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The Decline of U.S. Sea Power: An Empirical Study

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A thesis submitted to Central Michigan University, Mt. Pleasant, Michigan, in partial fulfillment of the requirements for the degree of Master of Arts.

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THE DECLINE OF U.S. SEA POWER:
AN EMPIRICAL STUDY.

⑨ Master's Thesis

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Nelson E. Modrall

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21 May 80

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A thesis submitted in partial fulfillment of
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Master of Arts

Department of Political Science

Central Michigan University
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May, 1980

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Accepted by the Faculty of the School of Graduate Studies,
Central Michigan University, in partial fulfillment of
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This thesis is dedicated with
love and appreciation to my
Mother and Father

PREFACE

If one accepts the theory that international politics is a struggle for power, as pronounced by Hans Morgenthau,¹ then it can be assumed that the United States and the Union of Soviet Socialist Republics are in a power struggle. Adopting the theory which defends a bi-polar distribution of military power -- a theory which presupposes two military superpowers, whose capabilities far surpass those of any third nation -- the potential ramifications of this struggle assume epic proportions.

During the era of the nation-state, international alliances have traditionally been the glue used by policy-makers to cement the fabric of international society together -- to maintain the status quo. While retaining some significance in maintaining the status quo, the alliances have been largely supplanted by the military capabilities of the two superpowers; around which large blocks of countries are polarized in varying degrees of cohesion. The disparity of military power, between the two superpowers and the other countries, is so great that the movement of a 'few' of these 'other' countries out of their respective orbits -- in itself -- would not alter the overall balance of power. As long as the military disparity existing between the superpowers themselves remains insignificant, a de-polarization of the current balance (based on fear) is unlikely. On the other hand, if this latter balance of power ratio should tip too far . . . , it could invite an exodus on a scale which could disrupt the status quo.

The policy of containment is aimed at the maintenance of the international status quo, and is directed against all forms of aggressive expansionism that might affect the present distribution of power. In 1947, the containment of communism (or Soviet expansionism) was formally introduced as a primary plank in American foreign policy.² Since then, the United States has provided resources for military and economic assistance, and engaged in 'limited' wars in support of this policy. In this particular instance, the policy of containment was the child of the policy of imperialism -- imperialism equating to an attempt to overthrow the status quo. The policy of the status quo denotes: a willingness to make changes within the existing order by compromising; without creating disruptions in the overall balance of power. Conversely, Soviet adventurism in Africa and in the Middle East can be used to support the argument that Soviet foreign policy is imperialistic in design, aiming at the rupture of the international order.

Presently, the U.S. capability to execute its containment policy in support of the status quo, is threatened on a new front -- a front where its superiority was unchallenged for nearly thirty years following the close of World War II. Nowhere, are the repercussions stemming from a military imbalance of power more crucial (and more discernible) to the U.S. and to the West, than on the seas and oceans of the world. To the West, free access to the sea equates with national survival -- U.S. sea power is the guarantor of this accessibility. If U.S. sea power loses its capability to guarantee this access -- or if it is perceived that this ability is lost -- the

balance of power itself will gain the authority to alter the status quo.

ABSTRACT

THE DECLINE OF U.S. SEA POWER: AN EMPIRICAL STUDY

By Nelson E. Modrall

Since the close of World War II, the United States has become increasingly dependent upon sea born commerce. At the same time, the American political processes have permitted the U.S. capabilities governing the transportation and defense of this trade to decline. Given the plausible ramifications of these observations, on the international status quo, an investigation of several hypotheses was conducted to determine scientifically the status of United States sea power. Each hypothesis was subjected to the same manipulation with parametric statistics to determine the association between variables, and the strength and significance of these relationships. The findings, overall, demonstrated support for the notion that a strong and meaningful correlation exists between the variables as stated above. In turn, this scientific evidence was used to support the conclusion that United States sea power is in a state of decline.

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CHAPTER I
INTRODUCTION

When the German war machine slashed into Belgium in 1914, and the Japanese Imperial Army invaded Manchuria in 1931, the curtains were raised on the drama of a world at war. In both cases aggressors were on the loose and the United States found itself with pitifully small military establishments totally inadequate for the monumental tasks at hand. During the initial phases of both conflicts, the Pacific and Atlantic oceans isolated the American mainland from the contesting military forces, thereby granting to the United States a lengthy reprieve. America used this stay to mobilize its own sea, land and air forces, and to gear up its industrial base for war production.

Today, defense experts would (largely) support the assumption that military technology and the posture of modern military forces under arms, have robbed America of the luxury of time the nation enjoyed in preparing for world war earlier in this century. Accordingly, the argument -- that the outcome of any future war involving the United States and the Union of Soviet Socialist Republics (U.S.S.R.) will be decided with the military hardware available at the initial clash -- must take on added significance. Further, it is held that a rough parity exists in nuclear weapons between the two superpowers. With each possessing sufficient nuclear warheads and delivery systems to destroy the other many times over (but neither holding an assured first strike capability), an all-out conventional war on the land, at sea and

in the air will not be summarily rejected. Rather, given its vastly more lethal alternative, conventional warfare should be viewed as the more rational (if not the more attractive) of these two options, which are currently available to decision-makers in Washington and Moscow. Postulating these as basic premises, the focus of this investigation will orient principally on the status of the conventionally armed naval forces and the maritime (shipping) capabilities of the United States.

CHAPTER II
THE POLICY DEBATE

Introduction

While the final verdict on the relative state of U.S. military preparedness vis-a-vis the Soviet Union remains to be heard, it would appear that more and more Western leaders and military experts are questioning the ability of the American armed forces to serve the aims of the nation it has sworn to defend. In this discussion, the concern looms largely in the arena of U.S. naval and maritime capabilities. In this regard, American defense officials, congressmen, admirals and other naval experts are arguing with increasing ardor that the American position as the world's dominant sea power has not survived the decade of detente (principally the 1970's) unshaken.³ With respect to this contention, these experts argue that the rate of decline in U.S. sea power threatens the capability of the U.S. to act unilaterally in defense of American interests on the high seas. The proponents of the aforementioned assumptions have made several allegations expressing their concern.

Facts, Assumptions and Statistical Generalizations

Writing in Sealift, Rear Admiral Ralph M. Ghormley, USN, has surfaced the allegations that the United States is virtually dependent upon sea born trade. With respect to this reliance, Admiral Ghormley has argued, the American capability to exercise sea control is vital to this nation's survival. An excerpt from this article reflects the

Admiral's concern pertaining to the impact the loss of overseas trade would have on the U.S. economy. Admiral Ghormley has stated:

Loss of our ability to continue that trade would not only imperil the sectors of the U.S. economy which are directly involved in importing and exporting, but also could bring our entire resource-dependent industry to a standstill. We don't have to have a war to face that event, we simply have to be deprived of the use of the sea or of foreign ports, or be put in a position in which there are not enough ships to carry U.S. trade . . .⁴

The Admiral supported his argument by noting a number of observations and statistics. He found that the United States is rapidly becoming a 'have-not' nation in respect to the raw materials he adjudged to be critical.⁵ While oil headed Admiral Ghormley's list, he also pointed out that America has no tin or chromite, and that the U.S. imports more than ninety percent of its asbestos, manganese, beryl, cobalt and bauxite.⁶ Further, he noted that the U.S. automobile production is dependent upon "31 products from 32 countries," and that materials from 15 different countries are used in the production of American missiles.⁷ In addition, Admiral Ghormley amplified the effects of the export/import trade on the overall U.S. economy, directing special attention to its impact on employment. According to Admiral Ghormley, in 1976, 35,000 ships entered U.S. ports; U.S. foreign trade was worth \$235 billion; American exports (\$113 billion) accounted for 7.5 million industrial and agricultural jobs; and U.S. imports of \$121 billion created jobs for another 8 million Americans.⁸ Finally, the Admiral noted that while American requirements for maritime intercourse have been on the increase, U.S. ability to unilaterally move this commerce has been on the decline.

Decreasing to the point where, in 1977, the United States delivered less than 5 percent of its imports in U.S. flag ships.⁹

At the same time, the Admiral has perceived a disparity between Soviet and American naval forces, which could impede the flow of the sea born raw materials to the U.S.¹⁰ To Admiral Ghormley, the capability of the U.S. Navy to execute its sea control mission (the ability to affirm U.S. access to the sea, while denying it to others), is absolutely essential to this nation's survival.¹¹ In this regard, he has stated that the tools the U.S. Navy would need to discharge its sea control mission are quantitatively inferior to those of the Soviet fleet. In support of this assumption, the Admiral has stated that the U.S.S.R. outnumbers the U.S. in all classes of major combatants, save the aircraft carriers; where the U.S. holds the edge thirteen to three.¹² The Soviet Union holds a decided advantage in frigates, destroyers and cruisers - 280 to 150, and in submarines (attack) - 350 to 118.¹³

Essentially, Admiral Ghormley has made the assumption that the United States is a maritime nation. Adhering to this basic premise, he contended that the U.S. is critically short of raw materials needed to "sustain the American way of life."¹⁴ His major concern focused on the U.S. ability to control the sea and to move raw materials and other commodities over the maritime lanes, should the Soviet Union attempt to interdict these lines of communication (LOCs).

The presupposition by Admiral Ghormley that the United States is a maritime nation has been shared by Mr. Charles E. Hiltzheimer, Chairman of Sea-Land Service, Inc.¹⁵ In Business Week magazine, Mr. Hiltzheimer penned a comment regarding U.S. maritime policy and the

declining state of U.S. maritime capabilities. While affirming that U.S. "economic survival depends on maintaining open sea lanes to our trading partners around the world,"¹⁶ he noted that American sea power is on the decline, and Soviet maritime capability is on the rise. In this regard, Mr. Hiltzheimer has reported that the Soviet merchant fleet has increased to the point where it can "carry 5½ times more general cargo than the nation generates."¹⁷ And, he continued, this fleet is making significant inroads into the export/import transportation market of the United States.¹⁸ At the same time the Soviet merchant fleet has been expanding, the size of the U.S. merchant maritime has been decreasing. Since 1950, the U.S. merchant marine has slipped from its ranking as the world's largest, to the world's eighth largest commercial fleet.¹⁹ In summary, Chairman Hiltzheimer has taken the position that the U.S. is in a crisis, generated by its decline as a naval and maritime power -- a crisis that the nation has yet to fully perceive.²⁰

In an address delivered on March 5, 1979 -- before a combined meeting of the National Reserve Association, Naval Enlisted Reserve Association and the Navy League of the United States -- Sen. Charles Mathias Jr. shared many of the same concerns voiced earlier by Admiral Ghormley, and prefaced the conclusions reached by Chairman Hiltzheimer. Senator Mathias contended that the United States is a maritime nation and should be totally committed to the objective of sea control -- an objective essential to American survival.²¹ This assumption was supported with statistics reflecting (1) the heavy bulk of the foreign trade conducted by the United States, and (2) the volume of the top seven natural resources imported; relative to the total consumed by the

