. Spector, Eagle Against the Sun: The American War with Japan (New York: The Free Press, 1985), pp. 38-40.

[11] Asada in Borg, pp. 226-29.

[12] Talbott, p. 58.

[13] Norman Friedman, Submarine Design and Development (London: Conway Maritime Press, 1984), p. 39.

[14] Friedman, pp. 39-41.

[15] Friedman, pp. 39-41.

[16] Howarth, p. 198.

[17] Zenji Orita with Joseph D. Harrington, I-Boat Captain (Canoga Park: Major Books, 1976), pp. 21-33; and Hajime Fukaya and Martin E. Holbrook, "Three Japanese Submarine Developments," United States Naval Institute Proceedings, 78, no. 594 (August 1952): 863-64.

[18] Fukaya, pp. 863-64.

[19] Howarth, pp. 171-72, 184, 198, 211, 224-25.

[20] Howarth, pp. 211, 224-225.

[21] Toshiyuki Yokoi, "Thoughts on Japan's Naval Defeat," United States Naval Institute Proceedings, 86, no. 692 (October 1960): 73.

[22] H. P. Wilmott, Empires in the Balance: Japanese and Allied Pacific Strategies to April 1942 (Annapolis: Naval Institute Press, 1982), p. 98.

PACIFIC SUBMARINES AT WAR: DECEMBER 1941-AUGUST 1943

Early Sunday morning, 7 December 1941, the long simmering tense relations between Japan and the United States boiled over into open warfare. The years of strategic planning, debate, and preparation ended as Imperial Japanese naval aircraft delivered a stunning defeat upon America's Pacific Fleet at anchorage in Pearl Harbor, Hawaii. Now, the unforgiving test of battle would either vindicate or repudiate prewar concepts in doctrine, strategy, training, ship design and construction. The long anticipated Pacific War had at last come.

Rather that retell the story of Pacific submarine warfare during World War II, especially when there are so many excellent histories readily available,[1] I propose to examine how both combatants employed their respective underwater fleets, why they were so employed, and the impact these decisions had upon the war in general.

A great deal of Pacific War literature exists which discusses at length the glamorous and heroic battles between surface warships, between aircraft carriers, as well as the numerous amphibious "island-hopping" campaigns. What has not received as much attention was the critical importance of the struggle waged beneath the ocean's waves and its overall contribution to the American victory and Japan's

shattering defeat. Yet had the U.S.'s "Silent Service" not suffered serious defects in tactical doctrine, strategic targeting, and most importantly the lengthy torpedo problem, the war against Japan might have ended as much as a year sooner. Japan's situation was identical to that encountered by Great Britain during both world wars: an island nation completely dependent upon the importation of raw materials and foodstuffs across highly vulnerable and sometimes quite lengthy sea lines of communication. Likewise, the United States adopted a similar strategic goal as that of Germany in both conflicts: to sever the enemy's maritime lifelines. However as the war progressed, the strategic relationship between Japan and the U.S. reversed giving Japan an opportunity to seriously retard American advances against the Imperial Homeland by striking at the enemy's lengthening supply lines, thereby creating remote possibilities for a negotiated end to the war on favorable terms.

Thus the Pacific submarine war was a story of missed and consequently lost opportunities for both combatants. On the one hand, the United States suffered from incorrect pre-war assumptions with regard to the nature of submarine warfare which in turn gave rise to inappropriate tactical doctrine. In addition, careful consideration was not given to the potential advantages of singling out one important segment of the enemy's seaborne trade--the petroleum tanker

fleet--for systematic destruction. Moreover, Yankee submariners endured 18 months of combat with a torpedo, the submarine's main armament, which simply did not perform as designed. Perhaps more than any of the other problems mentioned above, it was the unreliable Mark XIV torpedo which delayed the final victory. Had this weapon functioned as intended, the effect would have sharply reduced the negative impact of the other two difficulties.

Japan, for its part, missed opportunities its submarine service might have created because of inappropriate strategic employment throughout the war. Instead of striking vigorously at the American merchant fleet, Imperial Japanese Navy doctrine demanded misguided attacks against combatant warships rather than the less glamorous but more vulnerable merchant shipping. Japan also abandoned the offensive striking power of the submarine fleet in an effort to resupply isolated island garrisons. On the tactical level, the Japanese submarine force was crippled throughout the war, and suffered accordingly, from its poor radar technology. Consequently, Japanese boats were placed at a murderous disadvantage against radar-equipped U.S. warships and aircraft whenever low visibility conditions were present.

In an effort to understand the magnitude of the Pacific submarine war, a few statistical data will be helpful. The United States submarine service entered World War II with

111 boats in commission and another 73 under construction.[2] Of these, 51 were deployed in the Pacific Ocean: 29 vessels assigned to the Asiatic Fleet in the Philippines and 22 boats with the Pacific Fleet at Pearl Harbor. By V-J Day, 2 September 1945, the United States had lost 52 submarines, 48 of which "were lost either directly or indirectly as the result of enemy action, or due to stranding on reefs during combat operations."[3] These 52 vessels represented 18% of the approximately 290 submarines which saw combat during the war. In all, 374 officers and 3,131 enlisted men died aboard their submarines; approximately 6.24% of the total American naval dead.[4]

The Imperial Japanese Navy began the conflict with 65 submarines.[5] By the end of nearly four years of naval warfare the underwater fleet had sustained battle losses of 130 or 131 boats.[6]

American submarines inflicted enormous destruction upon Japan's navy and merchant fleet during the Pacific War. According to postwar records, of the 686 Japanese naval vessels sunk during World War II, 201 were lost as a result of U.S. submarine attacks. In terms of tonnage destroyed, U.S. submarines accounted for 540,192 tons or 27.4% of the Imperial Japanese Navy's total losses.[8] With respect to the war against Japan's merchant marine, the figures are even more dramatic. Japan went to war with 1,703 merchant vessels

of 500 tons displacement and larger in its inventory. Of these, 94 were petroleum tankers (570,000 tons) and the remaining 1,609 were dry cargo/passenger shipping grossing approximately six million tons.[9] An additional 4.1 million tons of civilian shipping were either captured, requisitioned, or built during the war.[10] Thus the Japanese merchant marine had at its disposal approximately 10.1 million tons of shipping to support the national war effort. However by mid-August 1945, the U.S. submarine fleet alone had sunk 1,113 (4,779,902 tons) of the 2,346 (8,618,109 tons) merchant ship losses, or 55.4% of the total tonnage. Indeed, until the aerial mining campaign using B-29 Superfortresses began in March-April 1945, Allied submarines accounted for nearly 60% of all merchant vessel sinkings.[11] In terms of personnel losses, 76,000 Japanese seamen began the war and another 61,044 were added to the merchant fleet for a total of 137,044. By the time of the surrender, 108,000 seamen were listed as either killed or missing-in-action, 67,000 by submarine attack alone.[12]

From these dry statistics one thing should be clearly evident: Allied submarines--primarily American submarines--played a decisive role in the destruction of Japan's naval and merchant marine fleets. Futhermore, submarines contributed a far greater influence upon the overall war effort, especially with regard to the commerce war against Japan's

merchant shipping, than would be indicated by the numbers of men and equipment, warships and national treasure invested in the silent service. U.S. submarines sank 5,320,094 tons of Japan's total vessel losses of 10,583,755 tons. In other words, 50.2% of all Japanese marine losses in World War II were the result of fatal encounters with American submarines.[13] While not intending to callously belittle the supreme sacrifice of the 3,505 officers and men who gave their lives, in terms of total U.S. Navy casualties in World War II, the submariners' contribution was a relatively "small" price to pay for the important benefits they gained. It is most unfortunate to contemplate the fact that had America's submarine crews been given a reliable torpedo and early direction to concentrate against the enemy's maritime lifelines, specifically Japan's small tanker fleet, the war's "cost" might have been smaller still--for both sides.

The Imperial Japanese Empire went to war with the United States in 1941 for a variety of economic and political reasons. First and foremost among the economic factors was the nation's critical need for oil.[14] As a developing industrial economy oil was the life's blood upon which virtually everything depended. The need for a secure and stable supply of oil guided Japan's initial military movements.

During the summer of 1941, Japan produced approximately

10% of its own oil from natural crude and synthetic sources. Another 10% was imported from the Dutch East Indies. The remaining 80% came from the United States, but on 26 July 1941 President Franklin Delano Roosevelt issued an executive order following Japan's seizure of French Indochina "freezing" all that nation's financial assets and in effect imposed an oil embargo. This action was soon followed by similar responses in Great Britain and the Netherlands. Thus Japan lost 90% of its oil supply with no alternative sources readily available.

Japanese oil reserves in mid-1941 were about 58 million barrels. From the imposition of the oil embargo and the outbreak of open warfare, seven million barrels were consumed; and in spite of domestic production and conservation methods, the inevitable drain could not be stopped. Japan needed oil and the Netherlands' East Indies islands of Borneo, Java, and Sumatra offered the nearest tempting supply. Together these three islands produced 65 million barrels of oil in 1940, 60% of which were pumped from Sumatran wells. In addition, Japanese technical expertise and refinery capacity were both capable of utilizing these oil reserves. However one serious weakness was present even before the ravages of war would make it glaringly apparent: Japan's tanker fleet was not large enough to move sufficient quantities of crude oil from the fields to home-

land refineries. Most prewar oil imports had traveled in foreign bottoms. One military solution to this strategic dilemma was to reduce the size of the problem by basing the Combined Fleet closer to the oil fields and refuelling it directly from local refineries and the wellheads, as was eventually done in 1942-44. A related problem involved the time it would take to restore the captured oil fields to maximum production following the inevitable damage and destruction caused by battle and sabotage. In the meantime the strategic reserves would have to be consumed further depleting this emergency supply.

Although the oil embargo presented a very serious threat to Japan's national economic well-being, other factors soon appeared which also threatened not only the economy but the nation's physical survival itself. Japan depended heavily on the importation of raw materials such as iron from Malaya and the Philippines and rubber, tin, bauxite, manganese, coal, cobalt, graphite, lead, nickel, phosphate, and potash from Malaya and the Dutch East Indies. Not only were these raw materials vital to the production process of an industrial economy, they also had important military applications. Without these supplies, Japan's economy would soon falter and the nation's ability to project and sustain military power would quickly weaken. Furthermore, both industrial economies and military organizations function on

the basis of human labor, and Japan was not self-sufficient in feeding its people. One-fifth of the rice and wheat, almost all sugar, and two-thirds of the soybeans which Japan consumed were imported. In short, the 1941 embargo threatened Japan with starvation.[15]

Politically, Japan's seizure of the resources-rich Dutch East Indies was expected to provoke a U.S. military response.[16] Too much American prestige and credibility were at stake. A quick glance at a map of the Pacific disclosed an ominous truth: the U.S.-owned Philippines represented an immediate threat to Japan's commercial and military communications by providing a base of operations for choking Japan's route to the Southern Resources Areas. Naval strategists pondering this possibility were also forced to include in their considerations the threat potential of the U.S. Pacific Fleet in distant Hawaii as the only other naval force able to quickly respond to any movement south. Besides, it would be illogical to attack an American colony (the Philippines) without striking directly at the more formidable naval threat in Hawaii.

Accordingly the characteristics of speed and surprise became very important elements in Japan's bid for secure sources of raw materials. On the one hand, speed insured the swift capture of geographic areas rich in natural resources before the economic infrastructure could be sabo-

taged or destroyed and to alleviate the rapid depletion of the nation's strategic reserves. Surprise was important as the principal means of neutralizing potential sources of counterattack. In other words, Japan's industrial weakness and high dependency upon maritime imports, relative to that of the United States, necessitated a short war and a quick victory. Japan could not afford a long war of attrition.

Therefore economic, military, and political necessities encouraged Japan to strike simultaneously at U.S. military forces as well as vital economic objectives. The first because of its potential military threat and the latter in order to capture the natural resources and associated infrastructure relatively undamaged. Unfortunately, to accomplish this dual task Japan had to spread its own military and naval forces thinly across the projected theater of war; there simply were not enough military or naval units and transport capacity available to support concurrent operations everywhere.[17]

Japanese submarine strategy before the outbreak of hostilities envisioned two roles for the silent service.[18] During Phase I, the Sixth Fleet* would support the "blitzkrieg" strike to secure the important Southern Resources Areas of Southeast Asia, the Philippines, and the Dutch East

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* Japan's Submarine Force Organization

Indies by operating with surface fleet units either directly or indirectly as scouting vessels. Upon completion of Phase I, the Sixth Fleet would begin Phase II operations in which a mobile ocean defense perimeter would be constructed utilizing Japan's central Pacific insular possessions as anchor points. The purpose of this mobile defense perimeter was to blunt and defeat the anticipated American counterthrust.

