THE SUBMARINE REVIEW

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EDITOR'S COMMENTS

The first quarter of 1992 has been a very significant period for the U.S. Submarine Community. In his State of the Union message, President Bush proclaimed the Cold War victory for which we had all worked, both ashore and at sea, for so long. Submarines and the people who built and sailed them for the more than forty years between Winston Churchill's "Iron Curtain" speech and the breakup of the Soviet Union are in for a large share of the credit for that victory. Even more importantly, perhaps we were the reason that the Big Hot War never did get started. That victory is commemorated in some small way in these pages with several remembrances of ships, crews and places.

This period also marks the fiftieth anniversary of that time in World War II when Americans realized that we were in a very tough fight and not doing very well. The submarine war in the Mediterranean is covered by two books reviewed in this issue and one book recounting an early-war submarine rescue from a Japanese-held island is reviewed by one of the rescuers. John Alden contributes a very interesting piece on our torpedo success in that war with lots of implicit lessons for the active submariners of today. The patrol report selected for this period is NAUTILUS' first war patrol. Their baptism of fire was to be in the middle of the Battle of Midway.

In terms of current concerns for the Submarine Community, however, perhaps the most significant aspect of the first part of 1992 is the cancellation of the SEAWOLF follow-on building program. As has been noted both in the REVIEW and in many other places, the consequences for the submarine industrial base are serious and far-reaching. In addition, that action has highlighted the SSN force level issue. A simple accounting shows that the number of attack submarines that we can expect to have for the middle of the next decade appears to be on the order of half of what was planned just a year or two ago. The question of sufficiency has to be raised. The real problem, of course, is in the combination of those two concerns. That is, if we let this fairly fragile industrial base dissipate in the 90s, how can we recover from too low a force level when we have to face any kind of significant emergent global threat ten or fifteen years from now?

Two phrases seldom heard in all of the debates about national purpose in the post-Cold War world and forces needed for regional conflict are Deterrence of Conventional War and Attack Submarine Presence. It has been suggested that the general public and policy makers alike do not have an appreciation for the low-risk potential of the SSN in the Uncertain Future. To the end of that education, several pieces are offered here to address both the problems facing the nation and the Navy and the benefits to be realized from a strong (enough) Submarine Force.

Jim Hay

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FROM THE PRESIDENT

As you are aware, coincident with the delivery of the FY '93 budget, the Administration proposed to terminate the SEAWOLF submarine program (i.e. complete SSN-21; cancel SSN-22 and SSN-23) and to rescind (recapture and redistribute) the previously authorized and appropriated funds. The potential consequences for the future Submarine Force and for our unique and fragile industrial base are matters of great concern.

During the next several months, decision makers have a wide range of options from which to choose, any one or combination of which would have some long term impact on the Force.

Select from the following menu:

a. Reject the proposed rescision and continue construction of the three SEAWOLF Class SSNs as previously authorized.

b. Reject the rescision; direct that SSN-21 and SSN-22 be completed; cancel SSN-23 (not yet under contract).

c. Approve the rescision; complete SSN-21; cancel SSN-22 and SSN-23.

d. Cancel the scheduled refueling overhauls of the early flights of the SSN-688 Class; apply the savings toward the construction of additional Improved SSN-688 Class as gapfillers until the arrival of the CENTURION New SSN.

e. Accelerate the design phase of the CENTURION New SSN to improve on the current FY '98 authorization goal.

f. All of the above.

g. None of the above.

You now know about as much an any *Inside the Beltway* mavin. The outcome is uncertain. We are taking advantage of every opportunity to educate, to ensure that all involved in the process are aware of the value to our nation of a strong and ready Submarine Force. Stay tuned. Film at eleven!

Our May Submarine Technology Symposium at Johns Hopkins University Applied Physics Laboratory, the fifth in the series, will be once again a sell-out. This year, we will examine those technologies which have the potential to enhance the performance of future submarines in regional conflicts.

Planning for our annual June Symposium at the Radisson Hotel in Alexandria, Virginia, is complete. We start with an exclusive preview of a filming on board a Russian TYPHOON SSBN, and conclude with a briefing by Ambassador Linton Brooks on the implications of START, for which he was a negotiator. In between, we will hear from OP-02, Vice Admiral Roger Bacon, the two Force Commanders, and others of note. Chief of Naval Operations, Admiral Frank Kelso, will speak to us at our awards luncheon, and Secretary of Defense Dick Cheney will be our banquet speaker. This should be your year to attend!

Hope to see you in June.

Bud Kauderer

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SUBMARINE ROLES IN THE FUTURE

31 January 1992

This paper provides a condensed version of "Submarine Roles in the 1990's and Beyond," issued by the Assistant Chief of Naval Operations, Undersea Warfare.

ABSTRACT: *With the Cold War ended, roles for submarines in support of U.S. national security objectives are examined. Roles are identified which are necessary in a world characterized by change and regional crises, and which are enhanced by the enduring characteristics of the nuclear submarine -- stealth, endurance, and agility. These roles are: Forward Presence, Surveillance, Deterrence, Regional Sea Denial, Precision Strike, Task Group Support, and Ground Warfare Support.*

PERSPECTIVE

The dissolution of the Soviet Union into its constituent states at the end of the Cold War compels a reassessment of U.S. military requirements. As a part of that reassessment, it is necessary to examine the roles that will best be executed by the submarine force.

By statute, the mission of the U.S. Navy is to conduct prompt and sustained operations at sea in support of all aspects of the national military strategy. Traditionally, seapower has been essential in maintaining freedom of the seas and protecting sea lines of communication to the United States, and this has become even more important in a world of global economic interdependence. Further, since World War II, naval forces have expanded their core missions through technology to include projection of power over land. The seas are no longer a self-contained battlefield, but a medium from which warfare is conducted. Submarines are essential to the successful conduct of these central missions, but their employment in support of American interests is not widely understood.

Historically, the effectiveness of the submarine in combat has often been underestimated and submarines have repeatedly achieved significant success in roles not envisaged in pre-war plans. In World Wars I and II, the Germans intended to use submarines to sink enemy warships. Instead, the U-boat was almost successful in defeating England by interdiction of merchant shipping. Prior to World War II, the U.S. submarine

force was planned to be used primarily as a scout for the battleship fleets; nevertheless, U.S. submarines were instrumental in the defeat of Japan by the attrition of shipping and supplies needed by the Japanese war machine.

Following World War II, the self-contained nature of our major adversary, the Soviet Union, diminished requirements for interdiction and attrition. The large Soviet submarine fleet and the utility of the submarine as the best defense against another submarine led to a new assignment for the U.S. submarine force -- antisubmarine warfare (ASW).

As Soviet forces evolved to nuclear weaponry in ballistic missile submarines within layered defenses of mines, surface ships and submarines, and under a powerful air-defense umbrella, U.S. submarines became the only force capable of operating in this threat environment. The U.S. submarine role of forward area operations at the van of the Maritime Strategy, became the central element in the design, operation, and sizing of the attack submarine force.

Now that the Cold War has ended, what roles should be planned for the submarine force? To avoid mistakes in addressing this question, it is important to assign roles that are enhanced by the submarine's unique characteristics that will endure in the future.

ENDURING SUBMARINE CHARACTERISTICS

The submarine has demonstrated a number of characteristics which provide critical advantages and which are unlikely to change over time. The most significant of these are stealth, endurance, and agility.

Stealth - This most basic and important characteristic derives primarily from the fundamental ability of the submarine to submerge and become virtually invisible to threat sensors. U.S. submarines also have a detection advantage so that they can detect other forces first and maneuver to avoid being detected. With nuclear propulsion, submarines are continuously stealthy. Extraordinary efforts in ASW have not significantly diminished submarine stealth. The cost of such efforts should preclude any possibility of eliminating submarine stealth in the future. The advantages of stealth are so pervasive that considerable efforts are being expended to provide aircraft and surface ships with

defensive measures and only a fraction of the stealth that the submarine can achieve by simply submerging. These advantages are:

Covertness - Stealth allows submarines to conduct assignments without any indication that American forces are present or involved. The amount of involvement to be disclosed can be controlled.

Surprise - Stealth allows the submarine to retain the initiative, conducting missions or engaging threats on the submarine's own terms when the adversary may not be prepared. The utility of surprise in warfare is well known.

Survivability - The submarine cannot be readily attacked because it cannot be readily detected. Stealth allows the submarine to select the conditions of battle so that it can fight when outnumbered, prevail, and live to fight again. It can be depended upon to continue its assignment. It is not likely to become a debilitating loss that could undermine the American will.

Freedom of movement - Because of stealth, the submarine can operate almost anywhere, including areas that are denied to other forces.

Self-defense - The submarine's primary defense is its stealth. It does not need other ships or aircraft to aid in its defense and can employ the majority of its weapons in offensive attack.

Uncertainty - Stealth can create uncertainty because an adversary cannot determine where, when, or how many submarines are in opposition.

Non-provocation - Submarines can be moved into position, remain on station, and be withdrawn without implications that might cause a crisis to escalate or result in an adverse response.

Endurance - The nuclear submarine can remain on station for several months, limited only by onboard food supplies or weapons expenditure. Submarines do not need to rely on forward bases, logistics trains, or prepositioned supplies, and

therefore do not place taxing requirements on the theater commander. Endurance provides the following advantages:

Continuity - The submarine can remain where needed for long periods of time, including before a crisis develops, during a crisis, and afterward until stability is restored. Continuity of presence can be critical to operational effectiveness.

Independence - Endurance allows the submarine to operate largely unencumbered by requirements to resupply, relocate, or rendezvous to remain ready.

Agility - The submarine can arrive quickly where needed and act promptly in response to a broad range of situations. Agility is much more than mobility. It results from four factors: (1) nuclear propulsion, which provides high speed for an unlimited time; (2) the multiple mission capability provided by the ship design, weapons, sensors, and crew training; (3) a proven readiness posture, and (4) reliable shore or tender-based submarine command, control, and communication facilities, which allow submarines to rapidly receive directives and to make timely reports anywhere in the world. Agility provides the following advantages:

Mobility - High speed allows submarines to arrive promptly in any area needed and to be quickly repositioned in response to an evolving situation. With forward deployment, nuclear submarines could be almost anywhere in the world within 48 hours.

Flexibility - Without changing typical loadouts, the attack submarine can execute warfare tasks of ASW, anti-surface ship warfare (ASUW), strike warfare (STW) surveillance and electronic warfare. Submarines can also be provided specialized loadouts quickly so that they can land special warfare forces or conduct mine warfare. This versatility allows submarines to meet a variety of operational requirements, so that the military response can be tailored to the situation. Submarines provide a wide range of options for action.

Readiness - Results of exercises and real-world crises have shown that typically the first submarines can sail in 1 to 2 hours and a large number of the operational SSNs can be at sea within 48 hours.

Responsiveness - Robust world-wide two-way communications links allow submarines to respond promptly to any directive and with flexibility to multimission tasking.

SEA POWER

Stealth, endurance and agility each provide significant capabilities to the submarine. The submarine is the only force that combines these three characteristics in a single unit, and this provides exceptional value. This combination allows the submarine to perform a variety of missions which are vital elements of American sea power. Submarines can go wherever they are needed. Each submarine can maintain positive, precise control over the tactical situation, so that it is exposed to risk only when warranted by the gain in mission execution. Submarines can be particularly effective in forward crises because of their striking power, relative immunity to attack, and ability to operate without support. All submarine weapons are precision-guided munitions, allowing effective attack on specific targets with high reliability and precision.

Although the value of the combination of stealth, endurance, and agility has historically been underestimated, the submarine has always exploited these characteristics to achieve exceptional results in every role assigned. Future roles must focus on the effective use of these enduring characteristics.

FUTURE SUBMARINE ROLES

Recent events have left the world with only one true superpower -- the United States. The demise of the otherwise stabilizing bipolar world order has, to a great extent, *made the world safe for regional conflict*. The exact scenarios and orders of battle in such conflicts cannot be predicted. History suggests that in the future there will be frequent crises and conflict, fueled by ethnic and cultural differences, changing geopolitical structures, or competition for control of economic resources. The global interdependence of nations and nearly instantaneous

communications implies that many of these crises and conflicts will have consequences for the security of the United States.

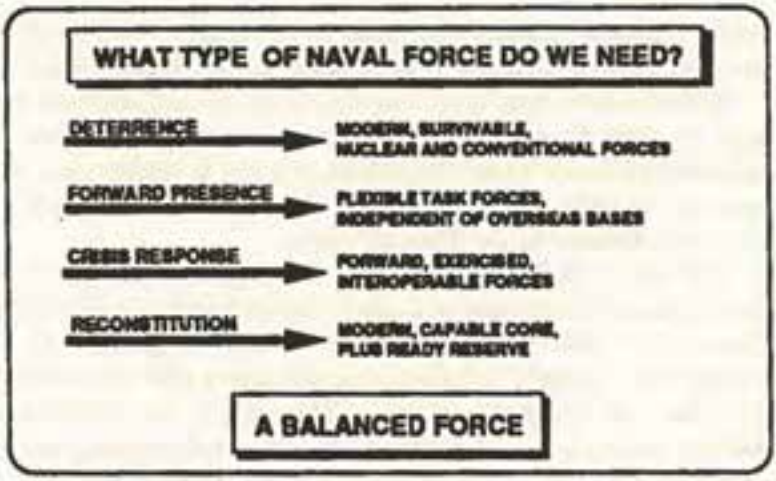
With the spectrum of threats so much less well defined and more broadly based, alertment to an impending crisis may be only several days. With foreign basing for U.S. forces curtailed, most forces that will be needed to respond to a crisis will be physically located in the United States.

The future defense agenda has been defined to consist of deterrence, forward presence, crisis response and reconstitution. These four pillars represent the military requirements to support our national interests and objectives and are so basic that they are likely to endure. The unique combination of stealth, endurance, and agility enables the submarine force to perform critical roles in implementing this defense agenda.

These roles are:

- Forward Presence
- Surveillance
- Deterrence
- Regional Sea Denial
- Precision Strike
- Task Group Support
- Ground Warfare Support

It is emphasized that a role is a part played by a force to achieve objectives. Military operations generally require that multiple forces, each with distinct characteristics, accomplish their parts in order to achieve objectives. Roles are assigned in consideration of both strategic objectives and capabilities of a force to contribute to achieving those objectives. Thus, the above roles will not necessarily be performed exclusively by submarines. For example, nuclear deterrence will continue to be performed by the triad of bombers, land-based intercontinental ballistic missiles, and ballistic missile submarines. **Similarly, submarine operations and missions in each role complement and enable those of other forces as part of a balanced joint force structure.**



Balanced Naval Forces to Support the Defense Agenda

The circumstances in which these roles are likely to be required of submarines and the nature of operations conducted in each role are discussed below.

Forward Presence - In this role, the submarine, as a U.S. capital asset, will support the defense agenda of forward presence through a spectrum of activities, such as forward deployments, combined exercises and operations, port visits, and military-to-military relations. These will be used to strengthen alliances, influence events, and foster regional stability, while complementing the more limited navies and military forces of many friends and allies.

Although this is not a new role for the submarine force, a greater degree of visibility will likely be needed to enhance the perception of global U.S. presence and commitment, to counter the image of American withdrawal as force reductions occur and fewer forces are forward deployed. The submarine's endurance allows it to perform this role without forward bases or logistic support. Stealth and agility can be used to orchestrate the image of the omnipresence of U.S. forces.

The visible presence of submarines in the Forward Presence role will be an unmistakable symbol of U.S. commitment to regional peace and stability. The potential presence of invisible submarines can multiply the effect of this symbology.

In the past year, submarines have conducted port visits in over 200 foreign cities around the world and operated with naval forces in a number of nations. These visits and operations clearly demonstrate American commitment to and interest in various regions of the world.

Surveillance - Covertness makes the submarine an exceptional maritime surveillance platform. The submarine can transmit real-time information to the National Command Authorities in time to avert or mitigate crises. The value of information derived from submarine surveillance operations will increase as available warning time decreases.

The submarine can also collect intelligence of long-term value because the adversary cannot tell when or if a submarine is present, so that information can be collected without affecting the observation. Submarines can conduct covert surveillance of surface ships such as the tracking of vessels suspected of carrying illegal arms or terrorists. Only the submarine can conduct covert surveillance of other submarines.

The Surveillance role can be executed in situations across the spectrum of levels of violence, including forward area surveillance to transmit early warning of threatening activities by potential adversaries and surveillance of forces that could conduct hostile acts against the United States or our allies.

An example of such operations occurred during the Falklands War. Two British submarines conducted surveillance from locations just outside Argentine territorial waters that were not safe for other surveillance assets. They were able to provide timely warning to the British Fleet of enemy aircraft sorties towards the Falklands.

Deterrence - The submarine force will play a critical role in deterrence of both nuclear and conventional conflict. The normal peacetime role of the ballistic missile submarine will continue to be nuclear deterrence, and, as long as a substantial nuclear strike capability against the United States exists, deterrence of nuclear attack will be the highest defense priority. The stealth of the submarine will make this component of the nuclear-deterrent triad the most survivable element against any eventuality.

The attack submarine will also contribute directly to nuclear deterrence by holding threat missile submarines at risk and indirectly as one of several means to verify arms control agreements.

Attack submarines will simultaneously continue their important role in conventional deterrence. In the role of conventional deterrence, the submarine force contributes by being an ubiquitous threat. Any potential adversary will be uncertain about the location of U.S. submarines, but will be certain that a submarine can deny use of the seas or conduct precision strikes ashore. Heretofore, the presence of a torpedo-firing submarine might not evoke the fear that is the cornerstone of deterrence; however, the current capability of the attack submarine to launch surprise precision cruise missile attacks, perhaps decapitating command and control, now adds another element to be considered by potential aggressors.

The stealth of the submarine allows it the freedom of movement to go where deterrence is required and to apply direct pressure anywhere needed. The deterrence provided by forward deployed submarines is analogous to that provided by unmarked police cars patrolling the highway. In this analogy, battle groups are the police cruisers.

Submarine stealth can also create uncertainty in potential adversaries. The ability of the submarine to choose to reveal itself, coupled with its mobility, can evoke the appearance of a large force. The submarine's stealth could be used to create deterrent pressure without any forces actually being present.

When used to increase deterrent pressure in an escalating crisis, the submarine's relative invulnerability can be vital in avoiding undesirable events that might occur if more vulnerable forces were present. In addition, the absence of a visible presence precludes inciting opinion against American *gunboat diplomacy*.

In short, the submarine has value as a perceived, but nonprovocative global presence. While the submarine alone may not cover the full spectrum of conventional deterrence sought through presence, its unique combination of capabilities provides significant support of this element of the defense agenda.

Regional Sea Denial - Submarines will be a lead force in establishing local sea superiority, which is necessary to conduct all naval operations, except submarine operations. The first step is to deny access to the area of interest by threat surface and subsurface forces. In contested areas, this is most readily accomplished by submarines because of their stealth, endurance, and agility.

Stealth enables submarines to operate in areas of interest where risks to friendly surface and air forces are unacceptable. In crisis situations that have escalated to conflict, the preeminent capability of the submarine for antisurface and antisubmarine warfare would be exercised to clear the area of threat maritime forces. Key forces to be defeated are likely to be diesel submarines and surface ships equipped with surface-to-surface and surface-to-air missiles. Further access to the contested area would be denied by interdiction of maritime forces departing port or by maintaining barriers around the area. Such operations would be enhanced by the submarine's endurance. The important offensive mining capability of the submarine could also be used to deny enemy use of the seas by closing ports or straits.

The utility of the submarine force in this role will most likely be greatest in areas close to an adversary's coast, where other forces may be at risk.

In the Falklands War, the sinking of the Argentine capital ship GENERAL BELGRANO by a British submarine had such a devastating impact that it was sufficient to deny the use of the seas to the Argentine Navy, essentially establishing Royal Navy sea superiority.

A principal use of submarines in regional conflict would be the early application of force to keep an adversary's maritime forces in port.

Precision Strike - This has become a new role for the attack submarine, with the accuracy and effectiveness of submarine-launched cruise missiles graphically demonstrated during Operation Desert Storm. The submarine can strike targets within 650 nautical miles of the coast with cruise missiles. This encompasses about 75% of the earth's landmass and includes most of the important potential targets.

The Global Reach of Submarine-Launched Tomahawk Land-Attack Missiles

The submarine provides a nonprovocative, low vulnerability, flexible method for conducting precision strike. The principal utility of submarine-launched precision strikes is to destroy fixed targets of significance, such as command and control facilities; to destroy targets that pose significant threats to other attacking forces, such as enemy air defense installations; or to destroy targets for which surprise is essential, such as offensive missile facilities. The number of missiles that can be fired at one time by a single submarine is not conducive to achieving saturation effects; however, a cruise missile attack using a force of submarines, composed of ten to twenty ships, can provide substantial land attack capability.

As an element of a coordinated strike, submarine-launched cruise missiles would be the vanguard element that attacks air defense, early warning, and communications facilities to reduce the threat against follow-on aircraft. The submarine enhances the performance of tactical air forces by suppressing air defenses, allowing more tactical air assets to conduct missions other than the suppression of those air defenses.

The stealth of the submarine allows it to get into position without pre-alerting or provoking the intended adversary. Just as important, stealth allows the submarine to exploit the element of surprise and to launch the attack without risk to the launching platform. The endurance of the submarine allows it

to be on station ready to conduct strikes for an extended period of time. The agility of the submarine allows it to get on station promptly and to respond quickly to launch directives and targeting changes. The precision weapons carried onboard allow the submarine to strike the designated target while minimizing the possibility and extent of any collateral damage.

During Operation Desert Storm, nuclear attack submarines LOUISVILLE and PITTSBURGH conducted effective Tomahawk strikes at key targets.

Task Group Support - This role would utilize the multimission capability of the submarine to enhance the effectiveness of task force operations. The task group might typically be a carrier battle group, but it could also be an amphibious force or underway replenishment group. The carrier battle groups of the future are likely to be fewer in number and smaller in size. In some cases, smaller task groups comprised of two or three cruisers, destroyers or frigates, and one or more submarines may be tasked to establish local sea superiority, provide forward presence, or project power in smaller regional conflicts or crises.

The submarine can operate in the Task Group Support role either independently or as an integrated component. The stealth of the submarine allows it to be the unseen eyes and ears of the task group. In this capacity, the submarine can operate with relative impunity in waters controlled by hostile forces, allowing U.S. surface ships to stay out of range of hostile fire. Its endurance allows the submarine to arrive on the scene before the task group, remain on station throughout the crisis, and depart well after the task group departs, if necessary. If the task group moves, the submarine can also move as directed. The agility of the submarine allows it to perform a number of missions as needed by the task group commander. For example, while conducting surveillance, the submarine could attack anti-air capable surface ships, eliminating that threat to friendly air forces and allowing tactical air assets and surface ships to conduct other missions. The submarine can provide friendly surface ships with over-the-horizon targeting for anti-ship missiles, intelligence reports on hostile force movements, and combat search and rescue. The submarine enables the task group to conduct its operations more effectively, while minimizing the risk of attack on elements of the task group.

During the Falklands War, the Royal Navy positioned submarines to shadow and report the movements of Argentine forces to protect the flank of the British task force.

Ground Warfare Support - The ability of the submarine to operate covertly close to hostile coastlines allows it to insert small groups of special operations forces for which surprise or secrecy is essential. Once ashore, these forces can perform critical missions in support of amphibious assaults or ground campaigns, including gunfire spotting, forward air control, target designation for air strikes, tactical intelligence, sabotage, and insurgency support. Although a single submarine is limited in the number of personnel it can carry, a recent exercise demonstrated that a group of these submarines could deliver a substantial force ashore. These types of covert submarine operations can also be used for the insertion or extraction of non-combatants. The submarine can also perform ground warfare support missions such as the collection of tactical intelligence or coastal reconnaissance in advance of amphibious operations.

The Ground Warfare Support role may overlap with the Precision Strike role, allowing the submarine to complement other available forces in conducting strikes ashore in support of ground combat. Submarines could provide the firepower for extensive destruction of key targets that pose difficulty for ground or air forces.

The Ground Warfare Support role of the submarine is essentially offensive in nature and would likely be conducted in crises that have escalated to conflict or in those in which conflict is imminent.

During World WAR II, submarines were used to insert and extract Major General Mark Clark into North Africa, behind enemy lines in preparation for the Allied invasion.

SUBMARINE ROLES SUMMARIZED

Future submarine roles will be significant contributors to establishing and maintaining stability in an era of uncertainty. These roles will complement other military forces in achieving national objectives, yet the inherent combination of stealth, endurance, and agility allows the submarine to perform missions which no other force can accomplish. Versatility allows the

submarine to perform more than one role simultaneously, if tasked. The following figure illustrates the way that submarines can execute vital roles across the spectrum of levels of violence in the operational continuum.

Submarine Roles in the Operational Continuum

CAVEAT

The foregoing roles for submarines were derived from consideration of the effective use of their unique combination of stealth, endurance, and agility to implement the defense agenda in a new world order in which the former Soviet Union is not a threat to U.S. interests. Threat implies some malicious intent. At this time, the states which comprise the Commonwealth of Independent States demonstrate little malicious intent toward the United States, but retain formidable military and naval capabilities. These capabilities represent a potential 'hazard' to our national security, but not a malicious 'threat'. Until those capabilities diminish significantly, it is prudent to continue to plan for the primary attack submarine role that evolved during the Cold War -- antisubmarine warfare -- while shifting our emphasis to account for regional conflicts. As the former Soviet military capability declines, submarine roles will evolve as discussed in this paper.

AFFORDABILITY

In spite of the capabilities provided by the submarine force, there remains the issue of affordability. Although an in-depth consideration of this issue is beyond the scope of this paper, there are two points that should be made. First, submarines cost less to operate than do other capital ships. In the 1992 budget, submarines comprised over 30% of U.S. Navy combatant ships, but required only 17% of the operating funds. Submarine manning requires only 7% of the naval personnel and only 11% if tender support personnel are included.

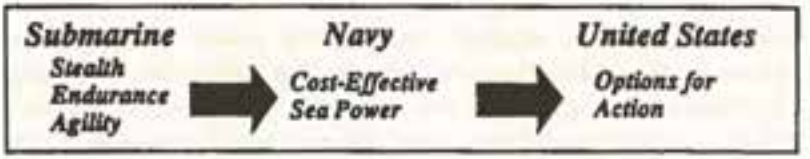
The second point is that like other modern ships, submarines must go to sea to sharpen professional skills. Unlike other ships, however, the cost of operating a submarine at sea is only slightly greater than keeping it in port, and, once a submarine is at sea, it does not cost any more to forward deploy it than it does to operate it locally.

