

perature they did? and how was it that at these temperatures they turned out such inferior work, as it is a well-known fact that separators do their work more completely under a high than under a low temperature?

TIME.

6. As regards the next point—the time taken in separating—the judges preferred, under the circumstances, to have a given quantity passed through the separators, instead of separating by time. The objection urged against this is, that whilst it is the *specialité* of one machine to show the best results in a short working, the other only does it in a long working. But surely this reasoning is false. The machine that gets quickest into its working is the best for farmers.

7 The seventh point—the quantity of milk required to work each separator—is practically not of so much importance, because each separator, whatever its size, works out the last contents by using skim-milk to finish with. But the judges thought it necessary to weigh the last contents for information, and to see how easily the drum could be emptied if it was found necessary to do so.

8. As regards the eighth point—the cost—having regard to the quantity of the work done, the De Laval was the cheapest, or rather the most worth the money; and as regards the cost of fixing them, there seemed little to choose between them. All machines traveling at a high rate of speed require a firm foundation, and it is very false economy to pinch the expense in this particular.

9. The ninth point—revolution—there seems, so far as experience has gone, no practical evil resulting from the high speed at which the De Laval machine rotates, and we are rather inclined to regard the difference in speed between De Laval and the Danish as more apparent than real, depending upon the size of the drum. But this is a question more for mechanical engineers to solve. But, with this high speed, comes the question of safety, and all the machines were made strong enough for the work they had to perform.

The A Danish exhibited a contrivance for raising the skim-milk to a higher level, and succeeded in lifting it 9 feet 2 inches, and it probably would have been able to have lifted it higher had pipes been prepared for that purpose. It is simply the elongation of the pipes that conveys the skim-milk from the separator drum. This power of raising the milk would be very useful in factories where large bodies of milk are in daily passage, but what effect the weight of such a column of milk would have upon the separating power of the machine there was no time or opportunity for testing.

This raising the milk seemed to be applicable to all the Danish machines, and was a point in their favor.

POWER.

10, etc. On the question of the adaptability for working by horse-power, it was not thought necessary to test the machines, as the Council did not desire that the power required to work each machine should be noticed; and there is no doubt that all the machines are suitable for working by horse-power, as, at the Royal Agricultural Show at Shrewsbury this year, both the De Laval and the Danish were worked by horse-power satisfactorily, and the judges therefore confined their attention to examining the intermediate motion, with a view to seeing what arrangement was made for counteracting the effect of the uneven paces of the horse. In the De Laval this was met by the arrangement of two friction pulleys, which worked together or independently, according to circumstances, and seemed to answer the purpose. In the Danish there was a simple clutch action on the shafting, which also answered perfectly the object desired.

THE DE LAVAL BEST.

In summing up the results of these remarks, it will be noticed that, though the De Laval and the Danish machines are on an equality as regards some of the minor points, in regard to the essential points of construction, separation, temperature and quality of cream, and analysis of cream, the De Laval was far ahead of its opponents, and quite deserved the gold medal given by the Council. The power of raising the skim milk after separation to a higher level seemed to entitle the large A Danish to a second prize, but the failure to separate the milk satisfactorily debarred the other Danish machines from any further recognition.

THE excellent paper on the American Flora, read by Professor Asa Gray in the Biological Section of the British Association for Advancement of Science at Montreal, has been printed *in extenso* in the *American Journal of Science*, so that we are now able to give our readers the benefit of it. It will be regarded as a treat by everyone who takes the slightest interest in plants and their ways:—

“When the British Association, with much painstaking, honors and gratifies the cultivators of science on this side of the ocean by meeting on American soil, it is but seemly that a corresponding member for the third of a century should endeavor to manifest his interest in the occasion and to render some service, if he can, to his fellow-naturalists in Section

D. I would attempt to do so by pointing out, in a general way, some of the characteristic features of the vegetation of the country which they have come to visit,—a country of “magnificent distances,” but of which some vistas may be had by those who can use the facilities which are offered for enjoying them. Even to those who cannot command the time for distant excursions, and to some who may know little or nothing of botany, the sketch which I offer may not be altogether uninteresting. But I naturally address myself to the botanists of the Association, to those who, having crossed the wide Atlantic, are now invited to proceed westward over an almost equal breadth of land; some, indeed, have already journeyed to the Pacific coast, and have returned; and not a few, it is hoped, may accept the invitation to Philadelphia, where a warm welcome awaits them—warmth of hospitality, rather than of summer temperature, let us hope; but Philadelphia is proverbial for both. There opportunities may be afforded for a passing acquaintance with the botany of the Atlantic border of the United States, in company with the botanists of the American Association, who are expected to muster in full force.

What may be asked of me, then, is to portray certain outlines of the vegetation of the United States and the Canadian Dominion, as contrasted with that of Europe; perhaps also to touch upon the actual causes or interior conditions to which much of the actual differences between the two floras may be ascribed. For, indeed, however interesting or curious the facts of the case may be in themselves, they become far more instructive when we attain to some clear conception of the dependant relation of the present vegetation to a preceding state of things out of which it has come.

“As to the Atlantic border on which we stand, probably the first impression made upon the botanist or other observer coming from Great Britain to New England or Canadian shores, will be the similarity of what he here finds with what he left behind. Among the trees the White Birch and the Chestnut will be identified, if not as exactly the same, yet with only slight differences—differences which may be said to be no more essential or profound than those in accent and intonation between the British speech and that of the “Americans.” The differences between the Berches and Larches of the two countries are a little more accentuated; and still more those of the Hornbeams, Elms, and the nearest resembling Oaks. And so of several other trees. Only as you proceed westward and southward will the differences overpower the similarities, which still are met with.