

Rear Admiral Robert R. Fountain, Jr., USN (Ret)

Admiral Fountain was born in Norfolk, Virginia and grew up in High Point, North Carolina. He attended the University of Rochester for one year as a Baker Scholar before entering the U.S. Naval Academy with the class of 1955. Graduating with distinction, he served as Engineer Officer of USS UHLMANN (DD 689) during two WESTPAC deployments and as intervening shipyard overhaul at Mare Island. He then was assigned as Aide and Flag Lieutenant to Commander Cruiser Divisions Six and Two during major NATO exercises in the Norwegian Sea and a Mediterranean deployment, embarked successively in the battleship WISCONSIN and the cruisers BOSTON, NEWPORT NEWS, DES MOINES, and SALEM.

He reported for submarine training in Groton in July 1958 and upon graduation reported aboard USS BREAM (SSK 243) in Pearl Harbor. Following completion of a WESTPAC deployment and special operation, and upon qualification in submarines, he underwent nuclear power training at Mare Island and Windsor Locks, Connecticut. On completion he reported for duty in USS SCORPION (SSN 589) near the end of PSA at Electric Boat Co. Completing four special operations and qualifying for submarine command and as engineer of a nuclear-powered ship, near end of tour he served simultaneously as Weapons Officer, First Lieutenant, Diving Officer, Main Propulsion Assistant, Electrical Officer, and Qualification Officer.

Admiral Fountain reported for duty as Engineer Officer (Blue) in connection with the construction and fitting out of USS JOHN C. CALHOUN (SSBN 630) at Newport News shipyard. Upon completion of shakedown, PSA, and one Polaris deterrent patrol cycle, he returned for duty in USS SCORPION (SSN 589) as Executive Officer, during which the ship completed two special operations and a five-month refueling RAV at Norfolk Naval Shipyard. In January 1968, prior to the ship's Mediterranean deployment, he was detached for duty in Washington as Assistant Program Manager, Nuclear Power Personnel (Pers-A422), responsible for the policy management of all Navy nuclear-trained enlisted personnel.

Upon completion of PCO training at Naval Reactors and COMSUBLANT, Admiral Fountain assumed command of the recently-commissioned USS SEA DEVIL (SSN 664) in Submarine Squadron Six at Norfolk. Under his command the ship completed three special operations, two Mediterranean deployments (one unscheduled), and an RAV at Portsmouth Naval Shipyard, winning two Navy Unit Commendations and a Meritorious Unit Commendation, SUBLANT Battle Efficiency and Fire Control "E"s, and nomination for the fleet Marjorie Sterrett Battleship Award. On completion of his tour in command, he was assigned to COMSUBLANT Staff as ACOS for Training and PCO Instructor.

In June 1976 Admiral Fountain assumed command as Commander, Submarine Development Group TWO (later COMSUBDEVRON TWELVE) with seven first line SSNs plus the precommissioning unit of a second new SSN-688 class ship. CSDG-2/CSDS-12 served as tactical development agent for both COMSUBLANT and COMSUBPAC. During this tour CSDG-2/CSDS-12 conducted the Mk 48 FOT&E torpedo program; began the SSN 688 class Tactical Development and Assessment Program; expanded its exercise program into the Pacific and Mediterranean; conducted an extensive series of sonar and fire control developmental tests; developed and promulgated the initial issues of the NWP-70 Submarine Warfare Series; implemented the SORAT submarine on-board training program in all SSN squadrons; developed, tested, and promulgated the Tektronix desk-top calculator with the Submarine Fleet Mission Program library (SFMPPL) to permit rapid implementation of acoustic, fire control, and weapons setting advances, and pioneered anti-ship missile and submarine ASW direct support tactics and command relationships. He served as Submarine Element Coordinator on the staffs of

COMCARDIV SIX in USS JOHN F. KENNEDY and Flag Officer Submarines in Northwood, England during major NATO exercises in the North Atlantic.

He returned to Washington in June 1978 as Deputy Assistant Chief of Naval Operations for Attack Submarines (OP-22B), serving for several months as the ACNO during major studies of alternative attack submarine designs and employment concepts. In April 1979 Admiral Fountain was selected for Flag rank and posted to Guam as Commander, Naval Forces Marianas, Commander Naval Base Guam, and CINCPAC Representative for Guam and the Trust Territory of the Pacific Islands. At the time Guam was the home of COMSUBRON FIFTEEN and PACFLT SSBNs and several other major naval commands plus the 52nd Air Division of SAC, with 10,000 uniformed personnel, 10,000 on-island dependents and 5,000 military civilian employees with major infrastructure construction programs on seven islands of the Trust Territory.