CONCLUSION

The U.S. submarine force will have critical roles to perform as a component of a balanced force needed to provide a variety of responses in the future. Specifically, nuclear submarines are uniquely capable of operating in harm's way with minimal risk. They can provide the first sustained presence in a contested region for surveillance, indication and warning, neutralization of diesel submarines and missile-firing surface ship threats to our task groups, insertion of special forces for clandestine operations, and/or launching the first precision salvo of a coordinated strike ashore. The submarine along with other joint forces allow the National Command Authorities and the Joint Chiefs of Staff to take a variety of actions with positive control, deter crisis development, tamp down a smoldering conflict, contain conflicts that do occur, and quickly prevail if conflicts encompass U.S. forces and interests. Because of the options for action that can be executed using the submarine, the submarine force provides a large number of arrows for the quiver needed to achieve our national objectives.

When costs of submarines are analyzed and compared to the benefits these ships provide, the submarine is a bargain. Most importantly, the costs of world events that might occur without the balanced forces needed for the new world order make it unaffordable not to maintain an effective submarine force.

It should not be forgotten that the Cold War was won through strength: political strength, economic strength, military strength, and strength of resolve. Weakness in any of these areas at many points along the way might have resulted in a far different outcome. These same strengths will surely be required to maintain our national security in the future. The characteristics of the submarine enable it to serve in critical roles needed to provide the military strength and options for action that will be necessary in the future. Failure to provide an adequate submarine force that is capable of performing these roles would be shortsighted and reminiscent of strategic errors made following wars in the past.



IN HARM'S WAY: Orderings and Observations

by Robert B. Pirie, Jr.

The uncertain future lying ahead for the security establishment of the United States obviously has some rocks and shoals for which the U.S. Navy, and the Submarine Force in particular, will have to be especially vigilant. In addition to keeping an alert watch for uncharted hazards, a prudent navigator also reviews all the Sailing Direction-like information for the seaway he is traveling. The purpose here is to point out the general geography through which the Navy will be sailing in the days ahead, to indicate the location of known dangers, and to emphasize the probability of encountering unforseen difficulties. In the year and a half since President Bush's Aspen speech outlining plans for the post-cold war U.S. strategic posture, two points have become obvious. First, that the reconfiguration of the military is being discussed on several levels, with a growing debate about national purpose taking precedence over force structure questions. In addition, although our fiscal problems seem to encourage quick action, the final answers to those force structure questions do not appear to be easily resolved. Thoughtful appraisal of the multi-dimensional problems facing the Navy seem necessary to help in considering the possibilities for the uncertain future. In an effort to encourage and inform those considerations some observations about a recent book with just that focus are offered.

IN HARM'S WAY:
AMERICAN SEAPOWER AND THE 21ST CENTURY
by Harlan K. Ullman. Silver Spring, MD: Bartleby Press
271pp.

The title of this book instantly betrays the author's concern for the future of the Navy, and by implication, the country. The end of the Soviet Union has made necessary a major review of the kinds and amounts of military forces needed to protect our national security. Such a review is appropriate and potentially a good thing. Unfortunately it is taking place during a protracted and very unpleasant recession, at a time when many domestic concerns press for urgent action, and, now, in an election year. We are already seeing the results. Hardly had the ink dried on the 25% force cut and the new, supposedly

enduring base force, than we embarked on a new round of cuts, heralded by the President's state of the union address. There is now no evident floor for the defense budget, at least not one supported by a theory of requirements.

Into this breach has stepped Dr. Harlan Ullman. He is not alone. But his focus on the problems that confront our Navy will be of interest to readers of this periodical. He can also argue that he was ahead of his time, since the book was published in August of 1991 and begun more than a year before that. It is not easy to write about a subject that is in tumultuous change before your eyes. Undaunted, Ullman steps up to the task, observing that "...'true north' is the realization that the Navy must make do with far less in a strategic environment where the basic assumptions and solutions of the past will no longer be sufficient for defining many future tasks."

Dr. Michael Nacht, Dean of National Security Studies at the University of Maryland, identifies four schools of thought on framing issues of national security in our current circumstances. The first school believes that the world situation has eased, but that the fundamental confrontation between the USA and Russia for world power and influence remains, and that a successor state to the USSR will again pose a serious military challenge to the West. A second school believes that the world has been fundamentally changed in the past two years in ways that are irreversible. Their view is that the U.S. cannot continue to be the world's policeman, but must remain selectively engaged abroad in places where we have strong interests. This school is typified by Zbigniew Brzezinski. A third school may be termed the Geo-economic school. For them the world has also been fundamentally changed, but for them the global competition for power and influence has been shifted to the sphere of economics. They see the struggle for world markets and resources as unlimited, with winners and losers -- the latter doomed to impoverishment and *third-worldization*. A principal exponent of this view is Edward Luttwak. Finally, a last group sees the dawn of a new age in which nations are equal before the law, and in which the United States has no special claim to leadership or responsibilities for world order.

Dr. Ullman fits none of these categories particularly well. He frames his analysis in terms of what he calls four "battle ensigns" -- four issue areas that are each vital to the Navy's

future. **They are strategy, domestic environment, infrastructure and operations.** The result, as readers will anticipate, cuts across the lines of Nacht's schools of thought, often in ways that are quite interesting. Clearly, dealing with the domestic environment -- the elusive matter of the national will -- is the key to solving our problems of competitiveness as well as developing the resolve to use our international status affirmatively and constructively. **Ullman sees the domestic environment as perhaps the most perplexing of the questions facing the Navy.** Although he doesn't say it explicitly he implies that this is because **the domestic debate is about issues far broader than the usefulness of military forces in the new world order.** Whatever the case, Ullman sees three options: (1) Continue to stonewall; (2) A sort of naval *glasnost*; and, (3) Some combination of the two. He is not attracted to further stonewalling but believes that being completely candid with the Congress might "...dilute naval control over naval matters by relegating them to a highly amorphous Congress." He favors the combination approach, and concludes, somewhat ambiguously, "...the next version of the maritime strategy may best be designed with the domestic environment paramount."

The new strategy, in Ullman's view, will feature two new elements. The first is to promote and protect international stability. By this the author apparently means the exercise of influence and management of crises in ways to avoid challenges to U.S. interests. This is clearly consistent with Nacht's school of selective engagement. The second new element is that the Navy should serve as a "transitional force." That is, as an insurance policy against things going badly wrong on the international scene. **The Navy, in this concept, would be most likely to be first on the scene of confrontation or conflict. Marines and Navy task forces would stabilize such situations locally or secure lodgements that would enable insertion of Army and Air Force units as needed. This is very likely an idea whose time has come.** While it has always been implicit in Title Ten, the long cold war, featuring a face-off in Central Europe, has led to the atrophy of the notion of Navy expeditionary forces. We are bound to hear more on this subject in the future.

On the infrastructure issue Ullman points first to the fact that the base structure -- 500 bases at home and over 90 abroad

– is a legacy of World War Two, **and no longer appropriate to a Navy of 450 or fewer ships.** Whether the structure can be shrunk and rationalized is a question not trivially related to the question of political will. Ullman's view is that it will take a comprehensive and cooperative effort involving OSD, the White House, Congress and the public to resolve the issue. He is not explicit on how to mount such an effort. **It is certainly true that we cannot afford the base structure we have now,** any more than we can afford to retain substantial overcapacity in military aircraft manufacturing or in naval shipbuilding. But the devil is in the details here, and one could wish that Ullman had pursued this issue further.

The last of Ullman's "battle ensigns" is operational issues. Here he raises **the perennial issue of how to package naval forces to achieve desired effects without incurring undue risks.** Must a battle force always include a large deck aircraft carrier? The author explores the alternatives from *super-super* carriers of 250-300,000 tons to much smaller air-capable ships. He appears to lean to the conclusion that large carriers will not always be needed in the future, but points out at the same time that technology and the proliferation of advanced weapons are driving warships of all types towards larger, multi-purpose configurations.

The analysis of the issue areas outlined above leads Ullman to conclude that "...the Navy should have at its core 8 to 9 CVBGs or their equivalents, about 350 ships, and a MEB assault capability on both coasts." This is assuming that the Russians behave. The author believes that in getting from where we are now to the minimum core goal we should engage the Russians in a naval arms control dialogue to ensure their good behavior. In any case the ships that are made excess in going to the core force should, in his view, **be laid away in inactive status as a *fleet in being* against the emergence of a greater than anticipated threat.** This interesting idea corresponds closely with that of *reconstitution* as advanced in current versions of the National Military Strategy. Exactly how, and how fast the fleet in being could be brought on line is left by Ullman to later, detailed study.

Unfortunately the author leaves a good deal in this book to further detailed study. The book abounds with interesting ideas and insights. But much of the hard work is left to the interest-

ed student. The Administration and Congress must get together and solve the infrastructure problem and the mess that the acquisition system is in. Our foreign policy goals and objectives must be clearly articulated so that military leaders may build appropriate force packages that Congress will approve because they are right for national security. The intelligence community must rid itself of its preoccupation with the Red Menace and become expert on the regional bad actors who will be the real troublemakers of the future. It is hard to disagree with all this. It would be stupid to disagree. But these issues have been around for some time, and had they been easy to solve no doubt someone would have done it.

These qualifications should not deter people from reading this book. Ullman has a lively intellect, an interesting style, and many challenging ideas. These ideas, among others, will be in play as the country decides on the nature of its future military forces. They are well worth knowing about, debating, and developing as we go forward.

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SUBMARINES IN THE NEW WORLD ORDER

by Vice Admiral Bernard Kauderer, USN(Ret.)

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A major contributor to our victory in the Cold war was the strength and readiness of the U.S. Navy, which enabled it to respond to and counter threats worldwide. Our technically superior nuclear submarines played an essential, but generally unheralded, role in that extended conflict. However, a proposed hiatus in submarine construction places at risk the tactical advantage our submarines have long enjoyed, and sets the stage for a loss of our technological lead to one or more emerging undersea warfare powers.

The President's Fiscal Year 1993 Budget calls for termination of the SEAWOLF submarine program, a decision based ostensibly on the premise that the collapse of the Soviet Union obviates the need for such a powerful and expensive ship. The decision process, however, may not have considered the broad potential military value of the modern nuclear submarine relative to other weapons systems. A unique combination of stealth, mobility, firepower, and endurance in one cost-effective envelope, submarines provide a responsive and survivable counter to any threat that might confront our nation in an era of increasing global uncertainty.

The nuclear attack submarine is a versatile warfighting (peace-keeping) machine. Of the many tasks to which it might be assigned, there are some which only a submarine can do, and some which only a submarine can do with acceptable risk. In justifying the need for a new class of SSNs, it is necessary to show that the missions for which it is intended are such that its availability in significant numbers is essential, and that alternatives, such as other platforms or systems, would entail too great a risk (i.e. casualties and prisoners of war), have too limited effectiveness, or cost much more in the aggregate for the same levels of availability, effectiveness and survivability than would the use of submarines. Such analyses, with attendant debate, are ongoing at this time, with the fate (force size and mix, capabilities, etc.) of the future submarine fleet dependent on the outcome.

The defining attributes of a modern nuclear submarine such as SEAWOLF are its potential for covertness (the tactical advantage of surprise!) in combination with firepower, mobility, and greater endurance. Considered in relation to the varied missions for which it can be employed, it is useful to focus on those core missions for which there is no realistically practical alternative to an advanced nuclear submarine, and to derive the performance and capabilities from these.

The core missions which are indisputably within the special purview of modern nuclear attack submarines include forward area anti-submarine warfare, covert intelligence collection, anti-surface warfare in the absence of adequate air or sea control by friendly forces, and covert mine warfare. Other missions that exploit the inherent stealth of SSNs include precision strike warfare (land attack with submerged launch cruise missiles), and special warfare (covert insertion and extraction of special forces). Attack submarines are also capable of performing anti-submarine barrier missions and area search, combined operations with air and surface anti-submarine forces, and of providing a variety of missions in support of naval task groups.

These core missions are fundamental to the operational employment of submarines. There will be a continuing need for submarines capable of performing such missions, independent of the rapidly changing world situation. Although the nature of the threat may vary, and the scenario may shift from one environment to another, the basic requirements remain, i.e., there will be a need for covert, independent operation, and only a nuclear submarine would be capable of executing the mission.

On August 2, 1990, President Bush first enunciated the basic tenets of the new national security strategy in a speech at the Aspen Institute. This strategy was formally set forth by the President in the National Security Strategy of the United States, August 1991. In turn, the Defense Agenda of the *National Security Strategy* was implemented by the Chairman, Joint Chiefs of Staff, in the National Military Strategy 1992. That Strategy is founded upon four elements: Strategic Deterrence and Defense; Forward Presence; Crisis Response; and Reconstitution. The modern multi-mission nuclear submarine contributes to each.

In Strategic Deterrence, a force of 18 OHIO Class Trident ballistic missile submarines will constitute the nation's funda-

mental and most survivable nuclear deterrent, and our advanced attack submarine force, through firepower and inherent stealth, serves even now as a potent conventional deterrent. SSNs deployed far forward in areas not tenable by other forces provide a ready response to crises worldwide, sustainable for extended periods without external logistics support, fulfilling the Forward Presence role. For Crisis Response, SSNs maintain a constant readiness to deploy rapidly, with great endurance, and an ability to execute a variety of missions in global or regional conflicts. The nuclear submarine force, comprising the most complex warfighting platform in our arsenal, however ,cannot be *Reconstituted* as envisioned in the Strategy. Hence, there is a valid need for a robust and viable submarine industrial base ready to augment the highly cost-effective, combat ready, and responsive force-in-being.

During the decades of the Cold War, a force of 100 nuclear attack submarines was accepted as an affordable goal. Approached asymptomatically, but never attained, the actual force level is currently in rapid decline, exacerbated by the early decommissioning of the early '60s technology STURGEON SSN-637 Class for budgetary reasons. Today's *base force* includes 80 SSNs, but the future is not bright for that number either. The proposed termination of SEAWOLF, coupled with any action to delay the Centurion New SSN, would lead to a force level of less than 40 early in the next century, assuming that the LOS ANGELES Class is overhauled and refueled as originally planned to reach a full 30-year operational lifetime.

The submarine technology and industrial base issues are complex and not very well understood outside of the Submarine Community. Stringent requirements limit construction of nuclear submarines to shipyards with large, experienced engineering staffs and highly trained and qualified production work forces. The discipline and commitment inherent in submarine and submarine system design and construction have been developed over several decades, and, if lost, would be extremely difficult, if not impracticable, to reestablish. To further complicate the problem, for certain unique submarine components, only single suppliers remain. Any interruption in the submarine construction cycle would close the doors of even those vendors. We are in danger of losing a national asset!

The need to control the seas in support of national security objectives will not diminish. As the availability of forward bases decreases, the value of forces that can operate independent of those bases and long logistics chains will increase. Stealth, endurance, and mobility each provide significant and unique capabilities to the submarine; the combination in one warfighting platform provides exceptional flexibility and value to the National Command Authority and his subordinates at any level. Enlightened and visionary leaders are beginning to recognize that value.

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NSL

WHAT DO YOU GET WITH AN SSN?

by LCDR P. Kevin Peppe, USN

So all of a sudden, poof, you're the Assistant Chief of Naval Operations, Undersea Warfare. You come to this new and wonderful life in front of the House Armed Services Committee, pondering the Chairman's question.

"I, like the rest of my esteemed colleagues, am a great fan of our ballistic missile submarine force. Many here today contend that these ships were in large part responsible for bringing an end to the cold war. And your people are doing a super job with those fantastic ships. But, Admiral, just what is it we get out of those fast attack submarines of yours, and exactly how many of them do we really need?"

O.K., don't panic. It's a fair question, especially in light of significant defense spending cuts and increasing pressure on Congress to produce on this *peace dividend*, sweeping changes in the nature of what for years has been our principle maritime threat and, last but not least, the high costs associated with new submarines. I mean construction funds for naval vessels in general, and nuclear submarines in particular, provide very attractive targets to civil servants laboring under those blinder-like green eye shades.

But geez guys, I thought all these three stars did was travel around the country giving speeches at retirement and commissioning ceremonies. And I don't suppose the congressmen or these folks here from CNN are about to cut me a break because I've only been Top Dog for about 30 seconds. No, I don't think so.

"Mr. Chairman. If I may, let me begin by talking about a few things you definitely **won't** get when you put an American hunter-killer submarine to work. What you **won't** get is Americans vulnerable to a primitive SCUD ballistic missile attack. What you **won't** get is Americans and a front-line U.S. warship vulnerable to a stray Exocet cruise missile that manages to penetrate anti-ship defenses. What you **won't** get are American aviators vuinerable to third world anti-aircraft fire. These gentlemen, are just a few of the things you **don't** get when you put a submarine to work.

"What you get, Mr. Chairman, is an invulnerable, independent U.S. instrument of war, fully capable of handling a wide

spectrum of national taskings. Throughout what follows, gentlemen, I ask you to keep the following fundamental truths in mind.

"First, no nation today is capable of hazarding a front-line American submarine in the prosecution of any of it's missions. Countless fleet and NATO exercises and near continuous *routine* operations in and amongst the most advanced anti-submarine forces in the world bear witness to this fact. Further, I'm unreservedly confident that this invulnerability will characterize our submarine forces well into the next century.

"Second, American submarines are able to conduct these many missions independent of other forces. Anti-aircraft support in the form of up to 80 aircraft is not required. Anti-missile AEGIS Cruisers are not required. Anti-torpedo Arleigh Burke Destroyers also are not required. Refueling and logistic support ships and aircraft are not required either. No, these forces, so vital in the defense of other naval vessels, most notably the aircraft carrier, are absolutely not required in support of American hunter-killer submarines.

"What do you get when you put an SSN to work? You get a warship, operating independent of any other national assets, fully capable of putting an opposing navy on the bottom. Not just the carrier, not just the cruiser, the entire sea-going navy. An incredible, audacious claim? Maybe. The truth? Definitely.

"American submarines carry sufficient torpedoes, in the form of Mk-48s and Advanced Capability Mk-48s, and cruise missiles, in the form of Tomahawks and Harpoons, to sink or completely debilitate all but a very, very few of the worlds navies. Seasoned by decades of front-line experience, crewed by the brightest warriors our nation has ever fielded, employing the most technologically advanced warship the world has ever known, this extraordinary potential is resident in each and every one of our operating submarines. While certainly primary, this is by no means our only mission.

"You get a warship capable of covertly mining and thereby closing the exit of an enemy's key ports. American submarines are able to load, carry, and deploy a variety of both anti-shipping and anti-submarine mines. Properly employed, anticipating the deployment of hostile warships, this capability, or perhaps more subtly, the threat of exercising such a capability, has proven extremely effective in denying an opponent

access to the open sea. While clearly important in keeping an enemy's maritime forces bottled up, the true value of such an option may be in completely shutting down a nation's maritime trade, those vital sea lines of communication without which most potential adversaries must soon sue for peace.

"What do you get when you put an SSN to work? You get a warship fully capable of destroying key enemy land-based instruments of war. From airfields to command posts to Surface-to-Air Missile sites, any and all are fair game.

"American hunter-killer submarines have the battle-proven capability of precisely employing Tomahawk land attack cruise missiles against vital enemy targets. Relying on its intrinsic invulnerability, a submarine might position itself in international waters off an adversary's coast and successfully hazard critical land-based targets over 500 miles inland. A quick glance at the globe will suffice to show just how much of the world falls under the submarine's cruise missile umbrella.

"You get a warship capable of denying the seas to any opponent. From blockade to quarantine, the presence, or even perceived presence, of a single U.S. Attack Submarine is sufficient to keep a nation's entire sea-going fleet tied up to their piers. From warships to cruise liners, from containerships to oilers, recent history has aptly demonstrated the nuclear submarine's sea-denial capability.

"Those, gentlemen, are the principle things you get when you put an American submarine to work. A quiet instrument when it needs to be, positioning itself covertly near a potential troublespot, it carries with it neither signal nor suspicion. Just so, it might quietly leave, the crisis having been resolved at the diplomatic level, no one the worse for it's work.

"If diplomacy fails, there is simple presence. Knowing an American submarine stands ready to engage will lead all but the very foolish to sue for peace. It's potential is undeniable.

"And in the absence of sense, there is offense. Able to unleash horrific destruction both at sea and ashore, this weapons system, in and of itself, may well prove enough to bring the antagonist to his knees. An independent, invulnerable instrument of war.

"Finally, then, there's the question of numbers. How many is too many; how many not enough? History and the Beltway are chock-a-block full of those in the business of trying to

answer this most difficult question. The truth is, I can no more tell you how many of them I need than I can tell you where the next war will be fought, or with whom. I can't tell you how many, but I can provide a little food for thought on this most pressing of questions.

"A national security policy, much like your own automobile insurance policy, is a long-haul investment in an uncertain future. While no one can be certain as to what tomorrow might bring to you and your automobile, you can do your level best to cover those most likely possibilities, from collision to theft to acts of God, while shopping around for your best insurance value.

"Just so is considering submarines as an integral part of our nations security policy. No one today can predict what tomorrow might bring, thus estimates of force size based on this or that possibility are only conditional projections. However, a reasonable man might develop the following logic. Conflict between nations has not ceased. Our United States will, at some point in it's future, once again become involved in hostilities requiring the use of maritime power. Further, when such issues do arise, they will not generally be of a nature to allow time for this nation to build more warships. That simply is not the nature of war at sea today. In today's vernacular, it will probably be a *come-as-you-are party*, the number of submarines we start with will set an upper limit on the number we finish with.

"Pressing the insurance analogy a bit further, consider this; you here today, quite unlike the typical consumer, have a far greater chore than simply deciding how much. You have the responsibility of ensuring that the business is fairly run, that the consumer gets a reasonable return on his policy dollar, that the market is robust enough to ensure survival over the long run, and that when we really need the product we've so diligently invested in over the years, it'll be there.

"In the world of automobile insurance, much like the rest of our consumer markets, competition is key to value.

"And the analogy holds. In making this extremely important investment in our country's future it is not enough to consider the type and amount of coverage we need to purchase. Issues of value must be addressed. Further, we'd like to enjoy the certainty of knowing that in time of need the company we've

invested so much in will be there for us.

"The continued health and vigor of both of our nation's submarine building yards must be maintained. And this is not a plea for maintaining the status quo in terms of submarine spending. What is important is that the nation's ability to competitively design and build the world's finest submarine value be retained. What is important is that the necessary tooling and production facilities be continuously maintained, exercised, and improved as the situation demands. What is important is that we retain the highly skilled labor force necessary to continue this very technical building program. What is important is the cadre of specialized submarine engineers and designers required to upgrade the ships of today and to further the submarines of tomorrow.

"It is these arguments then, arguments which speak to a long-haul investment in our country's future which, by and large, should dictate the size of our security policy. Production of multi-mission hunter-killer submarines at competitive building yards, priced so as not to tie up the preponderance of our nation's shipbuilding funds, is the requirement by which we should size our submarine building program. If this translates into one platform per year per yard, then that's the level below which we cannot afford to fall. If this means we professionals of the force must sacrifice some of the things we'd like in a submarine, in order to get a platform the cost of which will facilitate these competitive ends, then that is what should be done.

"Gentlemen. Carefully consider today's realities. Consider the enormous social and political costs associated with the loss of U.S. lives in combat overseas. Consider the inexorable trend of diminishing defense spending, rising overseas commitments, and increased international dependency. Consider America's history, her future, as inexorably tied to the sea, as the world's predominant maritime power. A reflective, deliberate body such as this will soon arrive at the inescapable realization that the future of these United States, even more than her past, will depend mightily on control of the sea, on our ability to protect and defend vital overseas interests, and, in the words of today's foremost military historian John Keegan, on "...the submarine as the predominant weapon of power at sea..." I am confident that, in the near future, Presidents of these United States and

members of this esteemed body will not ask "Where are the Carriers", but instead, "Where are the Submarines?"

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THE SUBMARINE REVIEW

THE SUBMARINE REVIEW is a quarterly publication of the Naval Submarine League. It is a forum for discussion of submarine matters. Not only are the ideas of its members to be reflected in the REVIEW, but those of others as well, who are interested in submarines and submarining.

Articles for this publication will be accepted on any subject closely related to submarine matters. Their length should be a maximum of about 2500 words. The content of articles is of first importance in their selection for the REVIEW. Editing of articles for clarity may be necessary, since important ideas should be readily understood by the readers of the REVIEW.

A stipend of up to $200.00 will be paid for each major article published. Annually, three articles are selected for special recognition and an honorarium of up to $400.00 will be awarded to the authors. **Articles accepted for publication in the REVIEW become the property of the Naval Submarine League.** The views expressed by the authors are their own and are not to be construed to be those of the Naval Submarine League. In those instances where the NSL has taken and published an official position or view, specific reference to that fact will accompany the article.

Comments on articles and brief discussion items are welcomed to make the SUBMARINE REVIEW a dynamic reflection of the League's interest in submarines. The success of this magazine is up to those persons who have such a dedicated interest in submarines that they want to keep alive the submarine past, help with present submarine problems and be influential in guiding the future of submarines in the U.S. Navy.

Articles should be submitted to the Editor, SUBMARINE REVIEW, P.O. Box 1146, Annandale, VA 22003.

IN A WORLD OF POTENTIAL NUCLEAR PROLIFERATION, THE SUBMARINE IS THE SHIP OF CHOICE.

In 1992, the nuclear submarine is the only U.S. platform that has no opposition. U.S. attack submarines control the seas — and with cruise missiles, they can strike land areas containing over 90% of the world's people. Even if a renegade nation gains nuclear weapons, U.S. nuclear submarines will not be endangered. In any scenario, they are far less vulnerable than any other kind of air, land, or sea platform. Because future threats are so diverse and unpredictable, construction of submarines is the wisest choice today. For the foreseeable future, no potential opponent, with any known weapon system, will be able to counter U.S. nuclear submarines.

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ULTRA REVISITED

by CDR John D. Alden, USN(Ret.)

[Ed. Note: CDR Alden is the author of The Fleet Submarine in the U.S. Navy.]

