

is a local oxidative discoloration. In addition, there is diffused, slower, nonoxidative darkening which develops. In both cases it was noted that carotenoid of chlorophyllaceous pigments changed relatively little.

Anthocyanin pigments in pureed foods such as beets are gradually bleached while the tissue itself is darkened. Highly pigmented preserves will also discolor in storage. When no plant tissue is present discoloration is apparently brought about by originally colorless materials present, such as sugar, pectins, acids, etc. The Maillard reaction is not thought to apply in any of these cases because protein content is quite low.

Although anthocyanin pigments in strawberry products can be measured to provide an objective color determination, such a method is limited because there are other pigments present. E. E. Meschter, American Preserve Co., and R. W. Liggett, Toelle Laboratories, have developed a spectrophotometric color determination suitable for these products. Transmittance measurements using a 1-mm. light beam at three wave lengths enable one to calculate both the value of the red pigment and the degree of browning. The absolute and relative values of these measurements provide a means of objectively determining color which compares closely with evaluation by visual tests.

shows that the aspergillus factor is not present in significant amounts in chemically purified vitamins, yeast extract, or other common growth stimulating mixtures.

A report on the action of orally administered antibiotics on the microflora of the rumen was presented by W. B. Hardie of Pfizer Research Laboratories. Although the inclusion of antibiotics in the rumen caused an initial drop in the cellulose hydrolyzing activity of rumen microorganisms, when chlorotetracycline and oxytetracycline are used the microflora return to normal levels if the antibiotics are administered over a long period of time.

Present analytical methods do not reveal any antibiotics in the tissues of animals fed antibiotics in growth supplementary amounts, according to H. P. Broquist and Richard Kohler of Lederle Laboratories. They reported that extremely high levels of antibiotics by oral administration were required before present assay methods could detect appreciable quantities of the materials in the tissues of the animals. If the antibiotic is withdrawn, all trace of antibiotic disappears within three days.

A number of papers on the chemistry and action of tetracycline were presented at the meeting. This antibiotic is prepared by the chemical modification of chlorotetracycline (Aureomycin). The preferred method of preparation is by a catalytic hydrogenation in the presence of palladium or charcoal.

The papers on the mechanism of action and pharmacology of this new antibiotic indicated that it is a broad spectrum antibiotic, with a low order of toxicity. The clinical reports indicate that the material is similar in action to chlorotetracycline and oxytetracycline (terramycin).

Industry

Spencer Forms Research Group To Study Agricultural Chemicals

Spencer Chemical has announced that it will build a laboratory and greenhouse at its Jayhawk Works, Pittsburg, Kan., to be used by a newly formed biological research group.

Otto L. Hoffmann, who joined Spencer in 1952 as a plant physiologist in the agronomy section of the sales development department, will head the new research program. The group will be engaged in evaluating chemical compounds as herbicides, fungicides, nematocides, and plant growth regulators, looking toward the development of new products in the agricultural chemicals field.

Plans for the laboratory are still in the formative stage, no site at Jayhawk having been selected as yet.

Evidence Presented for New Growth Factor

Chemistry and action of tetracycline discussed at symposium on antibiotics

WASHINGTON.—The increasing importance of antibiotic as growth stimulators was highlighted by the recent symposium on current research on antibiotics sponsored by the Food and Drug Administration and the *Journal of Antibiotics and Chemotherapy*.

Although the action of the antibiotics in growth stimulation is still not completely understood, it seems to be generally accepted that the mechanism is indirect and probably due to the effects on the intestinal microflora. The action of chlorotetracycline (Aureomycin) on the growth of pigs is, according to L. Y. Quinn, due to the elaboration of a growth factor within the intestinal tract. Dr. Quinn presented a paper on the action of chlorotetracycline in growth stimulation of swine. According to his report, the effect of the administered antibiotic is to stimulate the action of the fungus *Aspergillus flavus*, normally present in the intestinal tract. Additional evidence for the aspergillus growth factor is found in the fact that culture broth of aspergillus added to the ration of pigs caused a significant stimulation in growth.

