

### Concentration of Thiocyanate labelled with Sulphur-35 in the Thyroid of the Hamster

THIOCYANATES are known to inhibit the concentration of iodide by the thyroid. We have found that labelled thiocyanate is concentrated in the follicles of the hamster's thyroid. Adult hamsters were given  $^{35}\text{S}$ -thiocyanate (150  $\mu\text{c}$ . with 100  $\mu\text{gm}$ . of carrier) by intramuscular injection. The thyroid was removed 1 hr. later and dried from the frozen state at  $-40^\circ\text{C}$ . Contact autoradiographs were then made from sections of the dried tissue<sup>1</sup>. Patches of blackening were seen on the autoradiographs, corresponding to the areas of colloid in the section (Fig. 1). The density of the photographic grains over the centres of the follicles varied from 2.1 to 4.9 times the density over the centres of blood-vessels, the density over the smaller areas of colloid tending to be greater than that over the larger areas.

Thyroids were removed from other hamsters 1 hr. after injection of  $^{35}\text{S}$ -thiocyanate and the radioactivity compared with that in the plasma and whole blood (unpublished work). The ratio of the concentration of sulphur-35 in the thyroid to that in the plasma averaged 0.57, and in the thyroid/blood it averaged 0.56. Portions of thyroid taken from the same hamsters were homogenized with water, and the whole homogenate chromatographed on paper with the solvents recommended by Pollard and McOmie<sup>2</sup>. The radioactivity on the chromatogram was found to be confined to two well-defined peaks, one at  $R_F$  0.10 (the  $R_F$  value of sulphate ion in the solvents used) and the other at  $R_F$  0.75 (the  $R_F$  value of thiocyanate ion) (Fig. 2). The first peak of radioactivity accounted for 5–15 per cent and the second peak for about 85 per cent of the total on the chromatogram. Chromatograms made from plasma taken at similar intervals after injection of  $^{35}\text{S}$ -thiocyanate showed 95 per cent of their radioactivity at  $R_F$  0.75.

We conclude that thiocyanate ions are concentrated in the follicles of the thyroid as the unbound ion, some of them undergoing chemical change in the

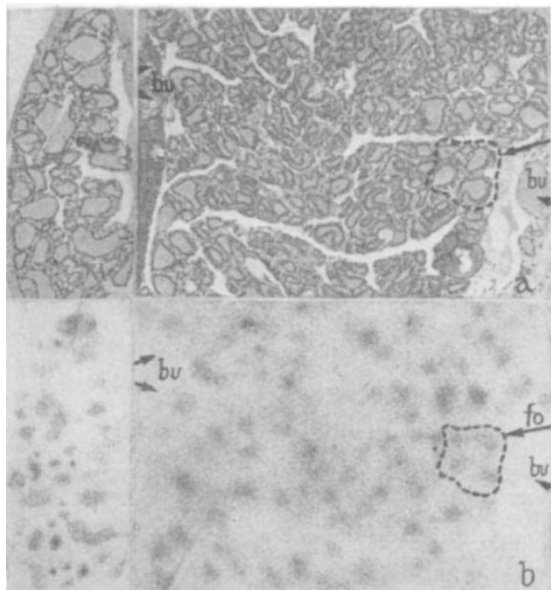


Fig. 1. Thyroid of hamster. (a) Sections stained with hematoxylin and eosin. (b) Autoradiographs from same sections. fo, Group of follicles; bv, blood-vessel. Corresponding areas shown on autoradiograph

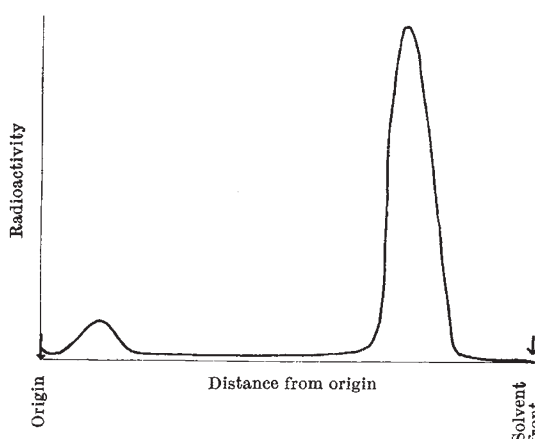


Fig. 2. Distribution of radioactivity along ascending paper chromatogram made from homogenate of thyroid 1 hr. after injection of  $^{35}\text{S}$ -thiocyanate. Solvents: butanol, pyridine, water and ammonia

thyroid, probably by oxidation to unbound sulphate. The low value of the ratio of the concentration of sulphur-35 in whole thyroid to that in the plasma may be explained by the small proportion of the total mass of thyroid tissue in which selective concentration occurs, and by the presence of muscle and connective tissue removed with the thyroid.

The pattern of blackening shown by  $^{35}\text{S}$ -thiocyanate is similar to that shown by radioiodide when thyroxine synthesis is blocked by propyl thiouracil<sup>3</sup>. This suggests that the inhibitory action of the thiocyanate ion on the concentration of iodide by the thyroid is due to competition between the two ions for the same transport mechanism.

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<sup>1</sup> Doniach, I., and Logothetopoulos, J. H., *J. Endocrinol.*, **13**, 65 (1955).

<sup>2</sup> Pollard, F. H., and McOmie, J. F. W., "Chromatographic Methods of Inorganic Analysis" (Butterworths, London, 1953).

<sup>3</sup> Pitt-Rivers, R., and Trotter, W. R., *Lancet*, **ii**, 918 (1953).

### Octadecadienoic Acids of Lamb Caul Fat

IN the course of investigations on the fat of rumen contents<sup>1</sup>, it was observed that the iodine values of  $\text{C}_{18}$  unsaturated fatty acid fractions were substantially higher than could be accounted for by the content of diene and triene acids determined by alkali isomerization<sup>2</sup>. However, the amounts of material isolated were small, and in order to investigate further the acids responsible for this anomaly, the methyl esters of the  $\text{C}_{18}$  unsaturated acids from the caul fat of lambs two to three weeks old, earlier described<sup>3</sup>, were used.

Crystallization of 52.5 gm. of the  $\text{C}_{18}$  concentrate three times at  $-60^\circ\text{C}$ . from ten volumes of acetone yielded 12.0 gm. (iodine value 145.3) of soluble constituents. These were chromatographed<sup>4</sup> on silica gel to yield concentrates of diene acids.