Many U.S. submariners of World War II are convinced that the official postwar assessment of credit (Japanese Naval and Merchant Shipping Losses During World War II by All Causes, Joint Army-Navy Assessment Committee, Washington, D.C.: U.S. Government Printing Office, 1947 - *Referred to as JANAC*) failed to account for many ships that they believed, at the time, to have sunk. More recent analysis of Japanese sources (Alden, John D., U.S. Submarine Attacks During World War II, Annapolis, MD, Naval Institute Press, 1989) has shown that many such cases can be explained by the self-imposed rules that limited the JANAC assessment to sinkings only of regular Japanese warships and merchant vessels of 500 or more gross tons. This excluded all cases of damage short of sinking and also many smaller warships converted from merchant types, such as submarine chasers, minesweepers, patrol craft, picket boats, and various auxiliary types. When such targets are accounted for, there still remain several hundred unexplained cases where sinkings or damage had been claimed during the war.

About two years ago CAPT Roger Pineau directed my attention to some recently declassified records of so-called Ultra intercepts, available at the National Archives and the Naval Historical Center (Allied Claims and Enemy Confirmation of Damage to Japanese Ships, CNO Pacific Strategic Intelligence Section, SRH 184, Record Group 457, National Archives). The records in question, although sketchy and incomplete, nevertheless proved very useful from several viewpoints. First, they confirmed most of the sinkings officially credited to specific submarines as well as most of the cases of damage listed in the Japanese postwar summaries. (It appears that JANAC had access to much, if not all, of the Ultra data). Second, they shed light on many attacks for which hits were claimed but the target was not identified up to this time. Third, they raise some serious questions about the use, or non-use, of the Ultra information during the war.

In the first instance, the close correspondence between the

Ultra intercepts and postwar records provides confidence in the accuracy of both. The fact that the Japanese, unaware that they were being intercepted, had no hesitation in reporting ship casualties, further supports the reliability of the Ultra information. Although I have identified some apparent errors in every source examined, JANAC and the Ultra records are remarkably clean. On the other hand, the intercept data cannot be accepted at face value without further checking and verification. This is because of the inherent uncertainties in the interception, decryption, and translation of the Japanese messages. Without going into detail, the records examined contain many gaps due to incomplete reception of the message; in many cases the ships involved cannot be identified. Similarly, ships referred to by their radio call signs may have been misidentified because of garbles and the lack of accurate information during the war. Also, many of the messages were decrypted and translated only in part because of the press of more urgent work. Finally, there were problems in translating and interpreting the Japanese text. For example, many Japanese ship names can have more than one meaning, and cases of incorrect interpretation are well known. Also, there are many cases where different ships had the same name, leading to confusion in the identification of the ones actually attacked.

The above caveats aside, I have found about 650 cases where the Ultra messages throw some light on hitherto unconfirmed attacks, about 55 percent by torpedo and the rest by gunfire or other means. (Gunfire attacks were made almost entirely on very small craft; while they are of considerable interest, they will be excluded from further analysis in this article.) A few of the torpedo attacks in question were made by British or Dutch submarines, but the overwhelming majority involved only U.S. subs. In about 240 cases the Ultra messages identify, to some extent, the Japanese ship attacked, either by name, radio call sign, or the convoy of which it was a part. Although the remaining cases are less definitive, all provide information that should be useful in tracking down further material in the Japanese archives.

A particularly significant finding, although one that will be a major disappointment to the submarine skippers concerned, is that **over 200 of the above intercepts, or about 57 percent, confirmed that the torpedoes missed or were evaded.** This

finding was so intriguing that I went back to the original patrol reports and reviewed every case where hits had been claimed, but not verified postwar, to see what evidence had been cited to support the claim of sinking or damage. In the great majority of such cases I found that the claims were based on inconclusive evidence such as timed explosions heard, distant flashes seen at night, pips fading from radar screens, screws no longer heard on sonar, breaking-up noises, etc. In some cases, the evidence was visible and apparently dramatic -- columns of smoke or spray, ships appearing to stop, list or settle by the bow or stern, or even blow up violently. Yet even in many of the most convincing cases, Ultra messages unequivocally reported that little or no damage had been incurred, and no contrary evidence has ever come to light.

The following examples will illustrate the quality of the Ultra material.

On 1 Nov 1943, **Davenport** in the HADDOCK (SS-231) reported a 7,000-ton transport burned and sunk in 15 minutes, leaving many survivors in the water, and a 4,100-ton AK sunk immediately after being hit by a single torpedo. Ultra identified these ships as the TATEISHI (a cable layer) and the KITAGAMI MARU, neither damaged. (Because of Davenport's vivid and detailed description, I consider this case open to the possibility that some damage was caused; however, the TATEISHI is known to have been sunk in 1945 and the KITAGAMI MARU presumably survived the war.)

On 9 Nov 1943, **Gross** in the SEAWOLF (SS-197) saw and heard explosions on a 5,000-ton AK, and was credited with damage. Ultra intercepted a message from the HOKURIKU MARU reporting torpedo tracks sighted, no damage.

The next day **Waterman** in the BARB (SS-220) claimed an 8,000-ton AK sunk and another of 5,600-ton damaged by torpedoes that were seen to hit. Ultra identified these ships as the YAMAHAGI MARU and NISHI MARU, plus three other ships in the same convoy, and said only the NISHI MARU might have been damaged. (It was sunk on 13 November 1944 by carrier-based aircraft.)

On 18 Nov 1943, **Munson** in the CREVALLE (SS-291) reported four hits with a big explosion at the bow of an escort carrier and claimed a sinking. Ultra reported that the converted

aircraft transport AKITSU MARU received no damage from three torpedoes.

Harral in the RAY (SS-271) on 26 Nov 1943, claimed a 4,500-ton AK sunk on the basis of hits seen and heard, the target's pip disappearing from the radar scope, and the absence of the ship from its convoy the next morning. An Ultra intercept from the SUMIYOSHI MARU reported no damage from two torpedoes.

On 27 April 1944, **Harlfinger** in the TRIGGER (SS-237) fired four torpedoes at three 7,500-ton passenger/cargo ships and reported that one exploded and sank, another settled by the stern and sank, and the third was believed sunk after last being seen stopped and down by the stern. Ultra confirmed that the MIIKE MARU had sunk, but reported that the NOTO MARU and TOSAN MARU were undamaged.

MacMillan in the THRESHER (SS-200) fired six torpedoes at a convoy on 16 July 1944, saw three pips disappear from the radar, and claimed a destroyer and two AKs. Ultra confirmed the attack, identified the convoy as TAMA 21C, and reported YURIN MARU and SHOSAN MARU as probably sunk.

The Ultra messages also provided valuable details about the extent of damage and the survivability of Japanese ships. For example, the fleet oiler SHIRETOKO was reported sunk on 13 September 1943 by **Bennett** in the PERMIT (SS-178), who last saw it low in the water. Ultra reported that it was being towed to Japan. On 13 November, **Schmidt** in the SCORPION (SS-278) damaged the tanker, which Ultra said was being towed to Sasebo, where it remained under repair until May 1944. Then on 7 October 1944, it received two torpedoes from the COD (SS-224) under **Adkins** and three from the RAY (SS-271) under **Kinsella**, who saw the oiler limp into port. Ultra confirmed the COD's hits but said the RAY's were avoided and the ship ultimately reached Singapore. (It was finally sunk by Army aircraft on 1 Feb 1945.)

Based on the combination of Ultra and patrol report evidence, I have made my independent assessment of the approximately 350 Ultra messages reporting torpedo attacks, as shown in Table 1.

Further, having re-evaluated almost 2,900 reported torpedo attacks, I believe the majority of the remaining unverified attacks by U.S. and allied submarines can now be explained by

TABLE I

PREVIOUSLY UNCONFIRMED TORPEDO ATTACKS IDENTIFIED BY ULTRA

	RESULTS CLAIMED IN PATROL REPORTS			
	Sunk	Damaged	Missed	Total
No. of Attacks	148	199	9	356

REASSESSMENT of the ABOVE ATTACKS BASED ON ULTRA INTERCEPTS

	Sunk	Damaged	Missed	Total
Probably Sunk	29	1	0	30
Possibly Sunk	6	2	0	8
Probably Damaged	15	28	3	46
Possibly Damaged	20	25	0	45
Probable Dud Hit	4	10	4	18
Missed	74	133	2	209
Total	148	199	9	356

NOTE: THE NUMBERS SHOWN ARE PRELIMINARY AND SUBJECT TO CHANGE AFTER FURTHER EVALUATION.

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three factors: the fog of war, over-optimistic reliance on ambiguous observations, and **defective torpedoes.** (I emphatically reject any implication that any submarine commander deliberately made a false report; some were obviously less skeptical than others, but I am convinced all reported what they believed they saw or heard.) There remain about 150 cases, five percent of the total, where patrol report or other evidence appears strong enough to support the possibility of a successful attack in the absence of any confirmation from the Japanese side. Japanese records may be irretrievably lost or contain errors that make it impossible to identify a matching submarine attack. However, I believe **at least 95 percent of all torpedo attack claims have been verified** or can now be satisfactorily explained.

The fog of war factor is easily understood, since most submerged torpedo attacks were made either by periscope with very limited visibility or by sonar with none, and most surfaced attacks were made at night, often in heavy weather or by radar alone. Add the confusion of wolf-pack attacks on milling convoys and counter-attacking Japanese escorts, and it is readily understandable how observations could be misinterpreted.

Submarine skippers can be forgiven for over-enthusiasm in basing claims of success on ambiguous observations. Records of attacks by German, Italian, and Japanese submarines (Rohwer, Jurgen, Axis Submarine Successes 1939-1945, Annapolis, MD; Naval Institute Press, 1983) show that they too made many unverified claims. What is surprising is the uncritical acceptance of almost all such claims by the higher commanders who reviewed and endorsed the patrol reports. Even the Submarine Operations Research Group (SORG) accepted the "task force commanders assessments" and apparently did not have access to the Ultra intercepts. Consequently, its analyses must have been distorted significantly toward the over-optimistic assessment of damage. Whether this had any ill effects on submarine operations might be worth further study.

The most significant observation to be drawn from the Ultra intercepts is the Navy's apparent failure to make the most effective use of them. It is now well known that the decryption of Japanese fleet operational messages (the JN-25 cipher system) enabled our carrier forces to win the Battle of Midway, led to the shooting down of Admiral Yamamoto, and contributed to many other successes. However, the late Rear Admiral Edwin T. Layton has written (Layton, Edwin T. with Roger Pineau and John Costello, And I Was There, New York: William Morrow and Co., Inc. 1985 [p. 470 et seg.]) that not until the so-called *maru* code was broken in early 1943 were our submarines routinely ordered into position to intercept convoys and sink many enemy ships, thanks to the Japanese practice of requiring daily position reports from the ships at sea.

According to Layton, the *maru* intercepts also supported the submariners' charges that their torpedoes were defective and persuaded Admiral Nimitz to authorize the inactivation of the magnetic exploder (Note: this is referred to by CAPT Wilford J. Holmes in his Undersea Victory, published by U.S. Naval Institute in 1979). In retrospect, the Ultra evidence of defective

torpedoes appears so overwhelming that the continuing delays in implementing corrective measures are incomprehensible unless the detailed evidence was never passed along to other responsible commands. The intercepts showed that defects continued to exist for many months in spite of the changes that were made. **Accounts of the torpedo fiasco have focused largely on problems in the depth control mechanism, the failure of the magnetic exploder to detonate, and jamming of the firing pin in the impact exploder. The Ultra records support the conclusion that premature detonations were equally serious.** In particular, the only logical explanation for the many cases where ships appeared to blow up, yet remained undamaged, is that our torpedoes were going off prematurely directly in line with the target or were being countermined by other explosions.

Layton also says that the decrypted messages often enabled submarine headquarters to learn of Japanese ship sinkings even before the boats reported making attacks. However, there is little evidence in the patrol reports that the operating forces were made aware that their claims of sinkings were seriously inflated. This may have supported morale among the submariners, but it also tended to induce complacency and downplay the importance of follow-up attacks to ensure that targets were really sunk. If submarine commanders had known how frequently their apparently successful attacks were failing, and how effective Japanese damage control and salvage efforts were, they would undoubtedly have done their utmost to improve their procedures and train their crews more thoroughly.

In summary, the Ultra records constitute a rich source of new information on the success or failure of submarine attacks against Japanese ships during World War II. Further study of material such as the original intercepts, if these are still available, might enable some of the remaining questionable cases to be resolved. Similarly, research in the wartime records of higher commands might clarify the extent to which Ultra information was disclosed to or withheld from the different command levels of the submarine force and its supporting elements. Input and comments from knowledgeable members of the Naval Submarine League are invited.

■

STEALTH IS A ZERO-SUM GAME (A SUBMARINER'S VIEW OF THE ADVANCED TACTICAL FIGHTER)

by Jim Patton

[Ed. Note: This a condensed version of an article by the same name originally published in AIRPOWER JOURNAL, the journal of the Air War College, Maxwell Air Force Base. Republished with the permission of AIRPOWER JOURNAL.]

One would hardly expect a submariner to advertise himself as an expert on the developing advanced tactical fighter (ATF), and that is not the intent, but there are some parallels between the nuclear-powered attack submarine (SSN) and the ATF, based on the evidence that the ATF is revolutionary and represents as dramatic an advance over previous fighters as did the SSN over conventionally powered attack submarines (SS). It should be kept in mind, however, that in addition to other dramatic differences, there are orders of magnitude between the time constants of the two platforms. For example, the running time of an SSN-launched torpedo from one's own ship to the target, following a 12-24 hour approach from the point of target detection, can easily be longer than the total mission time of an air superiority fighter from takeoff to landing.

It is interesting to note that not until the Air Force developed the B-2 bomber did the submarine community realize (and find the words to describe) just what we have been doing all these years -- practicing *stealth warfare*. Since then, the more that has been revealed about the application of stealth technologies and tactics in the air, the more it becomes apparent that concepts and principles of stealthy operation long taken for granted by submariners are now being rediscovered by aviators.

Of course, a considerable level of appreciation for the value of *surprise* among fighter pilots has long existed (and stealth is nothing more than the substitution of technologically-assured expectations as the source of surprise rather than a mix of consummate skill and blind luck). The U.S. Navy's TOPGUN syllabus from the mid-1970s has emphasized that 82% of all air-to-air victories during the Vietnam war were attributable to the victor's being able to attack prior to the opponent being aware of his presence. It would appear that what aviators call

situational awareness is much like (and clearly related to) stealth under the sea -- a *zero-sum game* - only one in a given duel can have it; the other is detected first and probably destroyed. The best past practitioner of stealthy tactics in the air may have been German WWII ace (with 352 victories!) Erick Hartman whose personal doctrine was SEE, DECIDE, ATTACK, BREAK. TOPGUN instructors have interpreted that terse guidance -- based on interviews with Hartman -- to mean that a pilot should attempt to detect without being detected, judge whether he can attack covertly, close to a point that would assure a kill, and then disengage rapidly to repeat the process, rather than hanging around in what submariners would call a *melee*, and fighter pilots term the *visual furball.*

When I reported to the USS SCORPION (SSN-589) at the Electric Boat Company in Groton, Connecticut as an Ensign in 1961, it had just recently joined the fleet as the 12th U.S. nuclear submarine. During the next 13 months, while qualifying in submarines, I watched some early Navy attempts to determine just how the SSN fit into the scheme of things. At that time, enthusiasm for SSNs within the Navy and the Submarine Force was far from universal. Except for the small but growing cadre of Rickover-trained disciples, most people viewed the SSN as a somewhat faster SS whose greatly increased procurement, training and maintenance costs made its justification questionable. Indeed, the increased cost and trouble of an SSN did not compete well with those of the tried and tested SS if all that was expected of the SSN was to perform the mission set of the SS a little faster.

Aboard SCORPION, new and more dominant missions began to emerge. In one particular operational exercise, SCORPION was tasked to operate in a somewhat constrained area while Task Force BRAVO -- a premier Anti-Submarine Warfare (ASW) group of that time centered on an ASW carrier (CVS) -- would demonstrate just how easy it was to detect, track and simulate the SCORPION's destruction. At periscope depth, SCORPION's skipper, Buzz Bessac -- a tiger of a submariner who had previously commanded an SS -- saw them *come over the hill* with active sonars blasting away, then raised the radar mast and radiated. (Fully realizing that every Electronic Support Measures (ESM) set in the task force would be tuned exactly to SCORPION's frequency). While painting the task

force disposition, two escorts (the "pouncers" of that period's doctrine) were seen to break off from the rest of the group and race down the line of sight towards their ESM intercept. In a controlled manner shortly after that, masts were lowered, full rudder and a flank bell were ordered, and SCORPION corkscrewed down to test depth leaving the world's biggest *knuckle* of turbulent, bubble-filled water as a sonar-reflective column. Heading toward the battle group, SCORPION slowed, came back to periscope depth, and simulated shooting both destroyers as they raced past towards their *target*. Oblivious to their simulated destruction, they passed, detected the knuckle and began a series of attacks on it.

SCORPION then turned towards the remainder of the approaching battle group and increased speed to almost twenty knots. Still at periscope depth, he began raising and lowering the many masts of that class capable of operating at that speed. Marked by the incredible *rooster tail* of wake and spray that this produced, SCORPION passed directly through the task force formation, and passed a few hundred yards abeam of the carrier. When the shock of the situation passed, the lead escorts turned around to chase the contact, and the pouncers were called despite their objections of having pinned down SCORPION. With several destroyers now charging back in the direction of the carrier, the organization of the group of warships deteriorated dramatically and soon turned into a frenzied melee. SCORPION meanwhile had slowed and was watching this from a moderate distance. When the confusion reached its peak, SCORPION moved back in and simulated emptying her torpedo room against the warships. From start to finish the encounter had taken less than an hour, each unit of Task Force BRAVO was attacked at least once, and no valid attacks or even sonar detections had been made against SCORPION.

One would think that this would have shown that the SSN was not just another SS whose only hope against a collection of ASW forces was to employ its stealth in a defensive manner, husbanding a limited quantity of stored energy while carefully extricating itself from danger. In fact, however, the emotional and angry debrief of the exercise all but condemned SCORPION for "*unfair and dangerous*" maneuvers that jeopardized the safety of Task Force BRAVO units. The CO of SCORPION remained completely unruffled by this criticism, and ridiculed his

colleagues for not appreciating that undersea warfare had taken on a significantly different aspect.

Unfortunately, some continued to pound the square peg of the SSN into the round hole of SS employment doctrine. The primary tactical submarine mission in wartime was then seen as the *barrier*, where SS/SSNs set in assigned geographical areas at choke points such as the GIUK Gap and waited for transiting Soviet submarines to drive in front of their torpedo tubes. Little or no difference was drawn between the SS and SSN regarding the assignment of areas or operational employment. Even vestigial remains of a wolf pack concept were to be found in the original design concept of the SSN-593 THRESHER class, where operational employment assumed two such units operated together and triangulated targets over *secure* underwater communications and data links.

In all, about 20 years passed before the Navy found the optimum *impedance match* between intrinsic platform capabilities and mission definition. This *best fit* occurred with what is now commonly referred to as the "Maritime Strategy" when -- exploiting expected intelligence and warning of an impending Soviet attack in Central Europe -- U.S. SSNs were to be scrambled to individual areas deep in Soviet home waters. If hostilities did commence, the SSNs would have quite simply destroyed the Soviet Navy -- surfaced and submerged -- with an absolute minimum of communications. Some authorities view this exploitation of the principal characteristics of U.S. SSNs as having created an *uncorrelatable force* which did much to unhinge Soviet military theory. Further, they maintain that -- in conjunction with other developments -- this force precipitated Glasnost, Perestroika and the outbreak of peace between NATO and the WARSAW PACT. As might be expected, submariners are prepared to humbly accept their share of the credit for winning the Cold War.

These principal characteristics of a modern SSN -- defined several years ago by Admiral Bruce DeMars in testimony to Congress -- are stealth, mobility, firepower and endurance. In retrospect, what delayed the appreciation of the vast difference between an SS and an SSN was an understandable lack of foreknowledge about the synergistic and nonlinear effects resulting from adding greater mobility and greater underwater endurance to already existing stealth. Another such dramatic

and nonlinear catalytic expansion of intrinsic capabilities will likely occur when the advanced tactical fighter adds stealth and the ability to *supercruise* (exceed Mach 1 without resorting to the extraordinary fuel demands and greatly increased thermal signature of afterburners) to the existing mobility (agility and maneuverability in fighter pilot terms) of current fighter aircraft. With luck, the best and brightest of the fighter community will conceive and implement the *right* new concepts in only two years instead of the twenty it took for the SSN.

One interesting but non-intuitive phenomena seen during the continuing development of subsequent classes of U.S. SSNs is that among the most reactionary of opponents to new or improved capabilities are the people who currently operate the present versions. Because submariners are in an incredibly introverted and externally cohesive organization, however, their objections to proposed developments are rarely heard outside the confines of submarine wardrooms. For example, those serving on NAUTILUS, the first SEAWOLF, and the SSN-578 SKATE class saw the breaking of submarine construction *rules* on the SKIPJACKs (single versus double hull, one main propulsion shaft instead of two) as radical and even dangerous -- although the results of these dramatic changes made the platform far quieter. While I served on SCORPION -- a SKIPJACK class SSN -- the SSN-593 THRESHER class was being developed. Internally, officers expressed concern about why so much money was being spent on her quieting -- surely SCORPION was quiet enough. Further, they thought at the time that putting torpedo tubes in the middle of the ship instead of the bow was a dumb idea, that installing such a big sonar array was unnecessary, and that trading any of SCORPION's speed for THRESHER's increased depth capabilities was foolish.

When building and serving on FLASHER -- a THRESHER class SSN -- the wardroom was convinced that the changes in that class had been worthwhile, but questioned the increased cost, greater size and even further quieting of the SSN-637 STURGEON class. A few tours later, having served on two STURGEONs, I was now senior enough to lead discussions rather than just listen, and actively participated in wardroom belittling of the even more stealthy 688 LOS ANGELES class then under development and construction. Why was it so big

and expensive? Who needed that much more horsepower? Why give up some depth capability for increased speed? (Complaints had come full circle!) At this moment, I suspect many 688 class submariners are questioning why in the world we should stop building the world's *perfect submarine* in favor of the SSN-21 SEAWOLF -- a platform "too big, too expensive and quieter than needed; besides, why do we need to double the torpedo tubes and number of weapons carried?" Throughout all these submarine developments, other important characteristics such as firepower, speed, and depth may have been traded off, but never, thank goodness, stealth itself -- the *Mother* of all capabilities.

In retrospect, the U.S. policy of **stealth first** in successive generations of attack submarine classes was money in the bank against the first incremental, then dramatic improvements made by the Soviets. As a result, U.S. SSNs commissioned more than a quarter of a century ago remain as quiet as anyone's newest and best.

I cannot authoritatively comment about professional discussions in fighter squadron ready rooms, but it would seem almost a violation of human nature if some of the hottest F-15 and F-14 jocks were not somewhat skeptical about why their aircraft needs to be replaced by an advanced tactical fighter. However, as Air Force fighter pilots begin to realize and implement the advantages that stealth brings to the arena of air superiority, doubts will soon vanish. Submariners have found intrinsic stealth a valuable asset across the entire spectrum of conflict. As a primary characteristic, stealth provides not only greater probability of mission accomplishments in general war scenarios, but also offers incomparable survivability in regional conflicts, when domestic intolerance of American personnel losses becomes a primary constraint on military action. Thus, rather than focus on and optimize for present or extrapolated expectations of usage, proper design policy should be to expand the set of all possible employments, particularly when dealing with breakthrough technologies such as stealth. Undoubtedly, future users will determine a purpose for what is currently *excess* capability. These as-designed excess capabilities become ever more critical as weapon systems are expected to last longer in a fast-changing world.

The unique and potentially revolutionary characteristic of stealth is about to invade the military fighter aviation community. Without being so presumptuous as to predict just how stealth will modify air superiority operations and tactical employment, let me briefly review a few lessons learned (sometimes painfully) as submariners coped with and exploited the stealth characteristics of modern nuclear submarines. Fighter pilots can judge for themselves whether the lessons apply to them.

- Stealth is a zero-sum game. In a given encounter, one platform has it and the other does not. The tactical advantage accrued by being able to detect, close and attack from a covert stance completely dominates all other factors in any encounter algorithm.
- Stealth is a commodity that can be employed towards different objectives. In an offensive sense (i.e., SSN) it can be employed to improve dramatically first-shot probability of kill. In a defensive sense (i.e., fleet ballistic missile submarine -- SSBN) it can be employed to dramatically improve survivability.
- Stealth significantly increases the emphasis on planning specific operational employments. That is, one must consider as many contingencies and provide as much pre-mission guidance as possible to greatly reduce two-way communications in support of real-time command and control.
- Stealth, which demands a greater degree of flexibility in the time domain, significantly reduces the desired degree of scheduling. The on-scene commander must be able to exploit stealth in support of both mission accomplishment and survivability by picking the right time and place for an encounter. Precise scheduling can create the illusion of professionalism, but -- for a stealth platform -- too much is forfeited if an action is directed to occur at "1032 hours" when it is really needed sometime on Tuesday morning.
- Stealth requires a dramatic change in concepts of command, control and communications. Since all stealth platform energy emissions jeopardize its covertness, these emissions must be eliminated or kept to an absolute minimum. Great benefits are gained from exploitation of the broadcast mode of command and control where a non-stealthy component (ground controller, airborne warning and control system,

etc.) directs actions that the stealthy components execute but do not acknowledge. If this link is up continuously -- whether or not operational traffic is being sent -- this methodology even denies traffic density analysis as a *heads up* to imminent actions.

