can be used to hold a telephone or a cigarette, to write and to perform a few other functions. Even more useful will be another Army dress hand with movable fingers as well as thumb.

Important advance for the person without hands is the new wrist flexion unit. This allows 22.5 degrees extension and 45 degrees flexion, or bending. With the 45 degree flexion, the hook can be brought right up against the body, which makes shaving and unbuttoning a shirt possible, explained Jerry Leavy, of Los Angeles, one of the testers for the artificial limb program. Mr. Leavy, incidentally, has become so proficient in the use of his two artificial arms that when he applied for a license to drive a station wagon, he finished up with a license for driving a truck.

The wrist flexion unit can be attached to any standard artificial arm. It has been released to the Veterans Administration and will be ready for the market as soon as VA puts through its procedures for releasing it.

Science News Letter, May 22, 1948

ENTOMOLOGY

Effects of Insecticides Need Study for Best Use

➤ CHEMISTS have been providing deadly insecticides so fast, of late years, that entomologists have not yet been able to find out their most effective uses, Dr. T. Walter Reed of the California Spray-Chemical Corporation, Haddonfield, N. J., told an American Chemical Society meeting in Bristol, Va.

DDT, benzene hexachloride, chlordane, chlorinated camphene and other insect-killing compounds are now being used in mixtures instead of "straight," he stated. A mixture of DDT, benzene hexachloride and sulfur, for instance, has had maximum effect on boll weevil. Locust plagues may be made a thing of the past through airplane use of chlordane, chlorinated camphene and benzene hexachloride.

But above all, field scientists must study the effects of their new weapons beyond the immediate attack on specific pests. There is always some offsetting disadvantage, in the destruction of beneficial insects or other useful life forms, and it will require great knowledge and care to see that the bad does not overbalance the good.

Science News Letter, May 22, 1948

AERONAUTICS

Flight Training on Ground

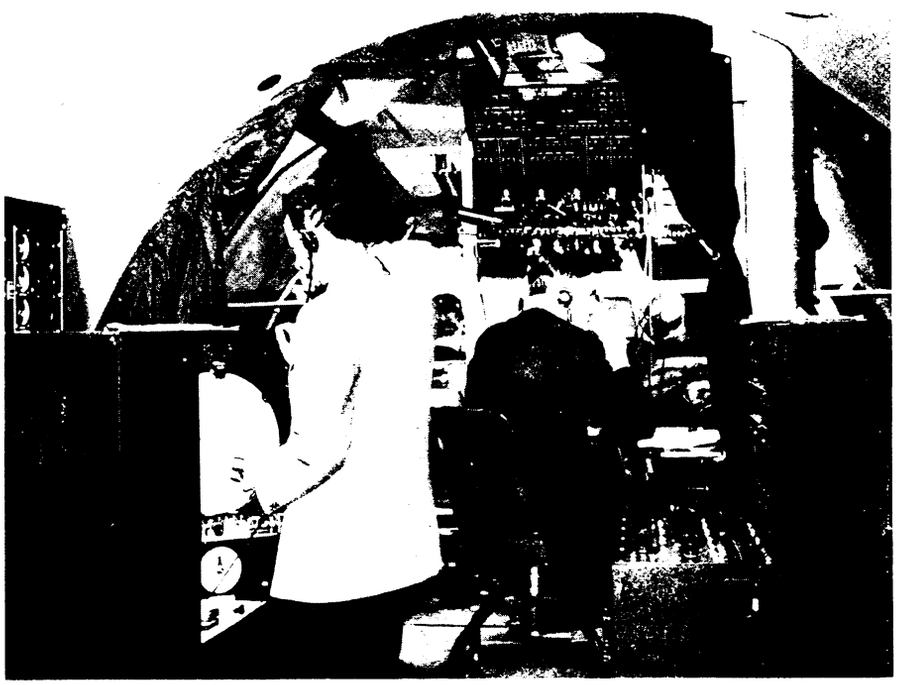
Electronic Flight Simulator duplicates in exact detail the cockpit of a Stratocruiser with electronic devices for simulating flight conditions.

➤ PILOTS of the future, particularly those who handle giant passenger airplanes, will receive much of their training without leaving the ground. This will be the training that has to do with operation techniques, and the ground-training is made possible by the development of a huge electronic-mechanical device in a model of a cockpit with all the hundreds of dials, levers, switches and controls which a pilot encounters in a plane.

This device is called the Electronic Flight Simulator. It reproduces in exact detail the flight deck or cockpit of the airplane whose performance it is designed to reproduce. It incorporates all the existing aerodynamic data upon which the plane itself was produced. Without leaving the ground, it can accurately simulate any condition of flight of which the plane itself is capable.

The simulator was conceived and designed by Dr. R. C. Dehmel of the Curtiss-Wright Corporation, with the cooperation of Boeing Aircraft Company. It is a complete replica of the Boeing Stratocruiser-type giant transport cockpit. The instruments and controls function precisely as in the real airplane. The device has just been purchased by Pan American Airways, and will be used in pilot training for handling Pan American Stratocruisers. Similar simulators can be built to aid in training for other planes.

This flight simulator cost some $250,000 to build, and this does not include the cost of ten years of research work which preceded its actual construction. It looks like a lot of money to put into



SIMULATED FLIGHT—Instructor supervises a simulated flight in the Curtiss-Wright Dehmel Electronic Flight Simulator with a Pan American World Airways crew in an exact duplicate of the cockpit of the Boeing 377 Clipper. On the left, the instructor watches the "scriber" trace the performance of the crew. The flight engineer, center, checks his engine instrument readings and reports to the pilot.