Cane sugar is added to conceal watering; its use, however, must be limited, as any large amount will give a decided sweet taste. Glucose, flour and other starch containing substances, dextrine and gums are added for the the same purpose as cane sugar, to give a body to watered milk. Gum tragacanth has been used, not for increasing the specific gravity, but to cause the milk to froth. Coloring matter as annatto and carrots are very liable to be found in watered milk. Skimmed milk having too blue a tint, the coloring matter is added to bring back the yellow tint which to the public eye is a guarantee of purity. A simple method for testing for annatto is as follows: one hundred c. c. of the suspected milk are rendered alkaline by the addition of 5 c. c. of a solution of carbonate of soda, and are poured into a jar five inches high. A strip of filter or blotting paper five inches long by one-half wide is then placed in the jar and allowed to stand in the dark for twelve hours. This strip is removed, carefully washed, when if annatto is present, it will be of a pale salmon color, and if dipped into a solution of stannous chloride will show a pink color. The addition of coloring matter to milk is usually in the form of an alkaline solution. Sometimes, however, a mixture devised especially for the purpose is used. A mixture of this kind largely used in San Francisco, had the following composition; common salt, saltpetre, traces of caustic soda, and a large quantity of sugar. The color is due to caramel. The above compound is dissolved in water and the solution used for adulterating milk.

Decomposition of Milk.—Milk when left to itself at a temperature of above 90° F. undergoes rapid decomposition. The first sign of this breaking up is the evolution of carbonic acid gas. The fermentation is arrested at this point by means of heat or antiseptics, the decomposition is arrested and the milk remains sweet. If the fermentation is allowed to continue, the next step is coagulation of the casein, owing to the formation of lactic acid. The formation of lactic acid from the milk sugar gives its name to this species of ferment. As has been shown by Pasteur, the lactic ferment is due to the presence and growth of one of the lower
organisms. This ferment on being added to a solution of sugar, changes it to lactic acid. The presence of the acid interferes with the growth of the organism, and finally terminates it. The maximum amount of lactic acid formed under ordinary conditions is 0.80 per cent.

Butyric Fermentations.—When milk has been subjected to heat with a view of preserving it, coagulation of the casein sometimes takes place after a certain time. On examination the milk is found to be alkaline, and it contains no lactic acid. If the fermentation is in an advanced condition the odor is very offensive. The odor of rancid butter is due to the formation of butyric acid.

Slimy Fermentation. In some parts of Norway the people are said to be fond of ropy milk and use it as a regular article of diet. The ropy milk is said to be prepared either by giving the cows grass or hay containing a certain plant (Pinguicula vulgaris), or by rubbing with this plant the interior of the vessels used for storing the milk. The milk then gets ropy, the cream is prevented from rising; the taste is insipid and after some time it becomes slightly sour. Milk in this condition is almost unchurnable, and the yield of butter is very small, consequently ropy milk is undesirable. Ropy milk is said to be produced by a variety of causes; illness of the mammary glands, inflammation of the udder, cold of the same organ contracted by lying down on the ground, atmospheric influences, fodder containing certain plants, distillery slop, unclean rooms and utensils, etc. The remedies are equally numerous. The alleged causes for ropy milk point to two assumptions: either the milk when drawn from the cow is infected with the ferment or the milk is infected after it is drawn from the cow. No experiments have been made to prove or disapprove the first assumption. That ropy milk may be caused by infection after it has been drawn from the cow has been proved by experiment. If sterilized milk be inoculated with ropy milk and kept at a suitable temperature it will be observed that no cream rises to the top and that the milk gets ropy within twenty-four hours. After forty-eight hours have elapsed the milk is of such consistency that it will not flow

5—D. & F.