

195

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OUR NAVAL REVOLUTION

NO OBJECTION TO PUBLICATION ON GROUNDS
OF MILITARY SECURITY

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I greatly appreciate the honor which you have bestowed upon me. As I have said many times before, no large project in this scientific and technological age can be the work of one man alone. I am sure you all realize that in honoring me you are really honoring the men and women who work with me in the laboratories, in the factories, in the shipyards, as well as in my own organization. I accept the award in that spirit and thank you in their behalf as well as my own.

The Veterans of Foreign Wars has always taken a keen interest in developments which affect our national strength. It is important in a democracy that you do so. Our country can be no stronger than the people, acting through the Congress, make their desires known. Your organization, by keeping informed on important national issues, plays an essential role in this process. Your past National Commander, Congressman James E. Van Zandt of Pennsylvania, has continued to be

active in both the Veterans of Foreign Wars and the Naval Reserve. He went directly from the Navy to the Joint Congressional Committee on Atomic Energy in 1946, when the Atomic Energy Commission was just being set up to take over from the Army's Manhattan Project. He has played a leading role on that Committee during the entire 13 years since that time, and I can assure you that his first-hand knowledge and interest in military and atomic matters has been an important asset to our country. He has unfailingly backed the naval nuclear propulsion program and deserves a great deal of personal credit for it. He also participated actively in a valuable study which the Joint Committee made in 1956 on the education and training of scientists, engineers, and technicians. This study clearly demonstrated the gravity of our educational situation compared with that of Western Europe and of Russia.

I would like to review for you the status and plans of the Navy's nuclear propulsion program on which the Atomic Energy Commission and the Navy Department have been engaged for twelve years. This program has been undertaken during a period when great changes are commonplace. To understand what has happened and what may be expected in the future, it is useful to establish a scale to measure the current rate of technological change.

We often say that the steamship revolutionized naval warfare. But because the conversion of the world's navies from sail to steam took the better part of a century, the changes wrought were more evolutionary in character than they were revolutionary. The impact of the steamship was therefore less drastic than if it had taken place more rapidly.

The change that is taking place in our Navy today however--the change from oil to nuclear power, is not only revolutionary in concept, it is also revolutionary in impact.

The first serious proposal to build an atomic powered submarine was made in 1949. Four and one-half years later the land-based prototype of the submarine was operating. A year and a half after that the NAUTILUS was at sea, and barely ninety days later she was accepted by the fleet as a combat-ready ship.

Now, less than five years after the NAUTILUS first went to sea, we are embarked upon a nuclear shipbuilding program embracing eight different types of propulsion plants for a variety of submarine and surface ship designs. We will have plants to power ships from the small hunter-killer submarine, the TULLIBEE, up to the nuclear aircraft carrier ENTERPRISE, propelled by eight powerful reactors which will develop 280,000 S.H.P. Our present nuclear shipbuilding program consists of 37 submarines and three surface vessels either completed and operating, under construction, or authorized for construction.

Within a few years we should have at sea the first nuclear powered task force--complete from submarines to carriers. Thus, a technological and military revolution, which in the past would have taken the greater part of a century, will be essentially completed in about a decade.

No conventional submarine has ever run submerged at its top speed for more than one hour. By contrast, the nuclear powered SEAWOLF on a single cruise ran fully submerged for 60 days, covering a distance of 13,761 miles. She then surfaced only because she had completed her mission. The SARGO, early this year, returned from a single cruise of 19,000 miles, of which 18,880 miles were fully submerged; only 120 miles were on the surface, primarily for entering and leaving port. Further, the SKIPJACK is capable of maintaining indefinitely a speed few ships of any kind can match. And just how well our nuclear submarines are becoming at home in the ocean depths is evidenced by the fact that the NAUTILUS, in her four and one-half year life, has spent a total of over one full year completely submerged.

Our nuclear submarines have done far more than demonstrate the basic capability of operating submerged at high speeds and for long periods of time.

Even as late as 1950, when the NAUTILUS land prototype was being built, an official publication was being distributed in Washington which contained the following statement, "Development of the trans-arctic submarine remains in the realm of fantasy."

Now, the NAUTILUS and the SKATE have thoroughly proved that the trans-arctic submarine is a matter of reality. They have opened up a fourth large ocean area for the use of our Navy.

The nuclear submarine is particularly adapted to the missile age. Soon there will be in operation the HALIBUT, a nuclear submarine capable of firing Regulus type air-breathing missiles, and the GEORGE WASHINGTON, first of our Polaris-firing submarines.

Armed with the Polaris missile, these underwater satellites could launch their attack from far out in the Atlantic, the Pacific, or the Arctic Ocean. They could be placed anywhere within hundreds of miles of their targets. They could be dispersed over literally millions of square miles of ocean.

The problem of locating and destroying such an underseas fleet will be tremendous. The enemy would be in the position of a man trying to find a black cat on a vast and empty plain on a moonless and starless night. An aggressor would know that if he dared to attack us he, himself, would inevitably be destroyed.

