

The object of this is to stop their production of estrogen, in the hope of stopping the estrogen-stimulating effect on the cancer.

Dr. Hertz' discovery of the anti-folic acid chemical's effect opens the possibility of using this chemical instead of removing or irradiating the ovaries. It might prove even more effective, because it would also stop the activity of estrogen from sources other than the ovaries.

The relation between folic acid and estrogen stimulation was first observed

by putting chicks on diets that contained none of this vitamin. Trial of the anti-folic acid chemical came next. Diets lacking other vitamins, such as riboflavin, pantothenic acid and pyridoxine, were also tested. But they did not have much effect on estrogen stimulation.

The possibility that other hormones may depend on "trace factors" in the diet, such as vitamins, is opened by the discovery.

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AERONAUTICS-RADIO

Calculate Speed by Radio

To measure how fast speedy planes travel, an improved single ground-based radio station has been worked out. Plane must fly directly to or away from station.

➤ FASTEST-TRAVELING airplanes may have their speeds accurately determined by an improved single ground-based radio-frequency measuring device, Boeing Aircraft Company, Seattle, revealed.

The new system is based on the so-called radio Doppler system which was worked out by the National Advisory Committee for Aeronautics at Langley Field, Va., in 1941. The earlier development made use of two ground stations 14 miles apart and a radio transmitter in the plane. The new system uses only one ground station.

In the new Boeing system, the ground station transmits to the plane. A receiver in the plane picks up this transmission, doubles its frequency and gives it to a transmitter for sending back to the ground station. At the ground station, the original frequency is likewise doubled. When the two doubled frequencies are compared, that is, heterodyned or "beat" against each other, their difference gives data from which the speed of the plane is easily determined.

The principle behind the action is similar to what takes place with sound from a rapidly approaching locomotive. This sound becomes higher-pitched as the train approaches, and becomes lower-pitched as the train goes away from the listener. Reason for the change in pitch is that sound is made up of air waves traveling outward from their source. If the source is approaching, the waves reach the listener more rapidly, making the sound seem higher in pitch.

Radio emissions oscillate, or vibrate.

Although they travel with the speed of light, there is a difference in their frequency coming and going, just as with the sound from a speeding locomotive's whistle. Furthermore, this difference can be measured with great accuracy on an oscillograph in the new instrument.

With the new system, the airplane may fly at any altitude and anywhere within a 50-mile radius of one ground

station, but its speed can be measured only when it is flying directly to or away from the station. The oscillograph of the instrument can clock the plane during a flight of several miles, indicating exact speed at every instant.

A slow-moving plane, at speeds up to perhaps 150 miles an hour, can be clocked with a stop watch. For faster speeds this method is inaccurate. In official tests under the sponsorship of the Federation Aeronautique Internationale, speeds are measured by an elaborate high-speed camera installation.

In the radio Doppler system worked out by NACA, the test plane had to fly at low altitude directly on the course between the two ground stations. Receivers at each station were tuned to the transmitter carried by the plane before it left the ground, and also to an auxiliary ground transmitter operating on nearly the same frequency. Thus both receivers got a heterodyne whistle at the same audible frequency. A telephone wire connected the two stations and fed the two whistles into an oscillograph. As the plane flew the course, the station behind it got a lower-pitched note and the one ahead a higher pitched note. The frequency difference showed on the oscillograph.

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MEASURING SPEED OF FAST PLANES—This is the equipment used in the plane with the improved Doppler system of measuring speed. It receives a radio beam from a ground station, doubles its frequency, and returns it to the ground.