U.S. economy. With respect to these statistics, the Senator has pointed out that 50 percent of the oil, 100 percent of the natural rubber, 98 percent of the manganese, 96 percent of the cobalt, 95 percent of the titanium, 94 percent of the bauxite, 92 percent of the chromium and 90 percent of the tin presently consumed by the United States must transit the seas.²² It is clear that the Republican Senator from Maryland has depicted an American economy strapped to the materials moving over the sea lanes ". . . in the Pacific, . . . Indian Ocean, . . . Persian Gulf, . . . Mediterranean, . . ." and the Atlantic.²³

Because of this linkage to the sea, it is not surprising that Senator Mathias has insisted that the United States must be able to keep the sea lanes open and move international sea born commerce under any of the probable crisis scenarios.²⁴ To accomplish these feats, he has stressed the point that America requires a sea-lift capability, with far more capacity than "What's left of our once great merchant marine," and a navy capable of maintaining sea control.²⁵ In regard to U.S. (flag) sea-lift forces, the Senator manifested his concern regarding the high percentage of U.S. imports and exports transported in foreign bottoms.²⁶ In short, Senator Mathias stated that the U.S. is 95 percent dependent on non-American carriers to haul the critical raw materials that must transit the seas to reach this nation's shores.²⁷ The U.S. Navy's plight, Senator Mathias has maintained, is just as bleak. In this vein, he has noted "our 479 ship fleet is only a pale shadow of the 600 ship fleet experts say is necessary" for the United States Navy to execute a sea control mission in the decade ahead.²⁸

In short, Senator Mathias has predicted trouble ahead for America, unless she reestablishes her naval supremacy and bolsters her sagging merchant marine.²⁹

Testifying in support of the shipbuilding and ship conversion programs for Fiscal Years 1977-1978 -- before the House Armed Services Subcommittee on Seapower and Strategic and Critical Materials -- the Deputy Chief of Naval Operations (Surface Warfare) remarked that the United States Navy, facing a mature and capable Soviet naval force, is operating with the smallest number of ships in its inventory since 1939.³⁰ At a time when the Soviets are posing a grave threat to "our free use of the seas," Admiral James Doyle, USN, noted that the quantitative decline of the United States Navy is continuing, while the Soviet naval capabilities are expanding.³¹ Observing that the U.S. Navy reduced the number of its ships by "50 percent since 1968," Admiral Doyle stated that the size of our active fleet would decline to 480 units by the end of 1976.³² Arguing that the force size of the Navy had reached an irreducible level, Admiral Doyle beseeched Congress to appropriate funds necessary to build sixteen ships during the Fiscal Year (FY) 1977.³³ The Chairman of the subcommittee, Mr. Charles E. Bennett, noted that this request included less than one-half the number of ships established as the minimum required to reach a balanced fleet of 575 to 600 ships by 1985 -- as stipulated by the Chief of Naval Operations, Admiral James Hallaway.³⁴

Testifying before the same subcommittee, Rear Admiral T.L. Malone, USN, as the Director, Attack Submarine Division, provided insight into the U.S. and Soviet submarine programs. Admiral Malone explained that

in 1973, based upon the "prudent risk" presented by the Soviet surface and sub-surface threat, the Navy had established a goal of commissioning ninety nuclear attack submarines (SSNs).³⁵ Since then, he added, the Soviet threat has continued to increase and any shortfall from the ninety SSNs would detract from the ability of the Navy to meet its peacetime commitments, and would significantly arrest its wartime mission capacity.³⁶ Remarking that the Soviet SSN is the primary threat to our "vital sea lines of communications,"³⁷ he provided the subcommittee with several statistics relating to the respective submarine strengths in the opposing fleets. The Soviets, he stated, have the largest general purpose submarine force; outnumbering the U.S. in SSNs 135 to 106, and currently out-producing the United States in this weapon's platform by a factor of three or four.³⁸ Using simple arithmetic, Congressman Floyd D. Spence -- during a question and answer session -- questioned the capability of the United States to keep up with the U.S.S.R. in this arena, much less catch the Soviets, at the current rates of production.³⁹

On at least two occasions, Congressman Paul S. Trible from Virginia, stood before his colleagues to assail the plight of the U.S. merchant fleet and the U.S. Navy, and emphasize the need for continued American access to the sea lanes of the world. On September 12, 1979, Mr. Trible rose in support of the Defense Authorization Act of 1980 to underscore the vital nature of this nation's ties to sea born commerce.⁴⁰ To punctuate his argument, he cited the contention that sixty-eight of the seventy-one raw materials adjudged to be critical must be imported into the United States in the holds of merchant vessels.⁴¹ Mr. Trible

has demonstrated the same concerns over the status of the United States Navy (and its ability to keep the sea lanes of the world open for Western commerce), as was noted by others previously. In this regard, he had earlier attacked President Carter's continued cuts on the shipbuilding programs, which had left twenty-nine naval vessels on the cutting room floor [in the Office of Management and Budget] in the brief span of two years.⁴² As a direct result of these "massive" cuts -- to be implemented in 1980 -- the U.S. Navy will add to its inventory only sixteen of the forty-five ships requested in 1977.⁴³

Calling the 1980 shipbuilding and conversion plan a "no Navy shipbuilding plan," Mr. Tribble argued that President Carter is stripping the navy of its surface combatant capability, without which this "island nation" would be unable to obtain the "vast quantities of raw materials from abroad" necessary to satisfy U.S. "strategic requirements," should the Soviets attempt to deny us access to the sea.⁴⁴ In this regard, Congressman Tribble has elucidated a call for sufficient ships in order to assure American sea control, noting that the United States cannot wait "until the outbreak of hostilities to begin building ships for the war will be over before we can finish our first warship."⁴⁵

Although he was not as critical of the administration he serves (as was the Congressman from Virginia), W. Graham Claytor, Jr., (in recent testimony before the Senate Armed Services Committee) pointed out that the Navy has not had the funds to purchase the ships and airplanes necessary to replace those lost to the fleet during operations and through retirements. In his most recent Posture Statement,

submitted to the select committee noted above, Mr. Claytor (as Secretary of the Navy) stated the Navy's portion of the Budget for FY 1980, was "very lean," and alluded to "sophisticated and capable" Soviet naval forces.⁴⁶

Sharing the views of the aforementioned authors, the Navy Secretary adroitly and firmly announced that this nation (for better or for worse) is more firmly wedded to the sea than ever before. Stating that the U.S. is "absolutely dependent on thirty strategic materials," which must be imported from abroad, Mr. Claytor added that it was his conviction that access to the world's seas is "vital" to this nation's security.⁴⁷ With this in mind, he argued that the United States must maintain "a clear margin of maritime superiority" well into the future. Only then, he surmised, could America prevent the Soviets from effectively strangling the life-lines which stretch across the oceans and seas of the world. The Kremlin, Mr. Claytor contended, has correctly perceived that the "Achilles heel of the United States and Free World" could well lay on the broad expanse of salt water covering the globe.⁴⁸ The failure to adequately protect these lines of communication, could prove the Soviets correct.

In a hearing before the same subcommittee, the Chief of Naval Operations, Admiral Thomas B. Hayward, shared Secretary Claytor's concern over the current state of U.S. naval forces. In this regard, Admiral Hayward stated that the number of ships in the U.S. inventory had reached the point where further reductions would seriously compromise the Navy's ability to perform its war-time function. While somewhat optimistic over the current capabilities of the Navy, he was not

so "sanguine" over the Navy of the future. Noting that "the Soviets will probably continue the programs that have steadily shifted the U.S.-Soviet balance during the last decade," he stated that his principal efforts would be made towards salvaging "our existing margin" of superiority"⁴⁹ by defending the Navy's position for more and better ships.

Speaking at a Naval War College strategy forum in May, 1979, Admiral Hayward elaborated on the relative strengths of the American and Soviet fleets, and the ability of the U.S. Navy to execute its assigned missions. Prefacing his remarks with the caveat that "the United States is an island nation whose entire history has demonstrated a vital reliance on the sea," Admiral Hayward pointed out that the United States is "outnumbered today by the Soviet Navy in virtually every category of naval weapon."⁵⁰ The Soviet Union, he added, continues to outdistance the U.S. in surface and sub-surface combatants to the extent that it has three times as many attack submarines, and 30 percent more surface combatants than does its American counterpart.⁵¹ The Soviets, he explained, are producing nuclear-powered attack submarines at a rate of eight per annum, while the United States "flagellates" itself with debates over whether to build one or two per year.⁵² Alluding to the margin of superiority included in his Posture Statement, he maintained that the U.S. has the capability to "marginally" fulfill its mission at sea, but the Admiral predicted America "is headed toward a loss of the relatively narrow margin we possess today."⁵³ In this regard, he added a final warning that the Navy today is at a "crossroads," and decisions made in the near term will determine

if the U.S. will maintain its supremacy over the seas -- or lose it in this decade.

The Commander-in-Chief, Pacific, Admiral Maurice Weisner, USN, expressed concern over the increased presence of Soviet naval forces in the Pacific and Indian Oceans. In testimony before the Senate Armed Services Committee, he explained his "grave concern over the ability of the U.S. Navy to protect the vital sea route from the Persian Gulf around the African Cape of Good Hope to Western Europe and the United States."⁵⁴ With this misgiving, he stated, that the determinant to the ultimate scope of U.S. naval capability must be the vital interests of the United States. U.S. naval forces, he confided, must be molded in sufficient strength to protect these interests -- and not solely with respect to the projected strengths of potential adversaries. Subsequent to this testimony, Admiral Weisner was quoted in the Atlanta Journal and Constitution as stating that the Soviet naval build up in the Pacific was aimed at the United States -- not China.⁵⁵ Furthermore, he stated that the purpose of the increase in Soviet strength in the Pacific was to insure that in the event of a confrontation with the U.S., the Soviets could successfully "challenge" the United States for naval supremacy in the theater. In this regard, Admiral Weisner noted: "We've got to do one hell of a lot for defense by increasing our armed force levels" if the U.S. and its allies hope to retrieve a position of rough parity with the Soviets in the Pacific.⁵⁶

Writing in Foreign Affairs, Admiral Stansfield Turner (then Commander-in-Chief Allied Forces South), noted that the decisive edge the U.S. once held in "sea control forces," has been slowly slipping

away from America.⁵⁷ Defining sea control as the ability to use and deny the sea as national interests dictate, the Admiral has stated that the United States is inexorably moving into a "high risk" era -- an era where its policy options will be curtailed by the changing balance of naval power. He has cited two major causes for the tip in the status quo: the rising demand in the United States for social expenditures, and the "dogged" build-up of the Soviet fleet. During the decade 1966-1976, the relative balance showed a marked decline in the U.S. naval strength, and a decided increase in Soviet offensive naval power.⁵⁸ Admiral Turner has taken particular note of the growing menace of the Soviet nuclear attack submarine fleet; which he discerned has expanded to 140 units, reflecting an increase of some 250 percent.⁵⁹ This increase in SSNs, coupled with an inventory which includes another 195 conventionally powered submarines and a sub-surface cruise missile capability, has compounded the anti-submarine warfare (ASW) mission for the U.S. fleet.⁶⁰ Yet, he retorted, during this same period the number of U.S. destroyers (primary ASW and escort platforms) declined from 205 to 69 ships, while anti-submarine aircraft were reduced in numbers "from about 428 to 132."⁶¹ In short, Admiral Turner has expounded the view that while the United States has added higher quality units to its submarine fleet and made "modest improvements in tactics and technology," the diminishing number of escorts, coupled with the Soviet advances noted above, is slowly swinging the balance against U.S. efforts to combat the Soviet submarine.⁶²

Assessing the overall conventional naval balance vis-a-vis sea control forces, the Admiral has stated that Soviet naval advancements

"have outstripped our capability to defend against them," and the U.S. is basically "running to keep up" by depending more on "technology and innovation" than on increasing the number of combatants.⁶³ In this regard, he has maintained that while the U.S. is "marginally" capable of executing its sea control mission, the scope of this capability is somewhat limited. By noting that the U.S. would likely experience difficulty in protecting its LOCs in the Western Pacific, the Admiral has tacitly inferred that the balance may have already tipped too far.