- Stealth places an extraordinary premium on the employment of passive sensors for detection, tracking and attack. As in the case of platform-initiated communications, active sensors with a low probability of intercept may be present, but none that are covert or secure by the absolute definition of the terms.
- Stealth dictates as high a probability of survival per engagement as possible. This generally translates to religiously avoiding a melee -- a situation whereby each platform is aware of the other's presence and each is within the other's weapon range. This concept is often implemented by doctrine which encourages the release of *more than enough* ordnance in the initial attack from a covert stance if it will even marginally obviate a subsequent melee.
- Stealth is greatly enhanced by the ability to reestablish a covert stance after the conscious decision to reveal one's presence through weapon release. The Battle of the Atlantic was won not by preventing a U-Boat's first attack, but by denying a second or third. The U-Boat simply lacked the requisite mobility to reliably extricate itself from reactive ASW units that first noted a submarine when it was *detected* by an exploding merchant ship within the convoy.
- Stealth, by itself, provides survivability and, therefore, does not require mutual support. Little is gained and much can be lost by operating with other friendly units. When a stealthy platform is assigned independent areas of operation in which no friendly units are present, it can avoid the problems associated with friendly fire. As an oversimplification, one might state that when non-stealthy platforms operate together, the tradeoffs between mutual support and mutual interference are such that one + one is greater than two. When stealthy platforms operate together, or with non-stealthy platforms, one + one can easily be less than two. As in chess, however, the fact that actions do not occur simultaneously does not mean that they aren't coordinated.
- Stealth requires a near-absolute understanding and knowl-

edge of the surrounding environment to properly exploit low observability within it. For submarines this includes historical, synoptic and in-situ knowledge of temperature, salinity, bottom type, ocean currents, fronts and eddies, conditions at the air/water interface. It can even include wind speed, cloud cover and radio-frequency propagation characteristics of the column of air above and around the unit's position as well as predictive orbital data for satellites -- U.S. and others.

Which of these parallels of stealth best transfer from the SSN to the ATF? Bright aviators will have to determine that. What does seem to be a valid observation is that air combat is at the doorstep of dramatic change. If the F-117A was the NAUTILUS of airborne stealth warfare, and the B-2 the GEORGE WASHINGTON (the strategic nuclear counterpart), then the ATF is the SCORPION. While all but the brightest saw NAUTILUS as a *better* SS -- more easily accomplishing the same missions -- all but the dullest saw the SCORPION and the Polaris submarines as revolutionary developments -- new types of platforms which gave birth to entirely new employments and missions.

■

IN REMEMBRANCE

Captain James B. Hagen, USN

CWO John Robert Holmes, USN(Ret.)

Mr. Frank W. Latson

Mr. Sam Painter

Mr. John Walter Prill

Mr. Walter I. Wittmann

CHAPTER FORMATION

by Dan Heflin and John Will

The Naval Submarine League provides a direct personal link to the operational submarine community for any member who chooses to exercise his or her membership prerogatives. The annual symposium, held in the Washington D.C. area each June, is an extravaganza certain to satisfy the most ardent submarine veteran or fan. It is a rich panoply of reports from the nation's highest command levels spiced with a wide range of present, historical, and emerging needs and problems associated with submarines.

For many members, fortunate enough to live near one of the regional chapters, the involvement with submarines is continued throughout the year by a series of *local* meetings featuring guest speakers, ship visits, facility demonstrations, and social events. If one does not live near a regional chapter and finds it difficult to attend the annual symposium, but wishes to have more connection with the submarine community than is possible through merely reading THE SUBMARINE REVIEW, perhaps formation of a local area Submarine League Chapter is the answer.

For an organization like the Submarine League to fulfill its mission, the annual symposium and quarterly review are not enough. There has to be a grass roots (deck plate) level involvement to carry out the League's charter -- i.e., people willing to put in a little extra time to inform the public about the U.S. submarine force and the work of the League and, if possible, to provide some service to that force.

It is natural that chapters have started in areas adjacent to submarine operational bases -- to wit, NAUTILUS Chapter (New London, CT), Hampton Roads Chapter (Norfolk, Newport News, VA), South Carolina Chapter (Charleston, SC), Atlantic Southeast Chapter (Kings Bay, GA), Pacific Southwest Chapter (San Diego, CA), Pacific Northwest Chapter (Seattle, Bremerton, WA), and Aloha Chapter (Honolulu, HI). However, interested individuals in other areas have started or are starting chapters in areas such as Philadelphia (Mid-Atlantic Chapter), Washington, DC (Capitol Chapter), Orlando, FL (Central Florida Chapter), and San Francisco, CA.

It is to those of you who do not live near a regional chapter

that this article is directed. You can organize a regional chapter and enrich your membership experience; it's not difficult, but it does require time and effort. Here is a step-by-step guide.

Step 1 - What is a Chapter?

A chapter is a formally chartered legal entity, sanctioned by the parent national organization and operating under approved by-laws as a recognized *branch* of the National Organization. The Board of Directors of the NSL has established policy for development and support of the chapters. Central to the policy is adherence to the goals, objectives, and purposes of the NSL as stated in its charter and Articles of Incorporation. A chapter is a self-managed organized group of fifty (50) or more NSL members that has petitioned for recognition, submitted and received approval of a set of by-laws, and been issued a charter by the NSL.

Step 2 - Developing a Chapter

The NSL has a standing committee charged with chapter development. Its role is to assist in the formation of new chapters, and to assist in the on-going activities of established chapters as a facilitator, coordinator, and headquarters advocate. The Executive Director of the NSL is a full-time headquarters executive who interfaces with the Board of Directors, the officers, and with all chapter officials and will provide invaluable assistance in avoiding problems.

Developing a regional chapter requires several sequential steps:

- Assemble a Formation Committee (ad hoc.)
- Determine the target geographic area for the chapter.
- Request a computer-generated set of mailing labels of members resident in those zip codes that comprise the geographic target area from NSL HQ.
- Prepare an introductory letter to send prospective members stating the intent to form a chapter, and seeking an expression of interest (enclose a response card).
- Determine whether a local employer might underwrite the initial start-up efforts, e.g., meeting place, postage, secretarial help, etc.
- Based upon results of the introductory letter responses, prepare an announcement of an organizing meeting.

- Select time, place and refreshments, etc.
- Develop an Agenda and a "Strawman" set of by-laws. Include these with the announcement.
- Set a time-table for events leading to charter award.

- Establish a budget to cover all expenses incidental to start-up and submit to the Executive Director for Board of Directors' approval and funding.
- Convene the announced meeting, establish the agenda and elect temporary officers to conduct the prospective chapter business. Proceed to:
  - Define the purpose, goals, and objectives.
  - Confirm the geographic limits of the chapter.
  - Select a name for the chapter.
  - Establish a formal committee to complete by-laws draft or do so during the meeting.
  - Establish a time table for formal chartering.
  - Sign the petition for charter. Note: Nominally a minimum of fifty (50) signatures are required. In unusual circumstances HQ may accept a lesser number. The intent is to ensure sufficient interest to maintain an active vital chapter. Certain geographic limitations may be rationale for acceptance of a lesser number.
  - Gain a consensus to proceed with formation of the chapter.

Step 3 - Securing the Charter

Submit the by-laws, the petition, and a forwarding letter to HQ stating the time-table preferred and other details. It is best to discuss the issues directly with the Executive Director prior to submittal to avoid delays resulting from inadequate information.

Step 4 - Beginning Operations

The Board of Directors will consider the petition and proposed by-laws and, when all is in order, award a charter. Step two ensured a smooth path through the Board of Directors. When the charter is awarded, all that remains is to formally establish the chapter through an initial meeting to receive the charter and elect a permanent slate of officers.

This rather simple four-step process will guide you through the formative process and establish a new viable chapter. The

direction, health, and enjoyment of the chapter will then be entirely in the hands of the chapter officers. There are very few rules imposed by NSL Headquarters. The cardinal ones are those established in the chapter charter and by-laws. The use of good common sense and coordination with NSL HQ via the Chapter Development Committee or the Executive Director will ensure a harmonious future.

■

SUBMARINE: Steel Boats, Iron Men

The NSL is pleased to offer its members VHS copies of **Submarine: Steel Boats, Iron Men** at a special price. The sixty minute film, produced by Varied Directions, Inc. with the assistance of the NSL, gives the public its first look inside a nuclear submarine in twenty years. A film team caught the Commanding Officer and crew of the USS HYMAN G. RICKOVER in action. Also included are interviews with some of the most honored submarine commanders, and an overview of the development and strategic use of the submarine in both world wars.

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EMERGENCE OF OFFENSIVE U-BOATS DURING THE GREAT WAR

by Richard Boyle

The theme of this discourse is the evolution of U-Boat designs in an extremely compressed time scale. Today, we are told that development of a single new submarine design (computer aided design (CAD) notwithstanding) takes 10-13 years. During the four years of World War I, Germany refined mobilization plans, developed more than a dozen different new designs, and built most of them in quantity.

The Imperial German Navy (IGN) commissioned 346 U-Boats during the Great War, 1½ times the combined August 1914 submarine strengths of the seven leading maritime powers of the world: UK - 74, France - 46, U.S. - 30, Germany - 24, Russia - 20, Italy - 18, Japan - 13, **Total: 225.**

Hans Techel, who had guided submarine development at Germaniawerft, Kiel(GW) since 1907, provided the inspiration for this incredible accomplishment and was truly *Father of the U-Boat.*

The Germans were late-comers to the submarine world because of efforts to build up their capital ship inventory vis-a-vis the British. Although slow starters, German designers provided double hull boats with bow planes from the beginning, never used gasoline engines, and avoided the pitfalls of steam.

In August of 1914, 24 U-Boats were in fighting trim, with 12 more building. Ironically, at the outset, only 17 additional mobilization (Ms) overseas boats were ordered for delivery between December 1915 and December 1916, because nobody thought the war would last that long.

U-1, commissioned on 14 December 1906, was the first GW design accepted by the IGN.

Design	Displ	Speed	Range	TT
U-1	238/283 Surf/Sub	10.8/8.7	1500/10	1 Bow

U-9 (Weddigen) sank 36,000 warship tons (British cruisers ABOUKIR, CRESSEY, HOGUE) on 22 September 1914 in just over an hour.

U-9	493/611	14.2/8.1	1800/14	2 Bow 2 Stern

U-17 (Feldkirchner) sank the British steamer GILTRA off Norway in accordance with Prize Regulations on 20 Oct 1914.

U-17	**564/691**	**14.9/9.5**	**6700/8**	**2 Bow** **2 Stern**

The coastal defense craft of the early 1900s had quickly become an effective offensive weapon against not only warships, but commerce as well. Legs were already long, even before Ms boats appeared:

U-27	**675/867**	**16.7/9.8**	**9770/8**	**2 Bow** **2 Stern**

At the end of six months of hostilities, both the British Grand Fleet and the IGN High Seas Fleet were at anchor for fear of submarines. Germany, suffering from a British blockade, hoped to bring Britain to her knees in a *guerre de course* against her merchant ships.

A study conducted before the war predicted that 222 U-Boats would be required to successfully blockade the British Isles. The highest U-Boat inventory was 177 (September 1918) and 178 U-Boats were lost during the war.

Major U-Boat offensives against commerce began in February (1915, 1916, 1917). We shall examine summary results of offensives and intersperse design data of emerging classes of U-Boats as the first of each class came into commission.

Coastal submarines emerged early on for deployment from Flanders. The UBI and UCI classes were designed and built in record time. These single screw, single hull craft could be shipped by rail in three sections. The first UBI was built in 75 days, and all 17 of the class were in service by May 1915. UCIs were minelayers, the lead craft was commissioned in April 1915, and all 15 were in service by July of that year.

UBI	**127/142**	**6.5/5.5**	**1650/5**	**2 Bow**
UCI	**168/183**	**6.2/5.2**	**750/5**	**None** **12 Mines**

The first of eight U-43-class boats came into service in April

1915: U-50, the last, was commissioned in July 1916.

U-43	**725/940**	**15.2/9.7**	**11,400/8**	**4 Bow** **2 Stern**

In July 1915 the first of five U-66-class boats was commissioned. Originally ordered by Austria-Hungary, they were all commissioned in the IGN by September 1915.

U-66	**791/933**	**16.8/10.3**	**7370/8**	**4 Bow** **1 Stern**

Cumulative results by the end of September 1915 were:

Tonnage Sunk	U-Boat Inventory	U-Boats Lost
833,328	57	22

Improved UBs (UBIIs) came on line in late 1915, and UCIIs appeared by June 1916. These boats were twin screw with saddle tanks. All UBIIs (30) were completed by August 1916. It took until June 1917 to finish the 64 UCIIs.

UBII	**755/292**	**9.2/5.8**	**6500/5**	**2 Bow**
UCII	**417/493**	**11.6/7.0**	**9430/7**	**2 Bow** **1 Stern** **18 Mines**

The first UE ocean-going minelayer went into commission in October 1915. There were ten boats in the class; all were completed by June 1916.

U-71	**755/832**	**10.6/7.9**	**7880/7**	**1 Bow** **1 Stern** **34 Mines**

U-51, first of six in the class, came on line in February 1916: U-56, the last, was finished by June of that year.

U-51	**715/902**	**17.1/9.1**	**9400/8**	**2 Bow** **2 Stern**

Three Ms boats of the U-63-class were built by GW in 11 months, a record. All three were in service by May 1916.

U-63	810/927	16.5/9.0	9170/8	2 Bow 2 Stern

The British blockade was strangling Germany by early 1916. There were other exacerbations as well:

- Shipyards without previous submarine building experience had to join the effort.
- Diesel engine production had to be expanded.
- Skilled labor was in short supply because of Army mobilization.

Because of these problems, most U-Boat deliveries during the war were late. Yet, U.S. inspections after the war reported that "nothing in the boats bore the mark of being constructed or fitted hastily."

Cumulative results by the end of April 1916 were:

Tonnage Sunk	U-Boat Inventory	U-Boats Lost
1,684,247	84	29

The first of nine U-57-class boats was commissioned in July 1916; the last, U-104 (hull numbers were not sequential), was finished in August 1917.

U-57	787/954	14.7/88.4	10,500/8	2 Bow 2 Stern

Six U-81-class boats emerged between August and December 1916:

U-81	808/946	16.8/9.1	11,200/8	2 Bow 2 Stern

The first of three U-60-class boats was commissioned in October 1916. The other two were finished by December of that year.

U-60	768/956	16.5/8.4	11,400/8	2 Bow 2 Stern

Cumulative results by the end of January 1917 were:

Tonnage Sunk	U-Boat Inventory	U-Boats Lost
3,709,507	153	48

Germany was desperate, and the last unrestricted offensive would begin on 1 February 1917. The goal was 600,000 tons of British shipping per month, and a consequence was U.S. declaration of war on Germany on 6 April 1917.

Between February and October 1917, six U-87-class boats joined the Fleet.

U-87	757/998	15.6/8.6	11,380/8	4 Bow 2 Stern

Twenty-two U-93-class boats were completed between February 1917 and the end of the war in November 1918.

U-93	838/1000	16.8/8.6	9020/8	4 Bw 2 Stern

DEUTSCHLAND and her sister BREMEN, nominally commercial submarines, had been completed in May and August 1916, respectively. (BREMEN was lost on her first Atlantic crossing, which began on 26 August 1916.) Six additional *cargo boats* were ordered in the summer of 1916. By February 1917, all seven had been taken over by the IGN for conversion to U-Cruisers. Hull numbers were U-151 through U-157. DEUTSCHLAND became U-155, was commissioned in February 1917, and was unique among the class with six torpedo tubes forward. All had two 15 cm (5.9 in.) deck guns, and the last boat completed (U-154) went into service in December 1917.

U-151	1512/1875	12.4/5.2	25,000/5.5	2 Bow

An extremely effective UB descendant emerged in June 1917: U-48 was first of the UBIII-class, and 89 were completed by the end of the war. Karl Dönitz commanded UB-68, which lost depth control on patrol in the Med on 4 October 1918.

She was holed by gunfire and abandoned. Four men were lost; Dönitz and surviving crew members were captured by the British. The UBIII design became the starting point for design of the Type VII U-Boat in the 1930s.

UBII	**516/651**	**13.6/8.0**	**8500/6**	**2 Bow 1 Stern**

The terror of unrestricted submarine warfare manifested itself in an average monthly sinking figure of 635,633 tons between 1 February and 31 July 1917. The peak was 860,334 for April. Convoys were first introduced in May 1917.

Cumulative results by the end of July 1917 were:

Tonnage Sunk	U-Boat Inventory	U-Boats Lost
7,523,305	162	72

In any study of the Great War, mines stand out with striking prominence. Germany completed a total of 115 minelaying submarines during the war. (She also lost at least 54 U-Boats to mines, more than to any other cause.) In March 1918, U-117, first of a new class of large ocean-going minelayers, entered service. Nine more were built by October 1918.

U-117	**1164/1512**	**14.7/7.0**	**12,500/8**	**4 Bow 42 Mines +30 in Deck Containers**

Three U-Cruisers were commissioned between March and June 1918. The first boat was U-140. Each was equipped with two 15 cm (5.9 in.) deck guns.

U-140	**1930/2483**	**15.8/7.6**	**12.630/8**	**4 Bow 2 Stern**

Only two of four U-135-class boats were completed in June and July 1918.

U-135	1175/1534	17.6/8.1	10,000/8	4 Bow 2 Stern

Improved UC minelayers started to come off the line in July 1918. Sixteen UCIIIs were completed by the end of the war.

UCIII	474/560	11.5/6.6	8400/7	2 Bow 1 Stern 18 Mines

The last gasp U-Cruiser design, U-142, came too late. Only one boat was commissioned in November 1918.

U-142	2158/2785	17.5/8.5	20,000/6	4 Bow 2 Stern

Convoying finally worked well, Allied ASW measures improved, and by September 1918 sinkings were down to 171,972 tons for that month.

Cumulative results at the end of the war were:

Tonnage Sunk	U-Boat Inventory	U-Boats Lost
12,284,338	171	178

The menace of U-Boats during the Great War should have sobered naval leaders of the major powers, but *guerre d'escardre* proclivities prevailed for another 20 years. Allied engineers were pleased to paw over surrendered U-Boats, and gained from the experience. German diesels were legendary. In the late 1920s and early 1930s, the evolving U.S. Fleet Type Submarine took features from both U-135 and U-140. It took us a long time to get our engine act together, but we finally managed.

On 29 August 1939, Dönitz indicated in his War Diary that the minimum requirement to win the war would be 300 U-Boats. He had 57, including 26 capable of operations in the Atlantic. By the end of April 1942 he had surpassed his goal, but that's another story.

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ACCIDENTAL LOSSES OF U.S. SUBMARINES

I am trying to locate a book which covers the history of the accidental losses of U.S. submarines. I purchased it in the 1971-1973 time frame at the GPO Bookstore in the Pentagon. It was published by the GPO, date unknown, and the last I checked it was not listed in their listing of books. I do not have the exact name, but it was something like U.S. Navy Accidental Submarine Losses. It had a blue cover with gold lettering. I have checked out the libraries at the Submarine School, Washington Navy Yard and the Pentagon to no avail. As a matter of fact, I can't find anyone who even knows of it.

Two of the incidents it tells about was the sinking of a submarine nested along side a tender with several other submarines at Newport, Rhode Island. The safety interlock on one of the torpedo tubes failed to catch and when the tube door was opened the submarine flooded almost taking other boats in the nest with it. A second incident was a submarine flooding in the Delaware River and going bow first into the mud with only the stern showing above water. The stern was cut open to rescue the crew.

Please send any information on this subject to:

Bernard D. Dunn, 5817 Shalott Court, Alexandria, VA 22310.
(703) 971-0540

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Researcher would like to hear from any submariner
who had any contact with
RECEIVING STATION FREMANTLE WESTERN AUSTRALIA
(formerly Old Women's Home) during 1942-45.

Please contact: Mrs. M. McPherson
25 Clara Road
HAMILTON HILL 6163
WESTERN AUSTRALIA ■


In the defense
of our nation, there can be
no second best.
716
Newport News
Shipbuilding

DEVELOPING INNER SPACE - A WAY AHEAD FOR THE SUBMARINE FORCE?

by CAPT Laurence P. Gebhardt, USN(Ret.)

What is the way ahead and the future of the submarine force? Submariners and the submarine industry tend to focus on roles, missions, force levels and capabilities shaped by our mostly-military experience. Can we stretch a little and expand our view of possibilities?

Dual Use Technologies, Industry and Forces

As nations move toward an integrated global economy with converging politics, reduction in military threat leads to public demand for a *peace dividend*. But the planet remains dangerous. Does defense prudence relate to economic challenges from abroad? The current U.S. National Security Strategy of the United States clearly links the defense agenda with the economic agenda for the 1990s. One idea, dual-use (military-civilian) of forces, technologies and industrial capability may be a reasonable approach to balance requirements and restrictions of both defense needs and domestic economic needs (e.g. jobs).

Deputy Secretary of Defense Donald Atwood has said, "There are very few technologies that are not dual purpose" (quoted in Inside the Navy, Feb 11, 1991). Charles H. Kimzey, who heads the Manufacturing Technology program for DoD (Production and Logistics) encourages exploration of new partnerships between Defense and business because, "the distinction between military and commercial technology dissolves" (Business Week, Dec 16, 1991, pp 92-96). Similar dual use of operating forces is noted. The Gulf War revealed again the importance of civilian air and sea lift integration with dedicated military lift. NASA has historically used the space shuttle for military and civilian purposes. We have had in our history one try at a commercial nuclear powered vessel -- but Savannah was a failure. In the early 1980's, General Dynamics-Electric Boat advertising advocated a technologically feasible submarine tanker project to gain access to Alaska North Slope oil safer than the now-degrading pipeline and ill-fated surface

tankers. Fresh legislation[1], such as the National Competitiveness Technology Transfer Act of 1989, points the way to sharing government/laboratory technologies with the private sector. Dual-use concepts should be examined in all the richness of ideas possible. How does this new and old thinking apply to the submarine force?

National Technology Strategy

Business groups and the Council on Competitiveness strongly advocate a national technology strategy in the face of European and Pacific Rim economic challenge. These forward-looking people are calling for a better government R&D policy with focus on global competitiveness along with the defense industrial base as partners in security and prosperity. Business people recognize that future force reconstitution may be required and that critical technologies must be preserved, and they call for dedicated research resources. The Defense Authorization Act of FY 1991 (Public Law 101-510) provided for development and implementation of a National Defense Manufacturing Technology Plan. Deputy Undersecretary of Defense for Strategy and Resources, I. Lewis Libby, has called for "a robust technological edge across the board in military capabilities" (statement to NASC Defense Policy Panel, March 12, 1991). Clearly, submarine and ocean technologies are critical areas in which the U.S. leads the entire world -- but which can slip away as, for example, our deep submergence capability. Secretary of Defense Cheney has advocated increasing the RDT&E budget despite economic pressures. How does submarine technology fit into the proposed national strategy? Do some commercial links exist?

Exploring "Inner Space"

Forget for a minute the budget pressures and evolving military threat. Reflect with some wonderment on our planet. What wealth, value and mystery awaits us in the oceans of the world?

[1] Federal Laboratory Consortium for Technology Transfer (1991). Technology Innovation - Chapter 63 United States Code Annotated: Title 15 Commerce and Trade - Sections 3701 to 3715 (as amended through 1990 public laws and with annotations.) St. Paul, MN; West Publishing Company. This publication summarizes legislation which has emerged since 1980 pointing the way to improved concepts of government-business partnerships. The earliest legislation is the Stevenson-Wylder Technology Innovation Act of 1980 (Public Law 96-480) and most recent included is the National Competitiveness Technology Transfer Act of 1989 (Public Law 101-89) and the Defense Authorization Act for FY 1991 (Public Law 101-510).

People have been building various types of submersibles and writing about submarine adventures since 300 BCE. Fast forward to 1985 when Robert Ballard chronicled his adventures exploring the seabed off Iceland in NR-1 - The Navy's Inner Space Shuttle) (National Geographic, April 1985). Later the same year, Dr. Ballard wrote about How We Found Titanic (National Geographic, December 1985), demonstrating impressive submarine technologies. Currently a media personality with his undersea marvel, "Project Jason," Ballard beams submarine technology into classrooms via satellite. Why has Dr. Ballard focused on submarine technologies? An oceanographer by training, he knows the value, public interest and fascination of *inner space*. Tom Clancy and Paramount did well with The Hunt for Red October. If we can spend $40 billion to build a space station to explore outer space, can we spend some amount to explore *inner space* -- the 70% of the planet covered by the oceans of the world? Will the public support such a venture? What could search of *inner space* reveal?

EEZ - The Exclusive Economic Zone

A key to answers is found in an important study chartered by the National Academy of Sciences and conducted by the National Research Council (NRC). In 1989, the NRC focused on the Exclusive Economic Zone (EEZ), claimed by President Reagan in 1983. The U.S. was the 59th nation to obtain such jurisdiction. This 200 mile extension of our coast lines seaward adds some 3.9 billion acres, 1.7 times the land area of the U.S., and is more EEZ than held by any other nation. Study conclusions, published as Our Seabed Frontier: Challenges and Choices (National Research Council - 1989, by the National Academy Press) reported a staggering diversity of conditions and opportunities in the EEZ.

The most extensive current EEZ use is off-shore energy. The EEZ provides the U.S. about 12 percent of total crude oil and 25 percent of domestic gas production and is estimated to have impressive oil and gas reserves. Our dependence on such resources is bound to increase as land reserves decline or are restricted by other countries or environmental concerns. Ocean and submarine technologies coupled with ocean engineering could be developed now as a hedge for energy independence and as exploration further seaward becomes necessary. The study summarized a litany of other possibilities not yet investi-

gated because of low economic incentive, lack of technology or just plain little imagination including: mineral exploration and development, waste disposal, telecommunications cabling, biological resources, ocean energy, cultural and recreational resources.

Some Submarine Possibilities

Is outer space exploration likely to increase our national wealth, preserve critical technologies and create a vast array of new jobs? Would developing *inner space* -- the oceans of the world -- be better? If *inner space* is developed, then there is no better conceptual or functional leadership than active duty and retired submariners and the submarine technologies industry. Could dual-use technologies and applications provide rationale for continuing large submarine reactor and propulsion design laboratories or industry? Could submariners conduct more oceanographic research projects while on patrol? What are the implications for continued improvement of undersea surveillance and global communications systems if submarine technology has a commercial spin-off? How might *reconstituted force* submarines be manned and who might provide operational planning, maintenance and analysis in remote areas? Perhaps dual-use ideas, conceptually linked to the Submarine Force, reserve or maritime organizations, provide some answers.

