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Histological and Microchemical Studies on the Lipin Content of the Human Thyroid.

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The lipid droplets found in the epithelial cells of normal human thyroids are the products of the secretory activity of these cells. According to their staining reactions they seem to consist mainly of mixtures of phospholipins. They are discharged into the colloid where they become gradually dissolved.

The cells excrete the lipoids in the form of small droplets and granules which are suspended in larger drops of a watery substance that does not take the fat stains. The fat droplets are soluble in ether, alcohol and acetone, but insoluble in chloroform. They stain blue or bluish violet with nieblue sulfate, and black with the Lorrain Smith method. Some of them are stained after the Caccio's method. In older persons also clusters of larger fat drops are given off by the epithelium. These drops dissolve only in hot ether and are usually Caccio positive. A desquamation of cells filled with fat is relatively rare.

The excretion of the lipins starts after the first year of life and increases with the age. But also in younger individuals much fat is occasionally found in the colloid. What influences the intensity of the lipid excretion is not yet quite understood. Diseases seem to have no effect.

In pronounced exophthalmic goiter, in tuberculosis of the thyroid, and in malignant adenomas fat is usually absent from the epithelium and the colloid.

Lipoid granules are also observed in the stroma of the thyroid. They give the same microchemical reactions as do the fatty substances in the epithelium and colloid. They are engulfed by flat and branched cells.

An interesting finding is the distinct staining of the plasma in the smaller blood vessels with sudan III. It was found in 45 per cent of the thyroids examined. This local lipemia not seldom is so intensive that it resembles the changes seen in lipemic diabetes or in experimental hypercholesterolemia of herbivorous animals.

The microscopical pictures under discussion were not only observed in thyroids secured from autopsies, but also in glands removed during life, in plain goiters as well as in normal specimens.

This excludes the possibility of dealing with post mortem or degenerative changes.

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A Specific Carbohydrate from *Bacterium Enteritidis*.

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During recent experiments with the soluble antigens of *Bacterium enteritidis*, large quantities of toxic Berkefeld filtrates of cultures grown in a simple salt medium were evaporated to dryness *in vacuo*, and this dry residue subsequently dialyzed. During the dialysis a grayish white precipitate settled out of the material in the dialyzing sac. This precipitate gave none of the usual protein tests; *i. e.*, biuret, Millon, vanillin, diazo, or ninhydrin; but it gave a brilliant Molisch test, indicating that it contained carbohydrate. Saline extracts of this material gave precipitin reactions with *B. enteritidis* antiserum, and not with any other serum tested.

Sixty per cent, by weight, of the material in this precipitate proved to be inorganic, and was chiefly diatomaceous earth from the Berkefeld filters used; 40 per cent was organic matter.

The carbohydrate was separated from the diatomaceous earth with difficulty. Either it is very slightly soluble in ordinary solvents, or it is adsorbed by the diatomaceous earth. The most satisfactory method tried so far has been the following: The dry carbohydrate-containing material was heated for 1 1/2 hours at 150° C. A weighed amount was placed in a small flask, distilled water added, and the suspension autoclaved at 5 pounds pressure for 3 hours. The diatomaceous earth was then removed by centrifugalization, and the supernatant fluid evaporated to dryness on a water bath. The small white residue adheres to the dish and does not redissolve readily, but it is sufficiently soluble to give a vivid Molisch test and a specific precipitin reaction with *Bacterium enteritidis* antiserum. In this way 77 per cent, by weight, of the organic matter was extracted from the diatomaceous earth mixture.

The usual method of hydrolyzing starch with N/2 HCl failed to yield any trace of sugars that reduce Fehling's solution. The carbohydrate was apparently unchanged by this acid treatment, for when the solution was evaporated to dryness on a water bath the residue still gave a specific precipitin test with *Bacterium enteritidis* antiserum.