

Greenest Plants Grow Most Efficiently

Plant Physiology

Plants whose leaves contain the most chlorophyll, the stuff that makes leaves green, are the most efficient at the business of making new plant tissues—which is, from the farmer's point of view, the chief end and object of plant existence.

Ever since pioneer plant physiologists found out what chlorophyll is, and learned that its function is to capture carbon dioxide out of the air and with the help of sunlight to combine it with water to make sugar, it has been taken for granted that the more chlorophyll a plant has per square inch of leaf surface the faster it can make new stems and leaves.

It has remained for Dr. H. B. Sprague and Dr. J. W. Shive of the New Jersey Agricultural Experiment Station to determine the relation accurately, using the exact analytical methods of the chemical laboratory.

A Cobwebless Mind

General Science

JONATHAN NORTON LEONARD in *Loki: the life of Charles Proteus Steinmetz* (Doubleday Doran):

The Steinmetz household had a non-religious atmosphere most favorable to the growth of a scientific mind. Although the father was not actively hostile to religion, he didn't let it bother him, and he took care to shield his promising son from its influence. He realized that religious training is apt to form in the mind of a child the disastrous habit of believing without proof. Pale hands from the years of infancy throw large monkey wrenches into the fragile machinery of reason. Inbred superstition never plays fair. If it can't cause active trouble it makes itself felt through bad mental habits: a desire to believe because believing is comfortable; a tendency to be shocked by the strong naked truth. Before a man can become a real scientist and not a mere technician, he must sweep his mind clear of all such cobwebs. It takes a strong intelligence to carry out this mental housecleaning, and much valuable time is lost in the process. In Steinmetz's mind the cobwebs were never allowed to accumulate.

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Oyster shells dredged from San Francisco bay are being used in cement making.

They have recently reported their results in detail to the American Society of Plant Physiologists.

They grew standardized breeds of corn under carefully controlled conditions. They supplied nutrient chemicals at a known rate. They measured the areas of leaves, extracted the chlorophyll and determined its quantity per square centimeter and weighed their plants as they harvested them.

Correlating their data, they found that the strains with the most chlorophyll per unit area had produced the most cornstalk in a given time. They also found that the plants which produced the greatest spread of leaves were most efficient at the business of growth. A yellow pigment, carotin, which is found in leaves, bore a similar relation to the rate of new stalk and leaf production as did the chlorophyll.

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Alcohol for Autos

Chemistry

Absolute alcohol, made cheaply by a commercial-scale process and mixed with gasoline, is the standard American motor fuel of the future. Prof. D. B. Keyes of the University of Illinois told how waterless alcohol has been made possible at low cost, and how it has been used satisfactorily as an automobile and airship fuel. Ordinary "pure alcohol" contains 95 per cent. alcohol and 5 per cent. water. The water prevents it from mixing successfully with gasoline. Until the process for cheaply dehydrating alcohol was invented, absolute alcohol was a costly chemical used sparingly in laboratories but never thought of for commercial use. The present low price of gasoline has prevented a large use of alcohol for the manufacture of high-grade anti-knock mixed fuel; but it is bound to come into its own in time.

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Largest Aerial Camera

Aviation

The world's largest aerial camera, weighing 130 pounds, and measuring about half the height of an average man, has just been tested successfully by photograph experts of the Army Air Corps at Wright Field.

The camera was developed to take widespread ground areas from high altitudes, and is the result of five years of experimentation. The pictures taken are 9 by 18 inches and the roll of film carried is 9½ inches wide and 150 feet long.

The camera's most unique feature is that its operation is fully automatic, possessing an automatic registering device whereby the elevation of the plane, the time, date, and the number of the negative are noted on one corner of the film. The device is electrically heated so that it will function at the below-zero temperatures found at altitudes exceeding 40,000 feet.

A test plane with a Wasp 420 horsepower motor was especially devised for the giant camera. The ship has been carefully balanced with a minimum of vibration. It holds six passengers without the camera, but carries only two when the camera is in place.

Ordinarily the camera is suspended through a hole drilled through a section of the ship's bottom. While the picture is being taken the plane moves at a speed of about 85 miles

an hour. The completion of an exposure, including the automatic setting and winding of the shutter, the rolling of the film and the "shooting" of the picture, takes only 15 seconds. During these operations the photographer has very little to do, since he has already set the automatically controlled mechanism to snap pictures at regular intervals varying from a few seconds to several minutes.

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