During a floor debate (in the United States Senate) concerning increased defense spending, Sen. Sam Nunn proclaimed that the U.S. "is rapidly becoming more maritime dependent with less ships, while the Soviets, a land power, have the largest fleet in the world."⁶⁴ The Senator from Georgia stated to his colleagues that the current posture of the U.S. Navy reflected wide-ranging shortfalls (in terms of capabilities to carry out the national purpose). In this regard, Senator Nunn remarked that the units in the fleet have been reduced by 53 percent during the past ten years; the number of torpedoes in the Navy inventory have "dwindled" to the point where there is an insufficient supply to support two wartime patrols by each attack submarine; the U.S. has lost the capability to keep its harbors free of mines; and naval aircraft have declined numerically by 21 percent in the past decade.⁶⁵ In summary, Senator Nunn argued that U.S. military requirements are not being matched by U.S. military capabilities.

Like Admiral Turner, Senator Nunn has blamed increased federal spending in the social arena as one culprit responsible for the decline in the U.S. military capabilities. In this vein, the Senator declared

that the defense posture of the United States "is a direct outgrowth"⁶⁶ of massive increases in social spending which began in the 1960's. While federal expenditures for defense spending increased 112% from 1965 to 1978, Senator Nunn has stated that federal spending for health, social service programs, and welfare jobs programs has increased 2463 percent, 1918 percent, 750 percent and 1655 percent respectively. Armed with these statistics, Senator Nunn attacked allegations declaring defense spending to be the cause of the spiraling U.S. inflation.⁶⁷

Entering this debate, Senator Nunn's colleague Sen. John Warner, (former Secretary of the Navy) has noted that the Navy's carriers lack their full complement of aircraft. Furthermore, in order to maintain this already low level of aircraft, the Navy must procure 180 additional tactical aircraft per year. In this regard, Senator Warner pointed to the FY 1980 Budget, which contained requests for thirty-nine naval aircraft.⁶⁸ "Budgetary constraints," he added, were the reasons cited by the White House to counter attempts made by the Armed Services Committee to increase that number. Senator Warner viewed the trends denoting America's defensive posture as adverse across the board.

Assuming a position opposite to that offered by Senators Nunn and Warner, the Chairman of the Senate Budget Committee, Sen. Edmund Muskie has countered with the postulations that defense spending is inflationary, and present U.S. military capability is sufficient to satisfy our national security requirements. During the aforementioned debate (concerning the Hollings Amendment, which recommended increasing defense spending by 5 percent in FY's 1980 and 1982), Senator Muskie

stated that the Department of Defense has not been standing still, and a real growth of 2 percent was realized by the Pentagon from 1975 to 1979.⁶⁹ Citing inflation as the number one enemy of the Republic, Muskie urged his colleagues to muzzle all aspects of federal spending: defense as well as non-defense.

In regard to the overall threat posed by the Soviet Union, Senator Muskie declared that if the United States was in imminent danger, the Government should take wartime measures; such as raising taxes and increasing defense spending.⁷⁰ Such a peril, he has stated, "does not exist," and he has taken issue with the arguments that the U.S. is in danger of losing its naval supremacy to the Soviets. Facing this latter allegation, the Senator from Maine stated that "the U.S. and its NATO allies have 30 percent more combatant ships and submarines than the Soviet Union and the rest of the Warsaw Pact."⁷¹ In short, Senator Muskie has found the United States Navy capable of protecting American interests into the farthest reaches of the globe.

With respect to Senator Muskie's latter allegation concerning the state of the U.S. Navy, the Senator has found a degree of support in a statement issued earlier by Mr. Charles Duncan, Deputy Secretary of Defense. Delivering an address to the Association of the U.S. Army on October 18, 1978, Mr. Duncan related that the U.S. is as militarily capable "today" as it was five years ago, and furthermore, that the U.S. Navy is capable of maintaining the LOCs to both Europe and North-east Asia.⁷² Mr. Duncan's overall assessment differed from the one offered by Senator Muskie with regard to trends. In this arena, Mr. Duncan has stated that with rising Soviet expenditures, U.S. defense

outlays cannot remain constant or continue to decline without a "dangerous tilt" in the balance of power.⁷³ Expounding on this latter contention, Mr. Duncan -- in remarks at the Department of State -- has argued that while "we are confident over our ability to win a conflict for sea control,"⁷⁴ the requirement exists to improve the quality and quantity of U.S. Naval forces. Mr. Duncan has taken the position that in the past fifteen years the Soviets have made gigantic strides in the military arena, and that the U.S. would ignore these trends, which he has predicted will accelerate, only at its own peril.

The editor of Jane's Fighting Ships has denoted the critical nature of the link between the maritime state and the sea. As Captain J.E. Moore, RN has put it: "History has proved too often that those who live by the sword shall likewise die -- he who depends on the sea may also die should it be denied him."⁷⁵ Captain Moore has noted that today trade statistics reinforce the argument that the "greatest proportion of the world's countries depend upon the free use of the oceans."⁷⁶ Further, he has broached the argument that the world's maritime lift capability has increased by 6 percent in 1977, and by 9 percent and 10 percent respectively, in the two preceding years.⁷⁷ With this in mind, Captain Moore has charged each Western state with the responsibility "to protect its maritime interests."⁷⁸ A government has no greater responsibility, he has claimed, than the "succor and welfare of its people," which in the case of the Western nations, includes guaranteeing free access to the sea.⁷⁹ In a world where aggression is at large, he has reminded the Western leaders not to build a naval capability to match the "intentions" of others, but

rather to maintain a fleet that has been assembled to match the naval capabilities of the "authoritarian" governments of the world. Continuing the basic themes forward into the 1980 edition of Jane's Fighting Ships, Captain Moore has reported that the Western maritime powers "have dropped their shield of maritime security."⁸⁰ By reducing the number of ships in their combined fleets, the Western nations have increased their vulnerability to blackmail. This blackmail, he has related, could take form in real deprivation of resources, markets and freedom. With respect to this decline, Captain Moore has noted the rapid decline in the numbers of U.S. combatants since the "peak of the Viet-Nam war."⁸¹ During this period the strength of the U.S. fleet dropped from 976 to 535 active combatants.⁸² If the U.S. continues to cut ships in order to save a proportion of the budget, Captain Moore has predicted that the United States could find itself with fewer than 400 active combatants by the year 2000.⁸³ A number, he added, "that could place the U.S. in an inferior position to that of the United Kingdom and other Western powers when considered as a balance to ships and population."⁸⁴

The thread of Captain Moore's arguments weave through the findings and recommendations of a study entitled, "Securing the Seas: Soviet Naval Challenge and Western Alliance Options," by the Atlantic Council's Working Group on Securing the Seas. Chaired by Mr. Paul Nitze, this committee focused its attention on the defense of the sea lanes. Among their findings, the working group reached the conclusion that the "Alliance force levels are probably inadequate to protect essential military convoys, and they have virtually no capabilities to escort

economic shipping."⁸⁵ These "circumstances" the committee found were due in large to a "contraction of force level in the West, rather than Soviet expansion."⁸⁶ Further, the study pointed out that the Soviet naval service portends a major threat to the West "at all levels of conflict" and that "the trends of the superpower navies are not encouraging to the West."⁸⁷ In this vein, the working group determined that the Soviet navy can operate across a broad spectrum (encompassing options reserved to deep-water, offensive navies), in all the world's oceans and seas and in a variety of roles potentially dangerous to the West. Defense of the sea lanes against this Soviet threat will be primarily determined in actions involving major combatants for control of the sea. To win this struggle, the panel contended, the United States would need naval assistance from the Alliance to counter a growing Soviet naval threat -- a threat that shows no sign of abating.

With respect to the United States merchant marine, the panel acknowledged a general weakness. This soft spot, the working group contended, was reinforced by the growing strength of the Alliance's maritime fleet and by the number of ships flying flags of convenience; which would most likely be made available to the United States during a crisis (or in an emergency).⁸⁸ Overall, the panel concluded the U.S. would probably encounter maritime lift difficulties in situations involving scenarios outside the interests of the Alliance. In this regard, the study group expressed concern that the U.S. merchant fleet may have reached a "danger point" whereby a unilateral American intervention may exceed U.S. lift capabilities, and therefore

recommended the U.S. merchant fleet be sized to accommodate support of a purely American venture.⁸⁹

Preliminary Conclusions

While orienting on the state of U.S. sea power, it is recognized that this review touched on issues outside the parameters as earlier defined. It is felt that the limited expansion of this investigation does not detract from the findings, but rather it prefaces a better understanding of the problem as perceived by those notables adjudged to be contemporary American political leaders and/or recognized naval experts.

While disparities in definitions, opinions, numbers and percentages were apparent throughout the literature reviewed, the study did reveal the following congruent themes: America's economic dependency upon the maritime lanes of the world, the decreasing size of the American naval and maritime establishments, the diminishing numbers and amounts of American raw materials, a basic uneasiness vis-a-vis the capabilities (present and future) of the U.S. Navy, a growing concern over the rising strength of the Soviet navy and the trends affecting the naval balance existing between the superpowers. In order for these concerns to be empirically tested in relation to the state of U.S. sea power, they must be translated into operational definitions and hypotheses. A logical process with which to deduce the state of U.S. sea power; however, will of necessity preface the formulation of the empirical model.

CHAPTER III
THEORETICAL PERSPECTIVE

Introduction

It has been generally inferred, in the preceding chapter, that the United States is in a state of decline as a sea power; the typical assumptions presented therein appear to have been induced from specific data as scientifically derived predictions were not in evidence. Accordingly, to precisely fix the status of the United States sea power, the empirical method employed herein tests the multiple hypotheses drawn from assumptions as stated in the policy debates. General information concerning this study is drawn from the period 1960-1980, inclusively.

