

AERONAUTICS

New Anti-Aircraft "Ears" Hear "Enemy" 12 Miles Away

Five Years of Research Improves Airplane Sound Locators Which Now Automatically Light the Planes

NEW "ears" for U. S. anti-aircraft guns that hear enemy airplanes a dozen miles away, automatically flood them with searchlights so that gunners can fire with daytime effectiveness in the stormiest, blackest night have been developed as the result of five years of research.

Cautiously buried in a technical paper delivered before the American Acoustical Society by Frank R. House, of the Sperry Gyroscope Co., were brief details of the new robot airplane sound locators. They can detect high-flying aircraft above clouds or in the black of night. Synchronized with the sound detectors are giant searchlights which quickly follow the hidden airplane throughout the sky. They make possible an accuracy of anti-aircraft gunfire at night comparable with that attained in the daytime.

Secret of their success is the system of soundproofing which sifts out extraneous background noises and allows the sought-for drone of the airplane propeller and motor to enter the apparatus. Once inside, it is amplified to audible intensity.

The new development makes possible the operation of the "ears" in howling winds and driving rain and yields a performance equal to that obtained with the older detectors under the quietest conditions.

Ordinary aircraft locators can detect an approaching airplane twelve miles away when the surrounding noise is of the intensity found in the open country. At the noise level of the suburbs the range is cut to six miles. With a background noise like that of a residential district the limit is three miles; while with city noises in the vicinity the range is only one mile.

Limit Approaches Ideal

By decreasing the intensity of these background sounds in the detector's amplifier system, the detection limit of the new aircraft "ears" approaches the ideal open country conditions.

With unsoundproofed airplane detectors a passing truck 1,000 feet from the "ear" will cut its range for open

country from twelve to three miles. Conversation within ten feet will cut the range to two miles, while a barking dog at twenty feet decreases the detection limit to one mile. Wind and rain may have even greater effects.

How the surrounding sounds are decreased in the apparatus and the airplane noises allowed to pass is still a secret, Mr. House said.

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BOTANY

Chemicals Cause Changes In Rate of Plant Growth

CHEMICALS out of a bottle proved quite as effective in causing growth-rate changes in plants, as did the special growth-stimulating substances secreted by the plants themselves, in experiments carried on by Dr. A. E. Hitchcock at the Boyce Thompson Institute for Plant Research.

The plant substances whose action was thus chemically duplicated are known as auxins; they are more or less analogous to the hormones or ductless gland secretions of animals. Auxins stimulate growth in plants, cause roots to start where no

roots grew before, etc. Applied to one side of a stem or growing leaf and not to the other, they will induce faster growth on one side and thus cause the plant to bend.

All these physiological responses Dr. Hitchcock obtained with three rather widely different organic acids. The first is a commercially available compound known as indole-3-n-propionic acid; it is chemically similar to the plant compound known as hetero-auxin. The other two acids, phenylacrylic and phenylpropionic, are chemically quite different.

But all three of them, applied to the stems and leaves of buckwheat, tobacco, tomato and other plants, produced typical auxin effects. Bending occurred toward the treated side of the plant if the amount used was large, away from it if the amount was small. Bending usually took place within an hour after the chemical was applied. Its degree depended on the age and activity of the plant part treated and upon the material in which the chemical was dissolved.

This response, together with the swelling and root initiation which these "activators" produced is similar to the behavior of plants exposed to carbon monoxide, ethylene acetylene and propylene gases in earlier experiments by Dr. Hitchcock and in others by Dr. William Crocker and Dr. P. W. Zimmerman of the Boyce Thompson Institute.

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Iran and Iraq are the official names respectively for Persia and Mesopotamia.

Iceland's capital, Reykjavik, has a thoroughly modern hospital of 100 beds.



LOPSIDED GROWTH

Chemical duplications of plant auxins have curious effects on the growth of plants within an hour after application. On the left is a normal tomato plant, untreated; in the center one treated with ethylene, and on the right one treated with indole propionic acid. Bending is toward the treated side when the application is large; away from it if small.