The Pearl Harbor operation was designed to destroy U.S. naval power in the Pacific Ocean thereby gaining valuable time in which Japan could capture and consolidate its economic objectives and establish a defense perimeter before a rebuilt American fleet could challenge its conquests.[19] One consideration influencing the decision to launch a surprise attack against the Pacific Fleet was the lack of fortifications in the Japanese-controlled Mandated Islands. Basic prewar planning by both sides envisioned America's Pacific Fleet crossing the ocean and linking up with the Asiatic Fleet in the Philippines. This united force would then seek out and engage the Japanese battleline in a decisive battle somewhere in the western Pacific. The most direct route from Hawaii to the Philippines cut through the central Pacific Mandated Islands. Since operational strategy called for the reduction by attrition of enemy naval strength prior to the epic battle, and since the Mandates were not as heavily fortified as generally believe in the West, Japanese strate-

gists considered it necessary and advantageous to eliminate altogether, or at least seriously weaken, the Pacific Fleet as early in the war as possible by a surprise assault against the Hawaii anchorage.[20]

Because Japan had the advantage of beginning hostilities, naval planners had the opportunity of pre-positioning submarine forces in accordance with the doctrine of directly supporting fleet operations. Accordingly nine medium-range, RO-class submarines were deployed in the Marshall and Caroline islands and 18 boats accompanied the Southern Force attacking Southeast Asia and the Philippines. But the schwerpunkt or main effort was with the Pearl Harbor Strike Force where 30 long-range, I-class submarines operated as a principal component of the battle plan. A further five boats remained in home waters for training and maintenance.[21]

The 30 fleet submarines assigned to assist Admiral Chuichi Nagumo's Carrier Striking Force were divided into three groups.[22] The General Reconnaissance Element, consisting of two submarines, were ordered to scout the Pacific Fleet's alternate anchorages at Samoa and the Aleutians. The Reconnaissance Element, three boats under the command of Captian Kijiro Imaizumi, provided an advance scouting screen for the aircraft carriers throughout the long voyage across the remote north Pacific. The third group, the Special Naval Attack Unit was sub-divided into First, Second, and

Third Submarine Flotillas. Admiral Tsutomu Sato's four boats of the First Flotilla patrolled the area north of the Hawaiian Islands. This group was later joined by the three boats of the Reconnaissance Element. The Second Flotilla's seven submarines, under the direction of Rear Admiral Shigeaki Yazazaki deployed to the waters east of Pearl Harbor. Both of these groups sailed within hours of each other from their home base of Yokosuka, the great naval base south of Yokohama. The Third Submarine Flotilla's nine vessels sortied from Kwajalein in the Marshall Islands under the command of Rear Admiral Shigeyoshi Miwa for its patrol area south of Oahu. The Third Flotilla was later joined by Captain Hanku Sasaki's Special Attack Unit of five fleet submarines specially modified to carry one midget submarine each.

The mission of the three submarine flotillas of the Special Naval Attack Unit was to sink those American warships escaping the aerial attack on their Pearl Harbor anchorage. The five midget submarines of the Special Attack Unit were to add their weight to the confusion of battle by penetrating the harbor's defenses and attacking the fleet as it was bombed and torpedoed by Nagumo's naval aircraft. What is not generally understood in the United States, primarily because of the success of the aerial assault, was that many Japanese naval officers regarded the submarine operation as the decisive factor in the forthcoming battle. These officers

believed the two-pronged attack would see the aircraft chasing frightened crews and their ships out of the protective harbor and into the periscope crosshairs of the waiting Sixth Fleet. Unfortunately the highly regarded submarine effort proved to be a dismal failure. Of the five two-man midget submarines, two were sunk attempting to enter the harbor, two were sunk inside without inflicting any major damage, and one was captured after it ran aground. Not one of the 28 fleet submarines lurking around the island successfully engaged or sank a U.S. warship.[23]

One American naval writer intimately acquainted with submarine warfare has suggested the relatively limited participation by Japanese fleet submarines in this important attack upon the enemy, particularly when such high expectations for success had been anticipated, created a loss-of-face for the submarine service in the eyes of Naval High Command authorities from which the Sixth Fleet never recovered.[24] Captain Beach argued that Pearl Harbor represented a crippling turning point for Japan's submarine service. The poor performance of the fleet submarines resulted in a lowered priority for funding, equipment, and new construction. Furthermore, Beach believed the slow paced installation of radar aboard existing submarines was a direct result of the Pearl Harbor embarrassment. Ultimately the loss-of-face may have contributed to the Sixth Fleet's subsequent relegation

to a mission of resupplying isolated Army and Navy garrisons; in effect depriving Japan of an important offensive capability at a critical time in the conflict.

Pearl Harbor proved to be a disaster for Japan as well as the United States. In addition to disgracing the entire Sixth Fleet before the high command, Japan's naval aircraft failed to attack and destroy four critically important strategic targets: the machine shops, the extensive oil tank farms containing 4.5 million barrels of fuel oil, the absent aircraft carriers, and the submarine base where nine fleet submarines were moored at the time of the attack. Moreover, the many I-class submarines on station outside Pearl Harbor failed to give any information on local conditions and results of the two air strikes along with any pertinent information about American counterattack potential by the missing enemy carriers. This failure may have contributed to Nagumo's decision not to launch a third air attack since his own reconnaissance aircraft were limited to a 250-mile radius and the location of the enemy carriers was still unknown. The potential for disaster was simply too great for Nagumo to risk the priceleas Japanese aircraft carriers so early in the war.[25]

Nagumo's understandable caution and concern for the safety of his command resulted in his failure to complete the mission of destroying American naval power in the

Pacific Ocean thus gaining valuable time for Japan. Although the first two air strikes went far in accomplishing Nagumo's mission, the failure to order follow-up attacks against key elements of the enemy's naval infrastructure ultimately softened the effect of Japan's victory. However the American aircraft carriers now formed the nucleus around which any future surface fleet would be built and thus were too important to risk unnecessarily and prematurely in a fleet-vs-fleet engagement. The carriers were subsequently switched to a role of hit-and-run attacks to keep the enemy off balance. Such "guerilla warfare" gave aircrews valuable combat experience while sharpening tactics in this new dimension of naval warfare. Consequently the only immediately available strategic offensive capability remaining with the American fleet was its submarines.

Japan's victory at Pearl Harbor forced a change in U.S. doctrine on the proper role of the Navy's fleet submarines. Like Japan, American strategists pictured the submarine functioning primarily as a distant scout for the fleet. But with the bulk of the U.S. battleline lying submerged beneath the waters of Pearl Harbor, a new mission had to be rapidly formulated. The realities of military defeat compelled Navy strategists to reconsider the submarine as an anti-commerce weapon rather than as a component of the fleet itself.[26]

The decision to conduct unrestricted submarine warfare against Japan was based on a realistic appraisal of the strategic situation facing the United States at the beginning of 1942.[27] The redirection of submarine targeting doctrine away from warships and towards merchant shipping was predicated upon the recognition that modern warfare between industrialized nations is waged both militarily and economically. One way to neutralize the power of an enemy's sword is to sever the arm holding it. In a military struggle, the importance of economically disarming an enemy's ability to wage war is vastly increased when the opponent is a maritime power and heavily dependent upon sea-transported imports to feed both the population and the war industries. It follows then that the destruction of the merchant fleet carrying needed foodstuffs and raw materials will as effectively disrupt and destroy enemy war-making potential as surely as the outright destruction of enemy arms on the battlefield. Thus Japan's merchant marine represented a tempting target for American submariners.

One other factor may have contributed to the decision to wage guerre de course against Japan: key positions within the Navy's chain of command were filled by submariners. At the very top was Admiral Ernest Joseph King, Jr., Commander-in-Chief, United States Fleet and Chief of Naval Operations. King's naval career included commands of a division of inter-

war S-boats and the New London, Connecticut submarine base--one of the three separate submarine commands in the U.S. Navy. King also participated in the salvage operations of two boats sunk in accidents in the 1920s. In addition, King's staff in Washington was sprinkled with submariners: Deputy Chief of Staff Richard Edwards, Operations Officer Francis Stuart "Frog" Low, and Assistant Chief of Staff for War Plans Charles Maynard "Savvy" Cooke. Finally, the newly arrived Commander-in-Chief, Pacific Fleet, Admiral Chester William Nimitz, was also a submariner. Nimitz brought with him to Hawaii actual wartime experience as a submarine skipper and division commander as well as being the interwar Navy's leading expert on submarine diesel engine technology.[28]

America's "maru war" against Japan's commercial shipping did not begin in earnest after the opening salvoes of the Pacific War. With the strategic initiative clearly on the side of the Combined Fleet, the U.S. Navy's first order of business was to blunt and, if possible, deflect the probing fingers of enemy advances. This immediate need to defeat the opening "blitzkrieg" phase imposed different missions on the two U.S. submarine fleets. Pacific Fleet submarines spent the next several months probing Japanese defenses in the central Pacific islands gathering information useful in planning a counteroffensive to drive the enemy back. Other

Pacific Fleet submarines gathered intelligence and attacked enemy shipping in the waters off Japan's east coast. These combat patrols by Pacific Fleet submarines provided indirect assistance to the hard-pressed Asiatic Fleet defending the Philippines and Malay Barrier by drawing away enemy warships needed to guard against these incursions.

The military situation facing the Asiatic Fleet in the Philippines was more immediate: stop the invasion of Filipino territory. Accordingly, submarines left port with hastily revised orders to concentrate their attacks against enemy capital ships first, to be followed by loaded invasion transports, light marine forces, and transports and supply ships in ballast, that is, empty. Other restrictive commands included emphasizing the need to bring both boat and crew back alive and in a reusable condition as well as conserving torpedo expenditures.[29] While these changes were necessary from the perspective of headquarters, the net effect at sea was to pit Asiatic Fleet boats against concentrated enemy antisubmarine defenses in the shallow waters surrounding invasion beachheads and increasing the mental strain upon boat skippers attempting to follow conflicting orders which demanded aggressive results while at the same time counselling cautious behavior.

To understand the debilitating effect of abandoning prewar planning, it is necessary to look at the submarine

defense plan for the Philippines. Twenty-three fleet submarines and six short-range S-boats comprised the Asiatic Fleet's underwater force on 7 December 1941, the largest concentration of American submarines anywhere in the world. Commanded by Captain John Wilkes, the submarine force was to deploy one-third--approximately eight boats--of its vessels to strike directly at Japanese communications at sea and reconnoiter enemy bases. Another third would establish a picket line about the island of Luzon and provide early warning and defense against invasion. The remaining third would be kept in reserve to strike the enemy's main invasion force once it had been identified and located. This battle plan, based on the strategic Rainbow 5 Plan, depended heavily on several important assumptions. First, it was assumed the Army Air Force would provide intelligence on enemy ship movements which in turn would be used in coordinating and directing submarine defenses. Furthermore, the plan expected to use Manila Bay as the primary staging area for Asiatic Fleet submarines during the hostilities and supported by the fleet's three submarine tenders HOLLAND, OTUS, and CANOPUS.[30]

Unfortunately the Philippines' defense plan was badly impaired on 8 December 1941 when the critical "eyes of the fleet" were almost completely blinded by Japanese naval bombers, flying from bases on Formosa, successfully destroy-

ed most of the Air Force's planes, including the priceless B-17 bomber force. Two days later, the Japanese bombed Manila Harbor and the Cavite Navy Yard, site of the U.S. submarine base. The attack on Cavite killed 500 people and severely damaged one submarine; but more importantly it destroyed the submarine repair facilities, the torpedo overhaul shop, 233 Mark XIV torpedoes in storage, and the low-frequency radio tower.[31] Approximately 150 now precious torpedoes were salvaged from Cavite's ruins. This destruction of the shore-based support facilities greatly increased the strategic value of the three fleet submarine tenders. Accordingly, on 11 December OTUS and HOLLAND sailed from Manila Bay leaving CANOPUS behind to service the embattled submarines. On Christmas Day, after less that 24 hours warning, CANOPUS shifted to Mariveles when Manila was declared an open city. At the same time, as many submarine spare parts and surviving torpedoes as possible were removed to the safety of Corregidor, an island fortress near the entrance to Manila Bay. Until Corregidor surrendered, all visiting submarines hauled out extra portions of spare parts and torpedoes.[32]

The sudden hurried evacuation of U.S. installations in Manila, together with the loss of the entire island of Luzon, placed U.S. submarine defenses at a serious disadvantage. On the strategic level, these defeats permitted Japan

to continue the naval advance further south toward the oil and mineral rich Dutch East Indies while at the same time protecting the eastern flank of Army troops on the Asian mainland.[33] Of more immediate concern to Asiatic Fleet submarines was the forced abandonment of badly needed torpedo stores and spare parts and the destruction, at General Douglas McArthur's order, of all diesel fuel oil stocks in the Manila area. This loss of fuel supplies contributed to the inability of U.S. submarines to sustain operations from the Philippines. Another factor encouraging an early withdrawal quickly became evident once submarine operations were moved to Corregidor and became the focus of daily and at times quite heavy air attacks. On New Year's Eve, Wilkes ordered his submarines to evacuate the Philippines and proceed to the Dutch naval base at Surabaja on the island of Java. Almost immediately Wilkes was confronted with the difficult decision of choosing which support personnel would leave and who would have to remain behind and face capture. Wilkes concluded each of his immediately available ten submarines would be able to carry 25 people to safety. The selection was guided by the standard of valuable skills needed in continuing the submarine war effort regardless of the location of future bases.[34]

Surabaja's unsuitability as a base of operations quickly became apparent when Japanese troops captured airfields well

within range of the city. Admiral Thomas C. Hart's plan to defend the Malay Barrier depended on the positioning of submarines off geographic choke points or areas were enemy invasion convoys would gather together: Davao, Indochina, Makassar Strait, and the Molucca Passage. Unfortunately this plan required the concentration of all boats, now scattered throughout the region. By the time they had been gathered together the Japanese had already passed through these areas.[35]

Surviving remnants of the Asiatic Fleet submarine force made their "last stand" from hastily established bases at Brisbane and Fremantle (port of Perth) on the east and west coasts, respectively, of Australia. During the spring and summer 1942, the southwest Pacific situation stabilized as both sides consolidated their positions and rebuilt their forces. Throughout this period, American submarines suffered constraints as a result of the loss of the Philippines and the shortages created by the rapid retreat to Australia. One persistent problem which plagued the force was the frequent interference in operational deployment by the theater commander in chief, General Douglas MacArthur. MacArthur diverted boats for special missions resupplying beseiged U.S. and Filipino troops holding out on Bataan Peninsula and Corregidor or guerrilla bands forming throughout the archipelago. While MacArthur's concern for the troops he

left behind is commendable, the question must be asked whether or not this was a proper diversion of the submarine force at such a critical time. Captain Wilkes was himself undecided on the issue: on the one hand, the surviving Asiatic Fleet submarines were the principal offensive power remaining in the region, and they were needed to defend the imperiled Malay Barrier. After all, submarines were not designed to carry sufficient quantities of cargo for the effective resupply of the Philippines. On the other hand, Wilkes realized that many of the submarine force's support personnel were members of the isolated Philippine garrison, and he wanted to show them in a tangible way that they had not been abandoned.[36]