In September 1981 Admiral Fountain returned to Washington and assumed duties as Assistant Deputy Commander, Naval Sea Systems Command, for ASW and Undersea Warfare systems during a period when such major Acquisition Category I (SECNAV interest) programs as the ADCAP torpedo, MK50 air/surface launched torpedo, SUBACS integrated submarine combat system, SQQ-89 integrated surface ship ASW combat systems, SSTD surface ship torpedo defense, TACTASS surface towed array sonar system, MCM combat system, and 27 other advanced and engineering development programs were underway. During this period he also participated in concept formulation for the new SEAWOLF SSN and served for several months as NAVSEA Inspector General. After four years in this capacity, Admiral Fountain retired from active duty on 1 July 1985.

In retirement, Admiral Fountain was employed by Honeywell, Inc. in Seattle as Director, Offshore Systems, engaged in design, installation, and support of precision control and positioning systems for semi-submersible oil drilling and production platforms operating in the North Sea, Caribbean, South Atlantic, and Southeast Asian regions. In 1987 Honeywell asked Admiral Fountain to form and direct a new Advanced Marine Systems Operation as Vice-President with headquarters in Minneapolis and major subsidiary offices in San Diego and Arlington, Virginia. AMSO was a designer and manufacturer of autonomous underwater vehicles, tethered robotic underwater vehicles for use in the oil industry, underwater cameras, the Navy's MNV mine neutralization vehicles, and advanced distributed underwater acoustic arrays and processors. After two years, he was assigned to head Honeywell Defense and Marine Systems Group's Research and Development program, including not only marine systems but tank and medium caliber ammunition, mines, air-dropped munitions, and advanced military air and surface robotic systems. Admiral Fountain continued in this role when Honeywell spun off its Defense and Marine Systems Group as Alliant Techsystems, Inc., and was based in Arlington, Virginia, until his retirement from the company in 1992.

Since that time Admiral and Mrs. Fountain have resided on their waterfront farm near Montross, Virginia, off the lower Potomac River. He chairs the Westmoreland County Industrial Development Authority, serves on the boards of the Bank of Lancaster and the Rappahannock Community College, on the Executive Board of the River Country regional economic development partnership, and is Vice-President and Legislative Affairs Chairman of the Virginia Council of the Retired Officers' Association. He is active in Virginia Republican politics as a member of the State Central Committee and Presidential elector (1996).

Squadron History and Accomplishments

RADM Robert R. Fountain, Jr., USN (Ret)



When Admiral DeMars contacted me and said I was to address the history of the Submarine Development Group, I thought about that a little. For one thing, when a fellow from Chicago says you're history, it gets your attention! But then I saw why he felt that way. Having relieved me three times in a row, I was always history to him! Down on the dirt tracks in North Carolina, the good 'ole boys call that drafting! What a move he made at the finish line!

In seriousness, each of us owes a great deal to those who have gone before, on whose accomplishments our own successes have been built. I do not propose today to dwell on individuals or particular boats which have brought luster to the DEVGROUP over the years, but rather to trace the broad sweep of the DEVGROUP's importance and contributions over time, and to consider some of the challenges before us today.

Many of us have reflected that the position of the Submarine Force in the late 1990's bears striking resemblance to that of the Force in the late 1940's. The Submarine Force stood then victorious at the end of a great conflict, having sunk or damaged two-thirds of all Japanese merchant shipping and one-quarter of all Japanese warships with less than 1.5% of the World War II Navy's manpower. That Submarine Force was targeted almost exclusively against surface shipping; however, and in the aftermath of the war no great surface fleet remained on the seas other than our own. To many, the gallant and victorious Submarine Force appeared on the verge of future irrelevance.

Today the Cold War is over. The world's other great submarine power lies likewise vanquished, a failed power without effective central government, destitute economically, its once-great

empire disintegrated, its vaunted military machine rotten at its core. Our Submarine Force now stands virtually unchallenged amid the ocean depths. Only in peripheral seas does a vestigial submarine threat remain, an annoying, inconvenient local threat, but no real peril to the nation. Granted that a number of capable Russian SSNs remain in inventory, and its force of nuclear missiles as well, but the decline continues. Irrationality is the only Russian threat today. It may be decades before a serious new strategic challenger emerges which is capable of projecting power in a manner to threaten the security of the United States.

Meanwhile, peripheral local conflicts abound. Korea and Viet Nam took place within the context of the Cold War. The wars in the Gulf, and now the Balkans, have happened since. Korea is again a serious problem. Taiwan could be. The Near East festers. *In none of these conflicts has the Submarine Force played an indispensable role.* The British campaign in the Falklands comes closest to one in which the submarine was decisive or potentially so, and for that reason each side of the conflict warrants our study. Our strategic missile submarine role remains essential, but the numbers diminish—41, 34, 18, 14, - - -. We, like our forebears in the late 1940's, must answer questions as to our future relevance.

