

Ocean Floor Map Needed U.S., Russia Engage in Race To Reach Bottom of Sea

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Editor's note—The United States and Russia are engaged in an intense rivalry to get to the bottom of the world's oceans and find a treasure chest of oceanographic knowledge which will have a host of practical applications. Overshadowed by the more dramatized race to the moon, the duel beneath the sea is no less significant, either in terms of cold war strategy or the resources it holds for man in a peaceful world. This is the first in a series of five articles by our Washington correspondent on this subject.

Washington—When the atomic submarine Thresher perished this spring in the North Atlantic, some Navy officials speculated that it might have crashed into an unknown underwater sea mount, just as aircraft occasionally collide with mountains.

The theory was later dropped—but it betrays the Navy's anxiety about one of the little known perils facing the latest, most advanced war vessels of the United States as they operate amid the ancient mysteries of the ocean depths. That peril is that submarine navigators don't have complete road maps of the ocean floors. The sea mount theory was considered only because the Navy just doesn't know where all the underwater mountains and valleys are located.

This points up a critical military problem, but it stems fundamentally from man's abysmal ignorance of the sea around him. As Interior Secretary Stewart Udall put it recently: "The ocean is the newest and the last frontier of the world. I would hazard a guess that we know more about the stars and the space above us than we do about the water—and the land beneath it—covering more than two-thirds of this planet."

The problem caused by this basic ignorance has suddenly become critical because the

cold war has been extended to the ocean depths. The Soviet Union is concentrating virtually all of its sea power in a mighty submarine force of some 800 vessels, and the United States is turning out nuclear submarines "like pancakes," as one congressman put it. Consequently, both nations have become intensely concerned about solving the mysteries of the deep.

In a word, the United States and Russia are locked in a race to get to the bottom of the ocean, in the broadest sense.

For this reason the Kennedy administration without fanfare has expanded significantly the government's oceanography program and laid out a decade-long effort to conquer the unknown.

A decade ago the federal budget for oceanography was about \$10 to \$15 million a year. Last year it was \$124 million; and this year President Kennedy has asked Congress for \$156 million. During the coming decade from 1963 to 1972 the government plans to spend over \$2 billion in oceanography, making it a major thrust of the U.S.A.

About 95 per cent of the impetus for this expanded effort is military, according to a key government official. Nevertheless, some 20 different federal agencies are involved in oceanographic research, civilian as well as military. They are measuring ocean temperatures, salinity, currents and waves, surveying the undulations of the bottom, exploring the mineral potential of the sea, looking for ways of increasing and utilizing the vast fish population, observing movement of icebergs, determining the influence of the ocean on weather, and ascertaining the affect of man's various activities such as disposal of atomic and industrial wastes on the oceans.

Research in some of these areas would be underway by both federal and private research institutions even if there were no threat from a foreign power, but the extent of the American effort

today is attributable to the Russian submarine threat. As a matter of fact, the U.S. has shown almost a knee-jerk reaction to foreign submarines. The history of oceanographic studies shows that the U.S. government over the years has been vitally concerned only in direct proportion to the rise of foreign threats to the nation's security on the high seas or beneath them.

It started in the first World War when the German U-boat proved a new menace. The Navy reacted by developing the crude hydrophones with which to detect the slow, noisy undersea craft. After the war, further attempts to venture into the unknown of the sea lagged.

With the advent of World War II, German submarines threatened once more. This time they were improved boats which could go down to 400 feet. The Navy reacted to the crisis by recruiting scientists for a new thrust into the neglected field of oceanography. This time they developed sonar, an electronic device for detecting undersea objects by sending out sound impulses and receiving the echo when it bounces off the object.

Both the hydrophone and sonar were based on certain principles learned by oceanographic research, chiefly the peculiar characteristics of sound waves as they travel through water. There are many variables which make the art of detection and communication underwater extremely difficult and uncertain—and this still baffles scientists to a degree.

Today's standard sonar can detect another vessel at a distance of 4,000 to 5,000 yards, or say three miles at most. American engineers are working on advanced design sonar which they expect will extend the reliable detection range out to 30 miles.

U. S. scientists are also working on ways of bouncing sound waves off the bottom of the ocean for longer range communication and detection. While generally sound travels faster through water than

through air, the scientists must contend with such curious phenomena as the banding of sound waves as they pass through the sea, and the influence of water temperatures and depth on the velocity of sound waves.

These unique and troublesome characteristics of the ocean, plus the unknown contours of the ocean floor, suggest the military necessity for

the expanded oceanographic program. The problem of the unmapped ocean floor is more recent than the one of sound wave movement. For it wasn't until after World War II that oceanographers discovered they were mistaken in assuming that the deep sea was not simply a vast and comparatively level plain.

They had known for a century of such major topo-

graphic features as the Atlantic Ridge, a 10,000-mile long range of peaks whose highest summit, emerging as the Azores, is 27,000 feet above the ocean bed. And they had known about deep depressions such as the Mindanao Trench, an awesome pit over six miles deep east of the Philippines.

But until the 1940s they didn't know that there are

about 160 flat-topped sea mounts between Hawaii and the Marianas. How many others may rise from the floor of the world's vast ocean stretches remains to be discovered.

The reason it is imperative to find out such facts is that advancing submarine engineering is producing vessels which are capable of traveling at greater speeds and with-

standing the pressures of increasingly greater depths. As one Navy spokesman put it:

"The task of navigating a submarine at high speed and deep submergence without bottom information that is accurate and adequate can be compared with diving a 10-ton truck on a freeway blindfolded."

Inasmuch as America's most prized submarines are equip-

ped with nuclear Polaris missiles, a deterrent power in which the United States has a clear advantage over the Soviets, the nation's military strategists are anxious to remove the blindfold from our submarine skippers.

That is a prime task of oceanography in America today. Next—What the Soviets are up to.

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Suburban Site Not Always Best Business Move

New York — UP — The growing number of office building and plant sites in the suburbs of major metropolitan areas is a familiar factor in today's regional planning layouts.

But the city vs. suburbs choice in a selection of a site for a new headquarters or plant sometimes may be a complex problem, not to be settled on the basis of cost alone or of convenience for some employees or for some portion of a company's operation.

Heart of the site selection matter stems from the undeniable fact that wherever you set up operations, you have to have people to run them. With that in mind, the downtown site may sometimes assume a more attractive appearance than originally expected.

14-Story Tower
This was the experience of Phoenix Mutual, one of the nation's leading insurance firms, which later this year will move into a new 14-story, elliptical glass tower in downtown Hartford, Conn., a city where a redevelopment project is well under way.

Five years ago, the company was getting ready to go into the suburbs of Hartford. It had the land and the building was under consideration when it was decided to review the choice.

For months, in conjunction with their architects and with their personnel officers, company executives reviewed the advantages of one site against the other. Much of their material they gathered from employees. Some of the factors considered were intangible such as would a move to the suburbs put the company out of touch with the financial and business establishments of the city.

Selection finally was made of the city site.

MISHAP KILLS DIVER
New York — UP — A skin diver stabbed himself to death with his own spear gun Sunday when he was knocked off balance by a huge wave crashing against a stone jetty near Jones Beach. Authorities said Robert Petty, 31, Westbury, N.Y., was adjusting his face mask and had wedged his spear gun between rocks when the wave came, impaling him on the spear.

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