

through the same cycle. This, however, is broken by the dense population of cities, when the phosphates, instead of passing again into the land, are lost by our present defective method of getting rid of city sewerage. A good deal of phosphate is also lost to this country by the shipment of cattle and grain to distant markets by sea and land, and hence the desirability of building up the waste thus made from the natural beds found in various parts of the world. Fortunately for Canada she has the richest and apparently the largest deposits which have yet been discovered on the face of the globe.

The first of these deposits was discovered by the late Mr. Vennor of the Geological Staff, also known to fame as a weather prophet, in 1871, in the County of Hastings. This area was subsequently much enlarged, specimens were found throughout the entire district lying back of the city of Kingston, and mining is still, to some extent, being carried on there.

It is in the Laurentian range of the Province of Quebec, and more especially, as far as has yet been discovered, in that part lying in the townships of Buckingham, Templeton, Wakefield, Hull, Derry, Portland and Bowman, that mining is chiefly being prosecuted, and more especially in the two first named townships. The question of the continuity of these deposits was at one time doubted, but later tests which have been made by means of the best mining appliances, such as steam hoists and drills, have shown that at the depth of three hundred feet the phosphate is of a higher grade, whilst the deposits are more extended. These discoveries go to show that our Quebec beds are practically inexhaustible.

These mines have a great advantage as being situated in contiguity to navigable water, the Lievres River, which is deep and sluggish, where the mineral

is placed on scows which are towed down by steam tugs, or are left to drift till they reach Buckingham village, situated on the Canada Pacific Railway. Hitherto most of our Canadian phosphates have been shipped to Liverpool by steamer from Montreal, where they have been treated with acid, and again distributed as superphosphates throughout Britain and Europe, a large percentage again finding its way across the Atlantic into the United States.

The grades shipped are known as firsts, seconds and thirds. The best is from 80 to 85 per cent., second-class 75 to 85 per cent., third-class below 75 per cent.

Phosphate is found in various forms, sometimes in crystals, at others in masses, varying from compact to coarse granular, in strata of a lamellar texture, and in a friable state called "sugar phosphate." The color varies from greenish to clear sea green, bluish, red, brown of different shades, yellow, white, and cream colored. Phosphate runs from twelve feet square to sixteen feet square to the ton, according to its compactness.

The old style of mining surface deposits has now been superseded by men of capital and powerful companies. These have introduced steam power and improved machinery, and by this means a higher grade of the mineral has been taken out at a less cost. This has placed mining operations on a more permanent basis. The actual cost of a ton of phosphates delivered in Liverpool is about five dollars, after paying all expenses for mining and freight. The price obtained in Liverpool ranges from twenty-six to twenty-eight dollars per ton, so that there is a large margin for profit. It is, however, only by a large outlay of capital that the above results are obtained. The first year's operations seldom leave a margin, owing to the heavy expense for plant