It is suggested that, when the calcium carbonate intake is sufficient, laying is preceded by an adjustment of the blood acid-base equilibrium in association with calcium storage, so that the newly deposited bone mineral may have a higher Ca/P ratio than the skeleton as a whole; this material would presumably be readily available for shell formation. Morgulis[6] has remarked that the carbonate content of bone (and hence its Ca/P ratio) may be related to blood alkali reserve.

The mineral metabolism of birds laying on low calcium rations requires special consideration and may differ from that of birds receiving adequate calcium supplements. It may be significant that serum phosphatase attains very high levels under such conditions[7].

It is hoped to publish a fuller account of these experiments at a future date.

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Co-existence of Oxidizing and Protective Mechanisms for Vitamin C in Plant Tissues

VITAMIN C occurs exclusively in the reduced state in fresh vegetables. Although enzymes and copper, which oxidize the vitamin, are widely distributed in plants, the vitamin is not oxidized. It would appear, therefore, that there must be some mechanism in plants which prevents the oxidation of the vitamin. Although the existence of such protective mechanism has been established in animal tissues[1], it has not been shown to be of such wide occurrence in plants.

During the course of researches on the nature of ascorbic acid oxidase of vegetables, an interesting observation was made on the existence of a protective mechanism in plants, which protects vitamin C against oxidation. It appears that both the enzyme 'ascorbic acid oxidase' and the protective factor occur together in certain vegetables, and the two factors have been separated from one another.

The procedure adopted in obtaining these two factors separately was to add an equal volume of acetone to the expressed juice obtained from the vegetable, and the precipitate which contained the enzyme was centrifuged and dispersed in water. The acetone extract after centrifugation was evaporated on a water bath in order to drive off the acetone completely and the aqueous extract thus obtained contained the protective factor, which protects vitamin C from oxidation, both in presence and absence of added copper. The course of oxidation was followed manometrically by measuring the oxygen uptake in Warburg respirometers, and by titration with the indophenol dye. These two factors are found to exist together in a number of vegetables investigated, and they can be separated by adopting the above procedure. Some of the typical plants which are found to contain these two factors are *Cucumis sativus*, *Cucurbita maxima* and *Luffa acutangula*.

So far there appears to be no indication in the literature regarding the co-existence of both the factors—the oxidizing and the protective factors—in plants. It is probable that the effect of the enzyme ascorbic acid oxidase present in plants outweighs the action of the protective constituents, so that the influence of the latter on vitamin C is not apparent, when both of them occur together. Hence it would appear that the failure of previous workers to observe any significant amount of protective substances in plants is to be ascribed to the occurrence of ascorbic acid oxidase in association with the protective substances, and without separating the enzyme from the protective constituents, the detection of the latter would not be possible.

Further work on the isolation, purification and the nature of the protective constituents is in progress. Full details of the work will be published elsewhere.

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Potassium and Carbohydrate Metabolism

Pulver and Verzár[1] have recently reported that the up-take of glucose by the yeast cell is accompanied by a simultaneous up-take of potassium, and that the latter is liberated again in the course of fermentation. It appears to me that this result has some bearing on the interpretation of certain other findings concerning the relation of potassium to carbohydrate metabolism.

It has been found that the anaerobic fermentation of glucose by baker's yeast increased, on an average, by about 150 per cent if potassium (0·01 *M* potassium chloride) was added to the medium, which contained as other cations hydrogen, ammonium and magnesium[2]. An increase occurred also if an equivalent amount of sodium was added, but it was much smaller. Other investigations have shown that the anaerobic fermentation of glucose by tumour tissue was markedly greater in a medium containing both sodium and potassium (in physiological concentrations) than in a medium containing sodium alone[3,4]. Similar results were obtained with normal tissue, especially brain cortex[4]. Further, it was found that the aerobic fermentation and oxidation of glucose by brain cortex could be increased considerably by the addition of a surplus of potassium to the medium[5,6].

These results have shown that potassium is able to activate the enzymatic breakdown of glucose, but the question was left open how this activation takes place. Pulver and Verzár assume that the inward diffusion of potassium which they have observed is connected with the phosphorylation of glucose as the initial reaction leading to the formation of a polysaccharide which afterwards breaks down. This assumption is supported by the result that substances which retard phosphorylation inhibit the up-take of both glucose and potassium. From this point of view there appear to be at present two main possibilities regarding the explanation of the effect of potassium upon fermentation and oxidation of glucose. Either potassium activates phosphorylation,