Ocean Energy, Oil and Gas

Our economy will be oil-energy based for decades to come. Imagine Navy submarines in the oil business -- a new strategic mission? Could dual-use rationalize funding for a revitalized deep submergence program for resource exploration and undersea construction? Could EB-conceived submarine tankers, equipped with aerial-refueling style underwater connections recently patented, help fill the strategic oil reserve or be commercially chartered in peacetime? In hostilities could survivable "SSONs" -- submersible nuclear oilers -- fuel the surface fleet or covertly place bottom-moored, inflatable POL storage containers to help our sister services project power? And if DARPA, Transportation Command (Strategic Sealift), Commerce, Energy, EPA and perhaps the oil industry fund a successful LARGE submarine pilot project, can a submersible aircraft carrier be beyond comprehension? (In this economic era, forget the SSCV(N) idea!)

Environment, Waste, Biological Resources, Telecommunications

Marine biologists, fisheries experts and oceanographers would prize the opportunity to spend prolonged periods in the ocean environment. Perhaps partnership with the submarine force would fit within a new R&D strategy to: restore our fishing industry; place and repair fiber-optic cables globally (all weather and under the ice); or examine some fresh ideas for environmentally sound ocean mining and waste disposal. If old SSBNs can be modified for use by special forces, could old SSNs or SSBNs be modified for ocean R&D?

Long-term Implications: Another Way Ahead for the Submarine Force

Some leaders in government, business and among legislators are reviewing EEZ ideas -- both commercial and defense related -- to help convert defense industry, to preserve the defense industrial base for reconstitution through dual-use concepts and to boost our national economy. It is believed that, in spite of technological challenges, the EEZ will be increasingly utilized in the next two to three decades, if not by the U.S. then by Japan, the new Soviet Union or the Europeans (EEC). What we do in the U.S. EEZ in the next 20 years will have long-range economic and environmental implications, not only for our nation, but for significant areas of the globe. Who else but submariners -- and people who think like submariners -- could develop a well thought out, coordinated plan for development that ensures the U.S. continued leadership in submarine and off-shore technology and minimizes the degradation of the environment?

As you reflect on your future as an active duty submariner, or one interested in preserving submarine and ocean technologies, consider these dual-use ideas. What's in it for you? Continue the dialogue about the future of the submarine force by sending your ideas to The SUBMARINE REVIEW as a clearinghouse.

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NO VICTORY PARADES, BUT A LONG WAR FINALLY WON

by James E. Collins

World War III was different from World Wars I and II. The latter were violent, relatively short, and bolstered by a population generally united behind the fighting man. World War III, on the other hand, was a long-drawn-out war, lasting forty-five years from 1945 to 1990. This war was probably the most complicated, most expensive, and most dangerous to the security of the United States than any previous war, save the American Revolution. The enemy was insidious, attacking us outright, from the shadows, and from within. The country was divided in its zeal for victory. Casualties were high in personnel, equipment, and in careers, from presidents and premiers to the lowest common soldier. One can never totally be sure that the war has finally been won, but judging by the economic and political status of the former Soviet Union, a Soviet regeneration seems remote at this point in time. Certainly, the Warsaw Pact is dead and gone. And while there were no victory parades, the equivalent was felt when Leonard Bernstein conducted Beethoven's Ninth, the "Ode to Joy," in celebration of the fall of the Berlin Wall, New Years Day, 1991, and tears of joy and relief were shed around the world, and tired soldiers, sailors, marines, and airmen could finally come off alert later in the year.

While many forces were involved, ranging from SAC bombers to fleets to armies stationed overseas, clearly one of the leaders of the campaign was the Submarine Service. SSNs and SSBNs alike played major roles, and veterans of countless deployments and patrols can look back with pride on their victory and feel a sense of accomplishment from the hours, days, and months of long lonely vigils beneath the sea.

For the attack boat sailors, they often formed the front lines in all the oceans of the world, alert for enemy movements, unusual events, and deployments. They were on station to detect the first signs of conflict, to monitor new developments, and to gather intelligence regarding new hardware and tactics. Submarine forces were almost always the first to respond and

continually had to maintain a high state of readiness for rapid deployment -- a capability often tested.

For the SSBN sailors from the first patrol of GEORGE WASHINGTON, and for the patrols before POLARIS, they were on continual alert, tested, and ready to respond. They provided the deterrent that led to the Soviet step-down from the Cuban missile crisis, and in their long independent patrols were on the front lines providing the major deterrence that kept the world away from the horrors of nuclear war -- and, most important of all, we never fired one missile in anger -- deterrence worked!

So submarine veterans, as well as all the veterans of the 45-years cold war, the most dangerous of modern wars, can look back with pride on their service to their country, even though they will never be recognized by massive parades down Constitution Avenue or showered with ticker tape. We may be off alert at last, but the need for readiness and the need to be the best in the world will always remain. World War III was a cold war with many small conflagrations to extinguish, but can we step down or demobilize as we did after both of the previous wars? Not by a long shot, for even though the status of the former Soviet Union may no longer be in a position to wage a major war, other would-be world rulers and nuclear powers are readying themselves to step into the void and assert their claim for world dominance. The veterans of the 45-years war can stand proud, but the vigil continues for the new warriors. And that vigil is a whole new challenge that, drawing on the lessons from the cold war, will require support from personnel and technology.

■

TWO CREWS ARE BETTER THAN ONE

by Captain Arthur C. Bivens, USN(Ret.)

The U.S. Navy's FBM Submarine Base in Holy Loch, Scotland is now decommissioned. The base had been operational since early March 1961 when the USS PATRICK HENRY (SSBN-599) moored alongside the submarine tender USS PROTEUS, which was secured to a buoy in the middle of the loch. Captain Hal Shear commanded the Blue Crew, which had been on their first deterrent patrol, having left New London, Connecticut in late December 1960. Commander Bob Long was the skipper of the Gold Crew, which was about to conduct the first crew exchange and submarine refit in the Holy Loch. As an engineering division officer in the Gold Crew of the PATRICK HENRY, I had the pleasure of participating in that first refit in the Holy Loch and other significant events of the early FBM Submarine Service. Because Holy Loch has now passed from the U.S. Navy scene and because that place and FBM submarines played such an important part in many of our lives, it may be of interest to share some observations and experiences of those early FBM years.

The PATRICK HENRY was the second SSBN to slide down the building ways. She was commissioned in April 1960 and soon after commenced Demonstration and Shakedown Operations with the Blue Crew. The first turnover from the Blue to the Gold crew took place in Port Canaveral, Florida at the U.S. government wharfs on one side of the harbor. Civilian facilities are on the other side. During the crew turnover the Gold Crew was billeted at Patrick Air Force Base down U.S. Highway A1A past the Cocoa Beach strip of bars, night clubs, hotels, etc. During the 60's, with all the missile and space activity, the Cape was a Go-Go place. There was plenty of action and distraction for our sailors during their liberty hours.

Prior to completion of the crew exchange, we in the Gold Crew had an opportunity to witness the submerged launch of a Polaris missile by the Blue Crew. We embarked on the USS OBSERVATION ISLAND, a missile tracking ship, and followed the PATRICK HENRY out to the launch area some twenty miles off the coast. PATRICK HENRY submerged to about 100 feet keel depth in preparation for the launch. The OBSERVATION ISLAND was lying-to a couple of miles from the SSBN.

We could see the top of the tall telemetry mast that had been temporarily installed for these test shots. Also, there was a U.S. Navy destroyer on station a few miles away with the duty to fend off trouble from whatever source (Soviets, demonstrators, etc.). When all was set with the count-down, including range safety, the missile was fired. The missile popped out of the water but its rocket motor did not ignite. The missile hung for a split second and then down it went, crashing back into the water on top of the PATRICK HENRY. The next thing we saw was a huge explosion like a shallow-set depth charge going off. I thought to myself, my God, the ship is doomed! Immediately after the explosion the second stage of the missile broke loose from the first stage, ignited, and came shooting out of the water like a runaway toy balloon with all of the air suddenly released from it. At one instant the errant missile was headed directly at us on the OBSERVATION ISLAND. Most of us were diving for cover. Not the camera man though. He kept his camera on that missile and got a remarkable film of that missile's antics before it crashed into the ocean a few miles away in the direction of the accompanying destroyer. Fortunately, the damage to the PATRICK HENRY was superficial. Just some missile deck plating was smashed.

A few days later the Blue Crew fired a missile that worked and then it was our turn. The Gold Crew operation was to be something special. We were to fire a series of missiles at short intervals similar to how they would be fired in a wartime scenario. This was to be a step up in testing the capability of the total system.

We got underway with seven admirals on board to witness this momentous event. They included Admiral Arliegh Burke, the Chief of Naval Operations, Vice Admiral Joe Grenfell, Commander Submarine Force Atlantic, and Rear Admiral "Red" Raborn, Chief of the Special Projects Office. Like a lot of momentous occasions, this one was a huge flop. The first missile exploded as it broke the water and our skipper, Bob Long, called a hold on firing the next missile. After some conferring, it was decided to continue the test. Well, the next missile went awry and exploded too. That was too much. The operation was stopped and we gloomily headed back to Port Canaveral to try and figure out what went wrong. Admiral Burke addressed the crew with some kind words. He said that

the experts would find out what went wrong and that we would get another chance. But to us, that day was *Black Friday*.

The Polaris A-1 missile never was very reliable. But the immediate problem had to do with the range safety missile destruct system not working properly. Our crew did get another chance and several weeks later we took the ship out several hundred miles into the Atlantic Ocean and fired four successful missiles down range. This was the first broad ocean Polaris missile firing and it was done in an operational environment similar to the real thing. We all felt vindicated and proud of our ship and crew.

The PATRICK HENRY commenced its first patrol in late December 1960. President Eisenhower had stated that there would be two Polaris submarines operational and on deterrent patrol before the end of his term. And so it happened that the GEORGE WASHINGTON and PATRICK HENRY were on patrol covering strategic targets before Ike turned over the reins of government to John F. Kennedy.

The GEORGE WASHINGTON returned to New London, Connecticut after her first patrol. The PATRICK HENRY ended her first patrol at our newly acquired base in the Holy Loch. The USS PROTEUS, a WW II built submarine tender modified to handle Polaris missiles and nuclear submarine requirements, was moored to a buoy in the middle of the loch ready to take the PATRICK HENRY alongside. The Gold Crew met the ship there and commenced the first Holy Loch crew exchange.

Transporting the relieving crew from our home port of New London was quite an ordeal in those early days. We were bused from New London to Maguire Air Force Base in New Jersey where our crew of 140 officers and men was divided into two groups to fly in two prop planes under contract to the U.S. Air Force. All the various ratings and specialists were carefully divided in case one of the planes went down. We would then have a core group to build on with replacements if a disaster happened. Happily, we have never lost a plane in the thirty years of flying those crews. The two plane airlift was abandoned with the advent of the larger and more reliable jet airliners. On the early flights, the planes landed in Gander, Newfoundland to refuel for the final push across the Atlantic.

Our first impression of Scotland in March 1961 was of the typically gloomy and misty day, not one to heighten our spirits. We landed at Prestwick where we were in for another long bus ride. We loaded on to three of the familiar British two decker buses for the trip to Greenock on the south side of the Firth of Clyde. At the time few of us appreciated the fact that we were in the heart of Robby Burns country or that we were right next to the famous British Open golf courses of Troon, Turnberry, and Prestwick. Not until later did I come to understand and appreciate Scotland better. At Greenock we again had to load ourselves, our luggage, and crew records into boats for the 45 minute ride across the Clyde to the Holy Loch and the PROTEUS.

No one was sure how long a proper crew turnover should take. Some people said it should be two weeks with both crews working together to help speed the refit. Our first one there was ten days and that was too long. The offgoing crew was eager to go home and the oncoming crew did not want them around after a few days because the ownership role had changed too. Soon after this initial crew exchange overseas the turnover length stabilized at four days.

The PATRICK HENRY entry into the Holy Loch was enlivened by greeters other than the Gold Crew. Hundreds of anti-nuclear demonstrators were on hand along with the press to complicate the crew relief. Some of the demonstrators paddled out in kayaks to harass or even board the ship. We had to develop new procedures to handle this kind of activity. Our Repel Boarders Bill was too violent and deadly for demonstrators. We warned the demonstrators not to touch the ship and if they climbed aboard we were instructed to take them into custody and then hand them over to the British Constabulary. We also greased the top of our upper rudder to foil their attempts to climb up and perch on it. The majority of the demonstrators sat down outside the gate to the British government pier at Sandbank on the Holy Loch and tried to block access. The British constables were quite efficient and the demonstrators were mostly peaceful, most of them sitting and shouting "No Polaris" as we picked our way through them, either going ashore or returning to the ship. (One of the demonstrators, an avowed Communist, later was a math teacher for one of my children in the local schools.)

The Holy Loch and the little towns of Dunoon, Sandbank, and Kilmun that border the loch were not strangers to naval personnel. During World War II the loch was home to a Royal Navy submarine squadron. The British Depot Ship (Tender) was moored to buoys at the same location as PROTEUS. Most of the Scots were very kind and hospitable. They recognized the need for our presence. They also could see a resurgence in their local economy. For example, anti-nuc demonstrators had painted in large letters on the Kilmun sea wall the words "POLARIS SPELLS DOOM." A local wag had changed the "D" in doom to a "B". Of course BOOM could be interpreted two ways, but to the local merchants it definitely spelled dollars.

The Holy Loch, the Firth of Clyde and the surrounding Scottish country is remarkably beautiful and enchanting. Many people are put off at first by the rainy weather and the short winter days. Some of our sailors griped that the beer in the local bars was served at room temperature and that the bars closed at 10:00 pm. Also, we had to time carefully our evenings ashore with the liberty boat schedule. But for those who took the time to explore the country and got to know the local people, or lived there as I did later with my family while on the Squadron Staff, Scotland was a wonderful experience.

My turn for command of a submarine came in 1967 as CO of the USS SAM HOUSTON Gold. However, I had to share the ship with another skipper, the CO of the Blue Crew. During my first year it was Zeb Alford, a gracious Southerner from Mississippi, a pleasure to work with. Zeb was relieved by Hal Glovier. He also was an excellent skipper and we got along just fine - most of the time. Whenever the situation looked like it might get a little tense we would go up to the handball court erected on the large open deck above the pilot house of the then resident tender, USS SIMON LAKE. There we would take out our frustrations with a few brisk games. It worked like a charm. We are still friends.

The first skipper of the SIMON LAKE was Captain Jim Osborn, known as "Oz." Oz also had been the first CO of the GEORGE WASHINGTON. Oz liked to play handball and squash. So while the SIMON LAKE was being built he had this wonderful handball/squash court erected. It was a great idea as a recreational feature on our mother ship, especially for us jocks. But alas, several years and another skipper later it was

decided to use this wooden structure for purposes other than sports. It was to be used as a temporary office for some contract workers sent over from the States. I led the protest against this action. We complained to everyone saying it was a bad precedent and not in line with the Navy's physical fitness program. Eventually the SIMON LAKE's CO backed off. I detected victory when the XO of SIMON LAKE called down to our ship to say that Captain Ben Sherman, the Squadron Commander, was in the handball court and why wasn't I up there playing handball?

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Remarks by CAPT Robert W. Stecher, USN(Ret.)
at the Deactivation Ceremony
of USS JOHN MARSHALL (SSN-611)
Norfolk, Virginia, November 24, 1991

Vice Admiral Zimble, Captain Konetzni, Commodore Jensen, Commodore Haley, men of the JOHN MARSHALL past and present, families and friends.

It's been 27 years since I last had occasion to talk to the crew of the JOHN MARSHALL, and it's a pleasure and a privilege to be back with you to celebrate her honorable retirement.

Having my brand new ship, my pride and joy, my JOHN MARSHALL, retire on 30 years' service as the oldest submarine in the Navy is, I suppose, not in itself a surprise; it is really no more than I would expect of her. But to have her do it so fast -- to have her spend so many years so quickly -- such fascinating and significant years in the history of the nation and the world -- that really gets my attention.

She was born right there across the river in Newport News. Having been with the Inspection Board that accepts new ships for the Navy and seen the output of shipyards across the country, I had decided that if the Navy ever gave me command

of a new ship, I hoped it would be built in the NNSB&DDC. And behold, not three years later, I found myself on a hot July day standing on the bridge of a Polaris submarine as it slid down the ways into the James River. Ethel Kennedy, wife of the Attorney General, splashed a bottle of top quality champagne all over the ship's bow and herself and the shipyard president, the band played Anchor's Aweigh, the crowd cheered, JOHN MARSHALL took to the water for the first time, and by golly, that was a thrilling moment.

But it is not possible to live on a perpetual high, and after the euphoria of the launching, reality set in. Probably not many of you in the present crew have been through a precommissioning period, and it looks as if not many will in the near future, but I can assure you, it is no picnic. There was a feeling of urgency in the air when we were launched. The cold war was at full heat, only 6 of the planned 41 FBM (Fleet Ballistic Missile) submarines were in service, and JOHN MARSHALL was desperately needed to increase the credibility of our growing deterrent forces -- forces, that is, designed to deter the Soviet Union from attacking the U.S. or its allies -- to deter them from making good on Kruschev's threat, "We will bury you." The Cuban Missile crisis, the highwater mark of the USSR's threatening moves against the U.S., was under way. The shipyard was working three shifts, with only a 2-hour gap in the early morning when we could get aboard, so we held School-of-the-Boat from 5 to 7 every morning. I can't say there was no grumbling -- it's a sailor's prerogative to grumble occasionally -- but the effort we put forth paid large dividends in welding together an integrated, trained, competent crew. I'll give you an example. SAM HOUSTON was the boat immediately ahead of us in the shipyard, so when she went out on sea trials, a contingent of JOHN MARSHALL sailors went along as observers. When some serious problems developed in the missile equipment, it was not the shipyard that fixed it and it was not the SAM HOUSTON crew; it was the JOHN MARSHALL observers who identified the problem and set it right, so that the sea trial could be completed successfully.

By the time of our commissioning in May of 1962, the men were well knit together as a solid crew. They were proud of their ship and themselves, and in a very nice way, they took nothin' from nobody. After the commissioning ceremony, of

course, we held open house for the guests, starting with a fast walk-through by the official party. The principal speaker for the commissioning was Chief Justice Earl Warren who, though he finished life as a jurist, never forgot that he started out as a politician. As he passed through the control room he stepped up to one of the sailors, stuck out his hand, and said, "Good afternoon, son. I'm Earl Warren, Chief Justice of the United States." The sailor, completely unfazed, took the Chief Justice's hand and said, "Good afternoon, sir. I'm Joe Belliveau, Electronics Technician First Class, USS JOHN MARSHALL." Then they both grinned.

The next one through was Paul Fay, Undersecretary of the Navy, touch football pal of President Kennedy, and a physical fitness devotee. He came up to Joe Belliveau, who, to put it charitably, was rather large, and said, "Son, haven't you heard of my weight loss program for the Navy?" "Yes sir," said Joe with his widest grin, "but she's a feeder."

JOHN MARSHALL set an enviable record in the shipyard. During the entire time we were there, we never missed our scheduled underway times for sea trials, and we never failed to complete successfully all objectives of the trials. But records are made to be broken -- and ours was broken -- badly broken -- on the last day, when we were to leave the shipyard for the last time and start our shakedown cruise.

You see, my Medical Officer in the commissioning crew was a starry-eyed, downy-cheeked young doctor, fresh from medical school, internship, officer school, Submarine School, Nuclear Power school -- long on training and short on experience. He found himself supported by two highly experienced, highly competent chief hospitalmen, Alex Nicholson and Lou Sikes. Like all intelligent young officers, the doctor hearkened to the voices of his chiefs. In the organization of their department, these three sages noticed that the number one periscope, which came down right through the medical office spaces, when lowered, left just enough room beneath it to stow the bed pan. The doctor agreed that this was the perfect solution to getting a little-used appurtenance out of the way of the more important stuff. Well, the night before our final departure, the ship's duty officer ran through an extensive checklist of equipment tests, just to make sure everything would be in readiness on the morrow. He even bypassed the normal stops and lowered the

periscopes to their under-ice position, which moved them down an additional few inches to provide extra shielding for the optics on top of the scope if we should ever happen to go under the arctic ice. No one expected a Polaris to operate under the ice, of course, but it was one of the details in making us a submarine fully capable of performing all missions.

The next morning when we were preparing to get under way, the navigator reported to me that the radar wouldn't work. It turned out that the problem was that the bedpan was of stainless steel, but the radar waveguide on the bottom of the scope was of copper. When the scope went down those last few inches, the bedpan was damaged, but the radar waveguide turned to spaghetti, and the young doctor thought his naval career had, too. Our departure was delayed for several hours while the shipyard personnel came aboard, earning triple time because it was a Saturday, and reassembled the radar. So much for a perfect record. But the net benefit of starting navy life under the tutelage of two good chiefs is evident from the fact that Doctor Jim Zimble just finished his own 30-some years of service, retiring as a Vice Admiral and the Surgeon General of the United States Navy. And I'm glad you're here today, Jim. And not only Jim Zimble, but I see more than a dozen JOHN MARSHALL plank-owners, Blue and Gold, sitting in the audience. It's great to see you guys!

It was really fascinating to compare the operations of our new nuclear submarine to those of the diesel-electric boats -- particularly wartime operations. From the days of their inventor, John Holland, our precious submarines had in truth been submersible surface ships, able to operate freely underwater for short periods, but faced with the paramount necessity of surfacing every night to charge batteries. In fact, the most significant change since my father's first command, the A-2 with its crew of six, to the 76-man TREPANG in which I made five war patrols, had been the replacement of gasoline engines by diesels.

But here suddenly we had a vehicle capable of operating indefinitely submerged, needing only to surface every two years to reenlist the crew. It is in fact a true submarine. I don't need to detail to this audience all the hidden ramifications of this fact, but there is one I want to mention. One of the prime requisites for a submarine sailor in the old days was a good pair

of sealegs, either brought with him to the ship, or developed in a very few days at sea. The boats were possibly the most seaworthy ships in the navy, but next to a destroyer, arguably the most uncomfortable. On our first war patrol in TREPANG, off Tokyo Bay in a typhoon, I saw an officer, thrown from his bunk in the forward battery compartment, instinctively hang on to his mattress and take it with him. He woke up with his head in the forward torpedo room, still holding his mattress. By contrast, the nuclear submarine, especially the FBM, stays submerged, and a sailor has no chance to develop his sea legs. In JOHN MARSHALL, I had sailors who would get seasick when we came to periscope depth in a state four sea. I wouldn't be in the least surprised if that were still the case!

The Polaris cycle of operations was in some respects very similar to the wartime cycle, in which we would go to sea for a patrol of nominally 30 days on station plus transit time, then return for a short refit, and repeat the cycle. A major difference is that in the boomers, you know just when you are leaving and how long you'll be out. You know the exact date on which the mid-patrol dinner of steak and lobster will be served. The most excitement you can anticipate is the scurrying around to repair the inevitable equipment casualties. The first and the last two weeks are endless, but the period in the middle just passes by. But in wartime, the time on station was spent in constant anticipation of combat, at any hour of day or night. If you found enough targets, you could fire all your torpedoes and come back for refit and rest camp, which could be the Royal Hawaiian Hotel or a barren atoll in the South Pacific. But for those unfortunate enough not to find targets, the thirty days would pass in a fever pitch of boredom, and the crew would return with frayed nerves and the disappointment of a dry run. I'm happy to say, we got rid of our torpedoes on all five of our patrols in TREPANG, sinking or damaging sixteen ships, including putting a fish into a battleship, and rescuing ten aviators.

The two-crew arrangement which permits the modern missile-carrying submarine to keep a schedule of almost continuous at-sea deployment, while the crew gets home occasionally for a little R&R, is, I believe, unique in the annals of warships. It has obviously been successful in general, and I can testify positively that there was no friction at all between

the first Blue and the first Gold crews of this ship. Oh, we had our little incidents. The night after we relieved the Gold crew in the Holy Loch, Scotland, after their first patrol, the Gold officers sneaked aboard at two in the morning, turned the stateroom speakers up to full volume, blocked all the doors, and put a tape on the wardroom recorder of a British army band that started out with the drum major shouting "huh, huh, huh, huh!" I can tell you that woke us up and shook us up. As you might imagine, we spent our whole patrol dreaming up a proper response.

We set our little surprise to go off during the Gold crew's first dinner after they relieved us. We had hard wired the spare reactor plant alarm into the electrical lines just above the wardroom table, and it sounded off right on schedule. It took them 20 minutes to get it turned off. The Gold Crew admitted that they had been bested by the Blue, and from then on out we confined our competition to striving to turn the ship over each time in better operating condition, cleaner, and with smoother paperwork than we got it. In that competition, we came out about even.

Let me tell you about a small incident we ran into. When we surfaced off northern Ireland after our first deployment into the Med (we'd operated in the Norwegian Sea up to that time), I saw through the periscope what appeared to be a long gash in the deck aft of the fairwater, Investigation showed that it wasn't a gash at all; in was ten fathoms of blue nylon line, with several six-inch fishhooks attached to it at intervals. I'd love to have heard that fisherman's tale of the one that got away. But you know, the more I think about that story the less funny it gets. I've lost many a night of sleep wondering what happened to the poor guy who was just out trying to make a living, and suddenly found himself being towed backwards at five knots.

The decision of the Navy's ship designers to make JOHN MARSHALL a fully capable, all-purpose submarine was amply justified when the Polaris type missile was overtaken by the advanced technology of the Poseidon and finally the Trident. With scarcely a break in her activities, JOHN MARSHALL was able to transform herself into an attack boat, and finally into this new, exotic configuration of Dry Deck Shelter/SEAL Delivery Vehicle. As one who went from the Submarine Force to being an amphibious sailor, I can fully appreciate the

potential for such a ship. And the skill with which you performed that mission is attested to by the Meritorious Unit Commendation you earned in the Med in 1989, and your honorable service in the recent Desert Storm operations.

JOHN MARSHALL the deterrent weapons system was a vital piece of one of the most successful strategies in the history of warfare. We were faced with the aggression of an implacable, self-declared foe, bent on world domination and the elimination of our way of life. We embarked on a strategy not of aggression facing aggression, but of deterrence. We faced the enemy with a solid front of our combined physical and moral strength, and in beating him, we did not have to fight. Not since the Biblical times of Nehemiah has there been a record of a strategy and a weapon system so successful. Nehemiah rebuilt the defenses of Jerusalem while standing up to the belligerence, blusterings, and blandishments of his enemies, and in the end, he did not have to fight. We are told that his enemies were "much cast down in their own eyes," and I can think of no better description for the humiliation of the Soviet Union and of Communism world wide, than that they are much cast down in their own eyes.

