

PLANT PHYSIOLOGY

\$1,000 A.A.A.S. Prize Given For Plant Research

**Drs. D. R. Hoagland and D. I. Arnon Honored
For Showing Plant Roots Actively Seek Nutrients**

DEMONSTRATION that plant roots actively go after needed mineral elements in the soil, actually working for what they get rather than just letting these nutrients drift into them, figured decisively in the winning of the annual \$1,000 prize of the American Association for the Advancement of Science by a paper read at the meetings by Dr. D. I. Arnon of the University of California. Dr. Arnon spoke on behalf of a seven-man laboratory team headed by Prof. D. R. Hoagland.

The classic theory of plants' absorption of mineral elements, still presented in all botany textbooks, holds that plant roots are quite passive, and that the mineral ions merely diffuse into them, very much as a drop of ink in a tumblerful of water slowly spreads to color the whole of it. This was shown to be in error by the researches of Prof. Hoagland and his associates, which proved that only roots which are actively ex-

pending energy can absorb the nutrient elements.

The researches were conducted on roots which had been cut away from the parent plants—usually barley. It was found that only roots giving off carbon dioxide—sure sign of active metabolism, or life processes—could absorb mineral salts. A high rate of growth or a high respiration rate always accompany rapid absorption. Cells that are not actively alive are poor absorbers of minerals.

In addition to its interest as "pure" science, this new concept of mineral absorption by plants has considerable potential practical importance, for its helps in getting a better understanding of such basic agricultural practises as irrigation and the use of fertilizers.

Also discussed in the prize paper were other phases of the work done at the Berkeley laboratory, particularly on the disposal of mineral elements by the plant after it has absorbed them through its

roots. Especial attention was given to some of the so-called micro-nutrients like manganese, zinc and boron, which are needed by plants in concentrations of only a few parts per million of water absorbed.

The research team working with Prof. Hoagland comprises, in addition to Dr. Arnon: T. C. Boyer, Dr. F. C. Steward, Dr. P. R. Stout, Dr. H. Jenny and Dr. R. Overstreet. One of the men, Dr. Steward, is at present conducting his work under severe handicaps—he is at the University of London, which is for the moment not in London but "somewhere in England."

Science News Letter, January 11, 1941

Chemists count at least 14 major types of *synthetic plastics* now used in human apparel.

PHYSIOLOGY

Vitamin A Blood Content Increases After Alcohol

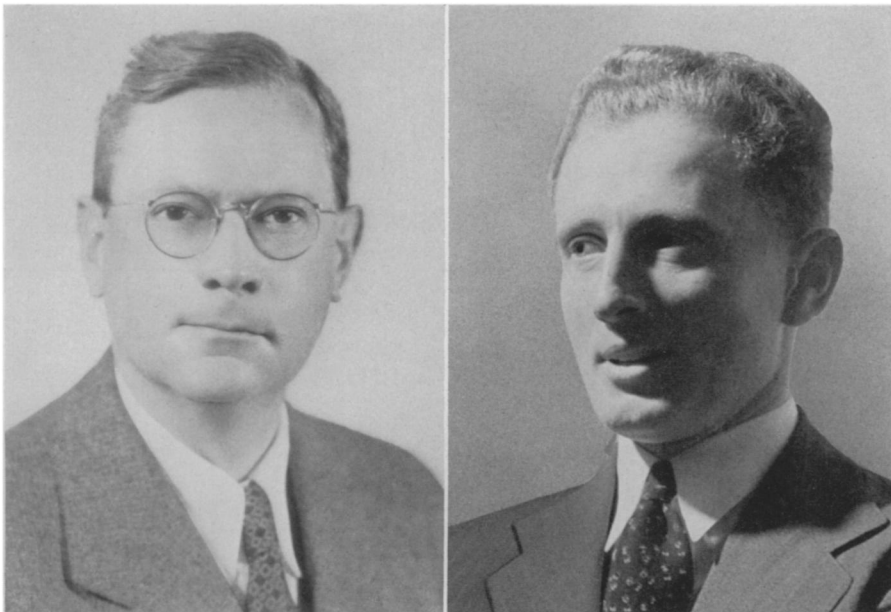
TAKING alcohol raises the vitamin A content of the blood in men as well as dogs, Dr. Samuel W. Clausen, Dr. Burtis B. Breese, Dr. William S. Baum, Dr. Augusta B. McCoord and Dr. John O. Rydeen, of the University of Rochester School of Medicine and Dentistry, announced (*Science*, Jan. 3).

Before-and-after tests were made on 10 persons taking alcohol in the form of mixed drinks as desired during the course of "the usual social evening drinking common in this country." In every case the amount of vitamin A in the blood was increased after the drinking. The increase was relatively slight in most cases but was remarkably large in one person who had a high level of vitamin A in his blood before the drinking.

Night blindness is one of the chief signs of lack of this vitamin, although it is required for health of other parts of the body besides the eyes and for normal growth of children.

Tests of ability to see in the dark, one method of determining whether a person is getting enough vitamin A, made after drinking, showed unaccountably short recovery time in dark adaptation. Dr. L. B. Pett, of the University of Alberta, who made this observation, suggested that the reason was the mobilization of vitamin A from its storage place in the body, presumably the liver, to the blood which would distribute it to other parts of the body including the eyes.

The vitamin A tests reported by the Rochester scientists were made on the blood, not the eyes. These scientists also



HONORED

Prof. D. R. Hoagland (left) and Dr. D. I. Arnon, both of the University of California, were awarded the annual \$1,000 prize of the American Association for the Advancement of Science for research that upsets the classic theory of plants' absorption of minerals.