Definitions, Premises and Parameters

The term sea power has several adjuncts, however, for the purposes of this investigation it is confined to 'naval and shipping capabilities,' and is measured by the numbers and/or tonnages of naval combatants and maritime vessels. In a more general sense, sea control is described as the ability to regulate events at sea, and is therefore dependent upon sea power. It denotes jurisdiction, free access, and is equivalent to supremacy of the sea and the capability to defend the sea lanes. Sea born commerce is dependent upon "friendly" control of the sea. With respect to sea control, naval forces dictate the extent of that capability. Furthermore, naval forces as units of analysis are strictly limited to those combatant vessels (frigates, destroyers,

cruisers, aircraft carriers and attack submarines)⁹⁰ that figure to play a decisive role in the battle for sea control -- that capability adjudged by the experts to be critical to the survival of a maritime nation. Without the element of sea control, it is generally assumed that the other classes of naval surface and maritime ships cannot survive. Even the attack and strategic submarines will become increasingly vulnerable, and force projection, naval presence and sea denial roles will no longer be practicable. Accordingly, the non-combatant types of warships that are not calculated to participate in this key engagement (to any great degree) are not contained in this study; solely on the basis that their inclusion would tend to mislead attempts to determine the actual state of U.S. sea power.

In this study the existence of a naval arms race between the U.S. and the Soviet Union -- and its impact on U.S. sea power -- is recognized and implied.⁹¹ However, the empirical nature of the investigation, limits the scope of the study to units which are readily quantifiable; namely naval ships, maritime vessels and sea born commerce. In this regard, limitation implies no degradation in importance or impact assigned to those other elements associated with the assessment of sea power.

Further, the investigation will limit itself strictly to naval capabilities. In this regard, it is assumed that naval capabilities, rather than political intentions, will determine the successful exercise of sea power in pursuit of state interest,⁹² i.e., the intentions of the state to successfully employ sea power will remain strictly subordinate to the naval capability itself.

With these observations in mind, the navies and merchant marines of nine maritime nations were selected to provide the units of analysis comprising the theoretical population observed in the study. A gross import/export sea born tonnage exceeding fifty million metric tons in 1977, was the sole criterion established for selection. Specifically, the nations included: the United States, the Union of Soviet Socialist Republics,⁹³ Japan, Norway, Italy, the Federal Republic of Germany, the Netherlands, the United Kingdom and France. These nations are being evaluated purely on the combined strengths of the major combatants within their fleets, and cumulative gross tonnages of the merchant ships within their registries.

The major naval combatants comprise the first units of analysis. This category is viewed in quantitative terms of units and, in the case of the United States, gross displacement tonnages, as well. There is no attempt to evaluate hardware quality, the effectiveness of one class of ship as compared to another, or the quality of naval personnel. While it is recognized that one platform (or weapons system) may be more effective than another in a particular role, it is generally conceded that the overall technological and qualitative gap has been narrowed to the extent that the U.S. no longer has a decisive edge in this arena.⁹⁴

The second unit of analysis is the national maritime fleet. The size of each fleet determines (largely) its national capability to move sea born commerce. Foreign carriers and "flags of convenience" are excluded, as it is assumed that while these types of vessels would be

made available during emergencies, their sea-lift capabilities cannot be guaranteed.

Closely related to the maritime fleet is the third unit of analysis: sea born commerce. International sea born trade is reflected in gross annual tonnages, loaded and unloaded, in the aforementioned maritime countries.

Characteristics associated with these three disparate units of analysis function as the independent and dependent variables, and are operationally defined in Chapter IV.

Assessments

Generally, there is a consensus affirming the premise that the United States is becoming increasingly dependent upon foreign sources for raw materials. A substantial volume of these minerals must transit the seas to reach the United States -- and it would appear that U.S. industry would indeed "quickly come to a halt" should the United States be denied these foreign resources. In addition, evidence indicates that the American economy is heavily dependent upon international trade. The U.S. requires access to markets, as well as to resources. Sharing a common border with only two of her many trading partners, the United States must use the seas to conduct the major share of its international intercourse. In short, U.S. access to the sea is vital to its survival.

In this regard, naval and political leaders alike are acknowledging that the United States must maintain control over its access to the sea -- for only then can the U.S. determine its own destiny. As previously defined, sea control connotes the ability to allow and deny

use of the sea. In the case of the United States, a sea control capability requires naval forces preeminent to those of its most potentially dangerous foe -- the U.S.S.R.

With respect to attaining this goal, it would appear that a disparity exists between the 'goal of sea control' as a prerequisite to U.S. survival, and the 'means to achieve this end.' Naval authorities are discounting claims alluding to U.S. supremacy over the seas, and are exhibiting instead, a mounting concern over the Soviet naval buildup vis-a-vis the contracting dimensions of the U.S. fleet. The once preponderate strength of the U.S. Navy is today at the point, where predicting the victor of a confrontation between the U.S. and U.S.S.R. would be extremely difficult. It has been emphatically emphasized that anything less than a total U.S. victory (in the battle for sea control) would permit the Soviets to deny America access to selected areas of the sea. In effect, the U.S.S.R. could interdict the flow of commerce vital to the heartbeat of Western society. For the unbelievers, the experts relate to the horrendous losses effected during World War II in the North Atlantic. Berlin successfully employed the strategy of sea denial with significantly fewer resources than are currently available to the masters of the Kremlin.⁹⁵

With regard to the U.S. maritime fleet, as it is capable of moving only a small fraction of U.S. needs, the bulk of American commerce, imports and exports, must be transported in the bottoms of foreign merchantmen. To a great extent, the U.S. is over-dependent upon flags of convenience and foreign carriers from other nations to haul the critical cargoes upon which the American economy feeds. With

its voracious industrial appetite, the denial of these vessels to the United States would be devastating to the American economy.

The acknowledged professionals are painting a rather dismal picture concerning the state of U.S. sea power. In spite of the rising demand for sea born commerce, the American maritime industry continues to languish; causing the U.S. to remain far behind the other maritime nations of the world in sea-lift capability. As U.S. dependency upon the sea lanes is increasing, the dimensions of U.S. naval (as well as U.S. maritime) forces are decreasing. The trends in naval growth appear to favor the Soviets, and the U.S. plight as a shipping nation does not appear favorable. In short, U.S. naval and maritime capabilities -- as outlined by the experts -- are but a shadow of the forces that once dominated the seas, and undermine the very future of American sea power.

Theories and Preliminary Predictions

In order to reach a scientific conclusion concerning the state of U.S. sea power from the facts, assumptions and statistical generalizations offered in the preceding chapter, the means to measure or quantify the state of U.S. sea power must necessarily be derived. In this regard, it is first theorized that U.S. defense of the sea lanes (assuming that the threat increases or remains constant), should be positively correlated to the nation's dependency upon the sea lanes. Second, it is proposed that as the nation's dependency upon sea born commerce increases, its national capacity to move that commerce will show a positive correlation to that variation. A positive relationship

between the U.S. defense of the sea lanes and the nation's dependency on these lanes would indicate support for the proposition that U.S. sea power is ascending. The same conclusion would be drawn from a positive correlation in the second instance. Conversely, a negative relationship in either case would lend support to the contention that the state of U.S. sea power is descending. Third, it is hypothesized that as the American dependency on the sea lanes increases, the Soviet ability to interdict the sea lanes and to transport sea born commerce, will show a corresponding increase. In the event that either of the aforementioned relationships regarding the state of U.S. sea power demonstrates an inverse correlation, a finding denoting a single positive correlation in this latter instance would indicate additional statistical support for the argument contending that U.S. sea power is on the decline.

To give a point of reference to the findings vis-a-vis the current state of U.S. sea power, identical logic has been employed to formulate additional research hypotheses selectively testing the same relationships in other maritime states.

In summary, the previously mentioned theories provide the core of the research hypotheses. These hypotheses will be tested to determine the association, strength and significance of the relationships depicted above. These findings in turn will provide the basis for the empirically derived conclusions regarding the state of U.S. sea power. With respect to these conclusions, based upon the facts and assumptions advanced in the policy discussions, it is anticipated that the statistical findings will support the conclusion depicting

U.S. sea power in a state of decline. Specifically, it is expected that the relationships between the variables denoting U.S. capabilities for attaining sea control (defense of the sea lanes), and U.S. dependence on the sea lanes will show an inverse correlation; while a comparison of the variables for the other maritime states will demonstrate: (1) a positive correlation between sea-lift capacity and sea-lift demand, and (2) an insignificant relationship between defense of the sea lanes and a sea-lift demand. The U.S.S.R. should show a positive relationship between its sea-lift capability and Western (maritime) sea-lift demand. The correlation between Soviet interdiction capability and Western Sea-lift demand is not expected to be significant. The variables will be operationalized in the following chapter.

CHAPTER IV

THE MODEL

The Variables

The purpose of the empirical model is to express relationships between variables, thereby enabling the political empiricist to reach a statistical conclusion regarding a specific research hypothesis. Before the relationship can be measured, however, the researcher's concept must be reduced to variables that can be operationalized into quantifiable units.

In this particular case, the research hinges on the comparison of four variables: (1) dependency on sea born commerce, (2) capability to defend the sea lanes (sea control), (3) the capacity to transport sea born commerce and (4) the capability to interdict the sea lanes (sea denial). Number one is the independent variable(x), and numbers two, three and four are the dependent variables(y). The independent variable, dependency on sea born commerce, is quantitatively expressed in shipping tonnage (metric tons loaded and unloaded). Variable number two, the capability to defend international waterways, is operationalized by equating the variable to (1) the number of major combatants and (2) the displacement tonnages of the major combatants -- U.S. only. Variable number three, the capacity to transport sea born commerce, is empirically functionalized into gross registered tons of the "flag" merchant fleet. The final dependent variable, the capability to interdict the sea lanes, is operationalized into the number

of major combatants -- U.S.S.R. only. The operationalization of the variables in this manner will allow for the formulation of a proper set of research hypotheses to determine the state of U.S. sea power.

The Research Hypotheses

Using the variables cited immediately above, six research hypotheses have been derived. First, it tends to be the case that as U.S. dependency upon sea born shipping increases, the U.S. capability to move international commerce on U.S. flag vessels decreases. Second, it tends to be the case, that as U.S. dependency upon the sea born commerce increases, the American ability to defend the sea lanes decreases. Third, it tends to be the case that as the sea born trade of the maritime nations increases, the capability of these nations to transport sea born commerce increases. Fourth, it tends to be the case that as the sea born trade of the United States increases, the sea born transport capability of the U.S.S.R. increases. Fifth, it tends to be the case, that as the maritime nations' (excluding the U.S.S.R.) sea born trade increases, their cumulative ability to defend the sea lanes decreases. Sixth, it tends to be the case that as the United States sea born trade increases, the Soviet ability to interdict the sea lanes increases. The sequence of the hypotheses will have no bearing in relation to the findings and conclusions.

Methodology

The operationalized variables within the research hypotheses will be manipulated statistically to determine the association between variables; and the strength and the significance of these relationships.

