

GENERAL SCIENCE

USSR Subs Threaten Korea

Russia may have up to 100 submarines in her Far Eastern bases. The submarine now has a decided advantage over any known method against it.

See Front Cover

► DEADLY, modern Russian submarines, operating from bases in Siberia and possibly Red China, are an ominous threat to our forces in Korea. At the end of World War II, the pendulum swung once more, giving the submarine a decided advantage over methods of defense against it.

Allied forces in World War II, through intensive application of science and great effort, were able finally to control the Nazi subs. But the late-in-the-war development by Germany of the snorkel breathing device, the long range torpedo and subs which could move faster underwater than the majority of their prey, have once more swung the balance so that the situation for transports and surface naval units in and around Korea is serious. Russia grabbed off many models of these modern subs and took into custody many German submarine engineers at the end of the war.

As Dr. Vannevar Bush, who directed our scientific effort in World War II, put it in a recent book: "If we entered a war soon, against a technically and industrially strong enemy, and if that enemy could effectively apply modern devices at sea, we should have the whole job of overcoming the submarine to do over again on a new and unattractive basis.

"Again we should face the severe threat that a nearly immune submarine fleet might determine the outcome of the war in favor of the enemy. Many of the successful methods of the last war are now obsolete against the truly modern submarine. There is no cure-all."

Russia may have anywhere up to 100 submarines in her Far East bases, many of them now equipped with snorkels and the latest type of speedy underwater engines.

The modern submarine's snorkel is the device that supplies fresh air to engines and crew, thus enabling submarines to remain submerged for almost indefinite periods. The snorkel's nose is shown on this week's cover of SCIENCE NEWS LETTER. Only top-most part of snorkel projects above the water.

Just as Russia has given the North Koreans tanks and planes, so she could turn over to the North Korean "navy" her Far Eastern submarine fleet. As United Nations troops and materiel are built up in South Korea, it would become a greater temptation to Russia to try to cut our sea supply lanes with submarines.

There are all sorts of gadgets for use in defense against submarines. Sonar sends out high frequency sound waves which come back as echoes when bounced off a sub. Sono-buoys work on the same principle and can be strewn over wide areas to give anti-sub ships and planes warning of the whereabouts of enemy undersea craft.

But sonar is relatively useless against a modern sub equipped with torpedoes with a range greater than sonar's range. And sono-buoys cannot cover the immensely greater areas over which a snorkel-equipped sub can roam today.

The best defense against submarines is to attack their bases. Russia has a large naval base at Petropavlovsk, on Kamchatka pen-

insula, facing the open Pacific to the north of Japan. Another base is at Vladivostok, only a few miles from the North Korean border. And there are other bases on the mainland coasts of the Seas of Japan and Okhotsk.

But this method of defense is barred so long as we are not at war with Russia and if the submarines are dubbed "North Korean."

Since the end of the war, when we realized that the submarine once again had the potential advantage, scientists and naval experts have been working hard to overcome that advantage. But peacetime progress has been relatively slow and hampered by interservice and intraservice arguments.

The war against the submarine today is more than ever a war of science, of developing new devices which will hunt out the lurking sub, new weapons and explosives which will hit and penetrate the attacking sub. Whether that war has yet been won, on paper, of course we do not know. Knowledge of the post-war development of the Russian submarine service and a glance at United States naval budgets make it reasonably certain the battle has not been won in terms of ships afloat and weapons at hand.

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CONSERVATION

Puerto Rico Waters Land

► PUERTO RICO, Uncle Sam's Caribbean outpost, is stretching its coastline by piping water through mountains. In a \$24,000,000 project to be launched soon, the island hopes to add 35% more acreage to its irrigated lands available for agriculture.

Five reservoirs and two hydro-electric

stations will be part of a system to bring water to the wide, arid Lajas Valley in southwestern Puerto Rico. The system will utilize heavy rainfall on the northern side of the mountains, bringing the water through eight miles of tunnels into a network of irrigation canals serving 25,000 to



IRRIGATE, RECLAIM, EXPAND—A \$24,000,000 hydro-electric, irrigation and water supply project in the southwestern part of Puerto Rico will soon be launched. This is part of Puerto Rico's agricultural and industrial "comeback."