

## MILITARY SCIENCE

# Most Rigorous Service

Service on atomic submarines is one of the most rigorous defense duties, for the crew lives a confined, monotonous life while the submarine is submerged—By Watson Davis

► **ATOMIC SUBMARINE** duty is considered among the most rigorous defense duties that can be performed, even though major dangers and accidents are not too frequent.

It is routine for a submarine and its crew when on Polaris patrol to be completely out of touch with its bases for some two months. The craft remains submerged for that length of time and the crew lives a very confined and monotonous life during those long weeks.

There is no communication with loved ones ashore. They do not know whether wives, children or relatives are alive and well, or sick or dead. Messages cannot be sent to the crew because of the dangers of revealing the location of the submerged warship, always on the alert to fire thermonuclear missiles should necessity arise.

There is no difference between day and night, little chance for exercise, and the close personal contacts in the cramped quarters put a premium upon balanced personalities. Senses are dulled by the monotony. There is no shore leave possible. The crew cannot be relieved or changed

in mid-ocean. Not even the waste and garbage of cooking and living can be dumped in the ocean for fear of revealing the location of the submarine to an enemy that would like to damage or sink it.

While a long and detailed period of training is necessary to fit seamen and officers for this essential but trying service, many of the best of the crew do not volunteer to this service after one or two cruises.

The control of the tightly closed atmosphere in which the men live, breathe and exist is a major physiological problem. Air pollution is much more intense than in any open air situation.

The crew of an atomic submarine will play card games for hours on end, carve whale's teeth or knit scarves, and undertake painting pictures by the numbers, or just have long arguments (bull sessions) to pass the time.

They serve upon the submerged front line of a cold war of deterrence, surrounded by monotony into which the sudden and deadly disaster can strike swiftly.

• Science News Letter, 83:244 April 20, 1963

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# Ocean Defeats Man

► **THE POWERFUL PRESSURES** and currents have taken their toll in man's eternal struggle to conquer the sea.

A newly explored world of vast mountain ranges and canyons, basins and ridges, peaks and valleys stretches in dark silence under the ocean surface. These seascapes are gradually being discovered, measured and analyzed by oceanographers as scientists design pressurized crafts enabling them to descend deep enough to explore.

All the seas, bays, gulfs and oceans of the world are actually one continuing body of water that covers 70.8% of the earth's surface. Into this vast water area stretch the continental shelves that are seaward continuations of the coastal plains. Sloping downwards at the rate of ten feet per mile, these shelves extend to distances about 42 miles into the sea.

At a depth of about 600 feet, the slopes increase markedly. Immense slopes, often 100 miles long, plunge downwards 12,000 to 18,000 feet into the abyss of the ocean floor.

Man has measured these depths by sounding, and has found the deepest spot lies in the Kuril-Kamchatka trench in the Pacific Ocean. This is measured at 34,077 feet deep.

As man descends into the ocean depths, the water becomes dark, for light waves cannot penetrate more than a few hundred feet. The temperature decreases with depth, but the pressure increases. Sea water weighs almost exactly 64 pounds per cubic foot.

The pressure increases with depth at the rate of 44 pounds per square inch for each 100 feet of depth.

Naval officials calculate that the hull of the nuclear-powered submarine Thresher was crushed (Apr. 10) like a paper sack at pressures of 3,697 pounds per square inch as it sank to depths of about 8,400 feet in the Atlantic.

In the area where the Thresher sank, 220 miles east of Cape Cod, searching is particularly dangerous. The water is churned by the warm Gulf Stream flowing northwards and the cold waters of the Labrador Current coming from the north through the Davis Straits between Greenland and Canada.

This turbulence hinders the accuracy of locating objects deep under the ocean by sound.

Salvage operations for the Thresher include work with the Naval bathyscaphe Trieste, a 50-ton craft sent by rail on an open track from San Diego. This 60-foot long diving craft has already descended seven miles under the ocean surface. This two-man craft has only very local mobility, with a range of only 2,000 yards. It is battery propelled with a small porthole, closed TV circuit, camera and floodlights. Plans are underway for a craft with aluminum plates and submarine hulls that could operate down to 15,000 feet.

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**SOCIOLOGY**—Which group among non-owners of fallout shelters is least anxious about world affairs? p. 246.

## SCIENCE NEWS LETTER

VOL. 83 APRIL 20, 1963 NO. 16

Edited by WATSON DAVIS

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N.W., Washington 6, D. C., North 7-2255. Cable Address: SCIENSERV.

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00; 3 yrs., \$14.50; ten or more copies in one package to one address, 7½ cents per copy per week; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage. Change of address: Three weeks notice is required. Please state exactly how magazine is addressed. Include postal zone number.

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Printed in U.S.A. Second class postage paid at Washington, D. C. Established in mimeograph form March 13, 1922. Title registered as trademark, U.S. and Canadian Patent Offices. Indexed in Reader's Guide to Periodical Literature, Abridged Guide, and the Engineering Index. Member of Audit Bureau of Circulation.



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