In this regard a simple regression ($y = a + bx$), correlation coefficient (r) and a "F" test will be computed to obtain the respective results. The slope of the relationship will be calculated using a simple regression. Because the research hypothesis cannot be proven, the concept of the null hypothesis (the logical complement to the research hypothesis) will be employed. The correlation coefficient will determine if the null hypothesis is accepted or rejected. In this regard, an assessment equal to or greater than $+0.3$ will mean rejection; while a lesser value will mean acceptance. The rejection of the null hypothesis will be interpreted as support for the research hypothesis. Conversely, the support for the null hypothesis will be translated into non-support for the hypothesis, and will rule out acceptance of the research hypothesis as it stands. A score of less than 2.9 on the "F" test, using 16 or 17 degrees of freedom (df), will indicate that the probability for simple random variation is equal to or greater than .05. In this case, the relationship will be summarily rejected and will provide the grounds for declaring the relationship insignificant, and therefore unuseable, in its present context. On the other hand, a "F" test value equal to or greater than 2.9, using the same df, will indicate that the relationship is significant. Each hypothesis or its logical complement will be subjected to the same manipulation with the parametric statistics discussed above. The findings derived therefrom will provide the subject for the subsequent chapter.

CHAPTER V

FINDINGS AND CONCLUSIONS

Findings

Using the parameters as defined earlier, the null hypothesis was rejected on the basis of a credible correlation coefficient in five of the six cases tested. The relationship between variables was adjudged to be significant in four cases. In one instance, the probability of simple random variation occurring within the theoretical population diluted the meaning of the correlation coefficient and rendered it unuseable as a basis for empirical support. (Notwithstanding this finding, it should be noted that in this particular case the entire population was captured, and the low significance reading could have been the result of the limited number of data points in the equation, rather than random variation. This is speculation; however, and the original parameters as noted in the preceding chapter shall prevail.)

As predicted earlier, manipulation of the data in Table 1 provided support for the first hypothesis that stated, it tends to be the case that as U.S. dependency upon sea born shipping (x) increases, the U.S. capability to move that shipping on maritime vessels registered in the United States (y) decreases. The "slope" was plotted at $-.021$ displaying an inverse relationship between the independent and dependent variables. The correlation coefficient was computed at $-.919$ indicating that the relationship between (x) and (y) was very strong. Interpolating for 17 degrees of freedom the "F" test was calculated

Table 1. U.S. Sea-Lift Demand Versus
U.S. Sea-Lift Capacity

(x)	(y)
307787	24837
298763	24238
325416	23273
349804	23133
382764	22430
402542	21527
427351	20797
420275	20333
453706	19668
462517	19550
511042	18463
492827	16266
550920	15024
676396	14912
677701	14429
654987	14587
746389	14908
818336	15300

Source: Statistical Yearbook, UN

Period: 1960-1977 (Consecutively)

x = Sea Born Shipping, Unloaded and Loaded, in the U.S.

y = U.S. Merchant Marine Fleet (Gross Registered Tons)
(Thousands of Metric Tons)

at 1781, denoting that chance variation figured to be less than .05. On the basis of these findings the null hypothesis was rejected.

In the second hypothesis, the manipulation of the independent variable; U.S. dependency upon sea born commerce; caused a negative fluctuation in the dependent variable; the U.S. ability to defend the sea lanes. (See Table 2.) In this particular case the independent variable remained operationally constant, but the dependent variable was operationalized in two disparate configurations. In the first instance, the hypothesis was tested using a dependent variable equal to U.S. combatant tonnage, and in the second case, U.S. ability to defend the sea lanes was equated to U.S. naval combatant vessels (units). Using the combatant tonnage as the dependent variable, the model indicated a regression of $-.017$. The coefficient correlation for this slope was computed at an interesting $-.856$ and the "F" test was calculated at 2472, using 16 degrees of freedom. With U.S. combatant units comprising the dependent variable, the regression was again inverted; the correlation coefficient was computed at a strong $-.953$ and the "F" test was assessed at 49.1, with 16 degrees of freedom. While the findings indicated a stronger relationship in the second instance, the results in both tests satisfied the criteria established for rejection of the null hypothesis, and therefore provided support for the research hypothesis as stated, i.e. it tends to be the case that as U.S. dependency upon the sea born commerce increases (x), the American ability to defend the sea lanes decreases (y).

The third research hypothesis predicted a positive relationship between sea-lift demand (x) and the sea-lift capability (y) for the

Table 2. U.S. Sea-lift Demand Versus
U.S. Sea Control Capability

(x)	(y ₁)	(y ₂)
307787	3107004	882
298763	3231428	905
349804	3318995	909
382764	3364210	898
402542	3321082	885
427351	3364957	879
420275	3393265	881
453706	3438114	852
462517	3280278	779
511042	3187585	734
492827	3091791	635
550920	2968486	565
676396	2732021	475
677701	2618526	404
654987	2585306	365
746389	2657066	361
818336	2670166	360

Sources: Statistical Yearbook, UN and Jane's Fighting Ships

Period: 1960-1961, 1965-1977 (Consecutively)

x = Sea Born Shipping, Unloaded and Loaded, in the U.S. (Thousands of Metric Tons)

y₁ = U.S. Combatants (Standard Displacement Tonnage)

y₂ = U.S. Combatants (Ship Units)

maritime nations. This hypothesis, remember, was tested to give the study a point of reference. In this particular case, the statistical manipulation depicted the regression at .045 and the correlation coefficient at .971. Interpolating for 17 degrees of freedom the "F" test computed at 458. (See Table 3.) Based upon an analysis of the statistical evidence, the null hypothesis was rejected and the proposition (as stated) was accepted.

The fourth hypothesis was established to determine the statistical relationship between U.S. sea-lift demand and the Soviet sea-lift capability. (See Table 4.) The findings indicated support for the hypothesis as stated, i.e. it tends to be the case that as U.S. sea born commerce (x) increases, Soviet sea-lift capacity (y) increases. In this case, the slope was plotted at .036 and the correlation coefficient was calculated at .944. The "F" test, with 16 degrees of freedom, was computed at 6.79. Based upon these findings, the null hypothesis was rejected.

The fifth research hypothesis measured the relationship between maritime nation's sea-lift demand (x) and the maritime nations' sea control capability (y). Manipulation of the variables (operationalized to sea born commerce and naval combatant vessels) indicated support for the hypothesis as stated, i.e. it tends to be the case that as the maritime nations' sea born commerce (x) increases, the maritime nations' ability to control the seas (y) decreases. (See Table 5.) However, the relationship was not adjudged to be significant. In this regard, the simple regression indicated a negative slope and the correlation coefficient was fixed at -.589. The "F" test, interpolated

Table 3. Maritime Nation's Sea-Lift Demand
Versus Maritime Nation's Sea-Lift Capacity

(x)	(y)
966842	86883
1028791	85675
1117563	91660
1213575	94876
1347481	97261
1466835	99976
1578931	104833
1678413	110839
1842287	117121
1999743	126047
2247955	132467
2305062	141122
2390126	147954
2792694	153063
2276943	159370
2581152	167953
2828361	175647
2652241	173828

Source: Statistical Yearbook, UN

Period: 1960-1977 (Consecutively)

x = Sea Born Shipping, Unloaded and Loaded, in the U.S., U.K., U.S.S.R.,
France, Italy, F.G.R., Netherlands, Norway & Japan (Cumulative Totals)

y = National Maritime Fleets as Depicted (Gross Registered Tons)
(Thousands of Metric Tons)

Table 4. U.S. Sea-Lift Demand Versus
Soviet Sea-Lift Capacity

(x)	(y)
307787	3429
298763	4066
325416	4684
349804	5434
382764	6958
402542	8238
427351	9492
420275	10617
453706	12062
462517	13705
511042	14832
492827	16194
550920	16774
676396	17397
677701	18176
654987	19236
746389	20668
818336	21438

Source: Statistical Yearbook, UN

Period: 1960-1977 (Consecutively)

x = Sea Born Shipping, Unloaded and Loaded, in the U.S.

y = Soviet Merchant Fleet (Gross Registered Tons)

(Thousands of Metric Tons)

Table 5. Western Maritime Sea-Lift Capacity Versus
Western Maritime Sea Control Capability

922142	1415
970263	1404
1050600	-
1137568	1383
1263807	1416
1375025	1391
1476182	1388
1569657	1373
1730395	1324
1883673	1291
2127083	1182
2177397	1052
2250824	977
2643146	910
2636691	781
2425911	711
2643293	703
2465114	686

Sources: Statistical Yearbook, UN.
Jane's Fighting Ships.

Period: 1960-1961, 1963-1977 (Consecutively)

x = Sea Born Shipping, Unloaded and Loaded, in the Western Maritime Nations (Cumulative Totals)

y = Western Maritime Nations' Combatants (Ship Units)

at 16 degrees of freedom, was set at 1.23, degrading the value of the findings.

The sixth hypothesis was not supported by the statistical evidence. The correlation coefficient was fixed at $-.172$ indicating that the relationship between the variables was weak, and for the purposes of this investigation, unuseable. (See Table 6.)

Conclusions

The six research hypotheses were established to test the relationships between specific variables. The findings derived therefrom were evaluated in consonance with the sea power standards (as set forth in Chapter III) to determine the state of U.S. sea power. In this regard, the assessment of the empirical findings (derived from a statistical manipulation of the variables), provided support in several instances for the contention that U.S. sea power is in a state of decline.

First, American dependency upon sea born commerce has increased significantly during the past twenty years, while the U.S. sea-lift capacity present in the American maritime registry has decreased markedly during this same period. The findings derived from a manipulation of the variables through the model, supported the hypothesis: it tends to be the case that as U.S. sea-lift demand increases, U.S. sea-lift capability decreases. The correlation was both strong and significant, and coincided with the conclusions reached by Senator Mathias,⁹⁶ Admiral Chormley⁹⁷ and Mr. Hiltzheimer.⁹⁸

Second, an inverse relationship between U.S. demand for sea born commerce and the American ability to defend the sea lanes was depicted

Table 6. U.S. Sea-Lift Demand Versus
Soviet Interdiction Capability

(x)	(y)
307787	710
298763	673
349804	656
382764	673
402542	697
427351	610
420275	640
453706	605
462517	612
511042	622
492827	659
550920	662
676396	662
677701	608
654987	638
746389	634
818336	662

Sources: Statistical Yearbook, UN.
Jane's Fighting Ships.

Period: 1960-1961, 1963-1977 (Consecutively)

x = Sea Born Shipping, Unloaded and Loaded, in the U.S. (Thousands of Metric Tons)

y = Soviet Combatants (Ship Units)

by the scientific method. The association once again proved to be strong and meaningful, and supported the deduction that U.S. sea power is declining. This finding underpinned the traditionally based position -- inversely relating sea-lift demand to sea control capability -- as expounded by Congressman Tribble,⁹⁹ Admiral Hayward,¹⁰⁰ Senator Nunn¹⁰¹ and Captain Moore;¹⁰² and reinforced their arguments that U.S. sea power is in a state of decline.

Third, the findings demonstrated a positive relationship between sea-lift demand and sea-lift capacity of the maritime nations. These empirical results were in stark contrast to those found for the U.S. (when using the same variables), providing additional basis for the argument that the scope of U.S. sea power is decreasing.

Fourth, a positive, strong and significant association between U.S. sea-lift demand and Soviet maritime-lift capacity was demonstrated statistically. In light of the negative relationship found to exist between U.S. sea-lift demand and U.S. sea-lift capacity, this particular finding assumed added import, and further supported the contention that American supremacy of the seas is ebbing away. In addition, these findings underpinned the argument (advanced previously by Mr. Hiltzheimer),¹⁰³ that the Soviet maritime-lift capacity is increasing in relation to increases in U.S. sea born trade.