In the late 1940's submariners faced many of the same questions. They fretted as budget cuts threatened to decimate the great wartime submarine armada. In fact, from a force of 232 on VJ Day, only 74 remained three years later. Submariners studied German submarine design and the British advances in passive sonar. They experimented with tanker submarines, radar picket submarines, midget submarines, guided missile submarines, troop carriers, SSKs, nuclear propulsion, hydrogen peroxide, streamlined hulls. Taking a leaf from the business world, they assessed the needs of their *customers*, the Navy and the nation. The Soviets having announced their intention to focus on building a massive submarine fleet, our submariners decided to examine whether and how submarines could play a role in anti-submarine warfare.

Today that decision seems obvious, but in the late 1940's the Submarine Force knew almost nothing about ASW. The Battle of the Atlantic had been won by surface and air forces. Our submarines had used sonar only in the final throes of attack to supplement periscope observations of surface targets. Nonetheless, they pressed ahead with development of the SSK, of submarine quieting, the Albacore hull, and nuclear propulsion.

Recognizing the Submarine Force's great knowledge void in acoustics and ASW tactics, then—Captain Roy Benson, the newly appointed New Developments Officer on Rear Admiral Fife's small SUBLANT staff here in New London, advanced the idea of establishing a small development group of four diesel submarines to work closely with the Underwater Sound Lab here in New London, with Woods Hole and other scientific centers, to draw on the best technology available from the post-war scientific pool to bootstrap the Submarine Force's ASW capability.

His story is fascinating. I commend to you Admiral Benson's oral history, available in the Naval Institute's library. With Admiral Fife's blessing he took his proposal first to fleet headquarters in Norfolk and then to Washington to sound out the staffs of CINCLANTFLT and the CNO. The reception was so positive that OPNAV issued a directive to form such a Submarine Development Group without there ever being a formal request from SUBLANT or the Fleet.

In this now-famous correspondence of 31 January 1949, the Chief of Naval Operations directed "that the Fleet Commanders assign one division in each fleet to [the] sole task [of solving] the problem of using submarines to detect and destroy enemy submarines. All other operations of any nature, even type training, ASW services, or fleet tactics, shall be subordinated to this mission."

After a further exchange of correspondence, SUBLANT established Submarine Development Group TWO consisting of four diesel submarines, two Guppy conversions and two standard fleet boats, with a staff of two officers and two yeomen reporting directly to him, and assigned Captain Benson to that Command. In the Pacific, COMSUBPAC assigned the responsibility to SUBDIV SEVENTY-TWO, but retained it within the existing command structure. These actions become highly instructive. SUBDEVGROUP TWO has continued to operate more or less independently under SUBLANT and retain much of its clarity of mission over the intervening years. In the Pacific, as time passed, SUBDIV SEVENTY-TWO was absorbed back into the Force and gradually lost its distinguishing role. This then is one of the keys to the success and importance of the DEVGROUP. Many times over the years advocates have proposed dispersing the DEVGROUP's unique role among the various "normal" squadrons of the Force, but inevitably such collateral assignments have borne little lasting fruit, becoming lost in the day-to-day operations of those squadrons. Only in the DEVGROUP's primary duty developmental focus has the needed impetus been maintained.

(If I may be spared a moment of personal reflection, there is a considerable resonance in my task today. I started out in the SSK-conversion BREAM in SUBDIV SEVENTY-TWO, served in an early SSN, commanded SEA DEVIL, an SSN 637 in the heyday of our ASW supremacy, commanded the DEVGROUP amid evaluation of the SSN 688 class, and finished up assisting in definition of the SEAWOLF class and guiding development of her combat system. Perhaps my role today is thus appropriate.)

Captain Benson's first key decision was to establish close liaison and day-to-day working relationships with the technical community, and especially the Naval Underwater Sound Lab then down river. He enlisted the Sound Lab to peak up the material condition of the then-limited sonar suites of the new DEVGROUP boats. Technicians found that in three of the four boats the consoles were not even connected to the linear hydrophone arrays! This, then, was the point from which we started! With the assistance of scientists and technicians from the Sound Lab, the sonar equipment was groomed and the operators were trained. Suddenly they began achieving much better results than ever before! Then they turned their attention to basic acoustics, improved arrays, and submarine quieting, removing the old fleet boat lifelines, deck guns, and other noise sources from the boats.