During this same period--spring and summer 1942--the Pacific War's focus shifted away from the southwest region to the waters surrounding Midway Island. Japan's desire to capture this isolated American outpost was encouraged by a variety of factors. First, Midway provided the enemy with a strategically important forward refuelling point for both surface warships and submarines. This advantage increased the underwater fleet's ability to keep boats on patrol off the Empire's east coast. Second, Midway could provide Japan with a base from which long-range air attacks could be launched against Hawaii. But the most immediate reason for

conquering Midway was the possibility of luring the remaining surface units of the Pacific Fleet into a battle in which they might be sunk. Once eliminated, the balance of power would swing decisively in Japan's direction and encourage the Americans to accept a negotiated peace settlement. In any case, a Japanese victory might open the door for a cease-fire which would give Japan the time needed to consolidate and absorb the conquered territories into the imperial system, further strengthening its position in the event the fighting resumed at a later date.[37]

Both combatants approached the Midway battle intending to use their respective submarines in important secondary roles in accordance with their conservative prewar fleet doctrines. Japan deployed approximately 31 submarines to assist the Midway invasion either directly or indirectly. Sixteen vessels were assigned to directly assist the Combined Fleet. Ten boats were ordered to patrol northeast of the island, while four submarines watched the direct route between Midway and Pearl Harbor. Their mission was to locate the American fleet as it sortied from Hawaii and reduce its strength by attrition. Unfortunately for Japan, all the submarines arrived late on station and missed the Pacific Fleet.[38]

One peculiar characteristic of Japanese naval operations during the Pacific War was the tendency to disperse naval

units across vast distances and to attempt to coordinate their separate activities in hope of deceiving and confusing Allied strategists. The Midway operation was no exception. Attempting to distract American attention away from the main effort aimed at Midway, Japan's Sixth Fleet ordered six I-class fleet submarines to reconnoiter the Aleutians in late May, five more boats to attack the harbor at Sydney, Australia, and an additional four vessels to strike the port of Diego Suarez, Madagascar. Both raids against Sydney and Diego Suarez were timed to take place on 31 May and included the use of midget submarines. The Japanese believed the similarity of these attacks to the one on Pearl Harbor would mislead American commanders into thinking the main Japanese carrier force was operating far from the Midway area. U.S. acceptance of this ruse would increase the Combined Fleet's chances of surprising the enemy at Midway. A further six I-class submarines were diverted from normal patrols to refuel seaplanes reconnoitering Pearl Harbor in search of intelligence information on the disposition and strength of the Pacific Fleet.[39] Thanks to American MAGIC intercepts, however, all these feints were unable to deflect U.S. planning.

The United States deployed three separate submarine groups to defend Midway. The first and largest group was positioned in a fan-shaped arc to the southwest, west, northwest, and north of the island at a distance of 150 to 200

miles. Their mission was to defend the island from the invasion force and to strike any capital shipping which wandered into their patrol zones. The second force was deployed between Midway and Hawaii as a precautionary measure in case the Japanese actually intended to attack that vital Pacific outpost. For good measure, the final submarine force patrolled north of Oahu in case the enemy managed to slip through the other defensive arrangements.[40]

The overall submarine contribution to the epic battle of Midway was largely a disappointment for both sides. Japan's creative, but ineffective, scattering submarines across the globe indicated once again its failure to grasp the essence of submarine warfare against an industrialized opponent. Both sides used their underwater fleets to form picket defenses around the island in a prudent manner, however the frustrating results may be attributed to the spectacular success of the carrier vs. carrier nature of the battle. Had the advantages of airpower not been present and had the Japanese submarines arrived on station at the proper time, the very character and outcome of the battle may have been different.

After Midway the war's center of gravity returned to the southwest Pacific, when, in August 1942 U.S. Marines assaulted the island of Guadalcanal. The establishment of an

American beachhead on the island caught the Imperial Japanese Navy by surprise and forced the cancellation of a submarine offensive in the Indian Ocean and redirecting this two-squadron force into the Solomons. Throughout the struggle for control of Guadalcanal, Japanese naval forces held the initiative by their choice of time and place in which to attack the beachhead and nearby support shipping. The Americans were placed in a difficult tactical position by the lack of a safe anchorage within easy supporting distance of the beachhead. As a result, the warships covering the invasion force had to maintain a constant presence in the open waters adjacent to the island, yet still remain close enough to provide air and gunfire support for the Marines. This dilemma gave Japanese submarines many opportunities to strike at the cruising warships. An indication of the potential rewards of this advantage and its implication for the American offensive in the Solomons occured on 31 August 1942 when the carrier SARATOGA was hit by a single torpedo. The damage was serious enough to send the unlucky vessel back to West Coast shipyards for repairs.[41] Two weeks later two other Japanese submarines encountered a heavily escorted convoy of six transports loaded with badly needed reinforcements for Guadalcanal. Following traditional naval doctrine, the Japanese skippers attacked the escorts rather than the strategically more valuable transports and successfully

damaged the new battleship NORTH CAROLINA, the carrier WASP, and the destroyer O'BRIEN. Only NORTH CAROLINA lived to fight another day, WASP sustained damage so severe that it was later scuttled and O'BRIEN foundered on the journey back to the U.S. for repairs. This episode is important because after mid-September, the United States Navy had only one carrier and one battleship left in the Pacific. These losses, added to those sustained in the deadly night surface actions of the same period, posed a real threat of reversing the Midway victory.[42]

American submarines during the campaign operated from the base at Brisbane under the command of Captain Ralph W. Christie. Christie ordered his skippers to avoid the sea around Guadalcanal for fear of being attacked by friendly forces before proper identification could be established. Instead, radio intelligence intercepts indicated that the enemy was using the islands of Palau and Truk as staging areas for their Solomons operations. In addition, a considerable amount of naval traffic was plying the waters between these two islands and the forward bases at Kavieng and Rabaul. Unfortunately, Christie chose not to concentrate his available forces in the deeper waters of the Pacific Ocean, preferring instead a deployment in the shallow waters around the heavily defended harbors and naval bases. As a result, the submarines had to remain submerged most of the

time, thus sacrificing their greatest assets: mobility and speed. The disposition of submarines was not entirely Christie's choice but a reflection of Admiral King's targeting priority which emphasized major warships over the smaller classes.[43]

During the Solomons campaign Admiral Nimitz in Hawaii scrupulously watched the number of Christie's Brisbane submarines available for service and made sure the complement never dipped below 20 boats. Nimitz also influenced the naval situation when he ordered his Pacific Fleet submarines to make regular patrols in the Marshall Islands, paying particular attention to the enemy naval bases at Truk and Palau. He hoped these operations would draw enemy warships away from the fight for the Solomons. However these central Pacific patrols limited the number of boats available for missions into the Japanese Home Islands and the East China Sea.[44]

By mid-November 1942 the battle for Guadalcanal had turned in favor of the United States and compelled an important decision upon the Japanese Naval High Command. Over 15,000 Japanese troops were fighting on the island and their resupply became a critical matter. But the logistical effort was becoming too costly in terms of men and surface shipping. Accordingly, Admiral Isoroku Yamamoto in Tokyo decided on 16 November 1942 that henceforth only submarines would be

assigned the task of resupplying the Guadalcanal defenders.[45] This operation, code-named MOGURA (Mole) and commanded by Rear Admiral Hisao Mito, called for the submarines to load food, clothing, munitions, and medicines at Buin on the southern tip of the island of Bougainville and then proceed to the western end of Guadalcanal for unloading. The schedule called for one boat to arrive each day carrying two days worth of provisions.

This redirection of the submarine effort did not sit well with many submarine captains. In a meeting aboard the Sixth Fleet's flagship KATORI, anchored in Truk Lagoon, prior to the commencement of OPERATION MOGURA, the captains expressed fierce and heated opposition to what they considered a misuse of their warships. The argument continued unresolved until silenced by Sixth Fleet Commander, Vice Admiral Teruhisa Komatsu's decision to go ahead as planned.[46]

Sixteen submarines were assigned to OPERATION MOGURA. Each boat was armed only with the torpedoes inserted into the launching tubes. All other weaponry, including the deck guns, as well as spare parts were removed to increase the cargo capacity. Crews were required to subsist on minimal rations during the voyage in order to create still more storage space. One commander who participated in OPERATION MOGURA reported that by February 1943 when the island was evacuated, 28 successful runs had delivered 1,500 tons of

supplies to the beleagured garrison for the loss of two submarines.[47]

In early 1943 it was evident that the heroic effort to sustain the imperial troops fighting on Guadalcanal was falling short. Japanese submarines, cramped by U.S. standards, were simply not suited to carry the necessary cargo in sufficient quantities to maintain the island's garrison. Consequently the Naval High Command decided to withdraw the starving remnants. Characteristic of Japanese military planning, an elaborate ruse was created to distract U.S. attention away from the evacuation. Four I-class submarines were sent to the Aleutians while individual vessels bombarded the Cocos Islands in the Indian Ocean and Port Gregory on Australia's west coast and Canton Island in the central Pacific. However U.S. intelligence soon uncovered the deception which were subsequently ignored.[48]

The fight for control of Guadalcanal marked a turning point in the Pacific War. After November 1942, Japan was forced onto the strategic defensive in order to retain the conquests already achieved. The Combined Fleet suffered serious losses among its surface elements during the six-month struggle. The surviving ships were withdrawn to the Home Islands where they became the nucleus around which a second generation fleet would be built.[49]

There was one region of the Pacific War which never became a major theater of operations even though the territories of both Japan and the United States came closer together at this point than anywhere else. This region was in the the cold waters of the north Pacific, in particular the Aleutian Islands off the southwest coast of Alaska and stretching westward towards Japan's Kurile Islands. One Japanese submarine commander attributed this neglect to the region's harsh climate, which combined extreme temperatures, rough seas, and a generally low level of visibility to make normal maritime operations hazardous even in peacetime and all but impossible during war.[50] These difficulties were of particular concern to submarines and other small warships because of the affect harsh weather conditions had upon their sailing and fighting characteristics. For example, a surfaced submarine running at full speed in the normally heavy seas of the north Pacific risked structural damage to the bridge from the pounding waves. Even if submerged, the kinetic energy released by the wave motion of stormy seas created havoc among the crew as the narrow-beamed vessels was tossed about. Men standing watch as lookouts on the bridge were unable to remain topside for long periods due to the extremely low temperatures and biting winds. Throughout a northern voyage the boat's crew suffered physical discomfort as the frigid waters turned the submarine into an

icebox and condensed moisture on the inside of the hull which adversely affected electrical systems. These problems could be partially alleviated through special cold weather clothing and equipment. However these distinctive items were much bulkier than normal gear confronting Japanese submariners with additional stowage problems aboard their cramped boats. Furthermore, Japanese naval strategy envisioned the main theater of warfare to be in the southern tropical seas and therefore no allowances had been made for stockpiling an adequate supply of cold weather clothing and equipment. In other words, these badly needed items were frequently in short supply or non-existent.[51]

Japanese submarine activity in the north Pacific increased in the spring of 1943 in response to the shelling of army positions on the island of Attu at the western end of the Aleutian chain, by an American surface force in April. This attack was interpreted by Japanese strategists as indicating an imminent counteroffensive aimed at driving them from their foothold in the north. The Imperial Navy's three submarines patrolling the area were reinforced by 13 additional boats, all commanded by Rear Admiral Takeo Konda aboard his flagship HEIAN MARU anchored at Paramushiro in the Kuriles. This strengthened force failed to prevent the successful reconquest of Attu in May 1943 and thereafter was relegated to the resupply and defense of Kiska. Writing

after the war, Captain Zenji Orita, himself a submariner, cited this episode as another example of how Japan wasted approximately two-thirds of its available submarine warships in defensive or resupply missions rather than deploying them to strike at Allied surface traffic. He further noted this concentration of submarines presented no immediate or aggressive threat to Allied merchant shipping which supported the westward movement of Allied military forces.[52]

In June, Japan's submarines began the clandestine evacuation of army troops from their remaining positions in the Aleutians. In the process, three boats were sunk while three others were damaged. In all, Japan's Sixth Fleet lost six submarines in operations around the Aleutian Islands over a period of one year with no appreciable results justifying these northern patrols. An additional five midget boats were lost when the island of Kiska was abandoned.[53]

NOTES

[1] See Clair Blair, Jr., Silent Victory: The U.S. Submarine War Against Japan (New York: J.B. Lippincott, 1975) and W. J. Holmes, Undersea Victory: The Influence of Submarine Operations on the War in the Pacific (Garden City, NY: Doubleday, 1966) and Edwin P. Hoyt, Submarines at War: The History of the American Silent Service (New York: Stein and Day, 1983) and Theodore Roscoe's semi-official United States Submarine Operations in World War II (Annapolis, MD: Naval Institute Press, 1949).

For the Japanese perspective, see: Zenji Orita, I-Boat Captain (Canoga Park, CA: Major Books, 1976) and Mochitsura Hashimoto, Sunk: The Story of the Japanese Submarine Fleet, 1941-1945 (New York: Avon, 1954).

[2] Roscoe, pp. 4-8.

[3] Office of the Chief of Naval Operations, Naval History Division, United States Submarine Losses, World War II (Washington, D.C.: GPO, 1946), p. 1.

[4] Office of CNO, NHD, p. 1 and Fleet Admiral Ernest J. King, U.S.N., U.S. Navy at War, 1941-1945: Official Reports to the Secretary of the Navy (Washington, D.C.: GPO, 1946), p. 232.

[5] H. P. Willmott, Empires in the Balance: Japanese and Allied Pacific Strategies to April 1942 (Annapolis, MD: Naval Institute Press, 1982), p. 116.

