amount of maltose formed at the blue-violet iodine endpoint in different preparations varies greatly. In a few cases, the iodine color endpoint was reached without any measurable maltose formation. This observation demonstrates, for the first time, that an amylase preparation can be made which in the early stages of starch digestion yields no reducing groups. This phenomenon is significant to the study of the constitution of starch.

Incubation of an aqueous liver suspension causes a considerable increase in its capacity to form maltose, while the iodine endpoint activity increases only slightly. In the centrifugate of such a preparation the comparative ratio of sugar formation to iodine end-point value is found to have shifted still further in favor of the sugar-forming component. Adding the resuspended residue to the centrifugate causes the latter to lose the increase in sugar formation observed in centrifuging, the iodine endpoint activity being practically unaltered throughout. The hypothesis, that there are two amylases with different characteristic maltose levels at the same iodine color endpoint, and an unstable inhibiting substance specific for the component showing more maltose formation, explains the observations here reported.

The inhibitor, soluble in fresh liver centrifugate, can be precipitated by treatment with acetic acid, pH 5.2, for 30 to 120 minutes. Resuspended in water, the precipitate can be redissolved by neutralizing, and in either state has a quantitative inhibiting effect on the formation of maltose from starch by liver preparations.

By treating fresh aqueous liver extracts with various concentrations of acetone, very stable amylase preparations have been made which show reproducible maltose formation at the iodine color endpoint at different levels, ranging from 3 to 15 mg per 100 mg starch. The conditions for producing fractions with a low sugar-forming level are very delicate, and have yet to be completely defined.

It is apparent that the digestion of starch by liver amylase, like that by plant amylase, is performed by two different components. Each component splits starch molecules in its own fashion, forming the fractions which make up the total course of carbohydrate breakdown.

The complete procedure and results of this study will be published in a later paper.

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A CANKER AND GALL DISEASE OF GARDENIA[1]

A CANKER and gall disease has been observed to occur on the branches, stems and particularly the crowns of several varieties of Gardenia grown in greenhouses in the San Francisco Bay region in California. Infection apparently takes place only through wounds and most readily where the wounded part is near or in contact with the soil. On branches and stems not in contact with the soil the disease manifests itself as oblong cankers, frequently with the woody cylinder exposed at the point of infection and with the bark surface rough and corrugated. On infected crowns the cankers remain typical for a comparatively short time, after which they become overgrown with hypertrophied cortical tissue. This hypertrophy involves the entire circumference of the stem, increasing its diameter to twice normal or more and extending longitudinally one to two inches in both directions from the point of infection, giving the effect of an oblong gall. This abnormal swelling seems to be correlated with moisture, as it is apparent only where infected parts are in contact with the soil. In both cankers and galls the cortex is colored bright yellow a considerable distance in advance of the invading fungus. Pycnidia of the causal organism are found partially submerged in the cortical tissues surrounding the point of infection. Two types of spores exude in a short tendril from the same pycnidium. One, the A type, is hyaline, unicellular, elliptic-fusiform; mean size 3.4×9.7. The other, B type, is hyaline, unicellular, filiform, curved or flexuous; mean size 1.4×22.2.

The two spore types would indicate that the causal organism belongs in the genus *Phomopsis*. The fungus is readily isolated in pure culture both from spore tendrils and from tissue plantings of diseased parts. Inoculation of twigs and crown of Gardenia with this organism gave rise to typical cankers and galls from which the fungus was re-isolated and again successfully caused to infect Gardenia plants.

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[1] Contribution from the Division of Plant Pathology, University of California, Berkeley, California.

BOOKS RECEIVED

Annual Report of the Secretary of the Interior for the Fiscal Year Ended June 30, 1933. Pp. 329. U. S. Government Printing Office.

MARTIN, THOMAS. *Faraday's Diary.* Vol. III, May 26, 1836 to November 9, 1839. Pp. xii + 466. Vol. IV, November 12, 1839 to June 26, 1847. Pp. xii + 448. Illustrated. G. Bell & Sons, London. £12 12s, for set of seven volumes.

TYSON, LEVERING. *Radio and Education.* Pp. vii + 203. University of Chicago Press. $2.50.