Fifth, the relationship between the maritime nations' sea-lift demand, and the maritime nations' sea control capability was confirmed by a strong correlation coefficient. However, the low "F" test result weakened the support for the hypothesis as stated, rendering the findings insignificant -- for the purposes of this investigation.

Sixth, the last hypothesis stated that it tends to be the case that as U.S. sea-lift demand increases, Soviet interdiction capability increases. A manipulation of the statistics demonstrated a low correlation between the variables, indicating that the Soviet interdiction capability is not linked (empirically) to U.S. sea-lift demand. This conclusion supports the null hypothesis, and discredits the argument that assumes Soviet combatants are targeted against the U.S. sea lanes, as inferred by Secretary Claytor¹⁰⁴ and Captain Moore.¹⁰⁵

In summary, four of the six hypotheses were supported -- as stated -- by the scientific findings derived from the model. Support for the null hypothesis was demonstrated in one case. In those cases where support was not demonstrated for the hypotheses, the association between the variables was too low or chance deviation was estimated to be greater than .05. Using the standards as defined earlier, the findings overall demonstrated scientific support for the notion that the United States is in a state of decline as a sea power. In this regard, the results demonstrated an empirical basis for the proposition arguing a meaningful relationship exists between maritime commerce and the ability to move sea born trade. In the cases involving the maritime nations (as a whole) and the Soviet Union (as a separate entity), the relationships were found to be positive, with sea-lift capacity increasing in consonance with sea-lift demand as previously defined. With respect to the United States, the relationship was inverted, depicting the American merchant marine declining sharply in spite of a growing U.S. demand for sea born commerce. At the same time, the relationship between the U.S. ability to secure sea control and the

U.S. dependence on maritime commerce was empirically affirmed. Again, the correlation was negative with the U.S. capability to control the sea declining in relation to a steadily increasing American demand for sea born trade. The notion that Soviet naval combatants are correlated to U.S. sea-lift demand was not supported by the empirical evidence derived from this investigation.

CHAPTER VI
IMPLICATIONS AND FUTURE PROSPECTS

Implications

The implications resident in the conclusions supported by this investigation are clearly discernible. With respect to these implications, it should be noted (once again) that the United States is a maritime nation. Separated from strategic resources¹⁰⁶ and foreign markets¹⁰⁷ by the oceans and seas of the world, the U.S. has more than a casual interest in sea power. Yet, at a time when the United States is becoming increasingly dependent upon sea born trade,¹⁰⁸ its ability to move and to protect that commerce is diminishing. Compounding the impact of this statistically supported conclusion is the growth of the Soviet merchant marine and the modernization of the Soviet Navy. Both of these developments, when combined with the massive contradiction of the American naval and maritime capabilities, could prove to be decisive factors should Moscow decide to probe Western resilience in its "Achilles' heel" - the maritime lanes.¹⁰⁹

Western naval authorities have expressed concern over the decreasing size of the U.S. Navy, and its ability to wrest sea control from a modern, blue-water Soviet navy.¹¹⁰ For the present, the consensus remains that neither nation has a clear edge in conventional naval capability, and the ability to attain sea control -- an issue so profoundly vital to Western survival -- remains in doubt.

Future Prospects

Testifying before the Senate Armed Services Committee on President Carter's five-year plan for defense growth, Secretary of Defense Harold Brown acknowledged gains made by the Soviet defense establishment (at the expense of the U.S.) during the past decade -- advances, he added, that: "will take years to eliminate."¹¹¹ However, it would appear that the recent events in Cambodia, Vietnam, Iran and Afghanistan have alerted the American Government to the potential for danger in today's world, and started the United States on a path to redress the situation. In this regard, President Carter, noting the "steady build up by the Soviets and their growing inclination to rely on military power to exploit turbulent situations," announced plans for a \$157 billion defense budget for FY 1981, and increases for defense spending of 4.5 percent in each of the out-years through 1985.¹¹² This increase marks the first time, since the end of the Vietnam war, that the U.S. has allocated defense expenditures (when corrected for inflation) in excess of those authorized in 1964.¹¹³

With respect to sea power, President Carter noted on December 17, 1979, that the U.S. would continue on a course to sustain a 550 ship navy for the 1990's, and "sea power" would remain indispensable to U.S. global strategy -- in peace and war.¹¹⁴ In support of this position, the FY 1981 Budget President Carter submitted to the Congress contained requests for appropriations to convert or build nineteen ships (compared with twelve in FY 1980).¹¹⁵ According to the marine aide to the Assistant Secretary of the Navy (Financial Management), the Congress has approved ninety-seven vessels -- including fourteen maritime

pre-positioning ships -- for conversion or construction during the span of the five-year plan.¹¹⁶

Do these actions by the American Government signal the dawn of a new era in which the balance of sea power will be redressed? While there is reason for hope, there remains room for skepticism. In this latter regard, the same budget request contained authorizations for 104 naval aircraft -- a number which would be insufficient to replace the naval aircraft forecasted to be lost in operations and to retirement.¹¹⁷ This projected shortfall would result in a probable net decline in inventory for the seventh consecutive year.¹¹⁸ Further, the FY 1981 Budget requested \$6.1 billion for shipbuilding and ship conversion;¹¹⁹ nearly \$4 billion less than the amount estimated as necessary to support a six-hundred ship navy (a minimum force structure, as viewed by some authorities).¹²⁰ Finally, the rate of production as outlined in the FY 1981 Budget falls short of the eighteen new, or converted, warships required each year to sustain a 550 ship navy¹²¹ -- a navy envisioned by the Carter Administration as the requisite force needed to protect U.S. interests at sea. The prospects appear even gloomier for U.S. sea power if one analyzes the U.S. track record on previous budgets, where the plans for spending in the out-years did not come to fruition. Unfortunately for the United States, the size of the U.S. Navy has been reduced to the point where "we will be in very serious trouble" if the projections requested in the FY 1981 Budget are not realized as additions to the U.S. fleets.¹²²

As the United States enters the decade of the 1980s, it does so without the overwhelming naval superiority America enjoyed for over

twenty years following the close of World War II. It will take a tremendous commitment on the part of the United States, calling for a massive realignment of priorities, to halt the decline of U.S. sea power. Should the United States falter in this regard, America will be forced to rely more heavily on the navies and merchant marines of its allies; trusting the latter to devote more of their national resources (to shipbuilding) to counter the growing Soviet naval threat. Just as certainly, should the U.S. falter, the U.S.S.R. will become the world's predominant sea power -- as the Soviets have demonstrated no penchant for reducing their shipbuilding programs.¹²³ In either case, the U.S. decline as a sea power could be the harbinger of a fatal trend, which will ultimately witness the end of an era -- an era in which the democracies controlled their own fates via the maritime lanes of the world. Decisions made in Washington during the next few years will decide just how "indispensable" sea power is to U.S. strategy, and will determine if the decline is to be arrested.

FOOTNOTES

¹Hans J. Morenthau, Politics Among Nations, 3d ed. (New York: Alfred Knopf, 1962), p. 27.

²Ibid., p. 19.

³A recent study compiled by the International Institute for Strategic Studies states that: "...The number of American naval units decreased sharply in the 1970's reaching a low of 172 major surface combatants. The International Institute for Strategic Studies, The Military Balance (London: The International Institute for Strategic Studies, 1979), p. 4.

⁴Admiral Ralph Ghormley, "Soviet Sea Power Puts On Muscle," Sealift 5, (May, 1978): pp. 4-9, as quoted in U.S., Congress, Extensions of Remarks, Congressional Record, 95th Cong., 2d sess., 1978, 125, pt. 160: 5448.

⁵Ibid.

⁶Ibid.

⁷Ibid.

⁸Ibid.

⁹Ibid.

¹⁰Ibid., p. 5449.

¹¹Ibid.

¹²Ibid.

¹³Ibid.

¹⁴Ibid., pp. 5448-5450.

¹⁵Charles E. Hiltzheimer, "Decline of U.S. SeaPower," Business Week, April 9, 1979, p. 10 as cited in the U.S., Congress, Extensions of Remarks, Congressional Record, 96th Cong., 1st sess., 1979, 125, pt. 50: 1843-1844.

¹⁶Ibid., p. 1843.

¹⁷Ibid., p. 1844.

¹⁸Ibid.

¹⁹Ibid.

²⁰Ibid.

²¹Senator Charles Mathias, Jr., "Sea Power and National Supremacy," as quoted in the U.S., Congress, Senate, Congressional Record, 96th Cong., 1st sess., 1979, 125, pt. 32: 2864.

²²Ibid., Also, the U.S. Bureau of Mines has compiled a list of thirty strategic minerals which are imported. In 1978, the United States was reliant on all of the 'selected' materials to meet consumption demand. The ratio of imported minerals to the totals consumed varied from 11 to 100 percent, with fourteen of the imported minerals providing amounts greater than 80 percent of the totals consumed. As cited in David J. Kroft, "Geopolitics of Non-Energy Minerals," Air Force 6 (June 1979): p. 77

²³Mathias., p. 2865.

²⁴Ibid.

²⁵Ibid., p. 2864.

²⁶Ibid.

²⁷Ibid.

²⁸Ibid., p. 2865.

²⁹Ibid.

³⁰U.S., Congress, House, Committee on Armed Services. Military Posture, Hearing before a subcommittee of the House Armed Services Committee on H.R. 11500, 94th Cong., 2d sess., 1976, p. 5.

³¹Ibid.

³²Ibid.

³³Ibid., p. 6.

³⁴Ibid., p. 1.

³⁵Ibid., p. 24.

³⁶Ibid.

³⁷Ibid.

³⁸Ibid.

³⁹Ibid., p. 31.

⁴⁰U.S., Congress, House, Congressional Record, 96th Cong., 1st sess., 1979, 125, pt. 116: 7728-7729.

⁴¹Ibid., p. 7728.

⁴²U.S., Congress, House, Congressional Record, 96th Cong., 1st sess., 1979, 125, pt. 4: 311.

⁴³Ibid., p. 312.

⁴⁴Ibid., pp. 311, 312.

⁴⁵Ibid., p. 312.

⁴⁶"Posture Statements," All Hands, May 30, 1979, pp. 25, 26.

⁴⁷Ibid., p. 25.

⁴⁸Ibid.

⁴⁹Ibid., p. 26.

⁵⁰Excerpts from remarks by Admiral Thomas Hayward at a Naval War College strategy forum as quoted in the U.S., Congress, House, Congressional Record, 96th Cong., 1st sess., 1979, 125, pt. 116: 7728.

⁵¹Ibid.

⁵²Ibid.

⁵³Ibid., p. 7729.

⁵⁴U.S., Congress, Senate, Congressional Record, 96th Cong., 1st sess., 1979, 125, pt. 19: 1615.

⁵⁵"Soviet Navy Buildup Menaces Oil Lines, Admiral Warns," Atlanta Journal and Constitution, December 9, 1979, as cited in the U.S., Congress, Senate, Congressional Record, 96th Cong., 1st sess., 1979, 125, pt. 183: 19136.

