

Hallier, who, after Pastern, farther pursued and perfected it, observed that milk which had been boiled in an isolated apparatus would become sour and coagulated in 24 hours after introducing *pencillium* spores, while the same milk, without this fungus, remained fresh for many months, and showed no trace of acid to the taste, nor of acid reaction. Hopper observed in 1859 that fresh cow's milk, coming in contact with atmospheric air, takes up oxygen and gives off carbon, and that the volume of the separated carbon is greater than that of the oxygen taken up; that this operation was apparently very active during the first 24 hours, and that milk, by standing longer in contact with a given volume of air greater than the milk, may, within from three to four days, take the whole of the oxygen out of this air. After farther researches, Hopper believes he is warranted in the conclusion that milk, under the process of taking up oxygen and giving off carbon, gradually forms additional fat, and that this formation of fat comes under the analysis of caseine; again, that a material must also be produced with the fat from the caseine, which considerably excels the caseine in its capacity for containing nitrogen. Although Hopper did not succeed in isolating this material, yet it may nevertheless be held in the highest degree probable, says Prof. Marteny, that the only extractive matter found in alcohol extract, and which exhibits nitrogen in a high degree, springs from this source. Deschamps found in 1840, in calves' rennet prepared with alcohol, and of such strength that eight drops was sufficient to coagulate one liter of milk, the following ingredients:—Muriatic acid in great quantity, butyric acid, capron capsin and lactic acid, salamoniac, chlorine, magnesia, traces of sulphate salts, phosphoric lime, and a peculiar material which he calls *chymos*, and which he regards as the peculiar active principle in the rennet. In order to separate the *chymos*, Deschamps pours a small residue of ammonia in the rennet, which precipitates the *chymos*, and then washes and dries the precipitate. The *chymosin* resembles gum outwardly. It is so insoluble in pure water that it may be reduced to a powder under it, but is soluble in acidulated water; and this makes such a solution as will coagulate milk with the same efficiency as the rennet itself.

Hallier, on the contrary, thinks that the rapid decomposition of fresh milk is owing to its being filled in a peculiar way with fungus cells; and he proves from his experiments that by a small addition of