So we have won the Cold War, but until we find a way to repeal human nature, we cannot afford to assume there will be a peaceful, trouble-free world. And as it becomes clear what measures of defense -- hot or cold, active or passive -- our nation's policy next dictates, the ones called upon to work first and hardest on that policy will be you young men and your successors in uniform. And as for JOHN MARSHALL herself, as long as any of us who served in her continue to serve, she will still be doing her share.

Thank you, Captain Wegner, and your sixteen predecessors for taking such good care of my ship.

God bless you, and your families, and the ships in which you will serve.

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ON PATROL FIFTY YEARS AGO

by Dr. Gary E. Weir

USS NAUTILUS (SS-168) departed Pearl Harbor on 24 May 1942 with the primary mission of participating in meeting the expected Japanese attack on Midway. NAUTILUS was one of the old interwar V-class submarines, displacing nearly 4,000 tons, which was much larger (and more awkward) than the newer 1,500 ton Fleet boats.

Under the command of LCDR William H. Brockman Jr., NAUTILUS located and attacked the Japanese fleet as it approached Midway. The submarine was spotted and had to endure a grueling depth charge attack, but they survived and inflicted considerable damage on the enemy. Without a doubt, NAUTILUS had a great view of the battle which became the turning point of the Pacific War.

USS NAUTILUS -- First War Patrol

NARRATIVE: (all times local) June 4, 1942

0420 Submerged on course 040°T.

0544 Intercepted message that many planes were headed for Midway from a point 320°T from Midway distance about 150 miles. This was on the northern boundary of NAUTILUS area and we were close to this point. Swept horizon continuously.

0658 Sighted a formation of six planes resembling Army Flying Fortresses dead ahead.

0710 Sighted bombing on bearing 331°T. NAUTILUS position Lat. 30-00 N, Long. 179-25 W. Changed course to 340°T and went to battle stations submerged.

0755 Saw masts over horizon. While making this observation we were strafed by aircraft. Changed depth to 100 feet. Echo-ranging first heard at this time.

0800 Sighted a formation of four ships. One battleship of ISE class and one cruiser drew toward the starboard bow, two other cruisers toward the port bow. Decided to attack the battleship and changed course to draw ahead. Sighted and bombed by plane. A cruiser of the JINTSU

class approached to attack with depth charges. At least two ships were echo-ranging on the NAUTILUS.

0810 JINTSU class cruiser dropped pattern of 5 depth charges followed seven minutes later by pattern of 6 depth charges.

0819 Went to 90 feet to avoid scouting planes. Nine depth charges dropped at distance of about 1,000 yards. When attack ceased, planed up to periscope depth to observe.

0824 The picture presented on raising the periscope was one never experienced in peacetime practices. Ships were on all sides moving across the field at high speed and circling away to avoid the submarine's position. Ranges were above 3,000 yards. The JINTSU class cruiser had passed over and was now astern. The battleship was on our port bow and firing her whole starboard broadside battery at the periscope. Flag hoists were being made; searchlights were trained at the periscope. The exact position of the NAUTILUS may have been known by the enemy at this time because #9 deck torpedo was running hot in the tube as a result of the shearing of the torpedo retaining pin during the depth charging. Periscope estimate was made on the battleship and put on the Torpedo Data Computer. Range estimated as 4,500 yards, angle on the bow 80° starboard, speed 25 knots.

0825 Fired #1 tube at battleship followed by #2 tube with a 1° right offset. After firing #2 it was found that #1 had not fired. Battleship changed course to the left and headed directly away. Range to battle ship had now increased to 5,000 yards and track was 180°. Held further fire. During this time echo ranging by surface ships was continuous and accurate. Immediately after our firing at the battleship, the JINTSU type cruiser headed for NAUTILUS.

0830 Went to 150 feet. Depth charge attack began.

0846 Ordered periscope depth. Battleship and other accompanying ships, except JINTSU type cruiser, were well out of range. Echo-ranging by cruiser was still accurate.

0900 Raised periscope and sighted aircraft carrier bearing 013° relative. Carrier was distant 16,000 yards and was changing course continuously. She did not appear to be damaged, but was overhung by anti-aircraft bursts.

NAUTILUS was on a converging course. While making this observation the JINTSU type cruiser began to close again at high speed.

0910 When cruiser reached 2,500 yards fired #2 torpedo tube. Cruiser was observed to change course.

0918 A cruiser attacked with 6 depth charges. These were more accurately placed than previous charges. Went to 200 feet, used evasive tactics at slow speed, but continued advance to close the carrier. Cruiser continued echo-ranging and at 0933 two of her depth charges landed close.

0955 Echo-ranging ceased. Ordered periscope depth to estimate the situation. On looking found that the entire formation first seen, including the attacking cruisers had departed. The carrier previously seen was no longer in sight.

1029 Saw 3 masts on the horizon bearing 005°T, distance 10 miles. Changed course to 005°T. Raised the vertical antenna and intercepted a radio message stating that a CV was damaged. Large clouds of grey smoke were seen at four places over the horizon. The nearest cloud of smoke had not previously been sighted, so continued to close it at the best speed that the condition of the battery and probable future operations for the day would allow.

1047 Sighted three planes approaching. Lowered periscope and vertical antenna and continued approach at periscope depth.

1145 Identified the source of smoke as a burning carrier. The carrier was still about 8 miles away and was in latitude 30°-13' N., Longitude 179°-17' W. Decided to overtake if possible and to attack.

1224 Range not having decreased appreciably, changed speed to two-thirds ahead on both motors after estimating that sufficient battery capacity just remained for operations until night fall.

1253 Range decreased. Sighted two cruisers escorting the carrier. Tentatively identified CV as a carrier of the SORYU class. The carrier was on even keel and the hull appeared to be undamaged. There were no flames and the fire seemed to be under control. Accompanying cruisers were about two miles ahead of the carrier.

1300 The CV, which had been making 2-3 knots when the approach began, was now stopped. At closer range it was seen that efforts were being made by boats under her bow to pass a towing hawser and many men were seen working on the forecastle.

The decision had to be made in which order to attack the targets presented. Attack on the cruisers and later on the carrier was considered, but the remaining capacity of the battery would not allow a further chase of several miles to catch the moving cruisers, even if it were possible to overtake them. The decision was therefore made to complete the destruction of the CV before she could be repaired or taken in tow.

Approach continued at periscope depth. An approach course was chosen to give torpedo hits on the starboard or island side of the carrier. During the next hour a repeated check was made of the silhouettes of American and Japanese carriers in order to be certain of the identity of the target. The target was a carrier of the SORYU class.

1359 Fired three torpedoes at the carrier from periscope depth. Attempts to fire the 4th torpedo were unsuccessful. Immediately prior to firing each torpedo, the Torpedo Data Computer generated bearing was checked by a periscope bearing. Mean run of torpedoes was 2,700 yards. The wakes of the torpedoes were observed through the periscope until the torpedoes struck the target. Red flames appeared along the length of the ship from the bow to amidships. The fire which had first attracted us to the attack had been underneath the demolished after flight deck and was nearly extinguished by the time the NAUTILUS reached the firing point. This fire again broke out. Boats drew away from the bow and many men were soon going over the side. All 5 officers in the conning tower observed the results of the torpedoing.

1405 Fired last of three torpedoes at the carrier. Cruisers began reversing course at high speed and started to echo-range.

1410 Cruiser passed directly over the top of the NAUTILUS. Changed course to 190°T and went to 300 feet. A prolonged depth charge attack now began.

1610 Came to periscope depth. Saw carrier, but the escorting cruisers were no longer in sight. They had abandoned the carrier and she was afire along the entire length.

1800 Heavy black smoke enveloped the carrier and formed a cloud over the ship to a height of a thousand feet. The officer making this observation compared the cloud to the oil smoke which arose from the USS ARIZONA when that ship burned at Pearl Harbor, T.H., December 7-9. Nothing could be seen of the carrier's hull.

1840 Heard heavy subsurface explosions and went to depth charge stations. A search by periscope failed to reveal any object in the vicinity except the still greater cloud of black smoke from burning oil. If the carrier was not found by patrol planes which searched the vicinity the following morning, the Commanding Officer believes that she was destroyed at this time by fire and internal explosions. He did not however actually see her sink.

1941 Surfaced with exhausted battery and returned to NAUTILUS patrol area. Five torpedoes expended, forty-two depth charges received. On surfacing no smoke or flame of any sort was seen.

[Editor's Note: From War Under the Pacific, Time-Life Books, 1980; "Brockman reported that he had put the carrier down and was officially credited with the kill. But in fact, the carrier had been set afire and sunk by bombs from U.S. planes. Japanese survivors later testified that two of the three torpedoes fired had been misses and that the one that hit was a dud."]

June 5

0414 Submerged.

0720 Surfaced in accordance with orders and proceeded at best speed for Midway.

June 9

1800 Departed Midway for patrol area. Made trim dive.

June 20

1530 Sound reported screws bearing 032 relative. Nothing in

sight but thinking this might be submarine, dived lat. 34-32.5 long. 141-49.5 E. Screws died out after they were heard to pass down our starboard side.

1600 Heard pinging.

1645 Sighted two ships from direction of pinging resembling the raider NARVIK. Started approach. Ships at first were heading in our direction but when range had decreased to 4,700 yards they reversed course and headed away.

1930 Surfaced.

June 21

0346 Submerged latitude 34-43, longitude 140-55 E.

1934 Surfaced.

2021 Sighted flashing light believed to be Katsoora Wan Light.

June 22

0345 Submerged latitude 34-48 N., Longitude 140-23 E. Periscope patrol.

0940 Heard echo ranging for about one hour. Could see nothing but visibility was bad.

1120 Sound reported screws bearing 170 relative. Nothing in sight.

1125 Sighted destroyer through mist and fog on starboard quarter distant about 1,020 yards. Started approach but depth control was momentarily lost and accurate set up on T.D.C. was not obtained until 1133 at which time one torpedo was fired. By the time torpedo had reached target track, target could not be seen due to visibility. Sound tracked torpedo to target and torpedo room reported hit. Seven minutes after torpedo was fired a loud explosion was heard and felt throughout ship. The Commanding Officer at that time had periscope trained on last bearing of target; visibility about 3,000 yards and nothing was in sight. From that time until 1210 screws were heard intermittently and then suddenly stopped and never heard again. The intensity of the explosion which was heard was the same as that of a depth charge 500 yards abeam. Except for a high noise level reported by sound and a cracking in the receiver nothing more was heard from this destroyer. In the opinion of the Commanding Officer a hit was made on this destroyer and she

sank at 1210.

1722 Sighted a vessel with clipper bow probably 1,500 tons; tried to close for attack; could not get closer than 3,500 yards.

1935 Surfaced.

June 23

0345 Submerged latitude 34-37, longitude 140-03 E.

0841 Sighted 2 engine high wing monoplane. Went to 100 feet for about one hour then continued periscope patrol. Noticed an oil slick today. Decided to run south during night and renew number three main engine exhaust valve gasket and determine cause of oil slick.

1935 Surfaced.

June 24

0345 Submerged latitude 34-19.5, longitude 140-20 E.

0900 Surfaced. Renewed exhaust valve gasket and discovered fuel oil must have come up through compensating line. Headed back to line which was supposed to be route between Marshalls and Sagami Nada.

June 25

0330 Sighted a large vessel on our port quarter, angle on the bow about 50 degrees starboard. Unfortunately we were silhouetted against the dawn so dived to make approach. We had apparently been seen because a destroyer now moved from the port side of this vessel and then about 1,000 yards on our starboard quarter started a depth charge attack.

0345 Fired two torpedoes at this large ship and went deep because depth charges were getting closer. Sound tracked torpedoes to target then reported rumbling sound and crackling noise and screws stopped.

0439 Three loud explosions were heard which shook the boat more than depth charges and were longer in duration.

0512 At periscope depth, nothing in sight.

0522 Sighted destroyer, range about 12,000 yards, started approach. For the next hour we probably closed a little.

0710 While destroyer was on course 200 T. he went ahead about 18 knots and was soon out of sight.

0831 Sound heard pinging from 196 relative.
0835 Sighted destroyer and commenced approach. This was not the same destroyer sighted at 0522.
0854 Fired first of 2 torpedoes. First torpedo was seen to be a bull's eye and flame issued from number two stack and amidships portion raised a few feet, but no other damage was immediately apparent. Fifteen seconds later the second torpedo hit forward and the damage was terrific. She immediately started sinking by the bow and heeled over to starboard. By 0858 the destroyer was seen to be sinking fast.
0905 Heard several explosions and destroyer sunk.
1930 Surfaced.
2018 Ran through a huge oil slick one mile across and several miles side. This was thought to be oil from the tanker which was attacked at 0345.

June 26

0339 Submerged latitude 34-32 N., longitude 139-55 E.
0450 Sighted a destroyer heading up the coast; started approach but could not close. Decided to remain in this position in as much as he may come back. Nothing more seen of destroyer.

June 27

0346 Submerged latitude 34-38, longitude 140-08 E. Further east than we had intended but weather conditions made navigation difficult.
0520 Fugi Yama in clear sight as well as the coast of Honshu, O'Shima and Niyaki Shima. Sea glassy calm.
1930 Surfaced.
2224 Sighted a Sampan about 1,500-2,000 tons headed in our direction. He was seen to change course once.
2226 Submerged to make periscope approach because visibility was at least 10,000 yards all around.
2244 Fired one stern tube.
2245 Saw flames aft and heard explosion of torpedo about same time. Sampan was seen to sink by stern.
2316 Surfaced, nothing in sight.

June 28

0340 Submerged latitude 34-40, longitude 139-56.
0355 Sound reported hearing screws bearing 070 relative.
3403 Sighted large Sampan range 6,000 yards. Started approach but unable to close.
1604 Sighted two ships plus three stack cruiser. Started approach on largest and closest one which resembled the KAMAKURA MARU. 17,500 tons.
1621 Fired three torpedoes and found that the cruiser had apparently sighted air bubbles and was headed in our direction. Ordered deep submergence.
1629 Depth charge attack which was the worst ever experienced by this vessel.
1745 Echo ranging ceased and started coming up slowly to periscope depth.
1815 Sound reported hearing crackling in receiver although not so loud as when destroyer was sunk.
1829 Periscope observation, nothing in sight.
1919 Just before surfacing heard and felt a heavy explosion as though from a great distance.
1935 Surfaced. Sighted several small Sampans during night.

June 29

0343 Submerged in vicinity of Miyaki Shima, decided this would be a more quiet area where damage caused by depth charging could be appraised.
0750 Sighted masts and stack of a small freighter probably 2,500 tons. Started approach but could not close.
1930 Surfaced.

June 30

0350 Submerged in vicinity of Miyaki Shima and found it impossible to run at periscope depth due to heavy swells. 100 feet was the shallowest depth that could be maintained. It is the opinion of the Commanding Officer that this ship should not be subjected to any more depth charge attacks due to damage.
1930 Surfaced in heavy swells.

July 1

0346 Submerged south of Inubo Saki. Heavy swells did not permit periscope patrol.

1930 Surfaced and made decision to return to Pearl due to material condition of this ship. Set course 093 T.

LCDR William H. Brockman, Jr., USN
Commanding Officer, USS NAUTILUS

REAR ADMIRAL WILLIAM HERMAN BROCKMAN, JR. UNITED STATES NAVY, RETIRED

William Herman Brockman, Jr. was born on November 18, 1904, at Baltimore, Maryland. He enlisted in the United States Naval Reserve Force on August 10, 1922, and in 1923 was appointed a Midshipman and entered the U.S. Naval Academy, upon appointment from the Sixth Ohio District.

In July 1929 he reported to the Submarine Base, New London, Connecticut, for instruction in submarines and upon completion of the course, in December 1929, was assigned duty with Submarine Division THREE, attached to the USS S-11.

He commanded the USS MALLARD from February 1938 to July 1939.

In September 1940, he reported as Operations, Gunnery and Torpedo Officer on the staff of Commander, Submarine Squadron TWO (later redesignated Submarine Squadron ONE) to serve until November 1941. He had two months' duty as Prospective Commanding Officer of Submarine Squadron SIX, and in February 1942, assumed command of the USS NAUTILUS.

For meritorious services as Commanding Officer of the NAUTILUS he was awarded the Navy Cross for action in the Battle of Midway on June 4, 1942.

On November 1, 1947, he was transferred to the Retired List of the U.S. Navy, and promoted to the rank of Rear Admiral.

Rear Admiral Brockman died on 1 February 1979 in Boca Raton, Florida.

■

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- Date of retirement
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Naval Submarine League History Book

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MORE "IN THE NEWS"

The ten pages of In the News items in the January 1992 SUBMARINE REVIEW were virtually all devoted to nuclear submarines. It is recognized that the readers of the REVIEW -- primarily the members of the Naval Submarine League -- have a lot wider interest than just the nuclear powered submarines.

A copy of Armada International, Dec/Jan 91/92, with its numerous submarine-related items, made me realize how interesting these bits of news are for the REVIEW's readership. Some of the items which seem appropriate for inclusion in In the News would be:

- "Litton will develop and demonstrate the operational advantages of hull-mounted submarine fibre optic sonars... and has demonstrated an all-optical towed array;
- Swedish Ordnance has been contracted to supply the 43 X 2 anti-submarine torpedo for delivery in 1993. The torpedo is wire-guided with an advanced homing head and can detect and track submarines in both deep seas and coastal waters. It will be operable from submarines;
- The URSULA, Britain's third UPHOLDER class diesel-electric submarine, has 9,000 a-h flat-plate lead acid cells;
- 12,000 Trimble Navigation Trimpack GPS receivers are on order. 1,000 were used in the Gulf War (with a geographic position accuracy of 30 feet). The Trimpack provides a cold start 3-D fix in 2.5 minutes and calculates a new position every second thereafter. About the size of a car radio, it has a colour liquid crystal mapping display and a near-gadget price-tag. (Yacht owners are buying such GPS receivers for about $1,200);
- Kockums AB has received an order to install a Stirling Air Independent Power system in the new A-19/Gotland class submarines -- the first to be launched in 1994. The Stirling system burns pure oxygen and diesel fuel in a pressurized combustor. This system is also installed on the French SAGA submarines and contracts have also been signed for it in Japan and Australia. The exhaust products can be discharged noiselessly and without trace. It can be retro-fitted into current submarines;

- McDonnell Douglas's Harpoon anti-ship missile now has Block 1D improvements which can be retrofitted to most of the current Harpoon missiles in inventory. The improved Harpoon can fly a clover-leaf search pattern if the target is not successfully acquired on the first pass, and its range is almost doubled by the Block 1D improvements."

Think how such technologies might improve the performance of many types of submarines.

W. J. Ruhe

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SUBS OF THE RUSSIAN/SOVIET NAVIES

Sumner Shapiro's review of Submarines of the Russian and Soviet Navies, 1718-1990 in the January 1992 issue makes an important point that should be emphasized for readers of the REVIEW and other submarine officers. Shapiro states (page 107): "while I agree that the Soviets have strived in recent years for qualitative improvements in their submarine force -- and made significant progress in that regard -- I fail to see any real evidence of their reaching the point by the year 2000, as cited [in the book] where their submarines will be equal or superior to the U.S. Navy in all technologies except passive sonar and in the quality of personnel... Presenting such speculation as fact does a disservice to the reader..."

To paraphrase, Shapiro is saying that the Soviets could not have achieved superiority by 2000 in

hull materials*	reactor power density*
hull design	weapon systems
dive depth*	automation systems*
maximum speed*	post-attack survivability

First, these were not stated as "fact" but -- as noted by Shapiro -- as speculation for the year 2000. Further, as stated in the book, this speculation is based on an article by a former Naval Intelligence analyst that was published in the U.S. Naval Institute Proceedings.

Second, it is painfully obvious that the Soviets were already ahead of the U.S. Navy in submarines already at sea in at least

five of the eight categories -- indicated by asterisks in the above list.

A look at the "blending" of sail and hull in the AKULA and BELUGA designs, the hull lines of those submarines, and certain other features indicates that the Russians may already be ahead of the U.S. Navy in hull design.

Weapon systems are more difficult to evaluate. The Soviets certainly predated the U.S. Navy in underwater-launched guided missiles, ballistic missiles in submarines, very-long-range ballistic missiles, tactical ballistic missiles launched from submarines, large-diameter torpedo tubes, wake-homing torpedoes, etc. There is certainly evidence of a more varied and intensive submarine weapons development program than in the United States.

Post-attack survivability is also a highly speculative issue. Double-hull construction and internal compartmentation are features of Soviet submarines that contribute to this feature, as do superior speed, depth, and possibly maneuverability.

While the loss of the MIKE SSN certainly raises survivability questions, the survival of a YANKEE SSGN for several days after a missile propellant explosion and the continuation of another SSBN on patrol after being rammed by a U.S. submarine are important evidence on the other side of the question.

Thus, there are ample indications that the current state of respective submarine technologies and Soviet submarine development rates -- coupled with a large number of R&D submarines -- could have surpassed U.S. submarine technology in most areas by the year 2000.

Third, Shapiro's statement that "presenting speculation as fact does a disservice to the reader" is frightening for two reasons: (1) it was not presented as fact, as noted above, and (2) such speculation is very useful when we see the failures of Western intelligence in the past to predict foreign submarine developments. As cited in the book, intelligence failed to accurately predict when the Soviets would put their first nuclear submarine to sea, their development of high-speed and deep-diving submarines, the use of titanium, wake-homing torpedoes, SSBN building rates, the low noise level of their 1980s submarines, etc.

In 1989 a blue-ribbon panel convened by the chairman of the House Armed Services Committee, which included several senior U.S. submarine experts and Submarine League members,

called for a complete revision of the U.S. approach to ASW because just the development of quieter Soviet submarines "could bring about a sea-change in sea warfare -- and not one to our benefit. Soviet hunter subs may now gain a substantial lead over U.S. sub hunters."

Shapiro wishes to ignore such speculation -- as well as historic facts.

Norman Polmar

■

REQUEST FOR INFORMATION

This is first letter to NAVAL SUBMARINE LEAGUE. I am a TV director of SAPPORO branch of JAPAN-BROADCASTING-COOPERATION (NHK = Nihon Hoso kyokai). I usually make programs about history.

I'm investigating the campaign of naval submarines at the Soviet-Far East (Vladivostok, Sakhalin, Hokkaido, Kuril-Islands) in August 1945. Where were U.S. submarines, and CCCP submarines? Where were the mines of U.S., CCCP and JAPAN? What attacked what, who defeated who, what destroyed what? What occurred in the Soviet-Far East Sea in August 1945?

If there is any data or retired submariners about the area in that time, please connect with me.

We Japanese don't know what occurred at the Soviet-Far East Sea in August 1945.

We Japanese don't know what was the plan of Stalin, whether he wanted to get Hokkaido or Kuril-Islands in August of 1945.

I want to know the truth of history.

Hiroaki Shimizu
NHK - SAPPORO
1 - chome WEST Oh-Dori
Chuo-ku, Sapporo, JAPAN 060

■

THE REGULUS BOATS

The January issue arrived recently and was interesting as always. Captain R. D. Gumbert's article recounting the history of Submarine Squadron Fourteen was particularly appropriate in this time of significant change in the strategic balance of power. However, his statement that "USS GEORGE WASHINGTON deployed on the first submarine strategic missile patrol" is not correct. She was the first Polaris submarine to make a strategic patrol, and the first submarine to carry ballistic missiles on a strategic patrol, but the honor of the first submarine strategic missile patrol rests with COMSUBPAC, Submarine Squadron ONE, and if my memory serves me well -- with USS TUNNY (SSG-282). I was on station in the North Pacific in USS BARBERO (SSG-317) conducting what I recall was the second submarine strategic patrol on the date that GEORGE WASHINGTON sailed for her historic first patrol. The BARBERO's crew was amused to learn that GW's crew was awarded the Navy Unit Citation at dockside before they sailed. Her CO, CDR Osborne, was awarded the Legion of Merit at the same time. Both awards were undoubtedly well deserved but to those of us who were already on station in a twice-converted WW II diesel submarine carrying Regulus I missiles, it had a certain irony. The four SSG's and one SSGN of Squadron One conducted 41 submarine strategic patrols from the late summer of 1960 through mid-1964 before the first SSBN arrived to pick up the load in the Pacific.

John F. O'Connell
Captain, USN(Ret.)
USS BARBERO (SSG-317) (Black and Blue)

■

THE SEAWOLF AFFAIR

Recently the members of the NSL received an urgent request from Admiral Kauderer asking for us to take an active part in an attempt to get the SEAWOLF program back on track. The Admiral argues that to stay in the submarine development and building game we must build more SEAWOLF's.

I question this.

Our continuance of an advanced submarine technology program for its own sake makes little sense without a real threat in the arena in which the SEAWOLF is to operate. What threat is out there that warrants our continuance of the SEAWOLF program?

If the NSL promotes this program only to keep an unneeded technological base alive, we may find ourselves responsible for the creation of a submarine building WorkFair program.

What constitutes the threat that our I-688 today, or CENTURION in the near future, can't handle?

If E.B. folds, so be it. The marketplace sets the rules in this society. The other (former) nuclear shipbuilders will get themselves re-certified and will (in the absence of E.B.) pick up the work when CENTURION's time comes. Personnel released from submarine design activities today will not evaporate -- they'll be out there building oil platforms and Space Stations.

Is our submarine design/building establishment founded on such an unstable foundation that it will all fall with the cancellation of additional SEAWOLF orders?

We have plenty of fine SSN's out there now. Why do we need the SEAWOLF today?

David D. Merriman, Jr.

RESPONSE FROM ADMIRAL KAUDERER

Dear Mr. Merriman:

Thank you for your thoughtful letter of February 12, 1992.

Perhaps you read more into my letter than I intended. I certainly would not condone creation of a "submarine building WorkFair program." However, the issue of industrial capability is a much larger one than that of a single shipyard's failure. As I noted in the letter, there are hundreds of vendors, contractors and suppliers whose livelihoods depend almost entirely on supporting submarine building programs. Some of these industries are absolutely critical and unique to the construction of future classes of nuclear submarines. If the Administration doesn't find a way to avoid a total hiatus in submarine construction, I believe that we will be throwing away 40 years of lessons which were learned under the most valid of tests (at sea, against

good unalerted opponents), and that we will find it painfully slow and expensive to counter the next threat to our national principles.

