stored at this temperature would not be so apt to be injured by gases from apples or other fruits. It appears that a temperature of 34° to 36° is best for carnations if they are kept in a room free from ethylene.

In the light of these findings it seems desirable that results of flower storage investigations which might have been influenced by the gases from ripening fruit should be repeated. It is also suggested that the effect of ethylene, whatever its source, on plants and plant parts other than cut flowers should be fully investigated as a factor in storage problems.

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THE RELATION OF INTERNAL SURFACE TO INTERCELLULAR SPACE IN FOLIAGE LEAVES

THE relation of the exposed cellular area of the mesophyll of the foliage leaf to the volume of intercellular space has been of considerable interest because the relation has an important bearing on transpiration rate and on other types of gas exchange. Although the volume of intercellular space was measured by Unger as early as 1854 and has been measured by several investigators since, the relation of internal surface to volume of intercellular space has been largely a matter of conjecture.

In a sample of twenty leaves from four alfalfa plants, the coefficient of correlation (r) between the internal-external surface ratio and the volume of intercellular space per sample area, as shown in Table 1,

TABLE 1

THE COEFFICIENT OF CORRELATION (r) AND ITS LEVEL OF SIGNIFICANCE (P) BETWEEN INTERNAL-EXTERNAL SURFACE RATIO AND VOLUME OF INTERCELLULAR SPACE AND BETWEEN INTERNAL-EXTERNAL SURFACE RATIO AND PERCENTAGE VOLUME OF INTERCELLULAR SPACE OF FOLIAGE LEAVES

Leaf samples	Intercellular space	r	P
Alfalfa	Volume	+0.874	< 0.01
Alfalfa	Percentage volume	+0.629	< 0.01
16 species	Volume	+0.463	< 0.10
16 species	Percentage volume	+0.071	> 0.10

was +0.874; and between the internal-external surface ratio and the percentage volume of intercellular space, the coefficient of correlation was +0.629. Although the correlation coefficient is higher between the internal-external surface ratio and volume of intercellular space than between the internal-external surface ratio and percentage volume of intercellular space, for both values the probability of chance occurrence (P) is less than 0.01, and the correlation coefficients are highly significant. The relation of the internal-external surface ratio to other mesophyll factors is expressed by the equation

$$R = \frac{t\,v\,(1-v)\,K}{d}$$

where R = the internal-external surface ratio, t = leaf thickness, v = percentage volume of intercelluar space, d = cell diameter, and K = a constant.

Random samples of leaves of sixteen different angiosperm species from various parts of the world showed no significant correlation (+0.071) between the internal-external surface ratio and the percentage volume of intercellular space, but showed a moderate positive correlation (+0.463) between the internal-external surface ratio and the volume of intercellular space (Table 1). For the latter value, P lies between 0.10 and 0.05 (Table 1); thus the correlation coefficient is not significant.

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THE ENZYMATIC DEACETYLATION OF HEROIN AND CLOSELY RELATED MORPHINE DERIVATIVES BY BLOOD SERUM

IN preliminary experiments designed to study the effect of morphine on choline esterase activity it was found that morphine salts were precipitated as the alkaloidal base in bicarbonate Ringer solution. An attempt was made to obviate this difficulty by using the more soluble and physiologically more active diacetylmorphine (heroin).[1] An apparent stimulation of the activity of choline esterase led to the measurement of the effect of serum on heroin. It was found that rabbit and human blood sera deacetylate diacetylmorphine.

The measurements of the rates of deacetylation were made with Barcroft manometers at 37.5° C. under an atmosphere of 95 per cent. oxygen and 5 per cent. carbon dioxide. The serum was tipped from a side arm of the manometric flask into a bicarbonate-containing solution of the acetylated morphine, and the carbon dioxide liberated was measured manometrically at desired intervals.

Observations were made using sera from six male albino rabbits, all fed Purina rabbit chow and lettuce. Sera (0.05–0.5 cc) from three of the animals, when added to diacetylmorphine (5.0 mgm), caused a rapid liberation of carbon dioxide corresponding in quantity to 85 per cent. of the theoretical for the hydrolysis of both acetyl groups. The other three animals hydrolyzed the heroin more slowly, and liberated carbon dioxide corresponding to 85 per cent. of the theoretical

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