the former. From this experiment it is possible to calculate the ratio of the degree of sweetness of the α- and β-form, as in the case of fructose[2].

The content of the α- and β-form in the two solutions at the moment of equal sweetness (15 min. after dissolution) was estimated by measurement of the mutarotation :

	$[\alpha]_D^{23}$	α-form	β-form
3·86 per cent β-rhamnose	+ 12°	54 per cent	46 per cent
4·29 per cent α-rhamnose	+ 6°	65 per cent	35 per cent

Representing the ratio of the sweetness of α- and β-rhamnose by x, it was found to be 0·39 from the relation, $(46+54x)/(35+65x) = 4·29/3·86$; that is, the sweetness of the α-form is less than two-fifths that of the β-form. This ratio is somewhat greater than that for fructose (0·33)[2], but much smaller than that for glucose (0·67)[1], showing that the difference of the sweetness of the α- and β-form of rhamnose is very remarkable. This fact is probably related to the comparatively rapid mutarotation.

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Molybdenum in the Growth and Metabolism of *Chlorella*

Recent papers have shown the need of molybdenum for the growth of *Chlorella*[1] and *Scenedesmus*[2]. Some observations on the effect of molybdenum deficiency on the metabolism of *Chlorella* are recorded here.

Chlorella pyrenoidosa was cultured in purified nutrient solution in 250-ml. Erlenmeyer flasks with continuous shaking and illumination provided by fluorescent lights giving a light-intensity of 1,200 ft. candles at the base of the flasks. In Table 1 the effect of molybdenum on growth as measured by dry weight, chlorophyll content, photosynthesis and respiration of *Chlorella* cultures after five days growth is presented (means of four replicates).

Table 1. Effect of Molybdenum on Growth (Dry Weight), Chlorophyll, Photosynthesis and Respiration of *Chlorella*

Added Mo (μgm./l. culture)	Dry wt. (gm./l. culture)	Chlorophyll (% dry wt.)	Photo-synthesis*	Respiration†
0	0·87±0·09	1·0±0·2	38±3	16 ±1
10	1·10±0·06	3·4±0·2	139±2	7·9±0·9

* Oxygen evolution expressed as ml. oxygen/gm. dry wt./hr., not corrected for respiration.
† Endogenous oxygen uptake expressed as ml. oxygen/gm. dry wt./hr.

Molybdenum-deficient cultures are characterized by their low chlorophyll content, and expressed on a unit dry-weight basis, low photosynthetic rate and high rate of endogenous respiration. The marked reduction of chlorophyll content of molybdenum-deficient cells has been reported by Arnon *et al.*[2] for *Scenedesmus*, and is perhaps one of the most characteristic features of molybdenum deficiency. The dry weight of molybdenum-deficient *Chlorella* cells was only slightly lower than that of the controls. In this respect, *Chlorella* at first sight behaved differently from *Scenedesmus*, in which molybdenum deficiency was associated with a sharp reduction in growth as measured by dry weight[2]. Recent results obtained by Arnon and Ichioka (unpublished), however, have shown that the dry weight, but not the chlorophyll content, of molybdenum-deficient *Scenedesmus* cells was markedly increased by the addition of vanadium, an element found to be essential for this alga[3]. In this respect the dry weight of the molybdenum-deficient *Chlorella* cells as shown in Table 1 is comparable to the dry weight found by Arnon and Ichioka for molybdenum-deficient *Scenedesmus* cells receiving vanadium.

The depression of photosynthesis in the absence of molybdenum is approximately proportional to the depression in chlorophyll content. Regardless of whether other factors were operative, the observed reduction of photosynthesis in molybdenum-deficient cells could be accounted for solely by their lower chlorophyll content.

Endogenous respiration was remarkably high in molybdenum-deficient *Chlorella*. In homogenized leaves of molybdenum-deficient tomatoes, Nason *et al.*[4] observed a marked lowering of endogenous respiration, a condition which might have been due to preparatory treatment. Spencer (unpublished results) has found increased respiration in molybdenum-deficient tomato leaves.

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Incorporation of Acetate-2-^{14}C into Human Erythrocyte Stroma as a Function of Storage

In an effort to elucidate the changes which may occur in the dynamic state of stroma constituents during storage of human erythrocytes (reported in part at the "Symposium on the Structural and Cellular Dynamics of the Red Blood Cell", June 1953 : National Research Council, Washington, D.C.), we have studied the incorporation of acetate-2-^{14}C into red cell stroma under *in vitro* conditions using a technique previously described[1]. Venous blood from healthy donors was drawn under sterile conditions into cold *ACD* solution (each 100 c.c. of the *ACD* solution contained 2·45 gm. glucose, 1·37 gm. sodium citrate and 0·50 gm. of citric acid ; 0·24 c.c. of *ACD* solution was added to each c.c. of blood) and then distributed as aliquots into an appropriate number of sterile tubes. These tubes were carefully sealed to prevent evaporation and were stored in two groups, one group at 4° C. and the other group at 37° C. At the intervals indicated in Fig. 1, tubes