⁵⁶Ibid.

⁵⁷Admiral Stansfield Turner, "The Naval Balance: Not Just a Numbers Game," Foreign Affairs, 55 (January 1977): 339.

⁵⁸Ibid., pp. 348-349.

⁵⁹Ibid., p. 349.

⁶⁰Ibid.

⁶¹Ibid.

⁶²Ibid.

⁶³Ibid., p. 351.

⁶⁴"Is the Hollings Proposal National Defense?", Congressional Digest, 57 (November, 1979): 282.

⁶⁵Ibid.

⁶⁶Ibid., p. 284.

⁶⁷Ibid.

⁶⁸Ibid.

⁶⁹Ibid., p. 273.

⁷⁰Ibid., p. 269.

⁷¹Ibid., p. 273

⁷²U.S., Department of State, U.S. Defense: Our State of Readiness, Current Policy Series, no. 43 (1978), p. 3.

⁷³Ibid.

⁷⁴U.S., Department of State, SALT and the U.S.-Soviet Military Balance, Current Policy Series, no. 58 (1979), p. 4.

⁷⁵Captain J. E. Moore, ed., Jane's Fighting Ships (London: Franklin Watts Inc., 1978), p. 127.

⁷⁶Ibid.

⁷⁷Ibid.

⁷⁸Ibid.

⁷⁹Ibid.

⁸⁰Moore, Jane's, 1979, p. 139.

⁸¹Ibid.

⁸²Ibid.

⁸³Ibid.

⁸⁴Ibid.

⁸⁵"Securing the Seas: Soviet Naval Challenge and Western Alliance Options," The Atlantic Community Quarterly, 16 (Winter 1978-1979): 476.

⁸⁶Ibid.

⁸⁷Ibid.

⁸⁸Ibid., p. 484. Also, it was reported by the U.S. Military Sealift Command that: "there are 326 Liberian and Panamanian tankers of 33.9 million deadweight tons 'which can reasonably be expected to be made available to the United States in time of national emergency.'" as cited in "A Convenient Political Flag," The Economist, August 27, 1977, p. 72. (Furthermore, the article pointed out that under the Merchant Marine Act of 1936, the U.S. Government has the authority to requisition U.S. ships flying flags of convenience, when a national emergency is declared.)

⁸⁹"Securing the Seas," p. 484.

⁹⁰Includes ships in reserve and under construction (contract awarded).

⁹¹Admiral Hayward briefly outlines the naval race in terms of its scope and ramifications to the U.S. as he states: "we are in competition with an adversary who is willing to invest big money in the construction of highly capable ships and aircraft in order to replace this country as the predominant maritime power in the world." Admiral Thomas B. Hayward, "A Report by the Chief of Naval Operations on the Fiscal Year 1981 Military Posture and Fiscal Year 1981 Budget of the United States Navy," Washington, D.C., 1980, p. 9. (Mimeographed.)

⁹²See Moore, Jane's, 1979, p. 139; Admiral of the Fleet of the Soviet Union, S.G. Gorshkov notes this relationship when he states: "Our country has built a modern navy and sent it out into the ocean in order to support own state interests. . ." (Italics mine.) Admiral S.G. Gorshkov, Sea Power of the State, as quoted in Studies in Communist Affairs, vol. 2: Naval Power in Soviet Policy (Washington, D.C.: U.S. Government Printing Office, 1978), p. ii; Turner, pp. 339, 348-349.

⁹³While the U.S.S.R. meets the criteria established to be defined as a maritime nation, it is widely acknowledged (and is held in this instance) that the Soviet Union is primarily a continental power. See Ghormley, p. 5448.

⁹⁴See Turner, pp. 339, 348-349; It is also acknowledged that technology can compensate for the disparity in numbers of ships but only to a point as "Qualitative unit capabilities cannot fully compensate for a lack of numbers." Hayward, "A Report by the Chief of Naval Operations," p. 57.

⁹⁵Sen. Robert Taft, Jr., White Paper on Defense, A Modern Military Strategy for the United States (Washington, D.C., U.S. Government Printing Office, [1976]), pp. 28-30, as cited in Michael Krepon, "A Navy To Match National Purposes," Foreign Affairs, vol. 55, no. 2 (January 1977): 360.

⁹⁶Mathias, pp. 2864-2865.

⁹⁷Ghormley, p. 5448.

⁹⁸Hiltzheimer, pp. 1843-1844.

⁹⁹Congressional Record, House, 96th cong., 1st sess., p. 311.

¹⁰⁰Hayward, Remarks Naval War College, p. 7728.

¹⁰¹"Is the Hollings Amendment National Defense?", p. 282.

¹⁰²Moore, Jane's, 1978, p. 127.

¹⁰³Hiltzheimer, pp. 1843-1844.

¹⁰⁴"Posture Statement," p. 25.

¹⁰⁵Moore, Jane's, 1979, p. 139.

¹⁰⁶Kroft, p. 77.

¹⁰⁷Ghormley, p. 5448.

¹⁰⁸Publishing Service United Nations, Statistical Yearbook 1977 (New York: Publishing Service United Nations, 1978), pp. 563, 573.

¹⁰⁹"Posture Statement," p. 25.

¹¹⁰Moore, Jane's, 1978, p. 127.

¹¹¹"End of America's 'Vietnam Syndrome'?" The Christian Science Monitor, 14 December, 1979, p. 5.

¹¹²"Carter Speech on Military Spending," Congressional Quarterly Weekly Report, 50, (December 15, 1979): 2854.

¹¹³Pat Towell, "Carter Says Global Threats Require More Defense Effort," Congressional Quarterly Weekly Report, 50, p. 2815.

¹¹⁴"Carter Speech," p. 2855.

¹¹⁵Pat Towell, "Budget Stresses Rapid Deployment Forces," Congressional Quarterly Weekly Report, 5 (Feb. 2, 1980): 249.

¹¹⁶Interview with Colonel James McGinn, Office of the Assistant Secretary of the Navy (Financial Management), Washington, D.C. 22 March.

¹¹⁷Hayward, "A Report by the Chief of Naval Operations," p. 19.

¹¹⁸Ibid., p. 20.

¹¹⁹Towell, Budget, p. 249.

¹²⁰"Securing the Seas," p. 476.

¹²¹Hayward, "A Report by the Chief of Naval Operations," p. 20.

¹²²Ibid., p. 21.

¹²³See Hearings on Military Posture, p. 31; Hayward, "A Report by the Chief of Naval Operations," pp. 9, 10, 13.

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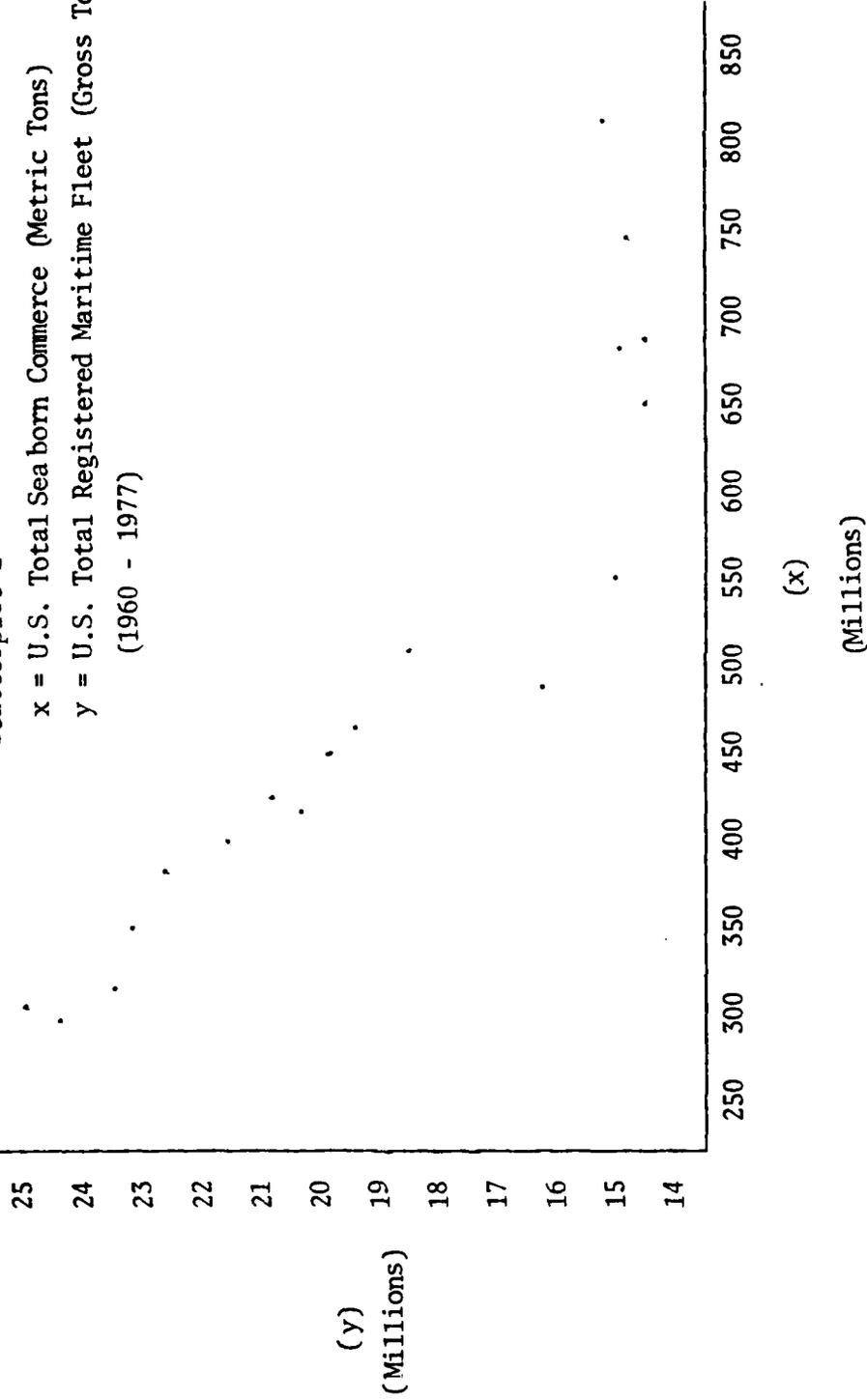
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APPENDIX A

Scatterplot 1

x = U.S. Total Sea born Commerce (Metric Tons)

y = U.S. Total Registered Maritime Fleet (Gross Tons)
(1960 - 1977)

