and by Brooks and Harley[4] have indicated that control of soft scald might be obtained by subjection of the fruit to an atmosphere of carbon dioxide prior to storage at low temperature.

Some work was undertaken during the current season in comparing the effectiveness of carbon dioxide treatment with that of precooling in the retardation of the ripening processes of fruit prior to storage at 32° F. A question arose as to the concentration of the gas in the intercellular atmospheres immediately following treatment and also as to the retentive capacity of various tissues for this gas. This short communication is a partial answer to some of these questions.

EXPERIMENTAL

Packed boxes of Bosc pears and Jonathan apples were placed in a suitable container immediately following harvest and treated with 35 per cent. carbon dioxide for 24 hours at 65° F. A representative number of untreated fruits were immediately sampled, and an analysis made of the gases in the intercellular spaces of the tissues. The gases were withdrawn from the tissues by a modification of the apparatus described by Magness[5] and analyzed in a Bonnier-Mangin gas analysis apparatus.

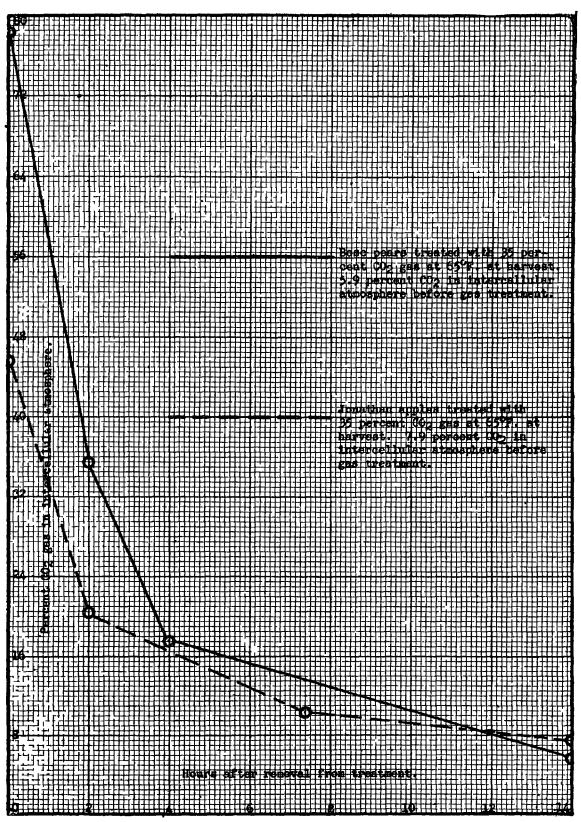

FIG. 1. Carbon dioxide concentrations of the intercellular atmospheres at definite periods following removal of the fruit from treatment with 35 per cent. CO_2 for 24 hours at 65° F. Wenatchee, Wash. 1933.

This sampling procedure was repeated on the gas-treated fruit immediately following and at stated intervals after the fruit had been removed to the ordinary atmosphere. Data and results are summarized in Fig. 1.

It is interesting to note that carbon dioxide is absorbed to a much greater extent in Bosc pear than in Jonathan apple tissues. In an atmosphere of 35 per cent. of this gas, apples had an intercellular carbon dioxide concentration of nearly 50 per cent. and pears 80 per cent. at the end of the gas treatment. Fig. 1 offers a graphic picture of the speed with which this excess carbon dioxide gas is removed from the intercellular spaces. Approximately 70 per cent. of the accumulated carbon dioxide in the tissues has been lost within eight hours after removal from the gas treatment. The carbon dioxide concentration of the intercellular atmospheres of both the pear and apple show a normal value within 14 hours after removal from gas treatment.

The fact that fruits of this kind have such a short retentive capacity for carbon dioxide must be considered in problems of precooling as well as in those involving respiratory changes. The supposition is suggested that fruit responses to non-lethal carbon dioxide gas treatments are confined largely to the actual period while under such treatment. Respiration and ripening data at hand bear out this suggestion.

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[4] C. Brooks and C. P. Harley, "Studies on Soft Scald and Soggy Breakdown of Apples." Submitted for publication in *Jour. Agr. Research*. 1934.

[5] J. R. Magness, "Composition of Gases in the Intercellular Spaces of Apples and Potatoes," *Bot. Gaz.*, 70: 308, 1920.

BOOKS RECEIVED

HOPF, EBERHARD. *Mathematical Problems of Radiative Equilibrium.* Pp. vi + 105. Cambridge University Press, Macmillan. $2.10.

HULL, CALLIE and CLARENCE J. WEST. *Fellowships and Scholarships for Advanced Work in Science and Technology.* Pp. 194. *Funds Available in the United States for the Support and Encouragement of Research in Science and Its Technologies.* Pp. 162. National Research Council. $1.00 each.

Japanese Journal of Geology and Geography. Vol. XI. Nos. 3 and 4. Pp. 157–347. Illustrated. National Research Council of Japan, Tokyo.

MALLOCH, JOHN R. *Diptera of Patagonia and South Chile.* Pp. 176. Illustrated. British Museum. 5s.

MEYER, CHARLES F. *The Diffraction of Light, X-Rays and Material Particles.* Pp. xiv + 473. 283 figures. University of Chicago Press. $5.00.