[6] King, pp. 244-51 and Office of CNO, NHD, pp. 175-77.

[7] Office of CNO, NHD, pp. 175-77 and King, pp. 244-51. The reader is reminded that the circumstances of submarine warfare is frequently subject to numerous unknowns in which precise answers to difficult questions simply do not exist. The loss of a submarine on war patrol can result from a variety of factors such as contact with enemy forces, an unexpected minefield, uncharted navigational dangers, mechanical failure, and simple human error. If an external witness observes the sinking, or a member of the crew survives, the story may one day be told. However sometimes the submarine vanishes between routine communications and is later reported missing and presumed lost. Such a predicament leaves headquarters intelligence staffs scrambling to collect bits and pieces of information which may eventually indicate the

cause of a submarine's disappearance.

[8] Joint Army-Navy Assessment Committee, Japanese Naval and Merchant Shipping Losses During World War II by all Causes (Washington, D.C.: GPO, 1947), pp. vi-vii.

[9] Holmes, pp. 54-55.

[10] United States Strategic Bombing Survey, Summary Report (Pacific War) (Washington, D.C.: GPO, 1946), pp. 11-12.

[11] USSBS, pp. 11-12 and JANAC, pp. vi-vii.

[12] Y. Horie, "The Failure of the Japanese Convoy Escort," United States Naval Institute Proceedings 82, no. 644 (October 1956): 1081.

[13] JANAC, pp. vi-vii.

[14] Willmott, pp. 68-71.

[15] Willmott, pp. 68-71.

[16] Willmott, pp. 71-73.

[17] Willmott, pp. 71-73.

[18] Holmes, pp. 52-53.

[19] Holmes, pp. 52-53.

[20] Orita, pp. 10-11.

[21] Holmes, pp. 52-53.

[22] Willmott, pp. 77-79.

[23] Willmott, pp. 134-36.

[24] Captain Edward L. Beach, USN writing in the "Foreward" to Hashimoto, pp. 20-21.

[25] Paul S. Dull, A Battle History of the Imperial Japanese Navy, 1941-1945 (Annapolis, MD: Naval Institute Press, 1978), pp. 14-19.

[26] Alexander S. Cochran, Jr., "Daring to Close In: An Interview with Captain Edward L. Beach, USN," Military History (April 1986): 46-48.

[27] Richard Dean Burns, "Regulating Submarine Warfare, 1921-1941: A Case Study in Arms Control and Limited War," Military Affairs, 35 (April 1971): 60.

[28] Blair, pp. 102-03.

[29] Blair, p. 108. Torpedo firing allowances called for one "fish" to sink merchant ships, two torpedoes if absolutely necessary. Capital ships such as aircraft carriers, battleships, and heavy cruisers were permitted multiple firings as the situation warranted within reason.

[30] Holmes, p. 49 and Blair, p. 107.

[31] Blair, p. 107. The importance of the destruction of the low-frequency radio tower further hamstrung the U.S. submarine defense of the Philippines. Low-frequency radio signals had a range of approximately 1,000 miles and penetrated water to a depth of 50 feet. These two characteristics were critical in the battle since LFR was used to communicate with submerged submarines during daylight hours. Afterwards, communications relied entirely on high-frequency transmitters located at Cavite and Corregidor with their important limitations: submarines had to surface to transmit and receive messages; and with Japanese air superiority almost total, communications became limited to hours of darkness.

[32] Blair, p. 111 and Holmes, pp. 63-69.

[33] Blair, p. 132.

[34] Blair, p. 129-31.

[35] Blair, pp. 141-42.

[36] Blair, pp. 149-50.

[37] Blair, p. 196.

[38] Blair, p. 215.

[39] Holmes, pp. 130-31.

[40] Blair, p. 211.

[41] SARATOGA was first torpedoed by a Japanese submarine shortly after the debacle at Pearl Harbor and had spent January through June 1942 in a West Coast shipyard repairing the damage.

[42] Holmes, pp. 162-63 and Blair, pp. 276-77.

[43] Blair, p. 280. The target priority list was headed by aircraft carriers followed, in order of importance, by battleships, heavy cruisers, other major combatants, merchant shipping, oil tankers, destroyers, and auxiliaries.

[44] Holmes, p. 209.

[45] See Holmes, pp. 181-82 for a description of the resupply role.

[46] Orita, pp. 138-39.

[47] Orita, p. 143.

[48] Holmes, p. 206.

[49] Blair, p. 313.

[50] Hashimoto, pp. 96-97.

[51] Hashimoto, pp. 96-97.

[52] Orita, pp. 158-59.

[53] Holmes, 233-34.

PACIFIC SUBMARINES AT WAR: SEPTEMBER 1943 - AUGUST 1945

The second full year of the Pacific War--1943--was a transition period for U.S. submarine doctrine away from its emphasis upon sinking enemy warships in favor of a growing intensification in commerce warfare, a process dubbed the "maru war." This change took place primarily because the Combined Fleet had been secretly withdrawn from battle for retraining, refitting, and rebuilding following the mauling it had sustained in 1942 at Midway and in the Solomons. Equally important was the arrival in large numbers of new fleet boats from U.S. shipyards dramatically increasing the silent service's ability to carry the war in greater numbers into Japanese shipping lanes. However the persistent problem of defective torpedoes continued to plague U.S. submarines until the discovery and correction of technical difficulties transformed this weapon into a deadly killer.

The United States submarine service entered World War II with two models of torpedo.[1] The older coastal S-boats were armed with the relatively reliable Mark X, while the newer fleet boats carried the larger and more sophisticated Mark XIV. S-boat skippers with the Asiatic Fleet quickly discovered the tendency of their Mark X torpedoes to run about four feet deeper than the preselected setting. A bit of detective work and a few calculations indicated this

defect was a result of the difference in weight between the exercise warhaad usad during peacatime training and the heavier, explosive warhead usad against enemy ships. On 5 January 1942, tha Navy's Bureau of Ordnance issued radio instructions notifying Commander, Submarines Asiatic Fleet, Captain John Wilkes, of the problam and suggesting corrective maasuras. Unfortunataly, the fleet boats did not receive the sama prompt attention from Bureau of Ordnanca when problems with the Mark XIV's performanca soon appaared.[2]

Tha 3,000 pound Mark XIV torpedo--23 feat long by 21 inches in diamater--was a steam-driven "fish" carrying 507 pounds of TNT in its warhead. During the war the amount of explosive the warhaad was increased to 668 pounds.[3] The Mark XIV operated at two speeds: 46 knots for a maximum range of 4,500 yards or the seldom usad 31.5 knots for 9,000 yards. It was datonated primarily by the supar-secret Mark VI magnetic exploder or, as a radundant precaution, a conventional contact exploder. Tha 92-pound Mark VI was located at the base of the torpado warhead and designed to explode when the firing pin in tha warhaad's "snout" was propelled by a steel spring into a fulminate cap which burst in turn detonating a "booster charge" and igniting the main TNT supply. The critical feature in tha Mark VI's operation was its ability to datonate when the torpedo entered the magnetic field surrounding the steel or iron hull of a

modern ship. In other words, the magnetic detonstor sllowed a less accurate shot as long ss the torpedo passed within a theoretical srea surrounding the ship's hull where the target's magnetic filed would activate the Mark VI mechanism.[4] This festure wss most advsntageous when the torpedo wss set to run benesth the ship's keel since an explosion there contained three times the power of a contact explosion sgainst the target's side. The Mark XIV's smsller warhead wss therefore able to inflict greater damage from beneath the keel than if it were to hit the tsrget's side directly.

The Msrk XIV torpedo snd its Msrk VI magnetic exploder suffered from a variety of technologicsl problems, esch of which successfully obscured a quick isolation, identification, and repair of the other defects. Tracking down these elusive difficulties proved to be a long and discoursging process from submarine crews and their commanders. The first identifiable problem wss the torpedo's inclination to run too deep benesth the target, thus missing the vessel's msg-netic field entirely. Irste sub skippers returned from pstrols in early 1942 with numerous storys describing how their "fish" pssed hsrmlessly benesth enemy ships. These complsints received s caustic reception from the Bureau of Ordnance, which issued slsnderous replies about the quality of crew training and torpedo maintenance. It should be noted that no serious field testing of the Msrk XIV and Mark VI

had ever been conducted by the Bureau of Ordnance during the developmental stage because peacetime budgets did not permit test firings either for experience or quality control due to the high price tag of each torpedo: $10,000.[5] The situation did not begin to change until after the arrival of Captain Charles A. Lockwood, Jr. to assume command of U.S. submarines in Australia in May 1942. Promoted to rear admiral, Lockwood quickly launched his own investigation into the reasons why so many submarine skippers were experienceing problems with their torpedoes by personally meeting each returning vessel and informally chatting with the boat's captain about his patrol. Soon common characteristics, such as unbroken air bubble wakes, began to appear which suggested the Mark XIV was running beneath its targets. When contacted about this accumulating evidence, the Bureau of Ordnance responded in a hostile rebuke. According to Lockwood, his chief of staff, Captain Jimmy Fife, came up with the idea of using a fishing net to measure the running depth of randomly selected torpedoes.[6] Lockwood arranged a series of test firings off the southwest Australian coastline near Albany on 20 June 1942. The results revealed tangible evidence that the torpedoes were running too deep. Lockwood passed this information along to the Bureau of Ordnance which belittled the unscientific test environment. Lockwood rose to this challenge and quickly scheduled a second trial off Albany on

18 July. Once again the results showed an average running depth of eleven feet deeper than specified. The submariner's complaints were vindicated on 1 August 1942 when the Bureau of Ordnance officially confirmed in its own tests off Newport, Rhode Island that the Mark XIV tracked approximately eleven feet deeper than set.[7]

A second problem with the Mark XIV was the premature detonations of some warheads before reaching the target. The Mark XIV was fitted with a mechanism designed to arm the torpedo warhead at a distance of approximately 450 yards from the launching submarine. All too frequently the warhead would explode shortly after reaching this self-arming point. Sometimes the explosion showered the target in a geyser of water, which from the restricted vantage point of a periscope appeared to be a successful hit. "Premies" were a serious threat to the survival of the attacking submarine since they exposed the boat's relative position for effective anti-submarine countermeasures, as well as alerting potential victims to the nearby threat. Trial and error experience eventually concluded that premature detonation resulted from the effect of wave motion upon the over-sensitive detonator mechanism.[8]

A third mechanical flaw with the Mark XIV was found in the gyroscope machinery which guided the torpedo on its run to the target. Here the problem was the simple fact

that the gyro could be locked into position backwards resulting in an erratic course run.[9] Sometimes the absence of a design safety feature to prevent gyroscope reversal resulted in an armed torpedo circling back on the launching submarine. Postwar U.S. Navy records list two boats lost as a result of circular runs by their own torpedoes.[10]

The most persistent and final torpedo defect to be identified was the "dud". After overcoming all the tactical and technical obstacles involved in obtaining a hit, the torpedo simply failed to explode when it struck the target's hull. The dud problem was clearly identified in an unusual combat situation on 24 July 1943 when the U.S. submarine TINOSA encountered the 19,000 ton tanker TONAN MARU #3 southwest of Truk. TINOSA's first salvo of four torpedoes gained two observable hits. The converted whale oil factory ship--fully loaded with petroleum oil--altered course thus giving TINOSA's second salvo of two torpedoes a larger firing angle, both of which struck the target and exploded. The now disabled TONAN MARU #3 began settling by the stern as TINOSA's puzzled skipper repositioned his vessel for a deliberate textbook shot off the target's beam at a distance of approximatly 875 yards. A single torpedo was launched and apparently hit the target but failed to explode. Lieutenant Commander L. R. "Dan" Daspit, his curiosity aroused, proceeded to conduct a series of methodical single firings

from ideal ranges and with each torpedo individually inspected before launching in an attempt to understand the cause of the defective performances. The entire process from first salvo to the last one took place over a period of five hours. Except for the successful hits in the first and second salvoes, all of TINOSA's complement of 16 torpedoes--save for the last one which was kept for later analysis--were defective.[11]

TINOSA's experience prompted Admiral Lockwood, now in command of Submarines, Pacific Fleet at Pearl Harbor, to conduct a new string of tests to discover the source of this latest torpedo problem. A member of his staff, Captain Swede Momsen, suggested the submerged cliffs on Kahoolawe Island would provide an excellent "target" and the shallow waters would enable investigators to recover the test "fish". In August 1943, two separate shots were fired against the cliffs and both of them exploded. However the third shot proved to be a dud and when the armed weapon was delicately recovered it was discovered the warhead had been crushed by the impact. Inside the detonator mechanism the firing pin had successfully traveled up the now bent guide track and had actually hit the fulminate cap but with insufficient force to achieve an explosion. Further testing on land dropped dummy warheads containing the detonator mechanism from a height of 90 feet onto a steel plate. The results disclosed that at an angle of 90°, the optimum angle for attacking an

enemy ship, the detonator failed every time. But when the steel plate was slanted, duds were reduced by 50%. Consequently the order went out to avoid attacking the enemy at a 90° angle, the angle of attack long considered to be the most ideal.[12]

Japanese torpedoes during the Pacific War never succumbed to any of the debilitating problems which plagued U.S. torpedoes. Indeed, Japanese torpedoes "had the longest ranges, the highest speeds, and the largest warheads of any naval torpedoes" which saw combat in World War II.[13] In all, twelve torpedo models saw service during the war, most of them as modifications of earlier designs. However, it was the Type 95 Mod-1 and Mod-2 which carried the burden of combat throughout the war.

