We are thrown back, therefore, on the alternative view, for which Vogt has already provided substantial evidence, that it is the high calcium content of the cake, and possibly other nutritive components, which facilitates rapid and increased development of the antlers.

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Effect of Skin Coatings on Apples

IN recent years considerable attention has been given by Hitz and Hant[1], Kaess[2], Smock[3], Platenius[4] and others to the use of skin coatings for the preservation of fruits and vegetables.

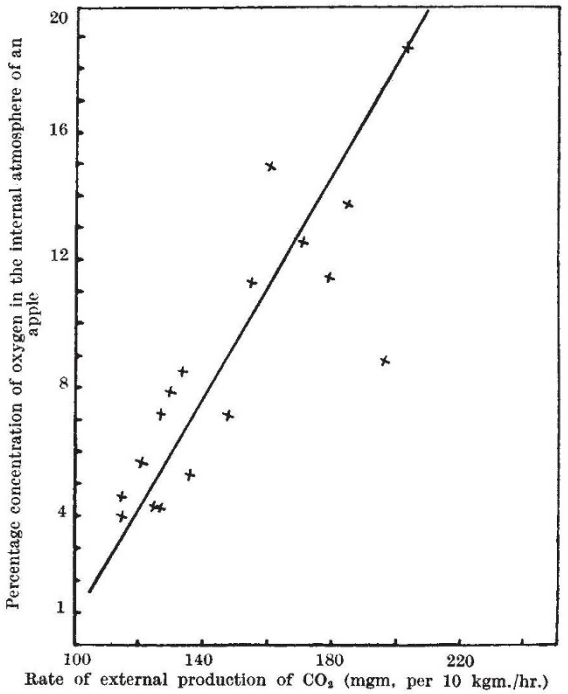
Experiments in this laboratory on Granny Smith apples have been carried out by investigators of the Division of Food Preservation of the Commonwealth Council for Scientific and Industrial Research in co-operation with the Department of Agriculture of New South Wales and the Botany School of the University of Sydney. The fruit was coated by dipping it in solutions of emulsions containing various proportions of oil, wax and shellac prepared so that the total solids were of the order of 5–10 per cent.

The relationship between treatments, internal oxygen and carbon dioxide concentrations, and external respiration has been investigated over a range of temperatures. The method used in analysing the internal gas composition was similar to that of Wardlaw, Leonard and Barnell[5] for papaws and bananas.

Smock and Platenius have shown that there is a marked lowering of oxygen consumption in fruits and vegetables treated with wax emulsions. Numerous workers have shown also that decreasing the external oxygen concentration (within certain limits) decreases the carbon dioxide output of pre-climacteric apples. Our results for pre-climacteric apples indicate that treatment with skin coatings reduces the internal oxygen concentration and thus the external output of carbon dioxide, but does not appear to increase the internal carbon dioxide concentration. The correlation between the internal oxygen concentration and the external output of carbon dioxide is shown in the accompanying figure.

As the storage period is prolonged, it seems that there is a gradual fall in the internal oxygen concentration of untreated fruits due to decreased permeability accompanying ripening changes, and eventually anaerobic respiration may occur. Though treatment with a skin coating may delay the onset of ripening changes, it will accelerate the fall in oxygen concentration when ripening does begin.

Prior to the onset of anaerobic respiration internal disorders may develop in fruit in which the internal oxygen concentration has been reduced to a low value by treatment with a skin coating. In this connexion it is interesting to record that lesions identical with 'brown-heart' developed in Granny Smith apples in which the internal oxygen concentrations were reduced to approximately three per cent by a skin coating but in which the internal carbon dioxide concentration was not significantly increased. Previously 'brown-heart' has generally been associated with fruit stored in atmospheres containing considerably more carbon dioxide than is present in air.



Alcoholic fermentation and internal disorders do not always develop after treatment, and in some cases skin coatings prolong the storage life. The conditions of picking maturity and storage under which a treatment may be beneficial for any particular variety of apple therefore require careful investigation. Other experiments with the Sturmer Pippin, Jonathan, Stayman Winesap, and Rome Beauty varieties indicate that different varieties respond very differently to the same treatments.

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[2] Kaess, G., *Z. Ges. Kalteindustr.*, **45**, 227 (1938).
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[4] Platenius, H., Bull. 723, Cornell Agr. Exp. Sta. (1939).
[5] Wardlaw, C. W., Leonard, E. R., and Barnell, H. R., Mem. No. 13, Imperial College of Tropical Agriculture, Trinidad (1939).

Detection of Clay Minerals in Soil Mortars by Photo-electric Cell

A RECENT communication by V. L. Bosazza[1] lends point to a description of the application of the photo-electric cell to the determination of the nature of the clay minerals present in soil mortars. After treatment with a solution of malachite green for a period of 10–15 min. to permit of base exchange, the liquid is filtered into a glass cell. The degree of decolorization of the filtrate is a measure of the amount of base