An examination of the intestinal microflora of pigs which had been maintained on rations with Aureomycin added at growth stimulatory levels showed that there was an increase in the relative number of *Aspergillus flavus* organisms. Previous studies have shown that there was no growth stimulatory effect following the administration of antibiotics to germ-free animals. Thus, the increase in aspergillus was thought to be connected in some way with the growth effect noted.

Dr. Quinn and the others in the research group at Iowa State College have developed a bioassay technique for the unnamed growth factor based on the response of the bacteria *Streptococcus faecalis*. At present they are attempting to isolate the factor and determine its chemical constitution.

Bioassay of standard feed supplements

On the Cover

Fertilizers and Better Management Are Improving Farming

With the advancement of scientific knowledge in such fields as chemistry and agronomy accompanied by the development of agricultural economics and farm management has come the realization that profitable farming calls for more than plowing, planting, and hoeing. Tradition is being replaced by the scientific approach.

The cover picture illustrates modification of tradition. Scientific management, technological developments, and the application of fertilizer have made it possible for farmers to realize profits from grazing on land which was marginal or inferior for cotton production.

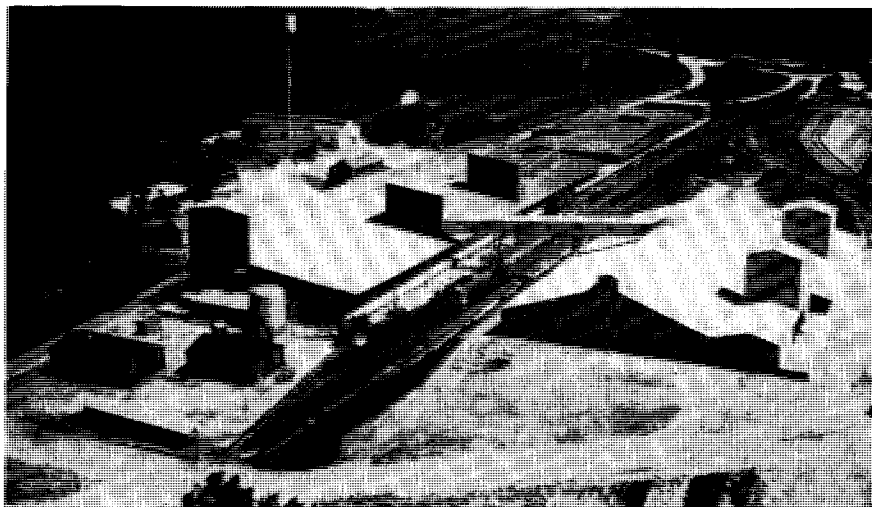
Farming in the South was, for many years, an extractive industry, taking wealth from the soil. We have learned that elements taken from the soil must be replaced by fertilizer in pasture and forage land as well as harvested crops.

General Mills to Process Baking Mixes at Toledo

General Mills will process and package baking mixes at a recently acquired plant in Toledo, Ohio. Production, it is announced, is expected to start about March 1 next year.

Necessary alterations and installation of machinery in the plant, a single-story structure 503 by 272 feet, are to be finished in the next 90 days.

Terry Taylor, former assistant to the cereal milling superintendent and engineer assistant at the Chicago plant, is to be plant superintendent. Dean E. Wilbur, assistant chief chemist at the Buffalo plant, is to be in charge of products control.



Dixie Guano's Plant Addition Completed

Aerial view of Dixie Guano Co.'s fertilizer-manufacturing plant at Laurinburg, N. C. At right is 39,000-square-foot addition. Automatic equipment will enable single man during seasonal lulls to fill entire bulk storage area with 12,000 tons of bulk mixed fertilizer, ready for processing and packaging in peak period. Structure is connected to old plant at left by eight-foot-wide overhead bridge. Conveyors transport bulk mixed fertilizer from old to new plant, where shuttle conveyor belts in 10-foot-wide roof monitor will receive and discharge fertilizer. Addition has section for screening, mixing, packaging, and shipping

Geigy Co. Merges with Geigy Chemical Corp.

Geigy Co., Inc., merged into its affiliate, Geigy Chemical Corp., on Oct. 30. The company's 14 agricultural chemical plants and branches will operate at the Geigy Agricultural Chemicals Division of Geigy Chemical Corp.

