

cell. Similar photographs are available showing a three-sided apical cell in *Fucus spiralis* var. *nana*, *Pelvetia canaliculata* *ecad* *coralloides*, *Fucus ceramoides* *megecad* *limicola*, *Fucus vesiculosus* *ecad* *caespitosus* and *muscoides*.

It is now suggested that the lack of sexual reproductive organs in these marsh fucoids is not so much a matter of their environment, as suggested by Baker and Bohling¹; but is instead a direct result of the retention of the juvenile apical cell. It may be supposed that the juvenile three-sided cell does not produce the growth-substance that stimulates the formation of sexual reproductive organs, or alternatively it may produce an inhibitor to the reproductive growth-substance. It would be interesting if workers in Great Britain were to study this aspect with the view of its confirmation or otherwise.

SHIRLEY D. BAKER

Botany Department,
Auckland University College,
Auckland, C.I.

July 24.

¹ *J. Linn. Soc. London*, 43 (1916).

A Decline of Citrus Plants in Venezuela

DURING the past year, the survey of a number of small *Citrus* groves has led me to conclude that a disease similar to "tristeza" is present in Venezuela, chiefly in the States of Carabobo and Aragua up to Sucre; western areas were not investigated. The disease has been previously attributed, by local agronomists, to high or deficient soil moisture or to an unclassified root injury, for the decay of rootlets, then of larger roots, occurs simultaneously with decline of the tops.

The symptoms are closely allied to the "podredumbre de las raicillas", described in Argentina, or "tristeza" of Brazil; the same disease has been found in Uruguay, and eventually in California¹.

In Venezuela, the disease has been recognized only when citric plants were cultivated on a commercial scale, and when sweet orange, local or introduced, was grafted on sour rootstock. (A peculiar die-back, of doubtful etiology, has been occasionally observed, for example, near Valencia, also on ungrafted sweet orange, at first with leaf yellowing, also with some vein yellowing and stunting of the young tree.)

As a rule, symptoms of the disease are later obscured by the interference of other causes of decline.

R. CIFERRI

Italian Cryptogamic Laboratory,
University of Pavia.
July 7.

Benett, C. W., and Costa, S. A., *J. Agric. Res.*, 78, 207 (1949).

Oxidation of Catechol by Tea-Oxidase

DURING the enzymic oxidation of catechol, approximately two atoms of oxygen are taken up for each molecule of catechol, whereas only one atom is required for oxidation to the *o*-quinone stage. Wagreich and Nelson¹ consider this extra uptake to be accounted for by the interaction of the *o*-benzquinone with water to form 1:2:4-trihydroxybenzene, which then reacts with a further molecule of *o*-benzquinone to produce hydroxy *o*-quinone and a molecule of catechol. Their evidence that a polyphenol is produced from *o*-benzquinone, capable of

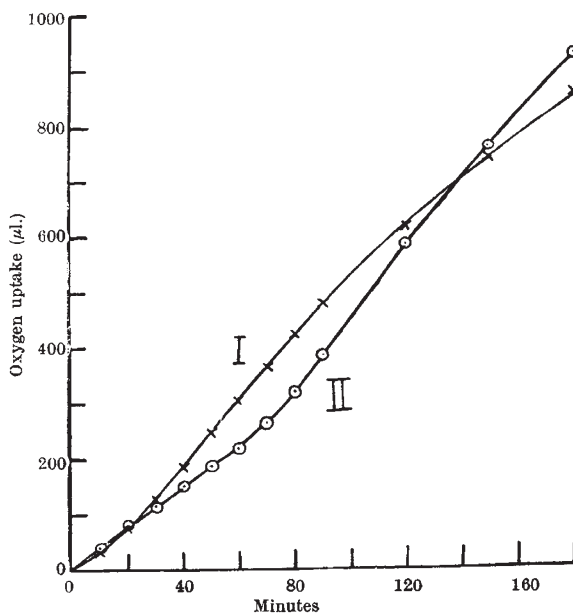


Fig. 1. Oxygen uptakes. I. 40 mgm. washed enzyme + 11 mgm. catechol at pH 5.6. II. 40 mgm. washed enzyme + 3 mgm. ascorbic acid

being oxidized to an *o*-quinone by tyrosinase, is convincing. That the polyphenol produced is identical with catechol cannot be taken as established. The scheme has also been strongly criticized by Wright and Mason².

We have studied catechol oxidation by the tea-oxidase, and some of our experimental results are at variance with the Wagreich and Nelson mechanism of catechol oxidation.

Using an enzyme preparation of acetone-dried tea leaf, washed exhaustively with water to remove adsorbed polyphenols, the oxygen uptake curve with 11 mgm. catechol at pH 5.6 is autocatalytic (Figs. 1 and 2). As *o*-benzquinone is not autoxidizable³, it seems likely that this autocatalytic rate is due to the production of a polyphenol, formed as an oxidation product of catechol, which is more rapidly oxidized

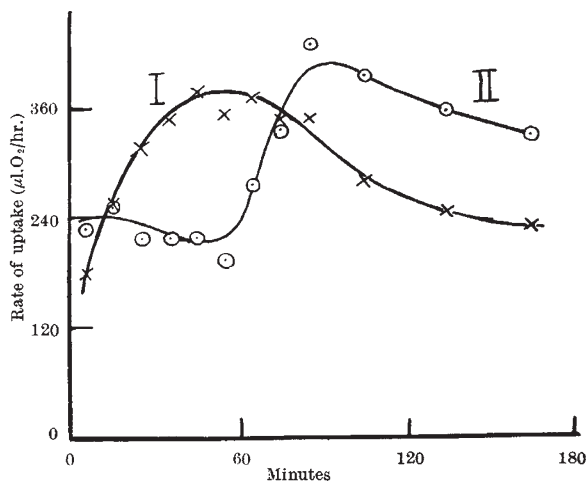


Fig. 2. Results in Fig. 1 replotted in terms of rates of uptake. With catechol alone (I) the rate increases with time for the first 60 min. In the presence of ascorbic acid (II) the rate is constant for the first 60 min. and then increases with time for the second 60 min.