Runtling with a large empty funnel cup, *a*, is important in two ways. For first, it lowers the centre of gravity, thus making the drum revolve more evenly and smoothly, with little or no liability to accident from the high speed at which it is driven, less than from an ordinary flywheel on a horizontal shaft driven at the same surface speed; second, there is no risk of spilling milk at the starting, and, when once up to the full speed, the milk is thrown out with considerable force from the mouth of the supply pipe, and by means of the wing in its rear moving at the same velocity as the drum, the influent current of milk receives immediately the separating velocity with comparatively no adverse commotion in the drum to disturb the mutual and conjoint action of the two separating forces.

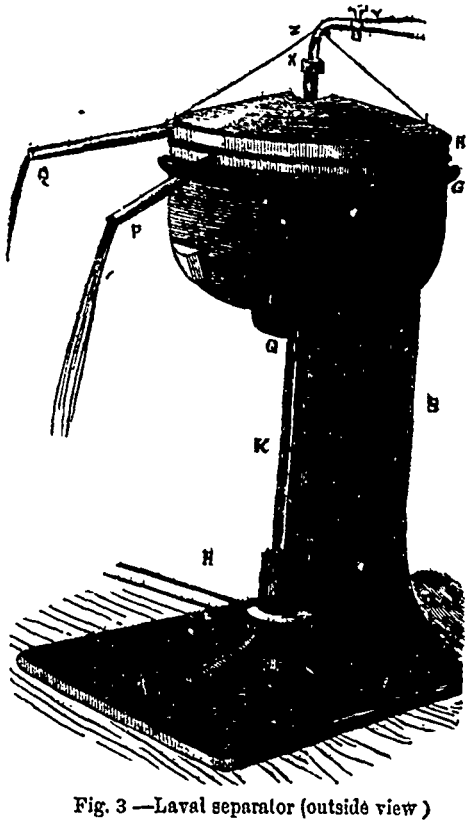

Fig. 3 —Laval separator (outside view)

The force and pressure of the milk from the supply pipe is distributed over the interior by centrifugal action, producing a continuous current of milk to *b* and cream to *c*, the former by centrifugal force, the latter by centripetal.

At the minor axis of the milk drum there is no centrifugal force, whilst at the extremity of the major axis, *i. e.*, the widest part of the drum, the centrifugal force is greatest. And as the milk globules are separated from the cream globules by centrifugal force (an outward force from the centre), and the cream globules from the milk globules by a centripetal force ? (a force from the circumference to the centre), the arrangement for bringing these two forces into operation in the new separator is a great improvement upon the whole plan, as will be seen on comparing figs. 1 and 2. In the new machine the new milk is thrown into the drum when the two separating forces are greatest, whilst in the cream, globules driven to the centre are free to rise upwards, there being nothing in the way until they reach the bottom of the funnel-cup *a*, where the whole volume is cream under a uniform pressure upwards from the centripetal forces below. The reverse was the case in the old drum, the central supply pipe standing in the way of the rising of the cream, whilst the new milk was thrown in near the bottom from two pipes, producing much commotion, thereby disturbing the free play of the separating forces.

The milk globules and cream globules are both subject to centrifugal force, but differently, owing to difference of specific gravity, and it is this difference of specific gravity and fluid pressure that gives rise to the centripetal force inwards to the centre. The force of gravitation due to the depth of the drum, 4 inches, may be considered *nil* in estimating the pressure on the internal surface of the drum at the major axis, due to a velocity of 6000 revolutions per minute. But the smallest cream globules are heavier than the milk globules, as the shell enclosing the butter is of greater specific gravity than the milk; others are of equal specific gravity. These cannot be separated; both go up *b* with the milk. The larger the globules of butter, and the thinner the skin in which they are enclosed, the lighter they are, and the more easily separated, and as a rule the better the quality of the butter; hence the reason why rich milk is more easily separated than poor milk, whose butter globules are small and the enclosing shells thick and coarse in quality. Hence also the advantage of testing the quality of cream by the new processes, in preference to the old plan of churning only.

The milk and cream as they come from the separator are not much increased in temperature above that of the milk in the supply can, thus proving that very little friction is experienced in passing through the machine. The milk from the separators appears sweeter to the taste than the new milk, but the milk sugar in the cream is slightly changed into lactic acid, thereby ripening it (the cream) for churning. Air is drawn in with the milk through the supply pipe, giving rise to the acidity of the cream. Cream from all separators is thus affected, but none of the creams we have examined from the Laval and Danish separators are so acid as to be unfit for using with tea and coffee, much less too sour for churning; and if the atmosphere is pure, the acidity thus acquired is better than keeping cream to sour in cream-crocks, or mixing sour milk in sweet cream to ferment the whole. The objection thus raised against cream separators is more in their favour than against them.

At the close of separating, the cream left in the new separator is easily removed by a cream extractor or dip skimmer. In removing the funnel cup *a*, the whole of the cream will be found floating in the neck of the drum, and, by dipping the skimmer, a vessel something in the form of a retail dairyman's measure, gently into the drum, the cream flows into it. All the cream can thus be removed in no time, which is a great improvement on the old plan. The drum can then be lifted out by hand, and its contents emptied into the milk can. As in the old separator, the milk and cream cans can be placed anywhere most convenient, the discharge pipes being turned and fixed in the proper position.—*Agri. Gazette, (England).*

AGRICULTURE.

Paris, August.

Messrs. Porion and Mehay have discovered a means by which the residue of distilled maize can be employed either to fatten stock or act as a manure, besides extracting an oil suited for the manufacture of soft soap. The plan rests on the well-known fact, that the oil contained in the grain remains constantly fixed to the undissolved solid parts, and the azotized matters rest also for their greater portion similarly united The composition of the cake prepared exhibits but slight variation, and can be made either in the end for food or a fertilizer; 2 cwts. of the refuse yield 6½ lbs. of a colored oil, and 22 lbs. of feeding cake. M. Ladureau, of Lille has tested the products; in point of aliment, these pro-