

riority. The experience gained by the American Navy in using carefully trained personnel and developing by trial and error a superior tactical use of the submarine, mutually supported by all elements of the Navy team, is ours alone. It cannot be taken from us nor can it be readily imitated.

There are countless indications of the increased importance of the submarine in the navies of tomorrow. Atomic energy is certainly the perfect answer to submarine propulsion requirements. Once worked out it becomes an unlimited power source and, more than that, it would require no oxygen supply for operation. Atomic propulsion would eliminate the link with the surface pro-

vided oxygen could be carried in sufficient quantities to support the life of the crew members.

Unfortunately, one of many innumerable obstacles to the installation of atomic propulsion in a submarine is the present limited space available in an undersea vessel. An atomic propulsion plant is going to require a lot of room.

The U. S. Navy probably will lay out several submarine types for the future so that we may do varying tasks better. In a future world of guided missiles, atomic warheads, and atomic propulsion the submarine will be a vessel with missions to perform which in many cases are now designed to be done by surface ships and aircraft alone.

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vention and instrument approach to an airport.

The same apparatus in the plane is used for all operations, and its total weight is about 100 pounds.

Science News Letter, April 19, 1947

VETERINARY MEDICINE

Eggs Found to Carry Serious Poultry Disease

► EGGS MAY BE the "Typhoid Marys" of one of the most serious of poultry diseases. Dr. W. A. Boney, Jr., of the Texas Agricultural Experiment Station, has discovered that turkey eggs can harbor the germs of the disease known as fowl typhoid. Although he has been able to isolate the organism from only one egg out of 374 examined, research men regard his findings as significant. Eggs have long been suspected as carriers of fowl typhoid, but efforts of earlier workers to locate the causal organism in them apparently were unsuccessful.

Dr. Boney states, in his report in the *American Journal of Veterinary Research*, that the organism can be isolated easily from the reproductive systems of both male and female birds. He points out that transmission by way of eggs may in some cases explain why outbreaks of fowl typhoid occur in brooder houses or on ranges where it seems impossible to account for its introduction from an outside source.

Science News Letter, April 19, 1947

AERONAUTICS

Teleran for Safe Landing

► A NEW AIRPLANE navigation and bad weather landing system has come out of the laboratories and is ready for development by engineers into a form suitable for airport installation.

The system, developed by the Radio Corporation of America, is named "Teleran." The name was coined from the chief ingredients of the new device, television and radar.

RCA engineers told scientists and aviation writers that Teleran as a practical device is not here, but "just around the corner."

In the new aircraft navigation and landing aid, ground-based radar, the same or similar to that in the Ground Control Approach equipment (GCA), scans the sky for miles about an airport.

Television brings the picture on the ground radar scope to the pilot in his cockpit in the plane.

The pilot sees not only the shadow picture on the radar scope but at the same time a superimposed map of the airport area. He sees his own plane as well as others represented by spots on light. The same television can also give the pilot weather maps or written traffic instructions. The picture is simplified by a screening process and made brilliant with special phosphors.

A special transmitter and receiver unit, called a transponder, gives the pilot a separate radar picture for each altitude.

The transponder has a receiver and transmitter connected together so that the transmitter emits one or more pulses when the receiver picks up a pulse

separated at a time interval that corresponds to the plane's altitude.

An automatic device called a discriminator circuit can be made to sort out automatically the responses sent by the ground station according to the altitude.

RCA scientists have been engaged for a half-dozen years in developing Teleran. A recently-perfected part of the system is a simplified television camera that is compact. Teleran can be used in air navigation, traffic control, collision pre-



TELERAN—The new RCA television-radar air navigation and traffic control is installed in the cockpit of a flight simulator. Data are shown on a screen on the instrument panel.