Geigy Chemical Corp. is a holding company with interests in Geigy Chemical Co., Inc., whose plant in Alabama produces basic insecticides, and Alrose



Here's the way to solve your nitrogen determination problems once and for all

LABCONCO KJELDAHL

Durable LABCONCO KJELDAHL nitrogen apparatus is made in many sizes and combination arrangements — one suitable for your lab. Six to 96 flask capacity, separate or combined distillation and digestion units. Gas or electric heat, guaranteed fume disposal without hoods.

In nitrogen equipment as well as other lab needs, look to LABCONCO — designer and leader in modern Kjeldahl apparatus since 1927.

FREE ILLUSTRATED BOOKLET

fully describes protein, fat and fiber apparatus; shows installations and arrangements; lists many users. Write today for catalog L-53.



LABORATORY CONSTRUCTION COMPANY
1115 Holmes Street
Kansas City, Missouri

Chemical Co., a Rhode Island manufacturer of agricultural and industrial chemical specialties.

Cominco's British Columbia Fertilizer Plant Starts Up

Consolidated Mining & Smelting has started production at its new \$9 million fertilizer plant at Kimberly, B. C. The plant is designed to produce 190 tons of ammonium phosphate a day, all of which is expected to be used on the Canadian prairies.

Phosphate rock is mined by Cominco in Montana and shipped by rail to Kimberly. Ammonia comes from the Cominco plant in Alberta. Iron sulfide, from the lead-zinc ore concentrator at Kimberly, is treated in the roaster building to generate sulfur dioxide, which is used to produce sulfuric acid for the fertilizer plant.

Dewey & Almy to Expand Cryovac Bag Plants

Dewey & Almy Chemical has announced an expansion program for its facilities to manufacture Cryovac plastic bags used in packaging poultry, meat, and cheese.

President of the company, Hugh S. Ferguson, states that \$1 million has been appropriated for enlarging manufacturing, bag making, and printing operations at plants in Cedar Rapids, Iowa, and Lockport, N. Y. Plans call for completion of the expansion by next spring to meet seasonal demands.

People

F. Otto Haas Becomes Executive VP of Rohm & Haas

F. Otto Haas has been elected executive vice president of Rohm & Haas Co. A director of the company since 1948, he has been active in the company's chemical and plastics sales division for the past two years.

Carl F. Prutton, president of Mathieson Development Co., division of Mathieson Chemical Corp., and vice president and director of all plants of Mathieson, has resigned from the company. In 1948 he left Case Institute of Technology, where he was head of the department of chemistry and chemical engineering, to enter private consulting practice, and a year later joined Mathieson.



Theodore Marvin, president of Michigan Chemical, has been elected chairman of the board also. He left Hercules Powder to become president of Michigan Chemical in July.

Deaths

Gaston F. DuBois, former officer and director of Monsanto Chemical, died Nov. 1 in St. Louis at the age of 73. Born and educated in Switzerland, he came to the U. S. and joined Monsanto in 1904 as the third member of the company's management. A foremost figure

in the development of the American chemical industry, he developed the first commercial production in this country of caffeine, glycerophosphates, and bismuth metal. In 1943, he was awarded the Perkin Medal.

Lewis G. Porter, chief of the fertilizer staff of the Office of Materials and Facilities, Production and Marketing Administration, USDA, died Oct. 15 at the age of 61. Mr. Porter had worked in federal government since 1933 and was a pioneer in promoting the use of synthetic nitrates and concentrated fertilizer materials.

Write for free illustrated brochure

For industrial expansion, here is the Grand River Dam Authority* "Package Deal" offering power as low as 5.3 mills per kilowatt hour, firmed up by steam —
 Abundant water at 5 cents per thousand gallons treated, and 4 cents raw Process steam at 20 cents per thousand pounds
 Natural gas in large quantities
 Choice plant sites, trackage, fire protection and sanitation facilities, favorable tax structure, and intelligent labor
 Investigate this unique locale today!

Grand River Dam Authority
 VINITA, OKLAHOMA
 * State-owned, self-supporting, self-liquidating