

Synthesis of some

PLANT PIGMENTS

A recently discovered enzyme, which occurs in numerous plant species, catalyzes the formation of the organic acid cinnamic acid from the amino acid, phenylalanine. Certain pigments, which may occur in only one or two plant species, are apparently formed by biosynthesis from cinnamic acid.

Discovery of these processes shows the metabolic relationship between the aromatic amino acids and many of the plant pigments which contain the benzene—aromatic—ring in their molecular structure.—*Eric E. Conn, Dept. of Agricultural Biochemistry, Davis.*

Progress toward control of

BRUCELLOSIS

Practical methods for eradicating swine brucellosis have been developed, but a successful eradication program must encompass all susceptible animals, including man.

A species of the bacteria causing abortion in swine may be found in cattle—but causing no apparent disease. Conversely, the causative organism of brucellosis in cattle may be found in swine without demonstrable symptoms. Another species—which causes brucellosis in goats and sheep—has been reported from both cattle and swine, but there is some question of the correct identification of the species. More accurate methods have been developed to distinguish the three or more species, because proper identification is fundamental to the control of brucellosis in all susceptible animals.—*H. S. Cameron and Margaret E. Meyer, Dept. of Veterinary Medicine, Davis.*

Changes in composition of milk from

COWS GOING DRY

Milk from cows nearing the dry period shows a high cell count and a reaction to the CMT—California Mastitis Test—similar to mastitic milk.

Studies on the changing composition of the milk were made with milk from

three cows in late lactation whose udders had some quarters with a history of experimentally induced mastitis. The milking schedule was altered for the experiment, from twice to once a day and then to every other day until milk production ceased.

The chloride content, alkalinity, cell count and strength of the CMT reaction of the milk all increased as the cows approached complete drying-off, though there were day to day variations. The total whey protein content rose steadily, but the rise was due to a relative increase in certain blood proteins which are normally present in milk in low concentrations. The changes were more pronounced in quarters where milk production dropped abruptly during the sampling period than in quarters where milk production dropped to a low but constant level.

There was no correlation between the CMT reaction and the relative concentration of the blood proteins in the milk. Evidence suggests that blood constituents pass into the milk at a constant rate but that the proportion of blood proteins increases as the production of udder-formed proteins decreases. None of the separated fractions of whey proteins produced the positive CMT reaction. However, a combination of factors may be involved in producing a positive reaction.

The CMT score, cell count, alkalinity and chloride content of milks from mastitis-free quarters were lower than from quarters which had suffered experimental mastitis. Changes in udder tissue produced by inflammation might be manifested under periods of subsequent stress, such as that caused by the interrupted milking schedule in the current study.—*Edward Carroll, Clinical Pathology, School of Veterinary Medicine, Davis.*

Vitamin B₁ and Body Storage of

CHEMICAL ENERGY

The role of vitamin B₁ as a catalyst in the formation of compounds used to store chemical energy is being investigated through the use of model compounds. One material, an organic iodide, has a half-life for carbon-carbon bond cleavage of less than one second in alcohol

or water. The extreme reactivity of the compound makes it a plausible type of intermediate in the vitamin B₁ catalyzed formation of compounds used to store energy in the organism. Experiments are in progress to learn more about the amount of energy evolved during the reaction.—*Fred G. White and Lloyd L. Ingraham, Dept. of Biochemistry, Davis.*

Synthesis of

FATTY ACIDS IN PLANTS

An intermediate and important compound in the biosynthesis of fatty acids in plants is malonyl Coenzyme A. The complex problem of malonate synthesis by wheat germ extracts has been resolved into at least two systems and is under close study.—*Paul K. Stumpf, Dept. of Biochemistry, Davis.*

Infiltration and leaching of

SALINE IRRIGATION WATERS

A current long-term outdoor study uses 60 lysimeters in an evaluation of water quality. The lysimeters are large circular tanks, 4' deep, and each contains 1,000 pounds of soil. The soils in the lysimeters are irrigated with nine different waters, containing various types and concentrations of salts found in the agricultural waters of California. A water table is maintained in certain of the lysimeters.

Crop yields are determined in relation to the various salts and their concentrations in the irrigation water. Special studies are focused on soil structure and infiltration rates, on the degree of accumulation of harmful salines in the soil, and on the quantity of leaching water required to maintain a productive soil. Three crops have been grown since the experiment was started. Already some of the higher salt waters have reduced yields, and infiltration rates have decreased following irrigation with waters containing a predominance of sodium bicarbonate. The experiment is expected to determine the amount of leaching required to maintain a sufficiently low salt level in the crop plant rooting zone for high productivity.—*L. D. Doneen, Dept. of Irrigation, Davis.*