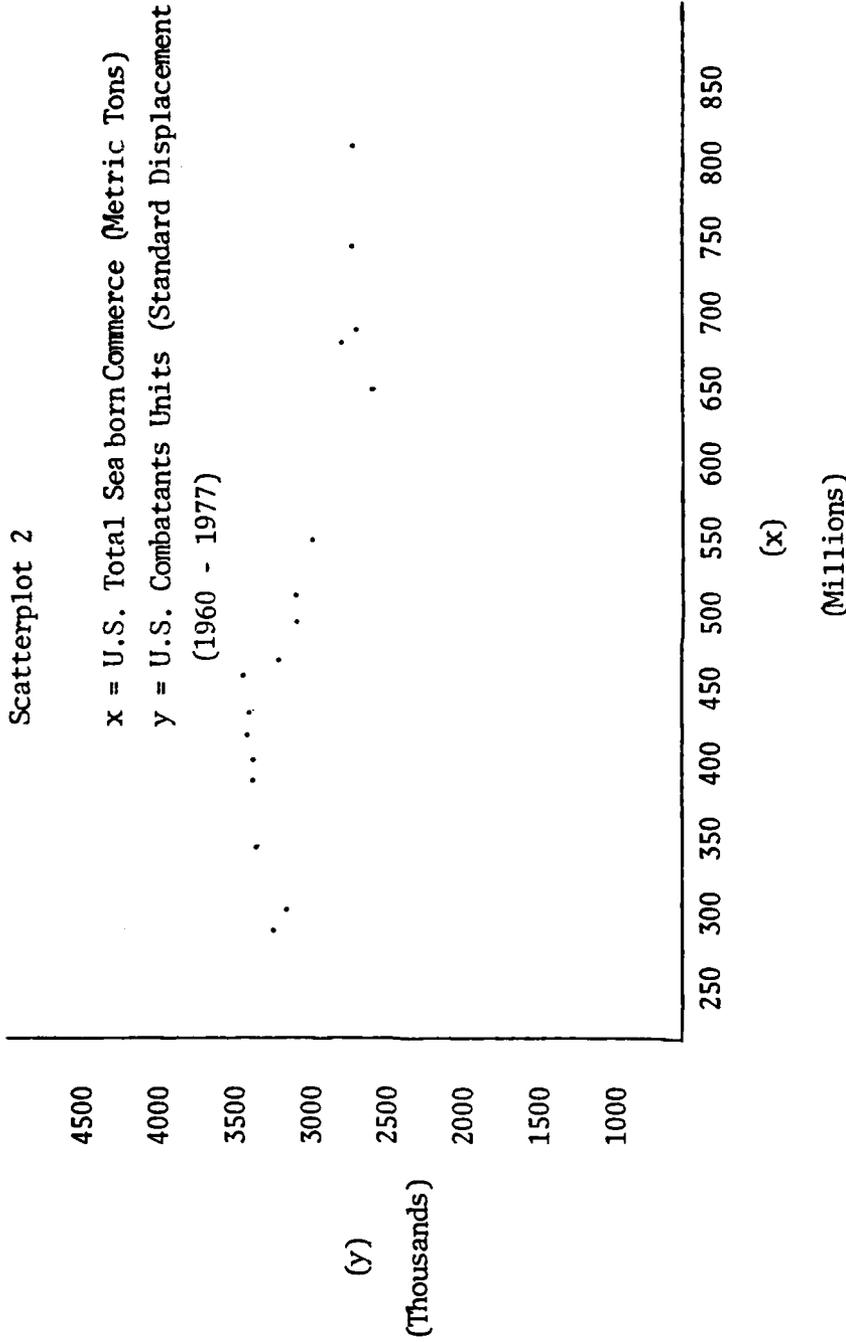


Source: Statistical Yearbook, UN.

APPENDIX B

Scatterplot 2

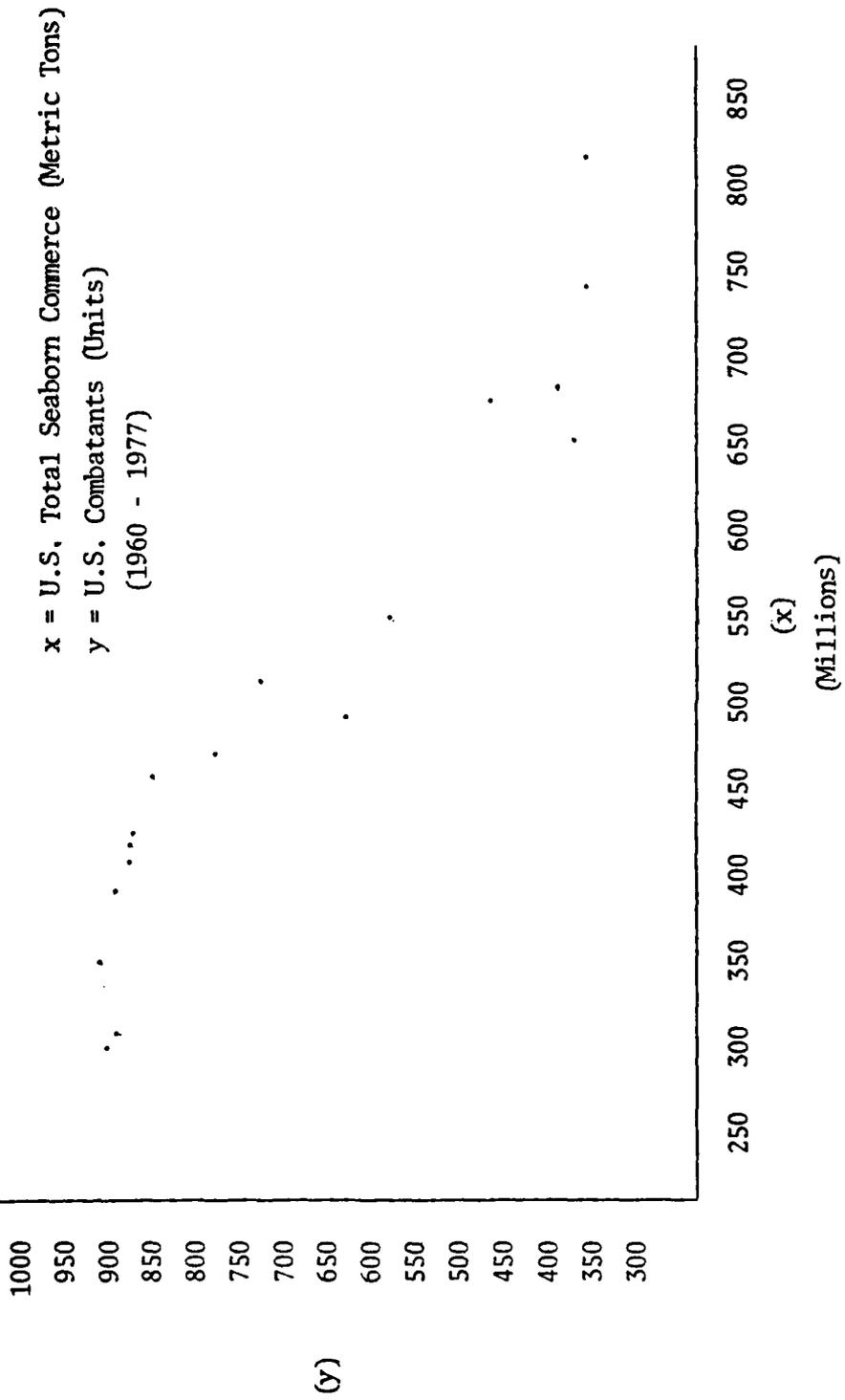
x = U.S. Total Sea born Commerce (Metric Tons)
 y = U.S. Combatants Units (Standard Displacement Tons)
 (1960 - 1977)



Sources: Jane's Fighting Ships
Statistical Yearbook, UN

APPENDIX C

Scatterplot 3



Sources: Janes Fighting Ships
Statistical Yearbook, UN

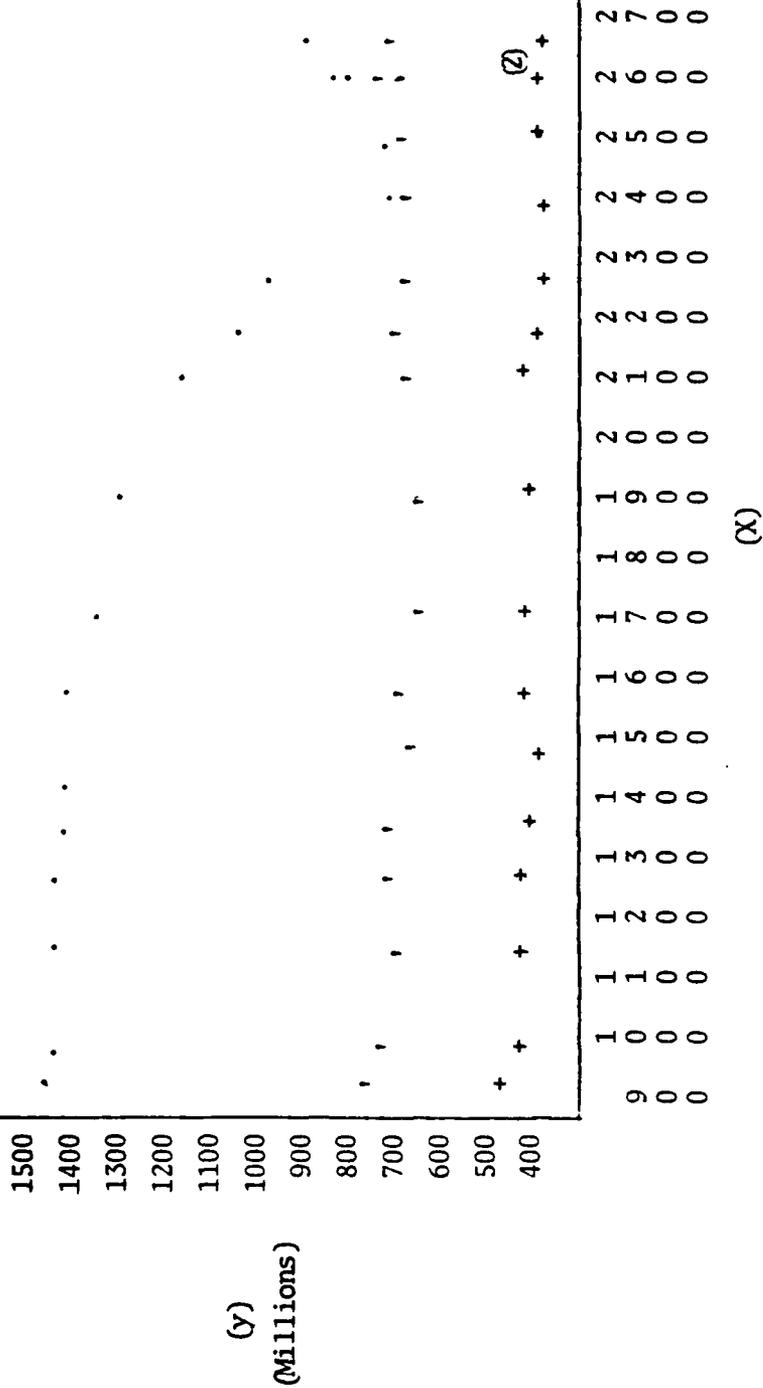
APPENDIX E

- x = Maritime Nation's Total
Sea Born Commerce (Metric Tons)*
- y = Maritime Combatants (Units)*
- . = Maritime Nations (-) USSR
- ' = USSR
- + = Maritime Nations (-) U.S. & USSR

*Excludes USSR

APPENDIX E

Scatterplot 5



(X)
(Millions)
Sources: Jane's Fighting Ships
Statistical Yearbook, U.N.