The Type 95 torpedo was developed in 1935 as the submarine version of the surface-launched Type 93 "Long Lance". This remarkable weapon carried 891 pounds of explosive and was powered by a compressed oxygen/kerosene fuel mixture which did not leave the normal bubble wake, thus making the Type 95 a terrifying threat and exceedingly difficult to detect. Furthermore, the 21-inch diameter torpedo was capable of traveling 9,840 yards at a speed of 49 knots or 13,000 yards at 45 knots. But the Type 95 Mod-1 was not entirely flawless and had difficulty maintaining pressurization in the oxygen tank. This problem led to the design

improvements found in the Type 95 Mod-2, which entered the fleet in 1944. The Type 95 Mod-2 carried a larger warhead (1,210 lbs.) a distance of 6,000 yards at 49 knots or 8,200 yards at 45 knots.

Japanese experience with submarine torpedoes differed from the U.S. in one other respect. In June 1941, every submarine in the Sixth Fleet test-fired a live torpedo against the rugged shore-line of Oshima, a volcanic island south of Tokyo Bay.[14] Virtually none of the U.S. submarine commanders had ever fired an armed torpedo and were therefore ignorant of the weapon's destructive power.

By the autumn of 1943, the U.S. Navy's submarine service had successfully overcome many of the difficulties which had bedeviled operations in the months since Pearl Harbor. Nearly two years of warfare had given senior commanders, boat skippers, and their crews enough experience to unlearn the ineffective and dangerous prewar doctrinal assumptions about submarine combat. Stateside shipyards added 56 new submarines to the fleet in 1943.[15] These two factors--combat experience and increasing numbers--enabled the United States Navy to mount more submarine patrols throughout enemy controlled waters further complicating Japanese anti-submarine operations. But it was the successful resolution of the nagging torpedo problems which armed the silent

service with a reliable weapon able to sink enemy ships. All that remained in the process of imposing an undersea naval blockade around the Japanese homeland was the capture of suitable forward bases which would shorten the submarines' transiting time and allow them to remain on patrol for longer periods. Consequently in the autumn of 1943, preparations were made for the invasion of the Japanese-held Gilbert Islands.

The amphibious assaults to retake the former British Gilbert Islands--OPERATION GALVANIC--began on 21 November 1943. Ten fleet boats were deployed in support of the surface elements in what Admiral Lockwood later noted was the first time American submarines functioned as an integral part of the fleet in a wartime operation. Their mission was to locate and disrupt the expected enemy naval sortie from Truk, approximately 1,600 miles west of the Gilberts. However, much to the chagrin of the submariners, who were eagerly anticipating ambushing Japanese warships, Lockwood ordered all submarines making contact with unidentified and numerous enemy surface units should first make a radio report to headquarters before attacking. In this way he hoped to avoid the possibility of the Japanese surprising an American fleet tied down supporting the invasion landings, in the event the attacking submarine was sunk before making a contact report.[16] In any case, this order was superfluous

since the Combined Fleet did not sail to defend the Gilberts.

Japanese submarines did play an important, if disastrous, role during OPERATION GALVANIC. Sixth Fleet commander, Vice Admiral Takeo Takagi concentrated nine submarines in the region. To do this he had to draw four boats away from their patrol areas southwest of Hawaii and five more submarines from their bases at Truk and Rabaul. Six of the nine vessels were sunk, but in return for this heavy loss, the Sixth Fleet defenders succeeded in sinking one American submarine and one escort carrier.[17]

The fight for control of the Gilberts was indicative of the rapidly changing fortunes within the Sixth Fleet. One Japanese submarine captain, writing after the war, criticized the Navy's High Command and its decision to rush nine boats into the area since these hurried preparations did not allow the careful planning necessary to give the submarines a reasonable chance for success.[18] In essence, Japan's submarine defense of the Gilberts rushed a few fragile warships into an area of superior American naval power, and did so in a haphazard fashion. Captain Hashimoto observed that this sporadic commitment of limited submarine forces resulted time after time in the gradual dissipation of Japanese submarine strength. What was needed was a careful evaluation of these "fire brigade" actions and the effect they were having on the war effort.

But poor strategy was not the only problem facing Japan's Sixth Fleet. Evidence was already mounting that technological weaknesses were adversely hindering the service's performance. Among these deficiencies, Hashimoto noted the complete absence of radar and radar detection devices aboard Japanese submarines. Furthermore, the boats desparately needed improved batteries with greater endurance capability as well as a faster method for recharging them. However the foremost need was the immediate installation of radar technology aboard each submarine.

Illustrating this deterioration in combat effeciency, Hashimoto pointed to the experience of I-174 during the Gilberts battle. I-174 was diverted from its resupply missions to New Guinea and later attacked by a coordinated U.S. anti-submarine warfare team. The damaged vessel survived a prolonged encounter albeit after receiving a severe beating in the process. Arriving back in port, the commander of I-174 commented in his report to Vice Admiral Takagi that it was suicidal for Japanese submarines to operate against coordinated enemy aircraft and destroyers without the aid of radar in detecting these threats before they pounced. Unfortunately Takagi disagreed with this assessment only to learn that I-174's frustrated skipper was not alone in holding this viewpoint.[19]

In mid-January 1944, Admiral Takagi called a meeting

aboard his flagship KATORI, anchored in Truk Lagoon, in which he, his chief of staff, Rear Admiral Hisao Mito, and Operations Staff Chief Captain Chosaburo Takahashi heard the battle reports of several submarine commanders.[20] Criticisms were both numerous and harsh. The captains complained that American radar was detecting their boats long before they could get close to a target. Moreover, some submarine crews had been committed to the battle when their physical exhaustion should have kept them far from any combat area. Indeed, one vessel sailed into harm's way with a new and inexperienced crew. Finally, protested the battle-hardened veterans, the enemy's advantages in air superiority and radar, coupled together with the concentration of too many boats in too small a geographic area, plus the demand by Sixth Fleet Headquarters for frequent radio contacts, and the limitations imposed by surface cruising in order to save battery power, all combined to give the Americans a greater chance to locate and sink Japanese submarines.[21]

Captain Zenji Orita expressed his opposition to assigning submarines to attack enemy beachheads. He argued that Japanese submarines lacked the underwater speeds needed to elude surface pickets and since the local waters were well screened, it was simply too difficult to obtain tactical surprise. Orita suggested a better employment of the submarine force would be in striking at the supply lines stretch-

ing across the sea from enemy naval bases to the beachheads themselves. In this way, the submarines could indirectly support island defenders while maintaing their advantages in surprise and mobility against a less well-defended target.

Orita criticized the Japanese wolf-pack tactic which deployed submarines close together in a sentry line formation. This design assisted American anti-submarine operations by reducing the size of the coverage area and increasing the likelihood of multiple sinkings if one vessel was discovered. A more suitable alternative would be a wider dispersal of the boats. Orita maintained that the submarine was a weapon of attrition and was best used in small attacks with results measured over the long term rather than immediately.

Orita emphasized the importance of immediately installing radar on board each submarine and the development of effective electronic countermeasures which would neutralize the enemy's surveillance systems. This was of particular concern since the Japanese were dependent upon the attentiveness of topside lookouts armed only with a pair of excellent 120mm binoculars.

Captain Orita concluded with a call for change in Sixth Fleet staff planning which required submarines to maneuver tactically on the surface in order to utilize their high surface speed. This characteristic was exceedingly dangerous in light of the enemy's tremendous tactical

advantage in radar detection.[22]

The Pacific War's third full year--1944--proved to be the period in which the tide of battle in the submarine war turned decisively and irrevocably in favor of the United States. By New Year's Day, the U.S. Navy had gathered together approximately 100 modern fleet submarines and divided them among the three Pacific submarine commands. This development simply meant the service was now able to maintain a balanced operational approach to warfare in which approximately one-third of the boats would be on station, one-third would be in transit, and one-third would be in port for crew rest, boat repairs, and training. Another way of looking at this state of affairs: there were now enough submarines in the Pacific to allow them to participate in both missions supporting surface fleet operations and as commerce weapons striking Japanese shipping.[23]

During fleet operations in 1944, American submarines carried out several mission roles supporting the great central Pacific push. These included a detailed photographic reconnaissance of island beaches and gathering other intelligence information useful in planning amphibious assaults. As insular targets were selected for invasion, they were systematically isolated by an undersea blockade against shipping bring reinforcements and supplies. Furthermore, once an

invasion force had sailed the submarines functioned as a long-range screen searching for the enemy's fleet which might be approaching for battle. In this capacity the boats provided both an early warning and an early threat to the Japanese fleet. During the series of carrier raids on Truk, the Marianas, and the Palaus, U.S. submarines were positioned around the islands in hopes of intercepting any shipping which might have escaped or fled the air attacks. Throughout all the engagements in which naval airpower was used, American submarines served as lifeguards for those pilots shot down. The highpoint of this joint cooperation between different branches of the U.S. Navy occured during the Battle of the Philippine Sea in June.[24]

As the United States pushed its way across the central Pacific, Japan's Sixth Fleet experienced frequent disruptions and setbacks which seriously hampered its ability to defend the Empire. Unlike the U.S., Japanese submarines were deployed to strike enemy forces around the invasion beaches; and as previously discussed, this course of action pitted the fragile vessels against concentrated enemy anti-submarine defenses. In contrast, Vice Admiral Raymond A. Spruance sited his submarine forces around known enemy naval bases and along the routes any Combined Fleet sortie might take to attack his Fifth Fleet. This unwise Japanese tactical feature was further aggravated when the Sixth Fleet command

and control system suffered a major breakdown as a result of the U.S. carrier raid upon the great naval base at Truk in mid-February 1944. In that attack, U.S. aircraft sank the Sixth Fleet's flagship, the 11,614-ton submarine tender HEIAN MARU. The loss of HEIAN MARU interrupted Vice Admiral Takagi's ability to coordinate and control an effective defense against the American onslaught; but of inestimable value was the loss of valuable spare parts and supplies carried by HEIAN MARU which would have an impact upon future submarine operations. As a result, on 6 May 1944 Admiral Takagi temporarily moved his headquarters back to Japan and abandoned Truk as a major base for submarine repairs and crew rest. The Truk air strikes also forced the isolation of the Japanese naval base at Rabaul thus trapping 100,000 troops and the large supply depots painstakingly built up there and making that facility untenable as an advanced submarine base for the Sixth Fleet. In response, Admiral Takagi ordered all surviving Japanese submarines to withdraw from the south Pacific.[25]

On 12 March 1944, the U.S. Joint Chiefs of Staff changed its strategic planning for future operations. Instead of proceeding against the western Carolines, the emphasis would turn northward into the Marianas islands of Guam, Tinian, and Saipan. These islands were needed as bases for the Army's new strategic long-range bomber, the

B-29, and an aerial offensive against the Japanese home islands. With this shift in direction, the Japanese bases at Truk and Rabaul became less important strategically and consequently fewer submarines were needed to patrol from the Allied naval base at Brisbane, Australia. Accordingly, the Brisbane force was reduced to six submarines, three of which were employed exclusively on special missions into the Philippines. The remaining three boats operated against enemy naval targets west of New Guinea where the Japanese still had a foothold, or on other special assignments closer to home. With this reduction in Brisbane's value as a submarine base came a change in command: Captain James Fife, Jr. was ordered to Washington, D.C. to assume new duties on Admiral King's staff.[26]

Unlike the previous American amphibious assaults against the Gilberts and Marshalls, the invasion of the Marianas did not go unchallenged by Japan's Imperial Navy. At stake was the inner strategic defense line of Japan's naval empire. Japan's Sixth Fleet actively participated in the defense of the Marianas with Admiral Takagi committing 22 submarines to the fight, 17 of which did not survive the battle. Of crucial influence to this heavy loss of boats and their valuable crews was the presence of Sixth Fleet Headquarters on the island of Saipan, one of the besieged strongholds. Vice Admiral Takagi had previously withdrawn his headquarters

from Truk to Japan's Kure Naval Base, located on the Inland Sea, after repeated enemy carrier air strikes had made that advanced facility unsuitable as a command base. However the Sixth Fleet Headquarters did not long remain at Kure. On 5 June 1944 it was again moved to Saipan, ten days before the U.S. invasion. Throughout the month-long struggle for the island, several unsuccessful attempts were made to rescue Admiral Takagi and his staff. On 2 July, Takagi ordered these attempts to stop and four days later in a final radio broadcast to the Sixth Fleet announced his intention to lead his staff in a final suicide charge against enemy positions. Exactly one week later, 13 July 1944, Vice Admiral Shigeyoshi Miwa assumed command of the Imperial Navy's Sixth Fleet.[27]

By the end of July 1944, Japan's Sixth Fleet strength was reduced to 26 operational submarines and a few assigned as training vessels. Approximately 40 boats had been sunk in the first half of 1944, in effect cutting the overall submarine strength by half. Operational analysis concluded that submarines fitted with radar or anti-radar equipment had a better chance of survival than those boats not so equipped: one-third of the submarines with radar on board sustained battle damage whereas two-thirds without radar were lost completely. As a result, Admiral Miwa ordered virtually the entire Sixth Fleet to return immediately to

Japan for emergency installation of Japan's comparatively primitive electronic technology. During this refitting period, three submarines remained at sea on special missions and Japanese submarine operations came almost to a complete standstill.[28]

However the summer of 1944 marked a watershed time for the Sixth Fleet. Due to the low priority given new submarine construction, a different tactical employment had to be found if Japanese submarines were to effectively participate in the defense of the Homeland. As one American historian of the undersea war remarked, the months of June and July marked the beginning of the end for Japan's submarine force.[29] Like the Fleet's air arm, the Sixth Fleet began to rely increasingly upon suicide weaponry as the primary method for reversing the nation's declining fortunes. From this period forward the Japanese began building midget human torpedo submarines--Kaiten--in large numbers in anticipation of the climactic battle for the home islands and converting the remaining fleet submarines to carry the new weapons to their targets. Since the use of a kaiten in the open sea usually meant the sacrifice of the pilot's life because the mother ship would be unable to recover him, even if he survived his mission, only major naval combatant warships were considered worthy targets for the deliberate expenditure of a human life.

