PHYSICS

Atomic Powered Navy

Program for developing propulsion of ships, submarines and aircraft by nuclear energy, with civilian commission, is planned by Navy.

➤ A NAVY powered by atomic energy as well as fighting with atomic weapons is visualized by Rear Admr. Harold G. Bowen, chief of the Navy's Office of Research and Inventions.

A vigorous research program for developing the propulsion of ships, submarines and aircraft by nuclear energy is planned by the Navy under the general guidance of a civilian atomic energy commission.

Admiral Bowen, speaking before the Engineers' Club of Philadelphia, declared:

"The prospects of harnessing atomic energy for the purpose of driving ships in the near future is an amazing possibility."

"If we start with a large vessel," Admr. Bowen said, "we will find that the elimination of the boilers and associated auxiliaries, as well as thousands of tons of fuel oil, offers the possibility of more advantageously disposing of weight. The application of this principle to commercial carriers is obvious. The bottoms of ships can be materially strengthened by using thicker plate, the whole hull structure can be materially strengthened, and armor can be more generally used, all with the idea of making ships less vulnerable to attack by atomic or other forms of bombing.

"Since economy of fuel will no longer be essential, turbines will be completely redesigned, with the whole idea of increasing the amount of horsepower per pound of turbine as much as possible. With resulting greatly increased speeds, there will follow a complete redesign of the underwater body. Marked increases in speed will be conducive to reducing the possibility of effective bombings, etc.

"We will be searching for an ideal coolant for the atomic pile which will be, we hope, fluid from room teperature to 1500 or 2000 degrees Fahrenheit, and not capable of becoming radioactive. The design of the necessary heat exchangers will furnish a fascinating problem to those who are versed in the art of heat exchange."

Admr. Bowen also listed five other problems in atomic energy that are Navy responsibilities:

"The development of nuclear munitions, and the vehicles to launch and carry them;

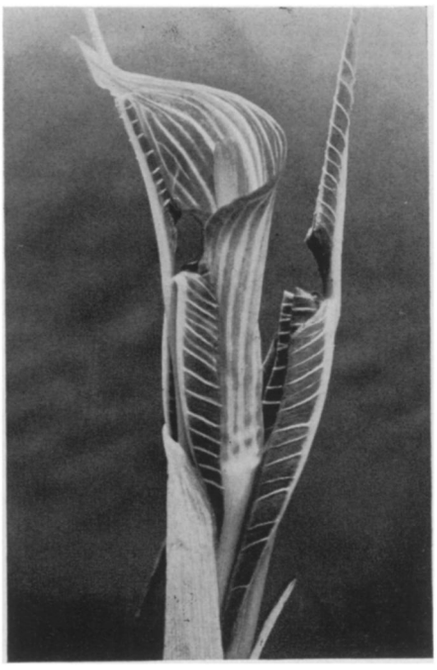
"The utilization of nuclear studies for the medical sciences;

"The exhaustive exploration of all possible countermeasures to nuclear munitions and their carriers;

"The maintenance of a broad program of research in nuclear physics and the allied fields of science; and

"The education and training of naval personnel in nuclear energy and its applications."

Science News Letter, May 4, 1946



SPRING BANNERS—New leaves are sometimes called by poets "the banners of spring." Here we see the banners unfurling. When Jack-in-the-pulpit prepares to bloom, a tall spike pushes its way up. Within, tightly rolled, are the curious floral structure of this plant and a pair of leaves. Nature photographer Lynwood M. Chase, New Bedford, Mass., has here caught the moment when the flower has partly opened, but the leaves are still close-rolled.

CHEMISTRY

DDT's Future Questioned

War-born "Ersatz", it proved better than insecticides it replaced but may in turn be replaced by other chemically related compounds now made in small quantities.

➤ DDT, now hailed as man's best weapon in the never-ending war against insect pests, isn't here because it was wanted in the first place. It was developed as a wartime "Ersatz" insecticide, to pinch-hit for old favorites like pyrethrum and rotenone when supplies of these were cut off or made inadequate by the war—and it surprised even the scientists who worked with it by being a more effective insect-killer than the ones it replaced.

At the meeting of the National Academy of Sciences, Dr. H. L. Haller of the U. S. Department of Agriculture told the story of DDT up to now, and gave glimpses into its possible future. One quite possible future for DDT may be that it may not have any. That is, Dr. Haller explained, it may be replaced by other chemically related compounds now being made in small quantities and tested, some of which may well prove to be even deadlier to insects than the parent compound, and at the same time less poisonous to larger and more desirable animals that swallow it incidentally or accidentally.

Discovery of DDT's value made life easier for chemical searchers for synthetic insecticides by demonstrating conclusively that to be an effective insecticide a compound does not need to be complex, with big, hard-to-synthesize molecules, like rotenone, pyrethrum and nicotine. Nicotine has been made synthetically, though it still remains cheaper and more practical to extract it from tobacco. Rotenone and pyrethrum have not been synthesized at all, and now it appears unnecessary to attempt the task. DDT has a small, relatively simple molecule, and the new British insect-killer, benzene hexachloride or 666, has a mole-

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