quantity and quality of the dairy-produce which the region affords. This western portion of the province, from its more southern latitude, and from the proximity of the great lakes, enjoys a much milder climate than the other parts of Canada. The winters are comparatively short, and in the more southern sections the peach is successfully cultivated, and the chesnut grows spontaneously.

cultivated, and the chesnut grows spontaneously. The mineral resources of this region, like those of the eastern portion of the champaign district, are comparatively few. Besides building-stones, lime, and cements, however, may be added gypsum and petroleum both of which will be mentioned in their proper places.

It being the plan of this essay to notice in the first place those points in the natural history of the country which are connected with its agricultural interests, the supplies of artificial manures for the soil, and of peat for fuel, may be here described. The building materials of the country will next be noticed, and finally the various ores and other mineral products which are the subjects of mining and manufacturing industry.

THE HORSE CHESTNUT.*

Of all the waste substances which might be profitably employed in domestic economy, there is none which has given rise to more discussion, or on which so many attempts have made, as the fruit of the horse chesnut, which contains a large quantity of starch. At various periods the utilisation of this product has attracted public attention, and many speculators have essayed to make it an article of commerce.

When first introduced from Constantinople, the fruit of the horse chestnut was considered edible; and Parkinson, writing in 1629, included it among his fruit trees, and described the nut as of "a sweet taste and agreeable to eat when roasted."

Very little use has ever been made of the nuts in this country, though in Turkey they are mixed with horse food, and are considered good for horses which are broken-winded. When ground into flour, they are used in some places to whiten linen cloth, and are said to add to the strength of bookbinder's paste. They contain, moreover, so large a quantity of potash, as to be a useful substitute for soap, and on the latter account they were formerly extensively employed in the process of bleaching. The nuts contain a great deal of starch.

Horse chestnuts are much used on the Continent, especially in the Rhine districts, for fattening cattle and for feeding milch cows. Hermstadt gives the following analysis of a sample dried in the air, and with 21.8 per cent. of the shell removed;

Starch	35 ·42
Flour fibre	19 78
Albumen	17.19
Bitter extract	11.45
Oil	1.21
Gum	13.54

98.57

Pabet estimates that 100 lbs. of dried horse chestnuts are equal in nutritive value to 150 lbs.

of average hay. Another authority, Petri, makes them equal, weight for weight, to oatmeal.

The starch obtained from the horse chestnut is white, and when thoroughly washed, perfectly free from any bitterness. They yield 29 to 30 per cent., and sometimes nearly 35 per cent., and contain besides a glutinous matter, which, according to Liebig, possesses eminently nutritive properties, but which experience proves very inferior to the gluten of cereals. Adopting the analysis of M. Chevallier and M. Lefrage, 17 per cent. may be taken as the mean yield of starch with operations conducted on a large scale. And therefore in its starch produce the horse chestnut may be taken to be equivalent to the potato, which root contains about 25 per cent. in the solid state, but after deducting the pulp rarely yields more than 18 per cent. of starch.

M. Flandin pointed out in 1849. ("Comptes Rendua," tom. xxvii., p. 349), a method of removing the bitterness from horse chestnut starch, by mixing with 100 kilogrammes of pulp one or two kilogrammes of carbonate of soda; then washing in several waters, and afterwards straining. The product thus obtained was mixed with other farinaceous substances, and constituted, according to M. Fiandin, snother food resource. It is probable that the employment of the soda was recommended by Hischermist, because in summer the washing water of the fecula acidifies very quickly. and leads to the formation of a certain quantity of dextrine, which involves a notable loss of starch.

But although the removal of this bitter principle is indispensable when the starch is intended for alimentation, it is quite unnecessary if the starch is to be used for industrial or manufacturing pur-Parmentier, in proposing to employ horse poses. chestnut starch to supply the place of paste made with food grains, very justly remarks that it has the advantage of not being attacked by insects on account of its bitterness. And bookbinders and makers of pasteboard frequently mix in their paste some aloes, with the object of keeping off insects and mould. It has been suggested by Parmentier and others that the fruit might also be utilised for its potash. The chestnuts are dried and burnt, and the salt obtained by lixiviating the ashes. Or, if preferred, the ashes may be employed direct in bleaching linen. Mercan-dier, in his "Treatise on Hemp," states that in Switzerland, and some parts of France, they employ the water in which horse chestnuts have been boiled for bleaching hemp, flax, and other fabrics, and it also supplies the place of soap

For a great number of years M. Klose, of Berlin, has operated on a large scale on the horse chestnut, and obtained the following products:

1. From the burnt pericarp an alkaline ley.

2. From the skin or husk of the peach the episperm, a very fine charcoal, which forms the base of different printing inks.

3. From the amylaceous pulp is extracted the fecula, which can be transformed into dextrine, glucose, alcohol, or vinegar, and which are all adapted to industrial use.

4. The fatty matter extracted serves to make a kind of soap, and to render certain mineral colours more fixed and solid.

5. A yellow colouring matter which serves for different purposes.