inately, they may be embraced together as a class under the term *Oleics*.

By far the larger proportion of oils and fats agree in being composed of a fat acid, united to a base called glycerine. The three principal acids are stearic, margaric, and oleic; when stearate or margarate of glycerine predominate (the compound being called stearin or margarin), the fat is more solid, as tallow, suet, &c.; when oleate of glycerine (called also olein) is in sufficient quantity, the fat is fluid or oily, as olive oil. The chemical connection between margaric acid, which is a solid crystalline fat, and vinegar or acetic acid, and the connection between acetic acid and common alcohol, are pointed out in an essay published in the 'Journal of the Franklin Institute,' 1848. Now since formic, acetic, and valeric acids can be shown to be derived from wood-spirit, common alcohol, and fusel oil, which are their respective alcohols, we may infer that the higher fat acids have also their alcohols. The investigations of Brodie in wax seems to point out such alcohols and their acids. The general formula for this fat acid series, the most extended series yet developed in organic chemistry, is $C_n H_n O_4$, n being an even number. No well-defined connection has yet been established between other fat acids not belonging to this group.

According to Georgey ('Ann der Chem. und Pharm.' lxvi.), the butter of cocoa contains the following acids:

Caproic	$C_{12}H_{12}O_4$
Capryllic	$C_{16}H_{16}O_4$
Capric	$C_{20}H_{20}O_4$
Pichuric (lauric, laurostearic)	$C_{24}H_{24}O_4$
Myristic (probably)	$C_{28}H_{28}O_4$
Palmitic	$C_{32}H_{32}O_4$

The *cocinic* acid of St. Evre is a mixture of capric and pichuric acids.

Gerhardt and Laurent have endeavoured to prove ('Comptes Rendus,' 1859) that the formula for stearic acid is $C_{34}H_{34}O_4$; that margaric acid is an isomeric modification of it, and should be called metastearic acid.

The train-oil of the Beaked Whale (*belæna rostrata*) has recently been examined by Scharling ('Journ. of Prac. Chem.' xliii.), who gives it the formula $C_{36}H_{36}O_4$. It consists principally of a liquid fat, free from glycerine, a minute portion of spermaceti, and traces of other fats. Its specific gravity is ·8807 at 52°. It burns with a bright flame, and its illuminating power is in the ratio of 1.57 : 1 of common whale oil. It also burns slower and emits less smoke than the latter oil.

Mr. C. Watt, Sr. (Newton's Journ.' 1848, 'Ch. Gaz.' vi.), uses the following method for bleaching dark oils or tallow. To every half ton of oil, take ten pounds of bichromate of potassa. Powder the salt, dissolve it in four pints of hot water, stir, and carefully add fifteen pounds of sulphuric acid, and continue the stirring until complete solution. This mixture is then thoroughly incorporated with the melted fat, previously separated from foreign matters by repose and decantation. The containing vessels should be of wood, and the temperature about 130° F. When, after much agitation, the liquid fat assumes a light green colour, the bleaching is completed, four buckets of boiling water are then to be added, the whole stirred for five minutes and left to repose for several hours, when it will be white and ready for use.

Mr. Watts, Jr., proposes to recover the chromic acid *ad infinitum*, and thus render the process very economical, in manner as follows. Transfer the green chrome liquor, after the separation of the fat, to a tub, dilute it with water, and then add thick milk of lime until the sulphuric acid is nearly saturated; leave to repose, decant the liquor from the sulphate of lime, and carefully add to it another portion of the cream of lime, until the precipitation of all the green oxide and the supernatant liquor is clear and colourless. Drain off this liquor, add fresh water, and, after settling, again decant. Repeat this washing, then transfer the precipitate to a red-hot iron slab, and keep it constantly stirred until it changes to a yellow powder. The chromate of lime thus formed, if decomposed by sulphuric acid in slight excess, yields chromic acid as well suited for bleaching purposes as that from bichromate of potassa.

A good oil-filter is said to be made of fine sand, charcoal, and gypsum; the sand to retain substances suspended in it, charcoal to decolorize it, and plaster to remove water. ('Journ. de Chem Med.' 1846.)

To decolourize raw linseed oil, a solution of two pounds of copperas in two and a half pounds of water is poured into a flask containg two pounds of linseed oil, and exposed to the sun for several weeks, during which it is frequently shaken. The oil is said to be rendered limpid and colourless, and may be drawn off by a siphon, or stoppered funnel.

Many substitutes have been proposed for the more costly oil for lubricating machinery, but hitherto with only partial success. Munkittrick's ('Lond. Journ.' xxxvi. 98) consists mainly in the addition of caoutchouc to common grease, the former being softened by spirit of turpentine; but he also uses other ingredients. For example: ten gallons of water being heated, one pound of glue and ten pounds of carbonate of soda are stirred in; ten gallons of oil or grease are next added, whereby a quasi-soap is formed; and lastly, four pounds of caoutchouc, softened by turpentine, are incorporated.

Boudet ('Jour. de Pharm. & Lond. Pharm. Journ.' 1850), gives the following as the process by which the French *liard*, or lubricating fluid is made. Add one pint of finely minced caoutchouc to fifty pints of rape oil, and heat until the mixture is complete. A very unctuous oil is thus formed, which remains fluid at freezing temperature, and does not clog the machines, but facilitates the motion of their parts.

Heydenreich proposes ('Journ. de Connais. Utiles,' 1849) to distinguish fat oils from each other by their odour when warmed, their colour by contact with oil of vitriol, and their specific gravities. By the first process the oil is heated in a porcelain capsule over a spirit-lamp, when the peculiar volatile odour of fish, linseed, and other oils may be detected, especially if compared in the same way with the unadulterated oils. For the acid test, from ten to fifteen drops of oil are dropped upon a piece of glass, underlaid by white paper, and a drop of oil of vitriol is brought in contact with it by a glass rod. If it be rape-oil, a greenish-