Within a few weeks of directing formation of the two special divisions, on 11 March 1949 CNO issued yet another remarkably prescient letter, outlining a phased step-by-step sequence for achievement of the needed advancements. This letter also presaged yet another key step in DEVGROUP's growth, the involvement of the Operations Evaluation Group to bring scientific process and rigor to the task. The wartime OEG was, of course, the team of top scientists attached to several of our major staffs, formed to scrutinize rigorously and scientifically the reasons for some of our failures early in World War II and suggest solutions. Let me cite some of those steps advised, for I think you will find them reverberating through the next 50 years.

Phase I — Training. Learn how to operate the sonar equipment at peak efficiency, train enough sonar operators to man a section watch rotation, and learn how to reduce self-noise to a minimum.

Phase II — Sonar Performance. Determine the capability of installed sonar equipment at various speeds and under various oceanographic conditions.

Phase III — Solve the Sonar Fire Control Problem. Develop techniques for passive and active ranging, particularly bearings-only solutions.

Phase IV — Develop tactics for detection, approach, and attack on submerged submarines.

Phase V — Develop group doctrine and tactics and evaluate the capabilities of submarines vs. submarines in all possible tactical situations, including close-in patrol off enemy submarine bases; barrier patrol lines in open sea to destroy enemy subs in transit; barrier patrol lines along convoy routes; tactics for combined air-submarine killer teams; tactics for operating in close proximity to convoys for convoy defense.

Phase VI — Determine the operational requirements for new and improved equipment to adequately perform the submarine vs. submarine mission.

In his forwarding letter for this historic March 1949 directive, COMSUBLANT specifically authorized and directed COMSUBDEVGROUPTWO to exercise direct liaison with the technical community and with other echelons of the Force to continue generating force-wide interest and support for ASW.

This is a truly remarkable series of correspondence, all issued within the first few months of 1949, which set the course for the Submarine Force for the next 50 years, with the DEVGROUPTWO as its instrument. I suppose I could say that was it, that the rest is all details, but it was not quite that simple!

Before we move on in time, it is worth reflecting a moment on how this all came about. Then—Captain Roy Benson was the point man, but the initiative and the follow-through was more broadly based. It lay in a group of young submarine captains, supported by their seniors, who returned from World War II heroes in their own right, who had the mental flexibility and vision to adapt to a totally new set of operational circumstances, and to set out purposefully to orient the Force to meet them. This lesson should not be lost upon us today.

The first decade of the intervening years was devoted to the basics, to experimentation, to gaining a fundamental understanding of acoustic principles. Very early on the DEVGROUPTWO visited the Royal Navy at Londonderry to learn of their wartime experience with passive sonar. From this visit grew a close association which continues even to this day. The DEVGROUPTWO engaged in basic sonar propagation experiments and worked with scientists on early acoustic beam-forming concepts to improve sonar performance. The Passive Range Prediction Manual was developed. They tried acoustic triangulation with hydrophones mounted at bow and stern, forerunners of PUFFS and Wide Aperture Array. Concepts of acoustic classification by nature of sound were explored. Conformal and circular passive acoustic arrays were introduced. Bearings-only TMA techniques and algorithms were developed. Techniques for employment of the new wire-guided MK 37 torpedo were developed. The passive acoustic horizon was expanded from a few thousand yards to the first convergence zone. It was a yeasty time, with everything on the table.

By the end of the first decade, the late 1950's, we were beginning to gain more focus. The BQR-4 system had shown the capabilities of large array sonars in the SSKs and SSK-conversions. Nuclear propulsion had been introduced, gaining power, endurance, and the mobility heretofore only dreamed of. The introduction of the nuclear submarine also changed the nature of the adversary. To this point the definitional target was the 8-knot transiting snorkeler. Now it was the high speed SSN. I remember the arrogance we in SCORPION felt as we blew by barrier diesels. With the equipment and techniques of the day, and short firing ranges, they couldn't handle the sudden high bearing rates.

If Admiral Roy Benson set the DEVGROUP, and Submarine Force, course for the 1950's, Captain Frank Andrews defined it for the '60's. He gave order, discipline, and focus to the DEVGROUP's program in the second decade. The most important organizational advance since the DEVGROUP's founding was the establishment of the Tactical Analysis Group, or TAG, as an integral part of the DEVGROUP staff.

