



### Agricultural Aristocracy

**C**ROP increase rather than crop limitation is the accepted normal function of the U. S. Department of Agriculture. Spokesmen from Secretary Wallace down have explained and re-explained the economic situation that necessitated the clamor-arousing "plowing under" programs, which last summer's drought has already made it possible and even desirable to modify.

Now comes a new move, planned directly for the day when growing two ears of corn where one grew before will again be an undiluted act of rural virtue. A world-wide survey of breeding stocks of all kinds of crop plants and farm animals is being undertaken by the Department, to make available to breeders all over the country the information they need for the more efficient conduct of their researches.

The list of wheats for better bread, of beeves for better meat, of grapes for better wine, and a thousand other growing things will form a Register of First Farm Families, a Mendelian Almanach de Gotha of grass-roots nobility.

As kings used to send afar to get the right daughters to marry their sons, so a potato breeder at the Idaho Experiment Station can send to Maine or Wisconsin for the right mate for his best vines, or a cattle geneticist in Texas can seek in Iowa the most advantageous alliance for his animals. We democrats may insist still upon hit-or-miss romances for our own personal lives, but for our servants on roots or hooves we will have none but marriages of convenience.

Plant and animal breeding has already gone far in this country. It has produced better quality, quicker maturity, heavier yield, resistance to disease and

drought, and a hundred other desirable qualities in a thousand plants and animals. So numerous have our First Farm Families become that in their present scattered states even specialists often do not know about the very thing they most need, if it is in the hands of another

specialist in a remote part of the country. We have half a hundred flourishing kingdoms of farm aristocrats and there are many others in friendly foreign lands; Secretary Wallace has moved to weld them into an empire.

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### PHYSIOLOGY

## Stimulus to Hearing Is Chemical, Not Electrical

**E**VIDENCE that the stimulus to the nerve of hearing is chemical and not electrical was presented by Drs. A. J. Derbyshire and H. Davis of Harvard Medical School at the meeting of the American Physiological Society.

Originally these scientists thought that the electrical changes developed by the sensory cells in the ear when sound waves reach them were the agents that stimulated the nerve of hearing to carry the impression of sound to the brain. The experiments they reported have convinced them that it is much more probable that the sensory cells set free a chemical substance which in turn stimulates the fibers of the hearing nerve.

They examined the electrical phenomena which are produced in the ear by the sound of a click. This stimulus produces two well-known responses, they found. One is developed by the sensory cells in the ear when they are subjected to the mechanical pressure of a sound wave. The other is the electrical change associated with the nerve impulses in the auditory or hearing nerve. They found that this impulse in the auditory nerve travels at the rate of about 60 miles an hour.

Even after accounting for the time for the impulse to travel along the auditory nerve, however, they found a delay of 5 ten-thousandths of a second between the response of the sensory cell and the start of the impulse along the nerve. This delay could not be explained by their first theory of stimulation by the electrical response of the sensory cell.

The frequency at which a nerve fiber can carry impulses explains why a loud noise occurring while music is being played interferes with the hearing of the fainter musical notes.

A nerve fiber cannot carry a second nerve impulse within an interval of about a thousandth of a second following a previous impulse, Drs. Davis and Derby-

shire found. This "refractory period" explains the mechanism of auditory masking, they said.

They investigated the electrical activity of the ear and of the hearing or auditory nerve of the cat when the ear is stimulated by two sounds simultaneously such as musical tones and sharp clicks. Just as the click would interfere with hearing of the fainter musical tones, the electrical disturbances which signal the passage of nerve impulses in the ear of the cat show masking of one sound by the other.

If the click falls immediately after the sound wave of the musical tone it will be masked. If it falls just a trifle earlier, the click will set up nerve impulses and be heard and one wave of the musical tone will be lost.

"But if the two sounds compete in this way for the same nerve fibers, one or the other will be masked to a certain extent, depending on which one succeeds in first exciting the nerve fiber.

"In the sense organ of the inner ear, there is no evidence of any such masking," they reported. Both sets of sound waves are represented simultaneously in the activity of the sensory cells, just as they are carried through the air as complex sound waves.

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## ● RADIO

*Tuesday, April 30, 3:30 p. m., E. S. T.*

**PLANNING FOR WATER RESOURCES DEVELOPMENT**, by Prof. Thorndike Saville, Professor of Hydraulic and Sanitary Engineering, New York University.

*Tuesday, May 7, 3:30 p. m. E. S. T.*

**THE ROMANCE OF MODERN EXPLORATION**, by Dr. Ansell Hall, Chief, Division of Field Education, National Park Service.

In the Science Service series of radio addresses given by eminent scientists over the Columbia Broadcasting System.