ENGINEERING

Launch 2 Nuclear Vessels

The U.S. Navy's first nuclear-powered surface ship and the world's first atom-driven merchant vessel have been christened this month.

TWO HISTORIC SHIP launchings this month may mark the start of a new area in shipping.

The cruiser U.S.S. Long Beach, launched in Quincy, Mass., on July 14, was the first nuclear-powered naval surface ship ever to slide down the launching ways. A week later, July 21, Mrs. Dwight D. Eisenhower christened the world's first nuclear merchant ship, the N. S. Savannah, at Camden, N. J.

The Long Beach and the Savannah thus join the Russian ice-breaker Lenin as the world's only nuclear-powered surface ships. The Lenin, more than 700 feet in length and with a displacement of 16,000 tons, was launched in Leningrad Dec. 5, 1957.

Already in operation are six U. S. nuclear submarines, the Nautilus, Seawolf, Skate, Swordfish, Sargo and Skipjack.

Despite the belief that the Lenin may have been a test for eventual larger Russian atomic warships, and reports that the Russians have several nuclear submarines and a nuclear whaler under construction, the United States apparently is far in the lead in the production of nuclear-powered ships.

In addition to the six operating submarines, the U. S. Navy has 27 other atomic submarines under construction or authorized. These include attack types, missile-launching types and one radar picket submarine.

The Navy also has a carrier and a frigate under construction, both with a tentative launching date sometime in June of next year. The 85,000-ton carrier Enterprise will be 1,088 feet in length and cost an estimated $393,000,000. The destroyer-type frigate Bainbridge will displace 7,600 tons and cost $108,000,000. It will be 550 feet long.

Although other important maritime nations have been slow to build atom-driven vessels, most of them have been studying the possibilities of building nuclear vessels of various types.

France and England already have one submarine each under construction. Italy, Norway, Sweden and Japan are studying the feasibility of nuclear ship construction and Canada is considering building an atomic icebreaker.

The 14,000-ton Long Beach is 721 feet long with a 73-foot beam. It will have two pressurized-water reactors similar to those used in the Navy's atomic submarines. Scheduled for completion late next year, it will probably join the fleet in 1961 or 1962.

Capt. Eugene P. Wilkinson, who was the first commanding officer of the Nautilus, will be the skipper of the $250,000,000 cruiser.

The Savannah is expected to be ready for sea trials early next year. It will have a cruising speed of 21 knots (25 miles per hour) and its initial fuel load should enable it to travel 100,000 nautical miles for more than three years without refueling.

The $42,500,000 merchant ship is 596 feet long. It will carry 60 passengers, 9,340 tons of cargo and a crew of 109.

The Savannah is being sent on a world-wide good will tour as a demonstration of this country's interest in the peaceful uses of atomic energy.

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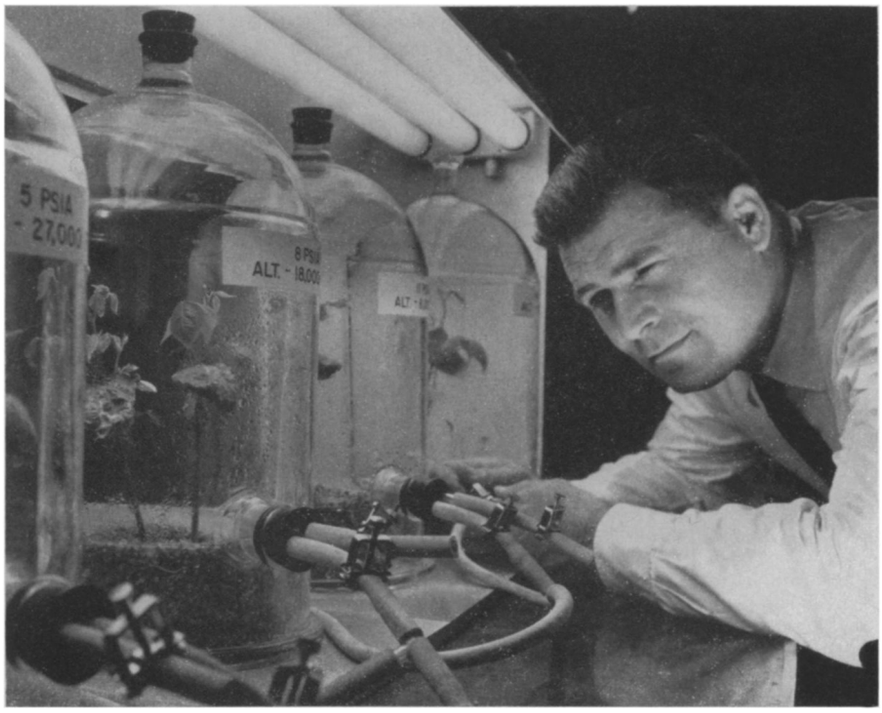

MOON GARDEN—Carrots, beets, snap beans and turnips are being nurtured at various simulated low-pressure and high-altitude conditions. Bill Taufman, shown, and other scientists at Republic Aviation Corporation are seeking the best design for a "lunar greenhouse" to determine the feasibility of growing vegetables on the moon if a base is established there. This research is being conducted for the U.S. Air Force's Ballistic Missiles Division.

BIOLOGY

Starvation Protects Animal From Radiation

A TINY, SIMPLE animal can be protected against some radiation-induced mutations through starvation.

Given enough time and the "right" metabolism, the microscopic, one-celled paramecium can actually lose some of the radiation damage that is potentially capable of causing mutation but has not yet done so.

Previous studies had shown that there was "some sort of reversibility in the mutation process," a team of scientists reports. Now these scientists have been able to demonstrate without question that there is a definite period in the life of the paramecium when mutation damage can be lost.

The essential thing, Dr. R. F. Kimball of the Oak Ridge National Laboratory told SCIENCE SERVICE, is to slow the animal's growth processes, delaying cell division. By thus allowing it more time, the potential for more mutation damage is averted. Starvation is thus a means to an end, he explained.

There is a time limit within which starvation protection can affect the animal following irradiation. This is the intermediate period. Following this intermediate period is what the researchers call the "terminal event."

Any potential for mutation that has not been lost by the paramecium at the time of the "terminal event" may become a mutation. There are two mutation effects following radiation. One is immediate. The other is potential; that is, it may or may not happen depending on time and metabolism.

Results of their studies indicate that the terminal event is "something" in the normal development of growing cells. What this "something" is remains unknown.

Details of the study on *Paramecium aurelia,* made by Dr. Kimball, Nenita Gaither and Stella M. Wilson, all of the Oak Ridge biology division, appear in the *Proceedings of the National Academy of Sciences* (June).

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