We are beginning to see what nuclear power can do for the submarine. For the surface ship it will provide virtually unlimited cruising radius. Nuclear ships will not have to shuttle back and forth to shore bases for more oil, or require an endless chain of tankers. Nuclear power multiplies about 20 times the distance an aircraft carrier can travel at full speed without refueling, and about 50 times the distance a guided missile destroyer can travel at full speed without refueling. This dividend we can predict. However, as was the case for nuclear submarines, we will be unable to fully

appreciate, until we actually operate these surface ships, the meaning of this dividend in terms of increased military capabilities.

Our naval revolution is proceeding quickly. But since returning from the Soviet Union I am more convinced than ever that we cannot afford to relax. The Soviets have the second largest naval fleet in the world. They have 450 submarines compared to our 120. They have done a good job of building an atomic powered icebreaker. In challenging our command of the seas they are proceeding as in all their other endeavors--deadly serious in attitude, unrelenting in aim, and energetic in achievement.

Since World War II the ^{SOVIETS} ~~Russians~~ have built 350 new submarines to our 24. At the outbreak of World War II Germany had but 57 submarines and of these only 22 were ocean-going. Before the German submarine fleet could be destroyed 14 million tons of Allied shipping sank to the bottom of the seas. It has been estimated that 20 percent of the entire Allied war effort was tied up in antisubmarine warfare. It should be a sobering thought to all of us that the Russian submarine fleet is now ten times as large as was the German submarine force at the beginning of World War II. The Soviets have more submarines today than the Germans had at any single time during that war.

Too often we think of this huge fleet of ^{DELETE} ~~Russian~~ submarines merely in terms of ships that might someday lie in wait to sink our merchant and naval shipping. It is common knowledge that the

Soviets can now launch missiles from their submarines with ranges of at least 200 miles. It would take but a single such missile accurately placed to cripple any one of our seaboard cities. Before too long missiles from submarines will reach any target in the U. S.

IN MY OPINION
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The best protection of our shores against missile-firing enemy submarines is in setting up submerged barriers of our own nuclear powered attack submarines which can destroy enemy submarines menacing our coasts.

Fortunately we are, at the moment, ahead of the Soviets in the development of the nuclear powered submarine. And, it is by far the best antisubmarine weapon we have today. We must make certain that we remain ahead with this antisubmarine weapon system and that we build a sufficient number of these attack submarines to combat the Soviet submarine menace.

The nuclear submarine is a ship that requires no armament for its own defense. The ocean acts as its protecting screen and its armor. As a result, the submarine can be made all weapon, rather than part weapon and part shield. Therefore each of these nuclear submarines constitutes a complete task force in itself.

The work ahead is full of challenge for us. There is much to do to complete the development of an industry to support an expanding nuclear Navy. Our new nuclear shipbuilding capability is just now being tried out. A number of shipyards which have begun construction of nuclear ships have yet to prove that they can rise to the stringent standards of quality and excellence which are a necessity for nuclear power.

We have just scratched the surface in nuclear technology. The NAUTILUS traveled 62,560 miles on her first reactor core of which over half were while fully submerged. To duplicate this performance, a conventionally powered submarine having the size and the power of the NAUTILUS would have required over two million gallons of fuel oil. It would take a train of tank cars over a mile and a half long to carry this amount of fuel. On her second reactor core, the NAUTILUS steamed a total of 91,324 miles of which 85 percent was fully submerged. We are now installing in her a third reactor core that may take her three times as far as her first core. We are working on designs which we hope will result in even further improvements in performance and reduction in cost.

One final thought I would leave with you: the rapidity of change in our modern world. There are many examples, but two, one industrial and one military, stand out in the context of what I have said.

The industrial one is Near East oil. In 1901 an Englishman named D'Arcy obtained a concession to drill for oil in Persia. Everyone considered his venture to be highly speculative, and events soon proved this to be true. By 1908, after many unsuccessful drillings his resources were exhausted and it had been decided to discontinue further drilling. Just then oil was struck on the site of an ancient fire temple.

It was this chance discovery which, in the short span of 50 years, had a more profound effect on the industrial life of Europe and on world international affairs than had perhaps the events of any similar period in modern history. The Suez crisis of three years ago has amply demonstrated this.

The second example, the military one, is our own Air Force. On August 1, 1907, the War Department created an Aeronautical Division under the Chief Signal Officer. This Division consisted of one officer and two enlisted men. Only 40 years later that three-man organization had expanded to become the predominant military arm of the United States. Never before in all history has so tremendous a military change taken place in so short a time.

The lesson from these two examples is plain. We must expect even more rapid changes and displacements in the future. Predominance in any field today is no guarantee of position tomorrow. In light of the ever-spiralling scientific and technological revolution we must be alert; we must anticipate change; we must recognize that no institution is so hallowed that it must not be examined periodically; we must ever bear in mind that the law of life for organizations as well as for nations is: "Adapt or Perish."