

fat is not the same as the fat of subcutaneous adipose tissue. The question suggests itself, Have the various tissues of the body the power of synthesizing glycerine and fatty acids into combinations suitable for their own metabolism?

When fat is transferred from one part of the body to another it is broken up into a soluble form and conveyed by the blood. In what form it really exists is a disputed point at present. Monk has shown that 0.15 gram of sodium oleate per kilo, or less of the palmitate or stearate, are fatal to rabbits. A. S. Lovenhart questions the existence of soaps in the blood, and thinks that Hoppe Seyler's methods of extracting soaps from the blood are open to doubt. Hoppe-seyler found from 0.05 to 0.1 per cent. of soap in the blood, and, more recently, Oskar Klotz has shown soap to exist in the tissues in calcareous degeneration.

The experiments of Rachford and Pflüger show that the fatty acids are very slowly acted upon by weak alkaline solutions at 37° C., and free fatty acid has been found in the blood by several observers.

It is quite probable that, besides the neutral fat existing in the white corpuscles, small quantities of soap and fatty acid may be found in the blood stream, and are thus carried from one part of the body to another.

#### CHEMISTRY OF FAT.

The fats found in the adipose tissue are combinations of glycerine with fatty acids. Fatty acids form a series of acids derived from the monatomic alcohols, by oxidation. Thus, to take ordinary ethyl alcohol,  $C_2H_5-OH$ , the first stage in the oxidation is the removal of two atoms of hydrogen to form aldehyde,  $CH_3C=O$ ; then on further oxidation these are replaced by one of oxygen to form acetic acid,  $CH_3COOH$ . A similar acid can be obtained from all the other alcohols.

Glycerine is a triatomic alcohol  $C_3H_7$   $\left\{ \begin{array}{l} OH \\ OH \\ OH \end{array} \right.$  and we may have one, two, or three hydroxyl groups replaced by an acid radical.

In the neutral fats we have all three replaced, so we speak of tristearin or tripalmitin, etc.

Olein is not a member of the fatty acids series proper, but belongs to a somewhat similar series of acids known as the acrylic series, of which the general formula is  $C_n H_{2n-3} OOH$ .

It is the eighteenth term of the series, and its formula is  $C_{17} H_{33} OOH$ .

Analytical results show that butter fat is essentially a mixture of various esters, those of butyric, palmitic, and oleic acids being the leading constituents.