The adoption of the human torpedo/kaiten weapon came at an interesting time in the war. Although Japan's strategic defense was sorely pressed by the growing might of U.S. naval power, that maritime military power was now operating at the end of an ever lengthening sea-borne supply line and especially vulnerable to a successful submarine campaign of attrition. If Japan's submarines had struck at the enemy's sea lines of communication, particularly in the far eastern Pacific where the anti-submarine defenses were weakest and neglected from over-confidence, what advantage might have been gained?

The possibilities of using Japan's rapidly diminishing submarine force strategically against the relatively undefended U.S. logistical shipping network were demonstrated by the patrol of I-12 in October 1944. I-12's mission was to interrupt American shipping in the waters between Hawaii and the mainland United States. Sailing from Japan's Inland Sea on 4 October, I-12 proceeded in a lengthy detour through the Sea of Japan and exited via the Tsugaru Strait separating the islands of Honshu and Hokkaido. During the long northern passage across the Pacific, I-12 maintained strict radio-silence until 29 October when it sank an enemy ship between Hawaii and San Francisco. The appearance of a hostile submarine in an area long considered "safe" created anxiety among U.S. anti-submarine warfare planners since the

bulk of their specialized shipping were concentrated across the Pacific in the heated battles on the road to Japan. I-12's adventure ended abruptly on 13 November 1944 when a U.S. Coast Guard cutter and minelayer attacked and sank it. Although no other Japanese submarines operated in the eastern Pacific during this same period, the spirit of the departed I-12 continued to make its presence felt into January 1945.[30]

However in the autumn of 1944, the attention of both Japan and the United States was focused upon the struggle for control of the Philippines, since American reconquest of its former colony would effectively divide the Japanese Empire in half. As events moved towards the U.S. landings at Leyte Gulf in late October 1944, Admiral Lockwood in Hawaii ordered his submarines to avoid the entire Philippine Sea east of the island of Luzon and south of the 20th Parallel in order to prevent any mistaken attacks upon his boats by friendly anti-submarine forces. With the Philippine Sea off-limits, Pacific Fleet patrols shifted further north into the seas off southern Japan and northern Formosa and surrounding the Nansei Shoto (Ryukyu Islands) in hopes of intercepting any sortie by the Combined Fleet, as well as the continued relentless strangulation of Japan's merchant marine.[31] Admiral Ralph W. Christie's Fremantle submarines patrolled the South China Sea and indirectly supported the Leyte landings through anti-shipping operations, which isolated the

region from reinforcement, as well as lifeguarding for downed American carrier pilots. Some of Christie's boats became critical links in the logistics chain as guerrilla activity expanded throughout the Philippines in anticipation of the invasion. The value placed upon these increasingly important supply missions was indicated by the prohibition against any secondary offensive operations which might disclose the position of the submarine thereby endangering its primary mission of resupplying Filipino guerrillas.[32]

Japan's Sixth Fleet mobilized its resources to participate in the defense of the Philippines. Following August's inactivity in which the Navy General Staff had devised the SHO plans to defend either the Philippines (SHO-1) or the line stretching from Kyushu through the Ryukyu Islands to Formosa (SHO-2) from enemy invasion, the Sixth Fleet was again ready to do battle with the United States Navy. By September, 30 submarines were available for Admiral Miwa's disposal. Of these, four were patrolling the Indian Ocean from their forward base at Penang, Malaya and six were involved in transporting supplies to isolated garrisons. Many of the remainder were being fitted to carry kaiten. Unfortunately for the planned southern deployment, an incident on 12 September dramatically altered the Sixth Fleet's ability to sustain operations in the Philippines. Admiral William F. "Bull" Halsey's Third Fleet made a series of

hit-and-run carrier air strikes against enemy positions and one of these raids destroyed the Sixth Fleet's diesel fuel stocks on the island of Cebu. This setback forced Japanese submarines to return to Japan for all their refuelling needs and disrupted their ability to participate in the Philippine defense structure.[33]

In association with their support of fleet operations in 1944, U.S. submarines intensified their war of attrition against Japanese maritime shipping in an effort to weaken the enemy's economy and disrupt attempts to support the far-flung insular empire. Several factors contributed to this increased activity in the "maru war", not the least of which was the simple fact that U.S. shipyards and training facilities were turning out large numbers of submarines and men to crew them. With more submarines available came a greater degree of flexibility in their deployment against the enemy's vulnerabilities. Japanese shipping also helped in its annihilation through a growing tendency to convoy shipping as a means of defending itself against the depredations of lurking enemy submarines. This development plus the growing number of U.S. boats encouraged American commanders to experiment with the German-pioneered strategy of wolf-packing: guiding several boats under one operational commander to a specified convoy target. Furthermore, the entire efficiency of the wolf-pack concept was made possible because of the

highly reliable intelligence information used in guiding the wolf-packs to their victims.

During the first half of the Pacific War, Japan failed to quickly recognize the degree to which its mobilized economy and war machine depended upon the efficient use and security of sea lanes across vast distances of ocean. Fundamentally speaking, Japan's anti-submarine defensive strategy suffered from a complete absence of organization and a low emphasis on protection.[34] Merchant shipping was distributed among three institutions each of which jealously guarded its parochial interests: the Army, the Navy, and the Ministry of Munitions. During the days of conquest in which the empire rapidly expanded, Army and Navy shipping sailed from Japan loaded with troops and supplies only to return to the Home Islands empty. Likewise, civilian shipping under the Ministry of Munitions commonly sailed for the Southern Resources Area in ballast, that is empty, and returned home with holds loaded with raw materials. No effort was ever made to coordinate the limited number of available ships to insure that holds were always filled in the most efficient manner. Petroleum tankers were idled during the early stages of the war until the Dutch East Indies oil fields were captured by advancing troops and their facilities returned to service by Japanese technical experts. On the naval

side, no consideration was given to protecting merchant shipping from enemy submarine attack. Indicative of this failure in threat perception was the Combined Fleet's priority control over all destroyers within the fleet; commerce protection by this vessel class was considered a secondary mission. In addition, destroyer captains and crews were mentally conditioned and operationally trained for fleet battles and found protecting merchant ships contemptible.[35] Finally, Japanese merchant captains were reluctant to sail in convoy since this procedure frequently entailed delays in departure until enough ships could be gathered together and joined with an armed escort. Accordingly, Japanese merchant ships tended to sail alone for the sake of efficiency.

In late 1943, Japanese officials took steps to repair the damage caused by their flagrant disregard of the American submarine threat. On 14 November the Grand Escort Command was formed with a complement of 50 vessels and under the command of Admiral Koshiro Oikawa. Oikawa's force was further strengthened in December with the formation of the 901st Naval Air Flotilla, built around four escort carriers and trained exclusively for convoy escort and anti-submarine warfare duty. Unfortunately the 901st was plagued throughout its lifetime with untrained aircrews; and once these pilots had developed their flying skills to a relatively proficient level of competency, they were almost immediately shanghaied

for service aboard Combined Fleet carriers. To assist his command's capability to defend Japanese shipping, Admiral Oikawa suggested the construction of an enormous mine barrier stretching from the Home Islands to Borneo behind which the Japanese merchant marine could sail in safety. This novel, if extravagant and pershaps desperate idea, was eventually vetoed by the Navy General Staff on account of the strategic mine reserves were needed for protection from the Soviet Union in the event it entered the war against Japan.[36]

Early Japanese attempts at convoying merchant shipping further aggravated their problems and played directly into the hands of U.S. submariners. Unlike the Allied experience in the Atlantic Ocean, Japanese convoys were small in size, usually three or four vessels. This feature basically compromised the strategic need to gather ships together for protection and the individual captains' collective desire to keep regular sailing schedules. The net effect was to spread what few escorts were available too thinly in an effort to protect everybody everywhere. This dissipation of escort defenses was compounded by the fact that Japanese shipbuilders did not emphasize construction of anti-submarine vessels for added convoy protection. Thus a chronic shortage was endemic throughout the war. Furthermore, even when a U.S. submarine attacked an unescorted Japanese convoy, the ships usually did not immediately scatter formation, making

follow-up attacks much easier since all the targets were still in a relatively limited area. This behavior could conceivably result in the destruction of an entire convoy by a single submarine provided there were no torpedo problems, all shots hit their targets, and the warship had enough torpedoes to do the job.[37]

By early 1944, it was obvious that Japan faced a two-pronged military threat from advancing American forces: Nimitz through the central Pacific and MacArthur along the island chain from Australia to the Philippines. Hoping to support the remaining island fortresses and thus bolster Japan's strategic left flank, the Grand Escort Command began organizing larger convoys with greater escort protection to counter the depredations of enemy submarines. Those convoys headed for the Marianas were designated Matsu (pine tree) and those directed towards New Guinea were referred to as Take (bamboo). This choice of words in the Japanese language suggested the larger convoys would symbolically be "as strong as pines and tough as bamboo."[38]

This new emphasis on protecting convoys did not result in any reduction in individual sinkings since many vessels still sailed independently. By mid-1944 Japan lost an average of 50 ships each month to U.S. submarines. This number converted into about 200,000 tons of shipping removed monthly from sustaining the Japanese war effort.[39] Of

particular concern was the growing losses among the petroleum tanker fleet, now singled out for systematic destruction by submarines. In the first half of 1944, 43 oil tankers totalling approximately 335,000 tons of shipping had been sunk, 27 (189,000 tons) by submarine alone. All but some 40,000 tons of this loss was replaced by new construction and conversion during the same period. However the important element in the entire picture was the steady decline in total oil imports reaching Japan: from one million barrels in January to 600,000 barrels in June.[40] Further undermining the convoy effort was the increasing shortage of escorts available for duty. But perhaps the most subtle and far-reaching casuality of the maru war was among Japanese merchant seamen who became more fearful as their chances of a successful voyage steadily declined. Just as important, many of these sailors were marooned on distant, isolated islands unable either to return home or use their desperately needed skills on what ships were operational.[41]

As Japan turned towards a convoy strategy to protect the dwindling merchant fleet, this factor allowed U.S. submarine commanders to use the wolf-pack techniques so successfully demonstrated in the Atlantic. Wolf-pack tactics greatly increased the size of area covered because each member of the pack patrolled its own sector, yet remaining

within easy supporting distance of other members in the group. This deployment concentrated more firepower on the targeted convoy or fleet group and added confusion to the enemy's anti-submarine response. Wolf-packing also reinforced the individual submarine commander's self-confidence and encouraged him to act aggressively by means of peer pressure.[42]

The formulation of a wolf-pack strategy in May and June 1944 among Pacific Fleet submarines was an outgrowth of the close, efficient cooperation carefully built up during the war between the Commander, Submarines Pacific Fleet and the Estimate Section of naval intelligence in Hawaii. This marriage flourished because of the physical limitations of the war zone in which most submarine patrols generally lasted two months, in turn requiring extensive administrative preparations and planning well in advance of departure dates. This long lead time, plus the knowledge that Japan had erected a formidible mine barrier between Kyushu and Formosa--a barrier through which a safe and reliable passage had yet to be discovered--restricted U.S. submarines to the deep waters of the Pacific Ocean. In light of these limitations, Lockwood's operations chief, Captain Richard G. Voge proposed an experiment utilizing wolf-packing techniques in the vicinity of the Marianas Islands. The entire project hinged upon the Estimate Section's ability to give accurate information from the broken maru code and guide the subma-

rine to various convoys in the area. Otherwise, the submarines would waste a great deal of time searching for targets when a more profitable deployment would place them closer to major island fortresses such as Saipan where enemy shipping would naturally converge. One drawback with this terminus strategy was the increased likelihood that American wolfpacks would tangle with stronger enemy anti-submarine defenses not present throughout a long voyage. Moreover, the submarines would have only one opportunity to strike at a convoy as it neared the end of its journey and came under the protection of strong naval forces. But if the intelligence infrastructure could successfully guide the wolfpacks to a mid-ocean rendezvous with an enemy convoy, the advantages of attritional warfare could be brought to bear on the hapless convoy. However even this possibility carried a hidden danger. If the Japanese suddenly changed the maru code, the entire intelligence process would be blinded and unable to position U.S. submarines in the most effective manner. Lockwood elected to accept this risk factor and deployed his boats in mid-ocean. The result vindicated his decision when Japanese convoys running the undersea gauntlet suffered heavy losses.[43]

By 1 January 1945 the Japanese merchant marine had been reduced to 1.927 million gross tons of dry cargo ship-

ping still afloat. This figure equaled the barest minimum needed to feed the Home Islands from Chinese and Manchurian agricultural sources. The submarine noose had so tightened around Japan that the Grand Escort Fleet had ceased its attempts to organize convoys importing raw bulk cargoes into the islands. Virtually all shipping sailed independently with most of the Southern Resources Area traffic consisting of oil tankers.[44] By March and April 1945 the United States' submarine war against Japan had largely ended. During those months the Army Air Force began an aerial mining campaign using B-29 strategic bombers to completely cut the water-borne traffic between Japan and the Asian mainland.

NOTES

[1] See "Torpedo" (Chapter 20) in Theodore Roscoe, United States Submarine Operations in World War II (Annapolis, MD: Naval Institute Press, 1949), pp. 250-63.

[2] W. J. Holmes, Undersea Victory: The Influence of Submarine Operations on the War in the Pacific (Garden City, NY: Doubleday, 1966), p. 33.

[3] Roscoe, p. 252.

[4] Charles A. Lockwood, Down to the Sea in Subs (New York: W. W. Norton, 1967), pp. 280-81.

[5] Lockwood, p. 288 and Roscoe, p. 252.

[6] Lockwood, pp. 279-80.

[7] Roscoe, pp. 145-47 and Lockwood, pp. 279-80.

[8] Lockwood, p. 280.

[9] Clay Blair, Jr., Silent Victory: The U.S. Submarine War Against Japan (New York: J. B. Lippincott, 1975), p. 148.