If we are to remain a major maritime power, we must retain the ability to reconstitute front line submarines in an orderly manner.

B. M. Kauderer
Vice Admiral, USN(Ret.)
President, NSL

■

THE SEAWOLF AFFAIR

Dear Admiral Kauderer:

I have received your letter requesting all of us to support the Submarine Force with contacts, letters, and phone calls to the Congress and the Executive Branch and I am responding. I also share your concerns for the disappearance of the Industrial Base ... there are many firms (us among them) who face severe problems with shrinking workloads, and a bleak future. For over 75 years we have developed the technology and work force to build unique and exceptional submarine periscopes.

Industry faces other problems, including competition from foreign firms who are chasing the few dollars in the Navy's budget. We certainly have no fear of competition, but we don't like to see our tax dollars go overseas in a bidding war which would close down facilities which would keep the submarine force's support base viable. Such a case is the upcoming R&D program for the "Photonics Mast Program", which is a non-penetrating periscope.

We urge you to ask the members of the Naval Submarine League to ask the Navy and their Congressmen to adopt a policy that restricts those few remaining research and development dollars to United States Industry.

Daniel F. Desmond
President, Kollmorgen Corporation
Electro-Optical Division

■

WORLD WAR II LOST TORPEDO

SEEKING: The CO of the submarine whose torpedo nose dived into the mud at the Pearl Harbor testing range in 1944 or 1945 (exact time forgotten). It surfaced alongside the destroyer USS DAVID W. TAYLOR (DD-551), was retrieved, and returned by the First Lieutenant (me) and boat crew. You promised a fabulous dinner at the Royal Hawaiian, but since the DWT was returning to the South Pacific that day, you gave us a verbal IOU. The DWT is having its first reunion this September in Independence, Missouri, and we are now ready to collect. However, location and date are negotiable. Contact Vince Colan, P.O. Box 2207, Hendersonville, NC 28793, or phone (704) 697-2748.

Thank you very much for your assistance.

Vincent J. Colan
CAPT, USNR-Ret.

■

CANADIAN SOVEREIGNTY

Commander Nathaniel Caldwell's article, Canadian Sovereignty and the Nuclear Submarine Program, (January '92 issue) is very informative and helpful. There are a few troublesome areas with respect to freedom of navigation, however. If these interpretations were to be followed by serving officers operating U.S. warships, it would weaken traditional navigation rights. Perhaps you have already received some commentary about these areas from others. I refer to p.52, para.3. I would differ with Commander Caldwell in the following points:

1. It is not "...customary for warships to notify the affected country of their intent to cross territorial waters." This was at issue in the 1988 transit of the Soviet territorial sea south of Sevastopol by the USS CARON and the USS YORKTOWN. Secretary of State Baker met with Foreign Minister Shevardnadze in September of the following year at Jackson Hole, Wyoming. They signed the following language with reference to prior notification as part of the document, Uniform Interpretation of Rules of International Law Governing Innocent Passage.

Para 2: "All ships, including warships, regardless of cargo, armament or means of propulsion, enjoy the right of innocent passage through the territorial sea in accordance with international law, for which neither prior notification nor authorization is required."

The problem is that prior notification infers a need for such notification and respondent authorization. This is a restriction on freedom of navigation which is unacceptable.

2. Ships of the USCG (Icebreakers) are, of course, warships (ships of a state) entitled to immunity under the law of the sea.

Scott Allen, Ph.D.
The Law of the Sea Institute
University of Hawaii

■

SEAWOLF Cancellation

• THE WALL STREET JOURNAL - January 7, 1992. "Defense Secretary Dick Cheney, carrying out budget cuts ordered by the White House, told the Navy's top civilian official to slash plans for a multibillion-dollar fleet of advanced submarines, Pentagon officials said.

"The decision, which officials said was conveyed to Navy Secretary Lawrence Garrett amid unusual efforts to control leaks, is expected to cut about $6 billion from Pentagon spending plans through the end of 1995 and more than twice that much through the end of the decade."

• WASHINGTON POST - January 29, 1992. "The $50 billion in defense savings outlined in President Bush's State of the Union speech last night would include canceling the $2 billion-per-copy SEAWOLF submarine and indefinitely delaying the Army's next-generation 'Block III' tank and RH-66 Comanche Light Helicopter, the largest weapons programs in the Army's budget, according to lawmakers briefed on the president's plan.

"Defense Secretary Richard B. Cheney told key lawmakers in a closed-door briefing at the Capitol last night that future defense budgets will reflect a new emphasis on developing weapons technology but will stop short of production in many cases."

• INSIDE THE NAVY - February 3, 1992. "The legal dispute between Newport News Shipbuilding and the Navy over the award of what was to be the second SEAWOLF submarine to Electric Boat will continue despite Secretary of Defense Dick Cheney's cancellation of the program, a source close to the lawsuit said. Cheney's move has no immediate affect on the lawsuit because Congress has the final word on the cancellation, he said. There still are issues that have to be decided regardless of the cancellation. For example, the source said Newport News still will try to recover bid preparation costs."

• WASHINGTON TIMES - February 18, 1992. "President Bush's attempt to cancel the government's order for two SEAWOLF submarines is gaining momentum on Capitol Hill. But the $2 billion SEAWOLF isn't likely to go down without a fight.

"Rep. John Murtha, Pennsylvania Democrat and chairman of a House Appropriations defense subcommittee, said he's leaning toward approving Mr. Bush's proposal because of the rapid change in the world military situation."

• HARTFORD COURANT - February 25, 1992. "In the tumultuous month since President Bush said the Groton-built SEAWOLF submarine should sail into oblivion, backers of the once-sacrosanct ship and its Connecticut manufacturer have suddenly found themselves on the defensive.

"To shore up their support, they are preaching what amounts to a SEAWOLF Gospel.

"But they are being confronted with a growing group of skeptics, nonbelievers who now include members of Congress who once were unquestioningly on their side.

"Those skeptics are challenging the assumption -- and what ultimately may be the myths -- that the SEAWOLF's backers are using to try to persuade their congressional colleagues to keep the attack submarine."

Industrial Base

• NAVY NEWS & UNDERSEA TECHNOLOGY - February 3, 1992. "The Navy has 60 days to decide what impact the cancellation of the SSN-21 SEAWOLF will have on the submarine industrial base, and create a plan to preserve the ability to design and build subs in the future.

"The project was officially canceled on Jan. 29 with the release of the Pentagon's fiscal year 1993 budget request.

"Almost two weeks earlier, the deputy secretary of defense wrote the secretary of the Navy and told him 'the preservation of key nuclear-powered submarine design, production and maintenance capabilities is an important priority.'

"Donald Atwood Jr., in the Jan. 17 memo to Navy Secretary H. Lawrence Garrett III, wanted to know how to 'maintain nuclear-powered submarine systems for the planned fleet; or design and produce such systems in the event of a need to reconstitute larger naval forces in the future, and that could not reasonably be re-established in a timely fashion to meet that need.' Garrett was told to start preparing a plan 'to achieve the appropriate, affordable preservation of essential, unique capabilities.'

"Atwood's memo was based 'on an assumption for analytical purposes of a decision not to proceed with the SSN-21

SEAWOLF program.' He used identical language five days later in a memo to the chairman of the joint chiefs of staff, the undersecretaries of defense, and the assistant secretary of defense for command, control, communications and intelligence.

"The Jan. 22 memo calls upon the assistant secretary to prepare 'an assessment of future threats to American interests for which submarine forces are needed, in light of other forces available.'

"It calls on the JCS chairman to 'identify the size and capabilities of the submarine force essential to meet the threats identified in the above assessment' and 'review operational uses of existing submarines for adjustments that could if necessary safely extend their useful lives.'

"Atwood's memo calls for the undersecretary of defense for acquisition to 'review the capacity available in public and private shipyards for submarine overhaul, repair, missile conversion and refueling' and make recommendations for greater efficiency.

"The Navy has 60 days to complete its part of the effort; the other three tasks will be integrated by the joint chiefs of staff into a 'comprehensive plan' and submitted to Atwood within 180 days."

• U.S. NEWS & WORLD REPORT - February 10, 1992. "The Bush administration's effort to cut defense spending by $50 billion by 1997 is in effect an attempt to mothball much of the nation's defense industry. The administration wants to stop production of today's planes, helicopters, tanks and nuclear attack submarines but to continue developing the weapons of the future, including the Strategic Defense Initiative. The Pentagon, in other words, is betting that if the nation calls them again, America's shipbuilding, aircraft and tank industries will still be there to answer. Now that the arms race with the Soviet Union has ended, that makes sense for the Pentagon. But it does not necessarily make economic sense.

"The Defense Department wants to fund research and development of 'next generation' weapons such as the Army's Comanche helicopter and Block III tank and the Navy's A-X aircraft and Centurion submarine without guaranteeing that it will ever buy any of the weapons. Historically, however, defense contractors have used profits from weapons production to help pay for research and development. 'The expectation of profitable production runs has kept companies in the defense

business,' a report by the congressional Office of Technology Assessment concluded recently.

"So for the Pentagon's strategy to work, research and development will have to be made profitable. And that will cost money. 'The Pentagon must be willing to pay companies for systems that may not work,' says Gordon Adams, director of the independent Defense Budget Project. Adds one congressional expert: 'Paying enough for research will give people sticker shock.'

"**A radical departure.**' Secretary of Defense Dick Cheney acknowledges that the approach needs more work. 'The new acquisition approach will require us to go back and take a new look and require industry to take a look at research and development,' he told reporters last week. 'This is going to be a radical departure from the way we've done business in the past.'

"So far, however, the Pentagon appears to be relying 'on the ability of individual companies to convert from defense to consumer production -- and then back again, when required,' as a recent Pentagon report on the defense industrial base put it. Many industry executives doubt the transition back and forth can be made smoothly. 'Defense companies that have ventured into the commercial market have met with dismal and costly failure across the board,' says Bernard Schwartz, chief executive officer of the Loral Corp., a defense electronics manufacturer.

"Moreover, stopping production of major weapons will affect not just prime contractors but also thousands of smaller firms. Canceling production of armored vehicles will hurt not only General Dynamics Corp., which makes the M-1 Abrahms tank, but also the smaller components for the tank's laser range finder. Cancellation of the SEAWOLF could mean closing one of the nation's two nuclear shipyards, General Dynamics' Electric Boat Division in Groton, Conn., but it also could endanger the makers of the specialized nuclear reactors that power submarines. 'The Pentagon will need an industrial policy is the upshot,' says Stephen Daggett, a defense budget analyst at the Congressional Research Service."

• INSIDE THE PENTAGON - February 13, 1992. "Spelling out his plan for preserving the defense industrial base, House Armed Services Committee Chairman Les Aspin (D-WI) yesterday (Feb 12) said the Pentagon must build on its new

acquisition plan to create a more "comprehensive resource strategy" to ensure key production elements of the base are kept in tact.

"Aspin praised the Pentagon's new thinking reflected in the latest acquisition strategy, which he said is based largely on his own 'rollover' plan of two years ago, but said it fell short of assuring the longevity of the U.S. defense base. He laid out a four-point plan to keep research and development programs strong while also keeping open key production elements of the base through limited production.

"The plan calls for:

- Selective upgrading of existing weapons systems;
- Selective low-rate procurements;
- A so-called 'rollover-plus' strategy of keeping technology fresh through continuous research and development programs that incorporate a greater utility of prototypes and manufacturing technologies; and
- Small-volume 'silver bullet' procurements of revolutionary weapons, such as the F-117, that can alter battlefield operations.

"The Pentagon announced two weeks ago its new acquisition strategy, which emphasizes r&d programs and 'prototyping' while deferring decisions to produce systems unless certain criteria are met. Namely that the technology of the system has been proven out, that there's a threat-based need for the system, or that the systems would offer a revolutionary advantage in battlefield operations."

• INSIDE THE NAVY - February 17, 1992. "The new acquisition policy being implemented by the Department of Defense (DOD) -- placing more emphasis on research and development than on production -- will not allow for the production of weapons just to support the industrial base above inventory needs, according to DOD Comptroller Sean O'Keefe. The support of the submarine industrial base is the key argument of the Connecticut congressional delegation in their fight to save the second and third SEAWOLF submarines.

"Reaction to the new acquisition strategy has been positive, O'Keefe said. 'We've gotten good early returns but not all of the polling sites have reported in,' he said. It does make some operational sense for certain weapon systems to move into low rate initial production, he said, and DOD is looking at limited

production numbers for some items. The shift in acquisition strategies clearly presents an industrial base problem, O'Keefe conceded. 'But it will be tough to sell a 1970s acquisition strategy (low production numbers with high per unit costs) to the American public,' he said. The Connecticut congressional delegation is arguing the loss of technological capability between the completion of the first SEAWOLF and the next generation of submarine will be irretrievable if the additional SEAWOLFs are not built.

"O'Keefe does not think the loss of suppliers on major defense programs will lead to higher production costs. (If items are not being produced, the vendor base will dry up, according to many defense-industry analysts.) He does see definite problems with certain supply areas particularly with Navy nuclear reactors. Outside of nuclear submarines there is no market for the vendor to sell to, he said."

• INSIDE THE PENTAGON - March 19, 1992. "Adm. Bruce DeMars, head of the Navy's nuclear propulsion program, last week took his fight for the Navy's submarine program directly to Capitol Hill, sending lawmakers a report that recommends restarting production of the SSN-688 attack submarine -- a proposal that runs counter to the Administration's defense plan submitted in January.

"The March 3 report states that, with the cancellation of the SEAWOLF submarine program, the Navy will irretrievably lose a significant portion of its submarine industrial base before construction of the next-generation submarine, the Centurion, begins in FY-98. Consequently, DeMars recommends drawing down the attack submarine force from 85 to 60 boats through the early retirement of SSN-688 submarines, and then applying the savings toward building improved SSN-688s until the Centurion comes on line. The plan calls for building five SSN-688s, one per year, until FY-98.

"'A hiatus in the submarine construction program until then would make it virtually impossible to design or build Centurion,' the report states. 'It would effectively foreclose the ability to reconstitute a U.S. nuclear-powered submarine design and construction capability later.'

"Although the report was written for Deputy Defense Secretary Donald Atwood, who tasked the Navy to study the submarine industrial base, DeMars also sent a copy last week to

key members of the House Armed Services Committee, including Chairman Les Aspin (D-WI)."

Collision

• WASHINGTON POST - February 19, 1992. "The Pentagon disclosed yesterday that a U.S. submarine on an intelligence-gathering mission near the Russian port of Murmansk collided last week with a submarine operated by the Commonwealth of Independent States.

"Moscow authorities said the collision occurred inside Russian territorial waters and blamed the United States for the accident, which apparently caused no injuries. Pentagon officials gave a different account, saying the LOS ANGELES-class attack submarine, the USS BATON ROUGE, was operating in international waters above the Arctic Circle in the Barents Sea at the time of the accident.

"The officials said the submarine was at periscope depth when it was struck by a Russian SIERRA-class submarine as the Russian sub surfaced 14 miles from the Kola Peninsula, home of the former Soviet Union's Northern Fleet. The BATON ROUGE was not damaged and is expected to return to its home port of Norfolk next week, officials said."

• JOURNAL OF COMMERCE - February 19, 1992. "U.S. Defense Secretary Dick Cheney said Tuesday he was not surprised by the collision of American and Commonwealth of Independent States attack submarines in the Barents Sea and saw no reason to change U.S. Naval operations.

"'We have a number of subs operating out of there,' he said. 'It's an important part of our security and I don't have any reason to believe there's any fundamental problem here that requires any change in our policies.'

"Mr. Cheney refused to discuss any previous collisions but told reporters traveling with him from Guatemala City that the Feb. 11 undersea accident occurred 'several miles' away from the 12-mile international limit off the Russian coast.

"Mr. Cheney said Washington later informed Moscow only as a post-Cold War courtesy that an American submarine was involved."

• CHICAGO TRIBUNE - February 20, 1992. "The Navy said Wednesday it will conduct a one-officer investigation into the nuclear submarine USS BATON ROUGE's collision with a Russian sub near Russia's Arctic coast.

"Rear Adm. Howard Habermeyer will conduct the informal investigation into the Feb. 11 collision as the BATON ROUGE was cruising at periscope depth close to the shoreline at the mouth of Kola Bay.

"Habermeyer is commander of Submarine Group 2, which includes the BATON ROUGE. His appointment prompted criticism from some former naval officers that the inquiry does not meet the test of independent investigation.

"Independent U.S. analysts said the U.S. attack submarine probably was on an intelligence-gathering mission near the Russian coastline, monitoring the activities of Russian submarines operating out of their main base opening to the Arctic Ocean and the North Atlantic."

• WASHINGTON POST - February 21, 1992. "**QUOTES OF THE WEEK.** *'The seas are free for everybody to operate in -- our, theirs, everybody else's.'* Admiral Frank B. Kelso, chief of U.S. naval operations, on the collision of the USS BATON ROUGE submarine and a Russian sub off the Russian Arctic coast last week."

• SEATTLE POST-INTELLIGENCER - February 24, 1992. "When the nuclear attack submarine BATON ROUGE arrives in Norfolk, Va., tomorrow, naval investigators will begin a probe into its collision with a Soviet-built sub on Feb. 11 in the Barents Sea near Murmansk.

"The key question will be why the collision occurred, not why the BATON ROUGE's mission took place.

"Although it may seem ironic that disclosure of the collision occurred while Secretary of State James Baker was in Moscow last week concluding an agreement with Russian officials to set up a joint early warning system against missile attack, Navy insiders say the voyage of the BATON ROUGE is more than a relic of the Cold War.

"Despite the thaw in relations, U.S. intelligence-gathering and reconnaissance efforts aimed at the former Soviet Union will continue to have a high priority, senior Navy officials and others say.

"The BATON ROUGE incident is in the context of a 30-year history of top-secret surveillance by the Navy's nuclear submarine fleet.

"'That's's what John Paul Jones got his name for -- driving ships in places of the world where people might not have

expected American ships to go,' Adm. Frank Kelso II, chief of naval operations, said last week. 'I don't think this incident is going to change that.'"

Submarine News

• BALTIMORE SUN - February 9, 1992. "U.S. military intelligence analysts believe that Iran will take delivery of its first Russian-built attack submarine by June, despite recent U.S. attempts to persuade Russian President Boris N. Yeltsin to drop the sale.

"That raises the possibility that Iranian submarines in the straits leading into the Persian Gulf will threaten commercial shipping, drive up oil prices and trigger a naval arms race that could ignite another war in the region, a senior Pentagon official said.

"Intelligence analysts have taken seriously Iran's expressed intention to control the Strait of Hormuz, although they don't think Iran will be able to use a submarine force effectively for several years, he said."

• SEATTLE POST-INTELLIGENCER February 12, 1992. "Federal and state environmental inspectors are looking into the possible airborne release of toxic asbestos at Bremerton's Puget Sound Naval Shipyard following complaints from workers, officials said.

"Inspections have been underway since Jan. 30, but state and federal experts have yet to gain access to several key areas because they have not obtained Navy security clearances, officials said.

"The security issue has delayed testing and a final report that could result in fines against the shipyard under federal environmental regulations.

"The alleged exposure involved materials being removed from a deactivated nuclear-powered submarine being scrapped, shipyard spokesman, Donald L. Ricks said Monday. One site under investigation included two cargo pallets containing pipe sections that had been removed from a submarine.

"The shipyard is involved in a program to dispose of deactivated nuclear submarines. In a complex process, radioactive spent nuclear fuel is removed, reactor compartments are sealed and cut off the submarine hull for barge shipment to Hanford for land burial, and the rest of the submarine is dismantled.

"Since 1986, 21 nuclear subs have been dismantled and their reactors buried at Hanford, Ricks said. Currently, four submarines are being disassembled."

• UPI February 20, 1992. "Electric Boat may close its Quonset Point, RI plant as early as 1993 if President Bush succeeds in scuttling the SEAWOLF attack submarine program, EB general manager Roger Tetrault told Congress yesterday. Tetrault asked a House subcommittee to help spare the second and third SEAWOLF submarines, already authorized by Congress, from the budget axe and buy the shipyard three more years of time."

• INSIDE THE PENTAGON - February 13, 1992. "The number of submarines possessed by potentially hostile Third World nations is expected to decline by 10 percent by the end of the century, according to the director of Naval Intelligence. Testifying last week before the House Armed Services Committee, Rear Admiral Edward Sheafer said increasing costs of diesel submarines and tighter budgets are putting the squeeze on developing nations, reducing significantly the submarine threat to the United States. 'Other than Iran, which has KILO class submarines on order from the Commonwealth of Independent States (CIS), few, if any, other developing countries are expected to become new seagoing submarine operators over the next decade,' he said.

"In addition, he said that submarine production in the former Soviet republics will likely decline by about 60% during the next several years -- from nine submarines to between three and three and one-half submarines each year. 'Fleet Admiral Chernavin recently stated the CIS Navy hopes to produce two general-purpose nuclear-powered submarines per year but that the likely foreseeable rate will be one to one and one and one-half per year,' Sheafer told lawmakers. 'He also indicated that only one diesel boat could be built for the Soviet Navy each year with a second boat each year for export.'

"Sheafer's testimony highlighted the declining submarine threat world wide and indirectly underscored the Pentagon's reason for terminating the SSN-21 SEAWOLF program. The SSN-21 was designed primarily as an antisubmarine warfare (ASW) platform to counter Soviet submarines. But the Soviet threat, and the threat form non-Soviet nations, will decline dramatically during the next decade.

"Sheafer's testimony also caps a year-and-one-half debate within the Navy regarding Third World submarines (Inside the Pentagon, Sept. 20, 1990, p1). Navy leaders at one time claimed that 41 nations besides the United States and Soviet Union possessed about 400 submarines, and up to 30 of these nations posed a potential threat to the U.S. interests. But Sheafer strongly discounted the threat from non-CIS nations."

Miscellaneous

• WAVES (Formerly SUBNOTES) - January/February 1992. "Vice Admiral Yogi Kaufman, USN(Ret.) presented a brief photo-essay on the Soviet TYPHOON class SSBN in the November 1991 *Proceedings* of the Naval Institute. He, along with a Discovery Channel crew that is doing a TV documentary on the history of submarine warfare, was given access to the largest submarine ever built in Severodvinsk. His color photographs of the TYPHOON are truly amazing. An experienced submarine officer himself, Admiral Kaufman said when he first got alongside of the ballistic missile sub, 'It's not a sub, it's a ...mountain!'

"The USS GUITARRO (SSN-665), one of the first STURGEON class nuclear attack submarines, has been decommissioned. She was commissioned in September 1972 and has many firsts in her distinguished career. Built at Mare Island Naval Shipyard, she suffered an embarrassing moment when a hatch was left open and she sank dockside prior to commissioning. The joke was at the time that Admiral Rickover rushed to the stricken vessel, stood on the dock and said, 'Arise!'

"The Royal Navy will have to take out of service or stand down its new diesel subs until a flaw in the torpedo tube launch system is corrected. Using a completely new system, HMS UPHOLDER, first of the class, discovered while on trials that water could inadvertently flow into the torpedo tubes. UK officials blame the design fault on the Admiralty Research Establishment and not on the prime contractor, VSEL. It will take about £10 million to correct the problem on UPHOLDER, UNSEEN and URSULA. UNICORN, which is presently under construction would have the corrected design incorporated before it become wet.

"The first French nuclear submarine, LE REDOUTABLE (SSBN) will be scrapped after 20 years of service. During 58 missions, LE REDOUTABLE has spent 83,000 hours under the

sea, sailed over 400,000 miles, with 20 different commanding officers and 2,500 crew members of all grades. The Brest shipyard has spent 6.6 million work hours for the three drydockings of this sub and 4 million move hours on maintenance work on this submarine."

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USS ANNAPOLIS (SSN-760)

To celebrate the Commissioning of the USS ANNAPOLIS (SSN-760), the City of Annapolis, Maryland, has made available many novelty items and selected pieces of jewelry which can be purchased through the City's official commemorative catalog. Some of the items are listed below:

- ***Homecoming*** - 25" x 18" poster depicts the USS ANNAPOLIS approaching Annapolis Harbor.
- **Caps** - snap back with commemorative logo on front panel, made in the USA.
- **Jewelry** - die struck, 24K two-tone gold, commemorative emblem.
- **Coffee cup** - 11 oz. Midnight blue with white commemorative logo
- **Sport bag and totes** - Durable, water repellent, oxford nylon, navy blue featuring commemorative logo and woven handles. Made in the USA.

Call (410) 296-7992 for ordering information.
Mastercard or Visa accepted.

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SUBMARINE TORBAY

by Paul Chapman, copyright 1989, printed in Great Britain
by St. Edmundsbury Press, Bury Street, Edmunds, Suffolk
Published by Robert Hale Limited, Clerkenwell House
Clerkenwell Green, London EC1R OHT
ISBN 0-7090-3821-6

Reviewed by Captain W. J. Ruhe, USN(Ret.)

This book, written by TORBAY's "first lieutenant" (the Executive Officer of TORBAY), covers the first eleven patrols of TORBAY in the Mediterranean, from early 1941 to early 1942. Under the command of Lieutenant Commander Anthony Miers, VC, TORBAY sank 36 ships in less than a year, earned Tony Miers the Victoria Cross, caused a highly controversial reaction in the British media in 1989 resulting in the writing of this book, and caused the U.S. Commander in Chief Pacific to send Miers around to the forward U.S. sub bases in late 1943 to tell of the tactics he used in his Mediterranean operations.

When Tony Miers arrived out in Perth to discuss his Med operations with U.S. submariners, I listened to what he had to say, carefully. What I heard then, in the middle of World War II, made for an incredible story -- 36 ships sunk in eleven patrols lasting an average of 20 days each. Most of the ships sunk were in an environment of heavy enemy surface and air antisubmarine effort. The majority of ships sunk were by TORBAY's gunfire and there was a rumored gun attack on a lifeboat carrying German troops. TORBAY was a key player in the landing of British commandos who attacked Rommel's Headquarters in North Africa. Through all of this TORBAY was not destroyed and remained functional.

How had Tony Miers managed to pull all of this off?