In February 1963 Captain Andrews proposed the establishment of a Tactical Analysis Group within COMSUBDEVGROUP TWO to pursue a unified ASW tactical analysis program in the Submarine Force. This followed a statement by the CNO that "if our policy formulation is to match the pace of technological development, we must take steps to encourage the use of what powers we have in observation, comparison and analysis." Tasks envisioned for the TAG at the onset were:

- To develop optimum tactics for submarine weapons systems, with focus on the new THRESHER class submarine.
- To perform thorough and detailed analysis of all submarine ASW exercises and establish common exercise reporting and analysis techniques throughout the Force.
- To provide continuity of the analysis effort so that lessons learned from year to year and exercise to exercise might be available in a meaningful form to all.
- To establish methods acceptable and understandable to all for numerically defining the ASW performance of submarine weapons systems.
- To assist in uniting the Submarine Force Atlantic and Pacific in an overall assault on the problem of developing submarine ASW tactics.
- To establish in SUBLANT a tactical development simulation program which can provide statistical answers to operational questions which cannot be answered from at-sea exercises.

He proposed that the Tactical Analysis Group be established as a separate cell within the DEVGROUP, staffed initially by four officers of the rank of LCDR or CDR, *each a past commanding officer, at least two of whom should be graduates of Operations Analysis post-graduate training*, plus a civilian operations analyst and five enlisted personnel. At this time already assigned to the DEVGROUP was a Royal Navy exchange officer as an operations analyst who would be made part of the TAG as well. To this request COMSUBLANT added two additional senior civilian computer programmers. Ultimately all these billet increases were granted except the scarcest of all resources, another yeoman and a second steward!

Establishment of the TAG came at a time of increased DOD scrutiny and analysis fleet-wide. Professional opinion was no longer sufficient at the budget table. Secretary McNamara sought to quantify all performance and define all decisions. OPNAV urgently needed performance data on the SSN 594 class in the forward area ASW role to sell the SSN 637 class building program. The new DEVGROUP TAG was thrown into high gear. The DEVGROUP responded by proposing a major SSN 594 Evaluation Program to develop quantifiable performance data on the 594 class against diesel and first and second generation (Soviet) SSNs in deep and shallow water. The short range (first year) program was to develop repeatable data in highly structured exercises. Longer range, the exercise program was to extend into advanced free play exercises.

By mid-1964 the staff began a rapid build-up. Commander (later Rear Admiral) Don Whitmire was the first TAG Director. Don was a former All-American football guard, a huge man. The exercise program soon became known as the “Big Daddy” series. The SUBSCHOOL Honeywell computer controlling the advanced trainers was used after hours for analysis. Soon the CNO called on the Chief of Naval Research to establish a Fleet ASW Data Analysis Program (FADAP) modeled on the DEVGROUPEFFORT. Two additional civilian contract analysts were assigned to the DEVGROUPEFFORT as part of the FADAP program. Maurice Fox came from GE as one of those, stayed to become Chief Scientist, and ultimately went on to found Analysis and Technology.

Masses of data flowed in. The analysis effort was highly labor intensive. The first phase was completed, analyzed, and briefed up the line in late 1965. The CNO sent it right on to SECNAV and Secretary McNamara, who ate it up. Its credibility was such that when the ineffectiveness of the MK 37 torpedo against high speed targets was portrayed, a decision was made on the spot to accelerate the MK 48 torpedo program by two years. The Submarine Force was used for years as the example for how the other communities should be operating in order to understand their own capabilities and develop effective tactics.

If the DEVGROUPEFFORT’s first decade was that of diesel boats and experimentation in tactics and equipment; the second decade one of transition to nuclear power, passive broadband sonars, the emergence of the Tactical Analysis Group, publication of the Passive Ranging Manual, and the 594/637 Evaluation; then the third decade encompassed the glory years of submarine ASW, passive narrow band and towed array sonars, the MK 48 torpedo, inception of the SSN 688 class Tactical Development and Assessment Program (TADAP), and intensive reconstruction and analysis of real world encounters. To some extent the 1970’s were years of culmination and consolidation.

The 1970’s saw introduction of the Semi-Automated Reconstruction Facility (SARF) at the DEVGROUPEFFORT, reducing much of the laborious, manpower-intensive exercise reconstruction effort while greatly improving the ease and accuracy of participant track correlation. The period saw continuation of a vigorous exercise program to expand the bounds of tactical capability, guide the technical improvement in sensors and combat systems, and test the limits of torpedo performance. It saw as well the beginnings of greater fleet exercise involvement on the part of the DEVGROUPEFFORT as an organization, with embarkation of DEVGROUPEFFORT commanders with staff members as Submarine Element Coordinators in fleet flagships to pioneer the tactics for employment of SSNs in fleet Direct Support, with detailed post-exercise analysis.

With 25 years of rapid growth in ASW tactical capability and technical advancements, with the accumulation of a great body of real world and quantifiable exercise data, and with the Submarine Force completely re-equipped with new ships, new torpedoes and new combat systems, the Development Group sat down to write the book, as it were.

