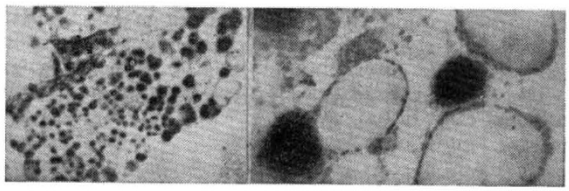

Fig. 1 Fig. 2

Fig. 1. Low-power view (× 40) of autoradiograph of mouse thyroid. Small and medium-sized follicles are blackened; larger follicles are not

Fig. 2. High-power view (× 270) of part of autoradiograph of mouse thyroid. Two large follicles can be seen with practically no blackening of the colloid. In the top right-hand corner can be seen a further large follicle in which the follicular cells are taller than in the other large follicles in the section. The colloid has blackened slightly more than in the others. Two small follicles can be seen which have given an intense blackening

and in the present work (two hours after injection) most of the follicles had shown some signs of concentrating the iodine.

The smallest follicles appeared to have concentrated the radioactive iodine more rapidly than the larger follicles. (Hamilton[7] made a similar observation on the thyroids of two hypothyroid children.) In some very large follicles no blackening in the region of the colloid had occurred. In these the process of concentrating iodine was probably at a very low level or had ceased.

It was found that no part of the thyroid was more active than any other part in concentrating the radioactive iodine. Follicles of different sizes were scattered indiscriminately through different parts of the gland. All the small follicles with cuboidal or near-cuboidal cells had radioiodine in their colloid, and all the large ones showed varying amounts according to the degree of flattening of the epithelium. In some large follicles with moderately flattened cells—although the colloid showed no reaction—there was a rim of blackened emulsion surrounding the colloid and coinciding with the epithelium. It is of interest that blood vessels in the preparations, which must have been carrying radioactive iodine, showed no signs of having blackened the emulsion, presumably because the former is present in too low a concentration. Leblond[8] has shown that, 15 hr. after administration, radioactive iodine is present in greater amounts in acidophilic than basophilic thyroid follicles (Mallory's trichrome stain); he believes the difference is due not to the differing powers of storing radioiodine but to variation in time of retention. The present experiment (2 hr. after administration) suggests that iodine is still being absorbed and that the follicles store it at various rates, and that the more flattened the epithelium the slower the rate of storage (a not unexpected finding). The staining method used did not permit a satisfactory differentiation between acidophilic and basophilic follicles.

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Effect of Phosphorus on the Hydrolysis and Absorption of Sucrose by Plant Cells

SOME years ago I demonstrated[1] that excised barley leaves from phosphorus-deficient plants showed considerably increased respiration intensities if their cut ends were immersed in neutral sodium phosphate solution instead of water. Feeding similar leaves with sucrose solution also increased the respiration-rates; but the increase was much smaller than when phosphorus was administered. The sucrose effect was less apparent when phosphorus deficiency was more acute. Still higher rates of respiration were obtained if the phosphorus-starved leaves were supplied with both sucrose and phosphate together.

Later, I showed[2,3] that when slices from storage organs are floated in sucrose solution, the latter is never absorbed by the plant tissues as such: but it is always first inverted in the medium and the products of inversion are afterwards absorbed. I have recently noticed the same phenomenon when the cut ends of plant leaves are dipped in sucrose solution, the sucrose being hydrolysed before its absorption. Feeding experiments on normal and phosphorus-starved barley plants are now in progress, and the results indicate that when excised phosphorus-starved leaves are dipped in sucrose solution, the rate of sucrose inversion in the medium and also the rate of uptake of the hydrolysis products are remarkably reduced. Feeding with neutral phosphate and sucrose together restores the normal hydrolytic and absorptive capacities to these plants.

This is interesting because it shows that in the early respiration experiments, the sucrose of the culture medium never entered the cells as such; and sucrose could not be synthesized inside the phosphorus-deficient cells because of the lack of phosphorus[4,5,6,7]. It is also evident that the respiratory substrate may be directly produced from sucrose hydrolysis[8,9,10]; but the latter process is extremely affected by phosphorus, being very much reduced under conditions of phosphorus starvation. In this connexion, it may be mentioned that Lyon[11] and Richards[12] advocated the view that phosphate is normally involved in the respiratory breakdown of sugar in plant leaves.

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Crystallization of Whale Myoglobin

ALTHOUGH the spectroscopic differences between blood and muscle hæmoglobin were first observed by Mörner[1] in 1897, it was not until 1932 that Theorell[2] succeeded in crystallizing myoglobin from horse-heart muscle.

The myoglobins from several species of animals have since been prepared by various workers[3,4,5,6], and recently Theorell[7] described the preparation of