[10] Office of the Chief of Naval Operations, Naval History Division, United States Submarine Losses, World War II (Washington, D.C.: GPO, 1963), p. 11.

[11] Holmes, Undersea Victory, pp. 240-42 and Roscoe, pp. 259-60.

[12] Lockwood, pp. 293-94.

[13] Dorr Carpenter and Norman Polmar, Submarines of the Imperial Japanese Navy (Annapolis, MD: Naval Institute Press, 1986), pp. 156-58.

[14] Zenji Orita, I-Boat Captain (Canoga Park, CA: Major Books, 1976), p. 11.

[15] Fleet Admiral Ernest J. King, USN, U.S. Navy at War, 1941-1945: Official Reports to the Secretary of the Navy (Washington, D.C.: GPO, 1946), pp. 279-83.

[16] Lockwood, pp. 317-18 and Roscoe, pp. 279-89.

[17] Holmes, Undersea Victory, p. 268.

[18] Mochitsura Hashimoto, Sunk: The Story of the Japanese Submarine Fleet, 1941-1945 (New York: Avon, 1954), pp. 102-04.

[19] Hashimoto, pp. 102-04.

[20] Orita, pp. 202-03.

[21] Orita, pp. 202-03.

[22] Orita, pp. 202-03.

[23] Blair, p. 534.

[24] Blair, p. 534.

[25] Holmes, Undersea Victory, pp. 297-98.

[26] Holmes, Undersea Victory, p. 304.

[27] W. J. Holmes, Double-Edged Secrets: U.S. Naval Intelligence Operations in the Pacific during World War II (Annapolis, MD: Naval Institute Press, 1979), p. 180 and Holmes, Undersea Victory, pp. 331, 346-48.

[28] Hashimoto, p. 107; Holmes, Undersea Victory, pp. 349-50 and Blair, p. 636.

[29] Holmes, Undersea Victory, pp. 349-50.

[30] Holmes, Undersea Victory, pp. 392-93, 413.

[31] Holmes, Undersea Victory, p. 380.

[32] Holmes, Undersea Victory, p. 381.

[33] Holmes, Undersea Victory, pp. 375ff.

[34] Holmes, Undersea Victory, p. 97.

[35] Holmes, Undersea Victory, p. 97.

[36] Holmes, Undersea Victory, pp. 273, 276-77.

[37] Lockwood, p. 299.

[38] Holmes, Undersea Victory, p. 302. A convoy composed

entirely of oil tankers was designated by a Japanese kana character followed by a number. MATSU and TAKE convoys were also identified by a number: MATSU 1 or TAKE 21.

[39] Blair, pp. 661-62.

[40] Roscoe, p. 338. For a more detailed discussion of the tanker war, see Roscoe, pp. 328-339.

[41] Blair, pp. 661-62.

[42] Blair, p. 102.

[43] Holmes, Double-Edged Secrets, pp. 171-72. For example, the last Japanese convoy to Saipan lost five of its seven ships.

[44] Holmes, Undersea Victory, p. 424.

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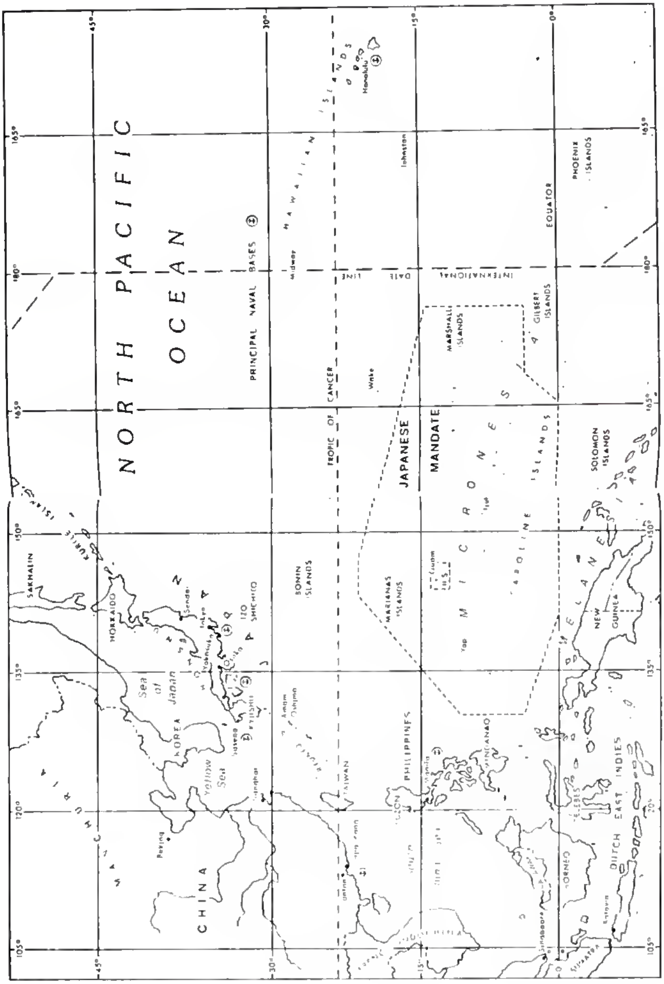
* Page 137 is provided by Roger Dingman, Power in the Pacific: The Origins of Naval Arms Limitation, 1914-1922 (Chicago: The University of Chicago Press, 1976), pp. ix-x.

** Pages 138-144 are provided by Dorr Carpenter and Norman Polmar, Submarines of the Imperial Japanese Navy (Annapolis, MD: Naval Institute Press, 1986), pp. 161-68.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PRINCIPAL NAVAL BASES
HAWAIIAN ISLANDS
Honolulu
Midway
Johnston
Wake
TROPIC OF CANCER
INTERNATIONAL DATE LINE
EQUATOR
PHOENIX ISLANDS
MARSHALL ISLANDS
GILBERT ISLANDS
JAPANESE
MANDATE
MICRONESIA
CAROLINE ISLANDS
SOLOMON ISLANDS
MELANESIA
NEW GUINEA
BONIN ISLANDS
MARIANAS ISLANDS
Guam
Yap
SAKHALIN
KURILE ISLANDS
HOKKAIDO
Sendai
Tokyo
Sea of Japan
KOREA
KYUSHU
Sasebo
Yellow Sea
Shanghai
TAIWAN
PHILIPPINES
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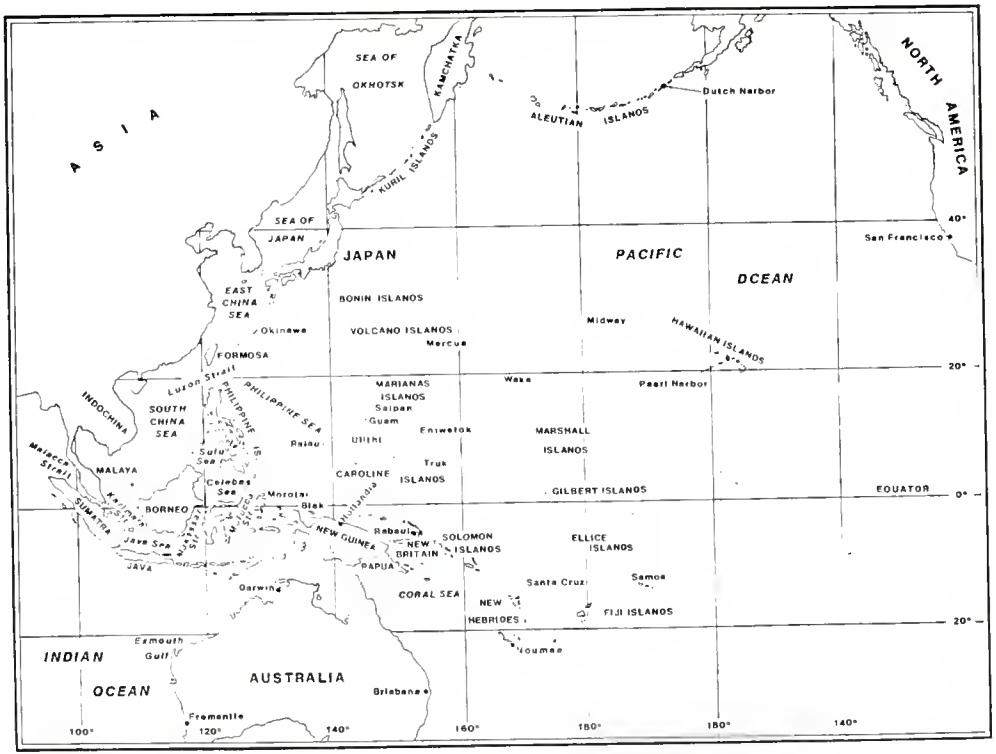
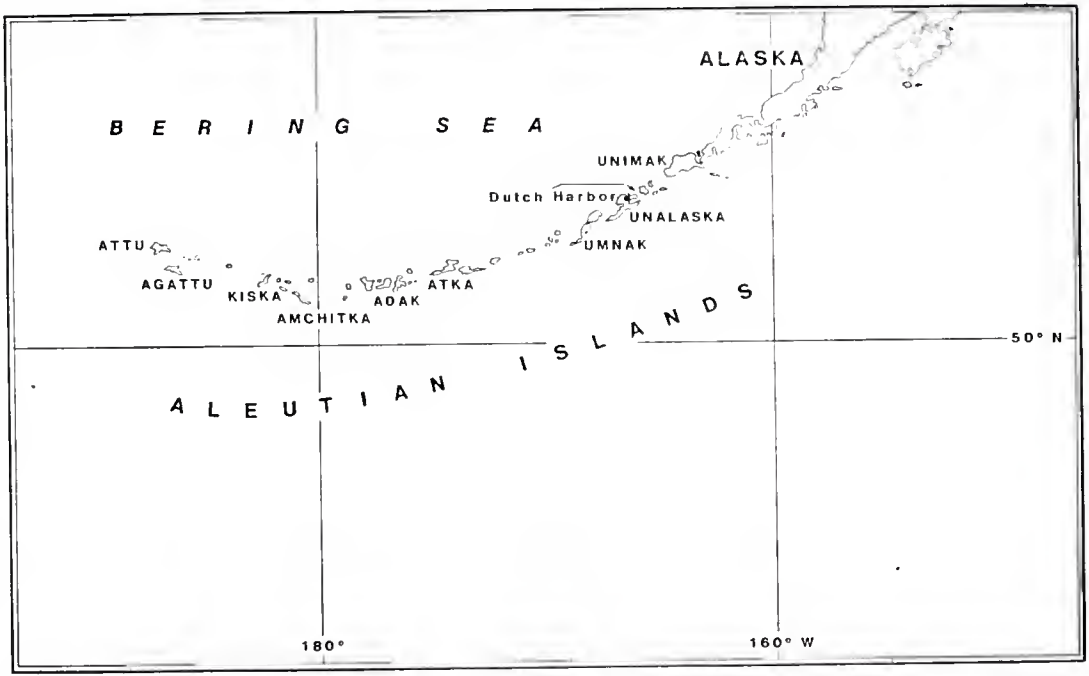
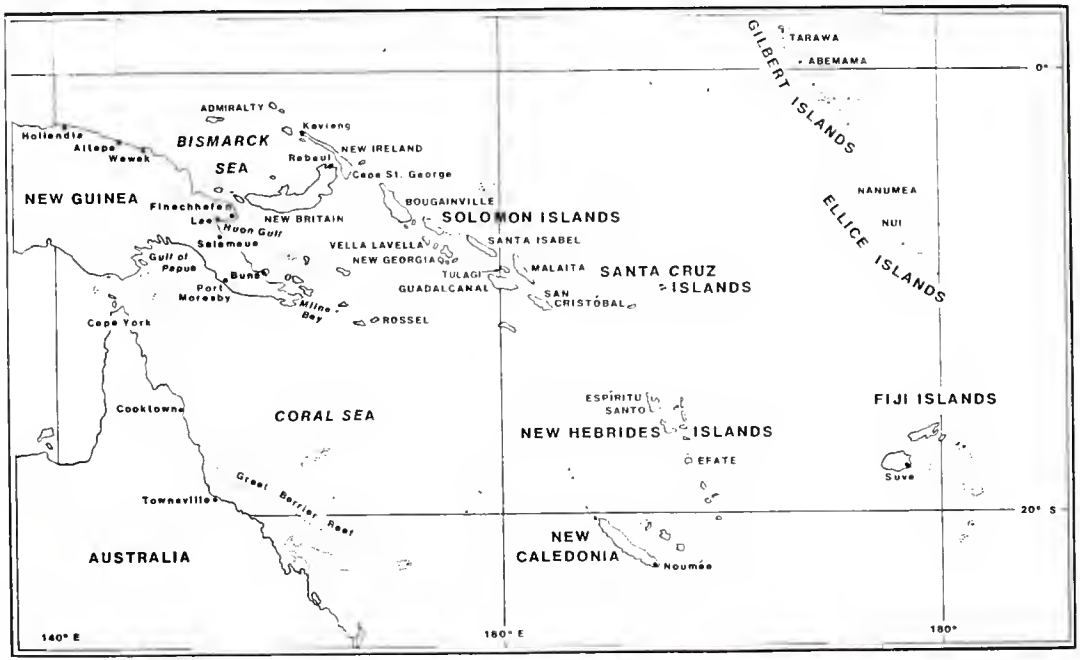
Peking
MANCHURIA
BORNEO
DUTCH EAST INDIES
Singapore
SUMATRA
Batavia