The most far-reaching new departure for the organization in the third decade, the 1970’s, was the assumption of responsibility for production, coordination, maintenance, and distribution of the Submarine Tactical Library, the NWP-70 series, a hierarchy of documents detailing the accumulated tactical knowledge of the Submarine Force in over 40 volumes of fundamental tactical guidance, from Approach and Attack to Tracking to Direct Support, to Acoustic Data Manuals, combat system operating manuals, and Weapons Employment Manuals.

Recognition of the need and conception of the program was the unique contribution of Captain, later Rear Admiral, Bob Austin. Heretofore submarine tactical guidance had been issued in a

variety of ad hoc DEVGROUP publications, TYCOM TACMEMOs, equipment operating and maintenance manuals provided by contractors, or buried deep in the annexes of classified patrol reports. Many times such guidance differed from fleet to fleet. So great had been the rush of development of new ships, new equipment, and new tactics that when I sat down to write the new Approach and Attack Manual, I found the one then in use little changed from that used by diesel boats in World War II.

Taking as his model the discipline and order then familiar to all in the Reactor Plant Manuals of Naval Reactors, and the system for timely correction and up-dating of those manuals, Captain Austin sold the idea of a comprehensive Submarine Tactical Library. When shortly thereafter CNO decided to revitalize the Naval Warfare Publication series (NWPs) under a new agency, Naval Tactical Support Agency (NTSA), Captain Austin resubmitted his proposal as the NWP-70 series. It was promptly bought, funding was provided, and the Submarine Force was off and running while the rest of the fleet was still coming to grips with the problem. Not only did this initiative provide a coherent and unitary set of tactical documentation to the Force, it kept control of submarine tactical guidance firmly in the hands of the submarine operating forces. Along the way, it greatly enhanced the reputation of the Submarine Force and the Development Group for having its act well together. Once again, the DEVGROUP became the exemplar to the rest of the fleet as to how to get the job done, just as it had when the TAG professionalized submarine tactical analysis.

By the mid-70's the DEVGROUP was composed of SSN 637s and the newly arriving SSN 688s. At the same time, deployment demands for SSNs continued to increase. COMSUBLANT concluded that he could no longer dedicate the DEVGROUP submarines predominantly to DEVGROUP operations. The wall had been cracking for some time anyway. An implicit bargain was struck. COMSUBLANT would increase the number of SSNs assigned to the DEVGROUP to full squadron size, but the DEVGROUP SSNs would have to take their turn in the deployment cycle. The DEVGROUP would have first call on their services while at home.

This imposed a further administrative load on the staff, which was not increased, but it enhanced the professional experience of the ships' crews and served to keep the DEVGROUP well grounded in the real world. This done, however, and with the fleet administrative structure recently standardized, it was appropriate to redesignate the DEVGROUP as Development Squadron TWELVE. This had the added value of relieving some confusion at the SUBASE, there also being a Squadron Two on the waterfront and a Group Two up on the hill. With no other change in organizational structure or manning involved, the change was readily approved.

The fourth decade, the 1980's, saw the widespread incorporation of digital combat systems, major upgrade of the MK 48 torpedo guidance system, and entry into the tactical missile era. It also saw marked reduction in U.S. submarine acoustic advantage, the result of traitors in our midst. Advent of the TOMAHAWK missile system required increased emphasis on development of Over-The-Horizon Targeting and fleet integration. SSN Direct Support employment had already increased demand for communication interoperability. Tactical land attack missile employment elevated these requirements still further.

ASW tactical development exercises continued apace, as the employment envelope of new systems was investigated and the TRIDENT SSBN was introduced. SSBN egress exercises and SECEXs became an important component of the DEVRON exercise program in support of the SSBN Security Program. By the mid-80's over 60 manuals of the NWP-70 series had been developed and issued by the DEVRON, and the exercise program had been extended into the forward areas of WESTPAC, the Mediterranean, the Indian Ocean and the Norwegian Sea.

The 1980's ended with the crumbling of the Berlin Wall, the break-up of the Soviet Union, the slow-motion implosion of the Soviet armed forces, and a gradual recognition that the Cold War was over. There was no formal surrender ceremony, no national celebration. There was just a slowly dawning realization that the certainties and clarity of mission that had impelled the Submarine Force for 40 years were losing focus.

The Development Squadron began to grapple with unfamiliar tasks such as mine warfare, mine countermeasures, low intensity conflict, littoral warfare, small coastal submarines, and SPECWAR tasking. While none of these roles was new, they were at best echoes of the past, not addressed formally in many years. Suddenly the 1990's began to look like the late 1940's-shrinking budgets, declining force levels, loss of mission clarity. The wheel had come full circle.