Thus, when Chapman's book arrived from Great Britain this February, I rapidly read it cover to cover to answer the many questions he raised in my mind almost fifty years ago. I wondered what Miers was actually like. Was he the warm, friendly, talkative, clever fellow who pleasantly discussed his tactics with U.S. submariners in their Rest Homes out in Perth?

Or was he an icy, curt, uncompromising, dull martinet who somehow lucked his way through an unbelievable eleven war patrols? I had to know!

Now, I would say that Miers was tilted more towards the latter description of his character than the former. But you've got to read this very short book very carefully in order to make any judgements about Tony Miers -- a fine warrior in a 1,000 ton diesel boat with ten forward torpedo tubes and a 4-inch gun in a roofless turret, and no radars.

36 ships sunk in less than a year of war patrols?

TORBAY did sink two destroyers, a submarine, a mine-layer, ten cargo ships, three tankers -- most by torpedoes -- and another nineteen caiques (Levantine sailing vessels) and cargo carrying schooners -- by gunfire.

But how was all this accomplished without losing TORBAY?

For one, TORBAY could dive to periscope depth in about twenty seconds and the gun crews could get below from their gun stations in a matter of seconds. But most importantly, Tony Miers' defensive tactics neatly complemented his aggressive offensive spirit *so essential to victory in war.* But what worked so well for him in the Mediterranean probably would have done him in if he'd been operating in the Far Pacific.

Miers had observed, with the help of his *first lieutenant* (Chapman), that the Mediterranean usually had (except for about two of the winter months) a dense layer of water which started "at about fifty feet" and "had a five-point difference in specific gravity of the water between the start of this *feather bed* and eighty feet." Miers also recognized that it was necessary for TORBAY to flood in five tons of water in order to go deep slowly through this layer. And pumping out the five tons of water to get back to periscope depth was a slow business. So when threatened by an enemy bomb or depth charge attack, to elude the enemy's weapons he took TORBAY to eighty feet, used "bursts of speed," and did not flood in any water.

Miers' combative spirit drove him to only eighty feet to evade shallow set bombs and depth charges and to stay above deeper set depth charges. Then he could come back up rapidly to periscope depth and resume the offensive. Miers also reasoned that staying shallow didn't stress TORBAYs hull, and that bombs and depth charges vented most of their energy into the atmosphere just above the submarine. He never knew

about thermal gradients and their effects on enemy sonars. He apparently didn't realize that he was doing just the right thing which made the destroyers immediately lose contact on TORBAY and miss because of his bursts of speed which would not be heard as TORBAY evaded in-the-layer.

Was Miers dumb-lucky in pulling off his attacks which won him the Victoria Cross?

Chapman's description of the Corfu operation for which Miers was cited for a VC is insufficiently detailed to tell very much about it. But it sounded like George Street's penetrating an anchorage in TIRANTE to win a Congressional Medal of Honor.

And how about the gunning of a lifeboat and the landing of commandos to get Rommel?

TORBAY's gunning of troops on 9 July 1941 were felt to be war crimes by the media in 1989 and there was agitation to rescind the Victoria Cross award to the then-dead Miers who passed away in 1985. Nothing came of it. Chapman says that "the Germans on 9 July were treacherous and were trying to use arms after calling surrender. The Germans did seek to decamp in a large and seaworthy rubber boat ... and could easily have reached safety on Antikithera Island ... According to the official report, the Germans were killed in their rubber boat." But Chapman who was not on the bridge of TORBAY during the gun action knows little more about what happened. The whole business sounds very much like the Mush Morton incident -- with no blame concurred in by higher authorities.

As for the commando attack on Rommel's Headquarters, there are some good and bad lessons for submariners engaged in amphibious operations. TORBAY did a creditable job, TALISMAN had a fiasco.

Disturbingly, the author, Paul Chapman, wrote about himself in the third person as "the first lieutenant" under Miers. For example; "The first lieutenant (the Executive Officer), as he was to be in charge of the 4-inch gun had been given the periscope to have a good look at the target...Seeing the enemy armament, he had reservations about taking on with the gun 'the German armed petrol-carrier of 1400 tons with a light AA gun in the bow and two larger guns amidships'... Chapman's worry had been the light AA gun rather than the heavier guns; there was no knowing whether our topless turret would keep out that sort

of shell." This sort of confusion as to who was doing what, continues throughout the book and this reviewer never was quite sure. This particular example is given because the British submariners understood that their submarines had sunk more enemy ships by gunfire than all of the rest of the British Navy combined.

Also disconcerting was the use of similes which American readers (but not Britishers) can't even guess at: "Miers went off like a 5 November squib, so having lit the blue touch paper, Chapman retired hastily to let him get on with it." Translated, this means that Miers reacted like a Guy Fawkes' Day sky rocket. The British celebrate their 5 November Day like we do our Fourth of July, and Fawkes attempted to blow up the British Parliament on that Day in 1605.

An even better example is used when "the Admiralty's 'Rule Book' disallowed payment for Chapman's dentures "since his rotted teeth had not actually been shot out by the enemy." At this, "Sir Max smote this back over the bowler's head for such a soaring six that it had ice on it when the ball came down." Cricket players know what this means -- but who else? (A "six" is the equivalent of a home run, with six runs scored by a hit which goes so far and so high that it picks up ice on its way out of the cricket field.)

"When the TORBAY cruised into Portsmouth harbour, Southsea Castle was black with cheering crowds."

Join the cheering crowds.

■

THE BRUTUS LIE
by John J. Gobbell
Charles Scribner's Sons, Macmillan Publishing Company
866 Third Avenue, New York, NY 10022
ISBN: 0-684-19249-7 @ $22.95

Reviewed by Don Ulmer

Expository writings present details and facts of a profession. To capture its passion, however, one must turn to its literary fiction, for it is there that these details and facts are embellished to plot a story. Only here does profession interact with the extensive and magnificent myriad of human emotions and from these threads great tales are woven. Fellow Leaguer

John J. Gobbell has succeeded in blending to near perfection the techniques of submarining with very believable and most intriguing characters in his recent novel, **The Brutus Lie.** The creative energies shown by Gobbell in this work make it certain that he will be heard from again and often. His novel is sure to engender good feelings about submarining among the broader American reading public.

Brutus is themed upon separate roads set by fate for travel by twin brothers, sired by a less than savory American naval officer and born by a Berliner prostitute who is killed in an accident in the early fifties. Only babies at the time, one boy, Anton Dobrynin, is taken to the east side of the *curtain* and the other, Brad Lofton, to the west. Their father leaves the service for a career in U.S. intelligence, but not before an enterprising KGB official focuses in upon his abandonment of the twins' mother, and exploits the unpardonable context of these circumstances regarded in American attitudes of the time. Felix Renkin, the boys' father, falls ever deeper into the KGB web which is spun for him. Both boys mature, unaware Renkin is their natural father.

Gobbell has done his homework and makes effective use of an intricate knowledge of formerly Soviet hardware. The result is a clever orchestration of people-machine interfacing sure to slake appetities of its most discriminating hi-tech readership. Plot accuracy benefits also from assistance by the University of Minnesota Center for Twin Adoption and Research. On separate and opposing sides, the boys matriculate into similar fields of endeavor. Dobrynin finds his way into the Spetsnaz, while Lofton becomes a SEAL. Later, both become naval architects in the field of submarine design. A totally unlikely, but intriguing sequence of circumstances brings the brothers into ultimate confrontation with results to defy the best of *guessers*. Here, the plot becomes complex, for while Brad Lofton's efforts are clearly in the best interests of his country, by the high position he has reached in government, Renkin is able to draw upon seemingly limitless U.S. resources to frustrate his son.

Brutus presents imaginative, exciting accounts of submarine warfare wherever space available between the surface and bottom can be used to exploit stealth in support of a meaningful mission, be it in a San Diego yacht basin, the open ocean, or in

the coastal waters of a potential adversary. **Brutus** itself is a mini-submarine whose long legs and automated operational mode does not push available technology too far beyond state of the art. Exaggerations are well below thresholds set in the box office success **Top Gun**. **Brutus** is fraught with concepts that accommodate wider and a more direct application of submarine warfare in the naval combat norm established over the past forty-six years.

The action literally spans the globe and draws together a most timely and believable plot that fits intricately with the current and very dynamic world political situation.

Gobbell spins a suspenseful yarn of submarine adventure and tells it in a universally comprehendible vernacular. Any *professional* who has ever agonized over the need for a *peek* into an unfolding tactical circumstance will find vivid reminders in the skillful prose. For the newcomer, there is an abundance of common knowledge fundamentals that lend effectively to points in need of making. There are also nits for the picky, but only excitement for the sizeable numbers of prospective *submarine sympathizers* whose shoulders might well become bent to the wheel of our submariner cause.

There is much more graphic violence than needed to support an otherwise excellent plot. The final chapters in particular appear to test reader knowledge on the degree to which the heroes' anatomies can be pummeled into hamburger meat and continue to sustain life. Gobbell must be forgiven on this point, for the subject is a demonstrated high one among priorities of American readership. Art for art's sake is a noble sentiment, but will not pay the grocery bill. Melville would learn this today if he attempted to market **Moby Dick** in the current environment. The book's few man-woman relationships are sensitive and in good taste and Gobbell's shows hard drinking to be definitely **not** an essential ingredient in macho characterization. **The Brutus Lie**, especially in view of the overall diminishing challenge currently available in TV programming, is a perfect submariner alternative. The schnapps of choice, a roaring fire, and a copy of **Brutus**; what better way to while away a cold and a dreary eve?

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TRAPPED ON TIMOR

By Colin Humphris. Published by
Hyde Park Press, Richmond, South Australia
pp 119 - $15.00
ISBN 0-646-05519-4 National Library of Australia

Reviewed by Joe McGrievy

There are many stories that have been told of the brave exploits of units, squads, companies and battalions, of single engined aircraft, of multi-planed bomber sorties, of single ships, squadrons and fleets of ships, and these have been published and proclaimed.

There are also many stories of heroism, bravery, depravation, and abject resignation to defeat that are still hidden away in the memories of those members who underwent the actual deeds.

This is that kind of a story. The story of the experiences of 30 odd Royal Australian Air Force personnel who were stationed at an air strip on the island of Timor prior to the start of World War II, and rescued by a U.S. submarine after the island had been overrun by the Japanese.

The author of this story was assigned to 2 Squadron and they were posted to Timor to bolster the other squadron personnel who had been assigned this duty station early in the month of September.

Upon his arrival starts a chain of events that culminated in one of the largest and most unique escapes from enemy occupied territory by RAAF personnel.

This is a story of individual bravery and group suffering, of human courage, of initiative and resourcefulness in the face of a victory-drunk army of savages, the victorious Japanese, who were sweeping through the South East Asia, the Pacific, the Philippines and the Netherlands East Indies following their sneak attack on Pearl Harbor on 7 December 1941.

This band of RAAF personnel were servicing the RAAF aircraft, plus an occasional B-17 or some flights of P-40's which stopped overnight for fuel prior to heading north to bolster the Dutch defenses of the island. On February 18, they were told everyone was to evacuate the island except a skeleton crew who would destroy everything and anything that might be of use to the invading enemy.

After completing their mission, this small band of men

mustered at the designated area from which they would be removed from the island and returned to another duty post, but the rescue vehicles never appeared. So these neglected survivors gathered all of the useful gear that they could carry, and made their way into the jungle to evade the landing paratroopers of the Japanese Army. Remembering that battles are not won by courage or sacrifice or even by brilliant generals, but that they are won by having the right gear in the right place at the right time, they took everything that they felt would be useful. Most important of all was their radio receiver/transmitter and batteries. One enterprising airman took a goodly supply of quinine, plus other essential things that he felt would come in handy in fighting the jungle, while awaiting rescue.

As the book unfolds, it outlines the stories of individual courage, resourcefulness, abilities, and overall group capabilities to get the job done with the few things they carried, and the manner in which they succeed or fail.

The radio was a constant source of solace and comfort to this weary band, for although they used it as infrequently as possible, it was sort of a tie to headquarters and a link with home. It did get heavy and was shifted from two-man crews to two-man crews very frequently. In that way they shared the burden of their only tie to home.

The days held scorching heat and the nights sheer horror with the dive-bombing of thousands of mosquitoes preventing sleep. With several men down with malaria, three unable to navigate due to large tropical ulcers, and the remainder just weak and weary, they received a crowning blow, when on 17 March they received a message -- a real morale builder -- it read: "NO repeat NO further help possible from this end."

Several endeavors to drop food and medical aid to the weak and weary survivors was tried by the RAAF, but as one of the men put it, "You would think our lads could hit the target sometime or the other."

Then, when each man was slowly abandoning hope for ever getting off that blasted island, a beam of hope arrived with a message that detailed a possible rescue by an American submarine. The reactions and elation of this band of forgotten men has to be read to be understood. Each man's hopes and fears were brought to the surface, and in their collective thoughts the utmost problem centered around the question,

"Can the American submarine get to us before the Japanese get us?" They had been notified by a friendly native, via a note, that the Japanese were within a two-day march of their position. How would this information affect the rescue if the submarine was aware of these conditions?

The saga of the submarine rescue is another story in itself, and as you read through the harrowing last hours of the rescue attempts, you will be filled with a desire to pray for the success of the mission.

The forward by Sir Robert Law-Smith sums it up with: "This is not a story of defeat, but of triumph of the human spirit and of courage and resourcefulness in the face of what might have seemed insurmountable odds, the Japanese were not the only enemy."

This is a *must read* book and a *must have* to complete a war history library. It is written and published by an Australian survivor, and can be obtained by contacting Joe McGrievy at 7525 University Avenue, La Mesa, CA 91941-4801, and sending a check or money order for $15.00. Cost includes postage and handling.

[Note: The Reviewer of this book, Joe McGrievy, was serving aboard the submarine and was a member of the rescue team sent ashore to get these men off the island of Timor. His description of the rescue alone would make a good book!]

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THE FIGHTING TENTH

by John Wingate

Published in Great Britain 1991 by LEO COOPER
190 Shaftesbury Avenue, London WC2H 8JL
ISBN: 0 85052 200 5
£24.95

Reviewed by Captain F. H. Hiscock OBE, Royal Navy

The history of the Second World War contains many well-known episodes: battles and fronts, alliances and campaigns, most well documented and with their personalities familiar. Two such are the North African Campaign and the invasion of, and battles for, Italy. Very different in character, of their place in the history of the War there is little doubt.

But the Mediterranean Sea lies between Africa and Italy, the key to both; the little-known battle for the middle part of it greatly influenced the result of both land campaigns. To a significant degree this was a submarine war, waged essentially by the British but with the solid and important support of exiled Polish, French, Dutch and Greek submariners fighting under their own flags. It was mounted mainly from the island of Malta by a flotilla, The Fighting Tenth, of tiny (720 tons dived) submarines, and it is their story that is vigorously recounted by John Wingate.

Although written by one of the submarine officers involved, this should not be seen as an amateur work. Wingate has a string of successful novels and naval historical works to his name, and The Fighting Tenth is well and authoritatively written. Nor does the authority come only from him. The Committee credited by Wingate with "making the book possible" was made up largely of COs who fought the battle, several continuing to serve after the War, some advancing to Flag rank; it also included the Director of the RN Submarine Museum. These are men who really know their subject, and it shows. The Acknowledgements make a very impressive list of figures from the Royal Navy's submarine flotilla.

The style may be unfamiliar to American eyes. This is essentially an English book, reminiscent of wartime memoirs written much earlier -- full of anecdotes, personal and understated, rather than purely factual or artificially racy. Do not be put off; the facts are there, in plenty and accurate, but this is an *account* rather than a *history*, and it makes excellent reading.

The Royal Navy is well-used to successful conduct of submarine operations, in the present as well as in the past. Wingate does much to illustrate the historical foundations of later developments; the Mediterranean was by no means the only theatre where RN submarines made major contributions in World War II, but it provides a microcosm of the many campaigns in which they participated, and this should itself catch the interest of the American submariner.

In addition to historical and literary value, there is much here for the modern planner to consider. Submarines as freighters? Read how submarines of various classes kept Malta supplied with everything from aviation spirit through cooking oil and medicine to a hull section for a destroyer -- not much, but

enough when the convoys were stopped. Small-scale Special Forces Operations? Difficult decisions over target selection? The need for risk-taking (and abatement) in successful submarine operations? The problems posed by enemy minefields? Make-do repairs under attack? All are vividly reported.

This is, however, a book about people – not only the submariners and their supporters, but also the ordinary people of Malta. The background to the award of the George Cross to the island becomes clear, and with it the eventual inability of the German High Command to sustain the Afrika Korps. The dark days (forty-five British submarines were lost in the Mediterranean), including the brief withdrawal in 1942, are as faithfully reported as the feats and successes; the enemy, too, receives credit in due measure. The reader is left with the knowledge of success, in adversity and often against the odds; but also of the great price paid for that success, and that part of the story is carefully worked in the whole.

The Fighting Tenth is a good book; gripping for the submariner, whose own experience will complete the picture of what cannot be described, it will be of genuine interest to many others. Some work may be required to find it in the library, but it will repay the effort. ■

MEMBERSHIP STATUS

	Current	Last Review	Year Ago
Active Duty	1002	1010	982
Others	2765	2767	2833
Life	232	230	215
Student	29	28	26
Foreign	80	74	72
Honorary	22	23	25
Total	4130	4132	4153

PLEASE RECRUIT 2 NEW MEMBERS FOR 1992!

NROTC OUTSTANDING ACHIEVEMENT AWARDS

Congratulations to the following NROTC seniors who have been awarded the Naval Submarine League Outstanding Achievement Award. Each winner has volunteered for and has been accepted into the Submarine Training Program.

Richard C. Cooke	*The University of Arizona*
Darren R. Poore	*Auburn University*
Craig S. Kujawa	*University of California*
Joel A. Goodsell	*University of California Los Angeles*
Sergey Sherman	*Carnegie Mellon University*
Christopher Cegielski	*The Citadel*
Bryan P. Van Ballie	*University of Colorado*
Kenneth Joseph Christy	*Cornell University*
Christopher M. White	*Duke University*
Salvatore Aurigemma	*University of Florida*
Lee Gordon Paisley	*The George Washington University*
Craig Coleman	*Hampton University*
Stephen D. Reck	*College of the Holy Cross*
Robin L. Barnes	*University of Idaho*
Mark Evert	*University of Illinois*
Nicholas H. Taylor	*Iowa State University of Science and Technology*
Matthew B. Thompson	*Jacksonville University*
Jason R. Karlin	*University of Kansas*
Gustavo Guiterrez, Jr.	*Massachusetts Institute of Technology*
Joseph A. Nosse	*The University of Michigan*
Jeffery D. Peterson	*University of Minnesota*
Michael L. McClam	*Morehouse College*
James A. Belz	*State University of New York Maritime College*
David W. Stavoe	*Northwestern University*
Ross J. Osborne	*Norwich University*
Jason W. Scarlett	*University of Notre Dame*
Bradley S. Perrin	*The Ohio State University*
Scott R. Spence	*University of Oklahoma*
Bryan J. Grappe	*Oregon State University*
Robert George Hanna III	*The Pennsylvania State University*
Stephen J. Eron	*Rensselaer Polytechnic Institute*
Andrew A. Grey	*Purdue University*
Thomas S. Trail	*Rice University*
Sean McKillop	*University of Rochester*
Tony L. Ellis	*Savannah State College*
William J. Dixon	*University of Southern California*
John Harrell	*The University of Texas at Austin*
Christopher A. Ness	*Texas A & M University*
Jesse J. Guerrero	*Texas Tech University*
Phillip R. Pickett	*The Tulane University of Louisiana*
Walter C. DeGrange	*Vanderbilt University*
John G. Busavage	*Villanova University*
David R. Eberle	*University of Virginia*
Shannon D. Terhune	*Virginia Military Institute*
Paul A. Whitescarver	*Virginia Polytechnic Institute and State University*
Augustus R. Lim	*University of Washington*

REUNIONS

SUBMARINE MEMORIAL DEDICATION
May 16, 1992

A submarine memorial dedication in honor of all submarine veterans who served in World War Two. Williamsport, PA. Please contact by 1 May:

Marjorie Ort
813 Lafayette Parkway
Williamsport, PA 17701
(717) 323-4849

USS SEA LEOPARD (SS-483) - July 1992 - Norfolk, VA
USS SIRAGO (SS-485) - July 1992 - Norfolk, VA
USS RATON (SSR-270) - July 1992 - Norfolk, VA

All officers and crew members of the above boats please contact:

Wendell Rausch
RR1 Box 78
Akeley, MN 56433-9725
(218) 652-2441

USS CLAMAGORE (SS-343) - 22, 23, 24, & 25 October, 1992 - New London, CT.
Contact:

Jim Storms
3029 Thrush Drive
Melbourne, FL 32935
(407) 254-9223

USS GUDGEON (SS-567) - 16, 17, 18, & 19 September 1993. To be held in conjuction with U.S. SubVets Inc. National Convention in Vallejo, CA.
Contact:

Clifford A. Smith
407 Roleen Drive
Vallejo, CA 94589

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NAVAL SUBMARINE LEAGUE
HONOR ROLL

BENEFACTORS FOR FIVE OR MORE YEARS

1. ALLIED-SIGNAL AEROSPACE COMPANY
2. AMERICAN SYSTEMS CORPORATION
3. ANALYSIS & TECHNOLOGY, INC.
4. ARGOSYSTEMS, INC.
5. ATLANTIC RESEARCH CORPORATION, DEFENSE SYSTEMS DIV.
6. BABCOCK AND WILCOX COMPANY
7. BATTELLE MEMORIAL INSTITUTE
8. BENDIX OCEANICS INC.
9. BIRD-JOHNSON COMPANY
10. BOOZ-ALLEN & HAMILTON, INC.
11. COMPUTER SCIENCES CORPORATION
12. DATATAPE, INC.
13. EDO CORPORATION
14. EG&G, WASHINGTON ANALYTICAL SERVICES CENTER, INC.
15. ELIZABETH S. HOOPER FOUNDATION
16. FMC CORPORATION
17. GE AEROSPACE
18. GNB INDUSTRIAL BATTERY COMPANY
19. GTE GOVERNMENT SYSTEMS CORPORATION
20. GENERAL DYNAMICS/ELECTRIC BOAT DIVISION
21. GENERAL ELECTRIC MARINE & DEFENSE FSO
22. GENERAL ELECTRIC OCEAN & RADAR SYSTEMS DIVISION
23. GLOBAL ASSOCIATES, LTD.
24. HAZELTINE CORPORATION
25. HUGHES AIRCRAFT COMPANY
26. IBM CORPORATION, FEDERAL SECTOR DIVISION
27. KAMAN DIVERSIFIED TECHNOLOGIES CORPORATION
28. KOLLMORGEN CORPORATION, E-O DIVISION
29. LIBRASCOPE CORPORATION
30. LOCKHEED CORPORATION
31. LOCKHEED SANDERS INC. (formerly Sanders Associates, Inc.)
32. LORAL CONTROL SYSTEMS
33. LORAL DEFENSE SYSTEMS - AKRON
34. NEWPORT NEWS SHIPBUILDING
35. PRC, INC. (Formerly Advanced Technology)
36. PACIFIC FLEET SUBMARINE MEMORIAL ASSOCIATION
37. PRESEARCH INCORPORATED
38. PURVIS SYSTEMS, INC.
39. RAYTHEON COMPANY, SUBMARINE SIGNAL DIVISION
40. ROCKWELL INTERNATIONAL CORPORATION
41. SAIC
42. SCIENTIFIC ATLANTA, GOVERNMENT PRODUCTS DIVISION
43. SIPPICAN, INC.
44. SPERRY MARINE, INC.
45. STONE AND WEBSTER ENGINEERING CORPORATION
46. SYSCON CORPORATION
47. TECHNAUTICS CORPORATION (formerly Argo-Tech)

48. TITAN SYSTEMS, INC.
49. TREADWELL CORPORATION
50. VITRO CORPORATION
51. WESTINGHOUSE ELECTRIC CORPORATION

ADDITIONAL BENEFACTORS

1. ADI TECHNOLOGY CORPORATION
2. AT&T
3. ALLIANT TECHSYSTEMS
4. APPLIED MATHEMATICS
5. ARETE' ASSOCIATES
6. BINGHAM GROUP, INC.
7. COOPER ASSOCIATES, INC.
8. CORTANA CORPORATION
9. DEFENSE - MARINE MARKETING, INC.
10. DIAGNOSTIC/RETRIEVAL SYSTEMS, INC.
11. DYNAMICS RESEARCH CORPORATION
12. EG&G SEALOL ENGINEERED PRODUCTS DIVISION
13. ESL INCORPORATED
14. FOSTER-MILLER, INC.
15. GENERAL DYNAMICS/UNDERSEA WARFARE
16. HALLIBURTON NUS ENVIRONMENTAL CORPORATION
17. HYDROACOUSTICS, INC.
18. INTEGRATED SYSTEMS ANALYSTS, INC.
19. INTERSTATE ELECTRONICS CORPORATION
20. KPMG PEAT MARWICK
21. MARTIN MARIETTA AERO & NAVAL SYSTEMS
22. MCQ ASSOCIATES, INC.
23. NOISE CANCELLATION TECHNOLOGIES, INC.
24. PAC ORD INC.
25. PLANNING SYSTEMS INCORPORATED
26. RADIX SYSTEMS, INC.
27. RIX INDUSTRIES
28. SARGENT CONTROLS
29. SEAKAY MANAGEMENT CORPORATION
30. SIGNAL CORPORATION
31. SONALYSTS, INC.
32. SYSTEMS PLANNING & ANALYSIS, INC.
33. TASC, THE ANALYTIC SCIENCES CORPORATION
34. UNIFIED INDUSTRIES, INCORPORATED
35. VACCO INDUSTRIES

NEW ASSOCIATES

Broadus Thompson
Robert E. Nelson
RMC(SS) Albert G. Dravidzius
LT David E. Berico, USN
LCDR Mark Kenny
Hope Becker
Peter Claby
James H. Maury, Jr.
CAPT Arnett B. Taylor, USN(Ret.)
CAPT Arthur F. Rawson, USN(Ret.)
LT Michael T. Simmons, USN
CDR R. Thomas Skelton, USNR
ENS Todd J. Hofacre, USNR
Ray A. Meaux
Stephen Garland Snyder
SK2 Elmorid C. Brown, USN
CDR W. J. Czerwinski, USN(Ret.)