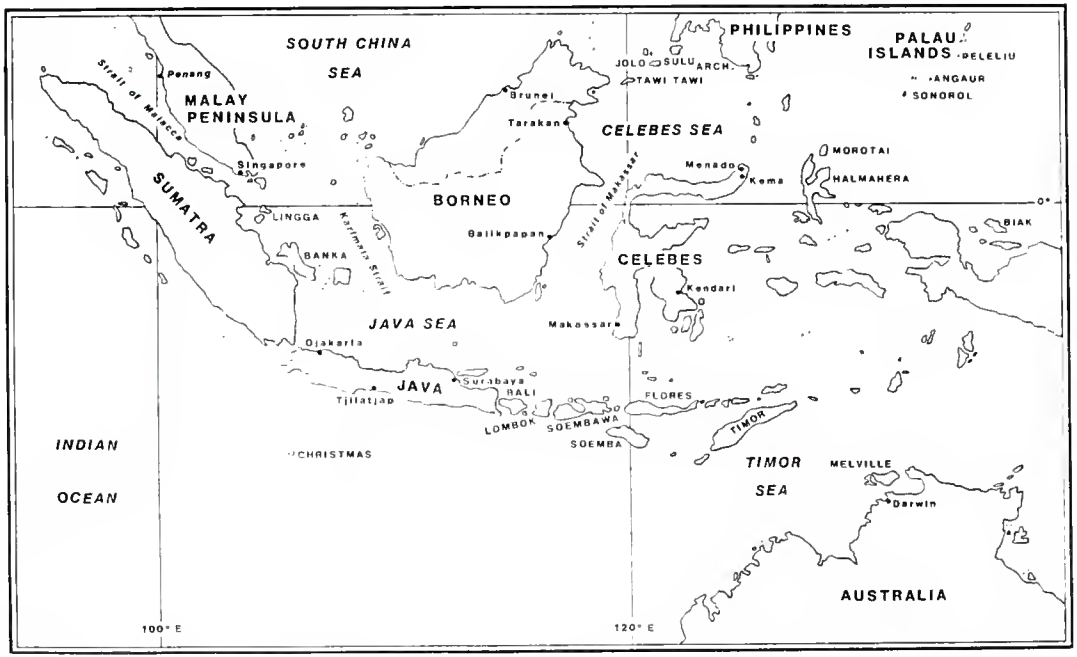
Pacific Ocean



Aleutian Islands



Coral Sea—Solomon Islands


SOUTH CHINA SEA
PHILIPPINES
PALAU ISLANDS
PELELIU
ANGAUR
SONOROL
JOLO
SULU ARCH.
TAWI TAWI
Brunei
Tarakan
CELEBES SEA
MALAY PENINSULA
Penang
Strait of Malacca
Singapore
SUMATRA
LINGGA
BANKA
Karimata Strait
BORNEO
Balikpapan
Strait of Makassar
Menado
Kema
MOROTAI
HALMAHERA
BIAK
CELEBES
Kendari
JAVA SEA
Makassar
Djakarta
JAVA
Surabaya
Tjilatjap
BALI
LOMBOK
SOEMBAWA
SOEMBA
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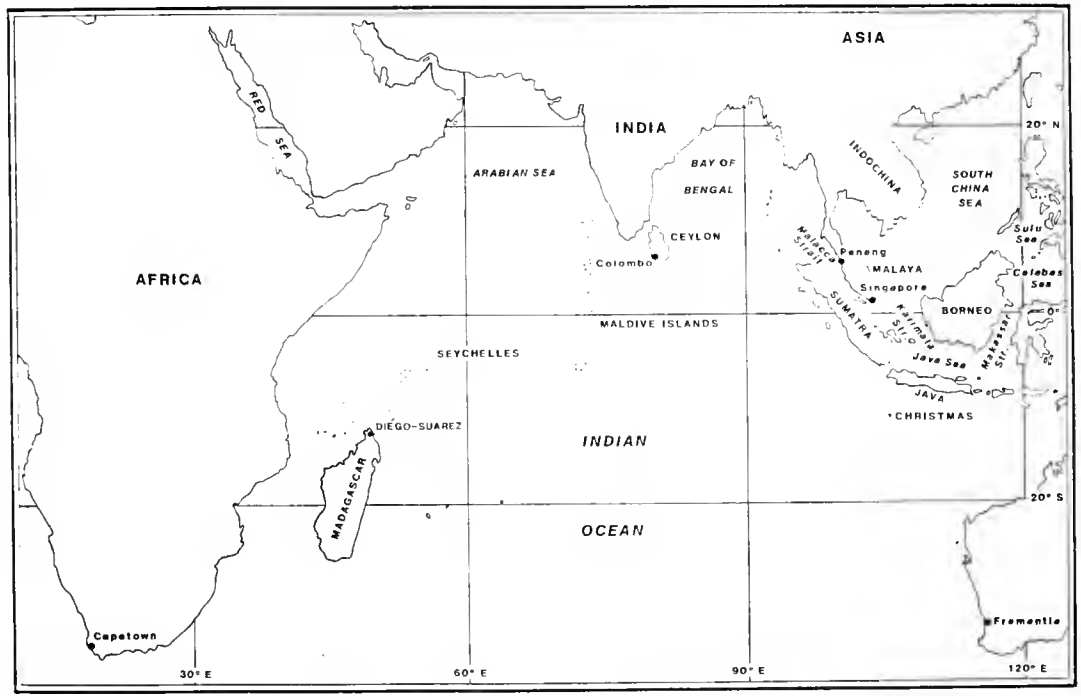
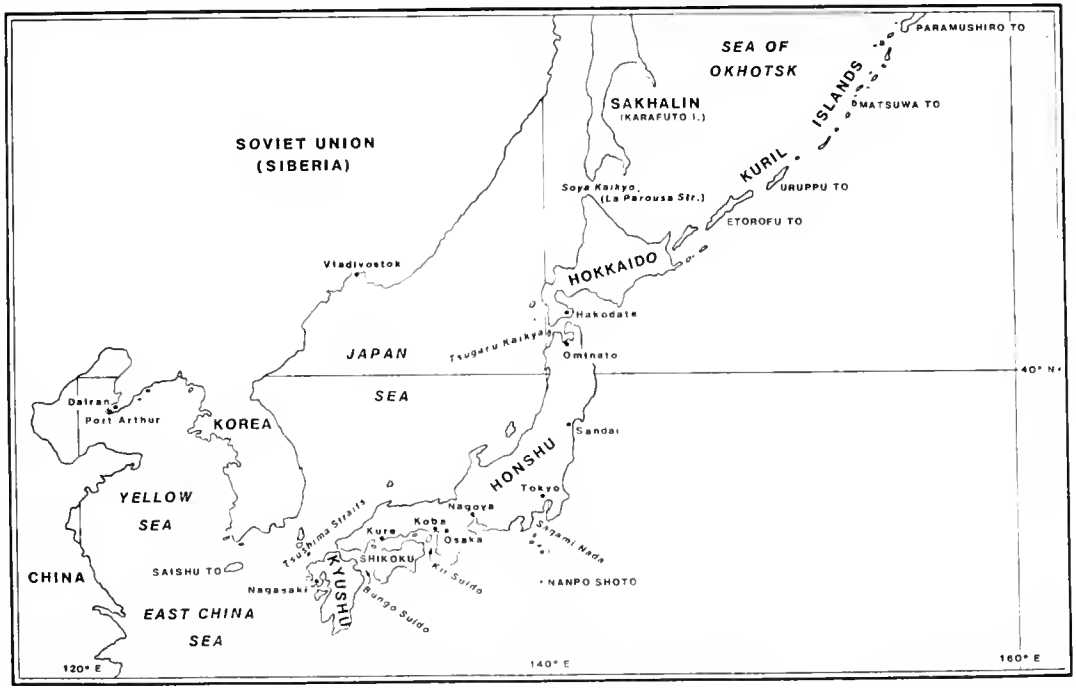
TIMOR SEA
MELVILLE
Darwin
AUSTRALIA
100° E
120° E

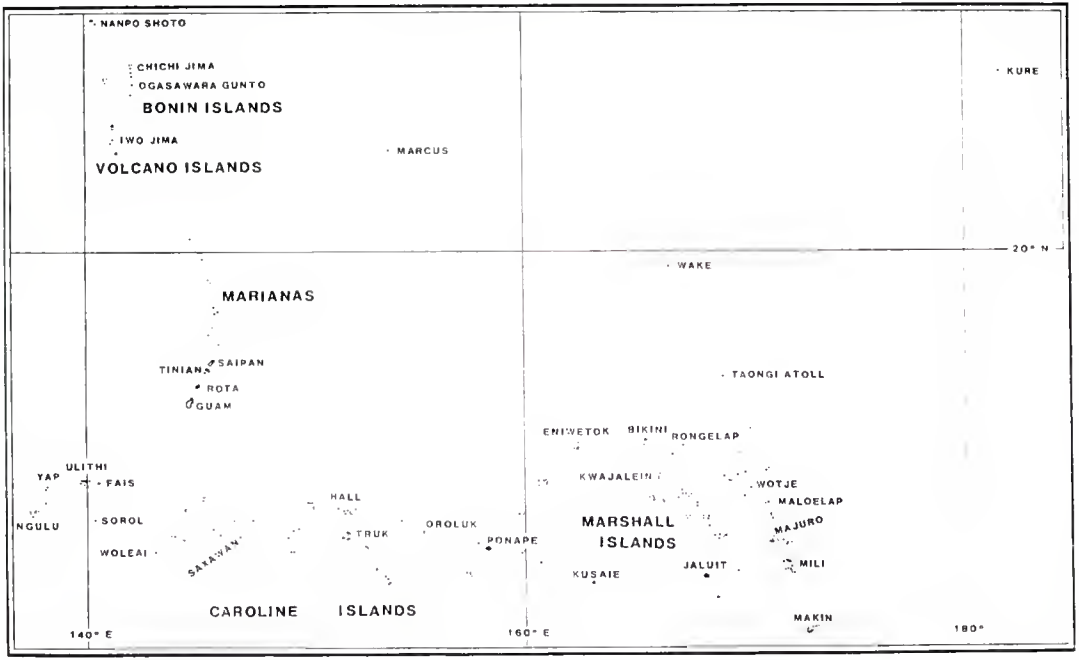
East Indies



Indian Ocean


SEA OF OKHOTSK
PARAMUSHIRO TO
SAKHALIN (KARAFUTO I.)
MATSUWA TO
KURIL ISLANDS
SOVIET UNION (SIBERIA)
Soya Kaikyo (La Perouse Str.)
URUPPU TO
ETOROFU TO
Vladivostok
HOKKAIDO
Hakodate
Tsugaru Kaikyo
Ominato
JAPAN
SEA
40° N
Dairen
Port Arthur
KOREA
Sendai
HONSHU
YELLOW SEA
Tokyo
Nagoya
Tsushima Straits
Kure
Kobe
Osaka
Enshu Nada
SHIKOKU
SAISHU TO
CHINA
Kii Suido
NANPO SHOTO
Nagasaki
KYUSHU
Bungo Suido
EAST CHINA SEA
120° E
140° E
160° E

Japan



West Central Pacific

PACIFIC SUBMARINES:
THE FORGING OF UNDERWATER FLEETS
IN THE UNITED STATES AND IMPERIAL JAPAN,
1921-1945

by

JON RANDALL MOCK

B.A., Baylor University, 1976

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

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Manhattan, Kansas

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During the years between World War I and World War II, diplomats representing the world's great naval powers met together in a series of arms control conferences intent upon reducing international tensions associated with rampant warship construction. The arms limitation process began in Washington, D.C. in 1921-22 when delegates agreed to restrictions on capital shipping, the standard by which contemporary naval power was measured. However the treaty system was initially hampered by the failure to reach agreement on secondary warship categories, most notably cruisers and submarines. The issue of submarines proved particularly elusive to negotiation, with positions ranging from outright abolition to legal constraints governing wartime use. In the end, the naval arms limitation process terminated when the political constituency supporting its existence evaporated and was replaced by militant elements hostile to any infringement upon national sovereignty.

At the same time, naval strategists in the United States and Imperial Japan debated the most likely war scenarios involving each other in a Pacific Ocean conflict. The sometimes heated discussions were tempered by the restraints imposed around the peace table. Both sides identified the submarine as a prominent element in their respective war plans and consequently sought designs and built submarine fleets suitable to fulfilling these tentative conceptions.

In December 1941, the tension between Japan and the U.S. boiled over into war in the Pacific. Japan's initial assaults virtually destroyed American offensive naval power with the exception of the submarine fleet. But the submarine war envisioned by both sides never materialized. Instead, both services endured similar problems of strategy and tactical employment which severely reduced their war-fighting capabilities. U.S. submarines in particular suffered for nearly two years with a torpedo plagued by numerous technical deficiencies which made the weapon completely unreliable.

The essential difference which determined the final outcome in the submarine war was that the United States learned from its mistakes while Japan did not. By the time America's torpedo problems were resolved, the U.S. Navy had accumulated enough submarines in the Pacific to embark upon a devastating campaign against Japan's commercial shipping industry. Japan never fully realized the critical importance of its merchant marine in supporting both the war effort and the nation's domestic economy. As a result, the Imperial Japanese Navy failed to take timely steps to bolster the defenses surrounding this vital link and consequently experienced the trauma connected with its destruction.

By the spring of 1945, U.S. submarines had so ravaged Japan's merchant marine that it almost ceased to exist as a factor in sustaining the nation. The tremendous contribution

of American submarines in gaining final victory and Japan's shattering negligence in achieving a reciprocal accomplishment with its own underwater service suggests the importance of submarine warfare in the Pacific Ocean during World War II. While the submarine is a weapon of attrition, with results measured over time, one cannot help but speculate on the final duration of the Pacific War had the United States not been crippled by persistent torpedo problems and had chosen to concentrate its submarine strength against Japan's vulnerable petroleum shipping early in the conflict. Conversely, how might Japan's situation have been enhanced if its submarine fleet had been directed against the U.S. logistical system rather than squandered in politically motivated, but irrelevant, missions resupplying isolated and bypassed island fortresses? Although the answers to these questions are intriguing to naval historians and armchair strategists, they indicate the powerful role submarine warfare played in the Pacific War.