Since the early 1990's the Development Squadron has labored mightily to be all things to all men. The most recent mission guidance promulgated by the Force Commander has replaced the clarion call of the CNO in 1949 to "solve the problem of using submarines to detect and destroy enemy submarines" by subordinating all other functions. Current guidance directs the DEVRON "to prosecute the development and improvement of submarine tactics, doctrine, and procedures which will enhance the tactical capabilities of all submarines in all submarine mission areas." Ancillary squadron functions proliferate. Increasingly it appears that so-called squadron functions diverge from the developmental role of the organization. Whether the great historic advantage of having organic submarine assets within the Development Squadron is being fully realized is unclear. Review of the command histories for this period is instructive. The Command History for 1993, for example, consists of eight typewritten pages. The DEVRON exercise program for the year is summarized in one paragraph of six lines.

The DEVRON has continued to soldier on, but the focus has blurred. ASW has receded as a high national priority. Technical change roars ahead. New fads emerge. The uniqueness of the submarine role diminishes. The breadth of effort expands, but the depth seems to grow thin. In 1994 it was reported that the DEVRON conducted 27 tactical development exercises and participated in five SHAREM exercises in the Atlantic, Pacific, Mediterranean, Adriatic, the Persian Gulf, and the Gulf of Oman, involving over 83 ships from eight nations. One wonders about the depth of analysis attained. There is no report of what was learned. Are we operating on decay heat? Where is the definition and clarity of direction analogous to that which emerged to vitalize the DEVGROUP and set the course for the Submarine Force in 1949?

To some extent the DEVRON has become victim of its own success, its own towering reputation! Increasing demands are being placed upon it to participate on numerous committees and in the planning and conduct of large fleet exercises, to run smaller exercises which provide anecdotal experience but little hard data. Are we being sucked into the morass so long strenuously avoided, of the hastily planned exercise, the feel-good quicklook message, and a quick departure?

Are efforts to drag the Submarine Force deeper into the network-centric fad of the day-to force the submarine into the common fleet mold, unique only in its troublesome capability to submerge-well considered? Until we can announce a clear mission and demonstrate a unique and necessary capability, these trends will continue, and we will be nibbled away by budgetary reductions and lowest common denominator thinking.

The Development Squadron's successes have lain in certain clear, distinguishing, and consistent strands from inception. These threads have been a willingness to innovate, close and open ties

to the technical community, unblinking candor in performance analysis, dedicated organic submariners focused on development, top-notch personnel, military and civilian, and a strong and clear mission focus. As we move ahead, we must from time to time look at our wake to see how steady a course we are steering.

The Development Squadron staff today has grown large, a far cry from the four officers and men with whom Admiral Benson began. Establishment of the TAG in the early 60's was a major impetus. With the TAG, the DEVGROUPE staff then totaled about 30 persons, including initially three civilians. Early success prompted rapid growth to 45 persons by 1968, including 13 civilians assigned full-time. This growth continued, until by 1978 the staff numbered 66 persons, including 20 officers and 28 civilians resident. At its high point in the 1990's, some 110 persons were assigned, 42 of them civilian. Recent reorganization—consolidating certain personnel, administration, communications, and engineering functions on the Lower Base—has reduced the billet count by about a dozen officers and enlisted, but on an apples-to-apples basis DEVRON manning has remained over 100 personnel throughout the 1990's, about half civilian, the vast majority resident contractors, many of them retirees. There has been a noticeable decline in the talent and educational levels of laboratory, scientific, and technical representatives in residence in recent years, however, indicating a loosening of ties with the technical community.

While the organization has become much larger, the number of officers committed to tactical analysis per se does not seem to have grown over the years. While reorganizations blur the distinctions, much of the officer growth has been staff and squadron support, plus technical systems and documentation functions. In earlier years the DEVGROUPE benefited from the availability of talented, PG trained, post-command diesel submariners. Currently, however, only the Chief Staff Officer, who doubles as the Deputy Commander for Development, has command experience, and none of the U.S. officers assigned to the TAG has formal training in Operations Analysis. I would think this a basis for some concern.

Proportionately greater and greater responsibility for the development of submarine tactics has fallen to civilian contract analysts. No doubt there are many fine individuals in this corps, but many appear to be former submariners who do not bring high levels of added skills to the task. As contracting has become more bureaucratic, some of the selectivity for unique talents been lost. Are we becoming too inbred? Overall, one is left with the impression of a watering down of the level of talent, a trend that has been underway for many years now. Ideally, it would seem desirable for the Submarine Force to bring to bear some of its finest officers and some of the brightest civilian minds available to address the questions of the day, especially in this period of uncertainty.

The apparent lessening of former close ties between the laboratory, academic, and technical communities and the Development Squadron also raises questions. On the one hand, the pace of technical change proceeds at breakneck speed. The Navy has thrown the doors wide open to rapid insertion of new technology into existing systems. (Recently, however, serious problems of interface control have prompted the Assistant Secretary of the Navy for Research, Development, and Acquisition to appoint a systems engineering czar for the Navy. I hope the Submarine Force, with the DEVRON's help, can remain clear of the precipice.) Is the rush of incremental improvement so occupying us that neither we at the DEVRON nor those in the laboratories are backing away from time to time to view the forest? One of the DEVRON's strengths over the years has been the ability to stand somewhat aside from the day-to-day thrash of the Force and think through hard problems in concert with the technical community.

What are the top five broad technical problems facing the Submarine Force today, in terms of tactical performance? Is the frantic effort to avail ourselves of COTS, of rapid insertion of off-the-shelf hardware into existing systems, addressing those problems, or merely incrementing small gains? Where are the Navy laboratories? Are they ready to concede that acoustics has reached its limit? Perhaps then we should turn more strongly towards academia for new ideas, or enlist more of the bright, agile minds of Silicon Valley. Perhaps they have now become rich enough to want to do something for their country.

Clarity of mission has been one of DEVGROUP's long-term strengths. The 1949 correspondence, while addressing the full spectrum of ASW roles, was singularly clear as to the ASW mission. Over the years, success and inclination substantially narrowed our focus to ASW as practiced in the open ocean. Should we continue to pursue ASW in the littoral seas as merely a subset of what we've done for years, or are new tactics and techniques indicated? Perhaps we should break out a clean sheet of paper and do an entirely new analysis of the current tactical problem. Are there new ways to attack it?

Obviously the Force must hold its own against the reemergence of a true open ocean ASW threat, just as preservation of the capability for shipping interdiction has been a need since World War II, but will this mission remain primary? Or does Submarine Force need to take a fresh look and consider how best to address the local area littoral problem of small coastal submarines, mines, reconnaissance, and surprise attack against key targets ashore with missiles or Special Forces? Should we consider what a submarine optimized for these roles would look like? Do our submarine design teams have any fresh ideas?

A recent DEVRON document I had opportunity to examine describes the function of one officer on the staff as development of tactics to support the *missions* of command control, communications, computers, and intelligence. Have we confused the means with the ends? Are communications and computers really Submarine Force *missions*? Another officer has responsibility for tactics "to support the missions of special warfare, coordinated operations, amphibious warfare, and non-combat operations." I find it troubling when coordinated operations and non-combat operations become *missions*. Clearly ASW still remains a major focus of the DEVRON, and clearly the Force is casting about for new roles of national importance to which submarines can make a unique contribution, but are we at risk of becoming "a mile wide and an inch deep?"

One of the great strengths of the Development Squadron over the years, and the source of much of its fine reputation, has been in the integrity of its evaluations and thoroughness of its analysis, the step-by-step breakdown and deconstruction of its weapons systems effectiveness, the identification of the Force's weak points, and the setting in motion of necessary corrective action. In this we have had the consistent support of our Force Commanders, who never flinched from unpleasant facts when presented. I have to say, it has not always worked that way elsewhere in the Navy. We want to make sure in the future as we become more closely integrated that we maintain those highest standards. Fewer exercises, thoroughly milked of their essence, and replicated to ensure consistency of result, are far more valuable to understanding our capabilities than dozens of superficially reconstructed and poorly analyzed encounters.

I fear too many of the fleets' exercises today are little more than training opportunities in the exercise of command for the benefit of some transitory senior officer. He goes away pleased, but the fleet's warfighting performance may not have been greatly improved. The DEVRON should in general be spared involvement in exercises lacking promise of thorough analysis and

true tactical advancement. To what extent should our focus be on the capability of individual submarines, and to what extent on their performance in the matrix? Are these different questions, appropriately addressed at different levels of command? Such questions should be carefully examined.

For 50 years Submarine Development Group TWO, now Submarine Development Squadron TWELVE, has been the ornament of the Submarine Force, keystone in the arch of its success, the source of illustrious leadership, and repository of its jewels of knowledge. I salute the many of you in attendance here today who have contributed so much to the Force over the years through your work on the DEVGROUP staff-the civilians and the laboratories which have worked so closely with us, the submarines and their crews assigned who have proved at sea the ideas and concepts advanced. The half dozen Meritorious Unit Commendations awarded the Command and the myriad awards to individual DEVGROUP submarines over the years attest to the esteem in which our organization is held. It is highly appropriate that we pause here briefly to consider its achievements and help muster its energies for the still more challenging times ahead.

Thank you.