

that it does good work. Our attention has been directed recently to the many advantages the "Sturtevant" mill possesses for this particular class of work. It has been designed for crushing and grinding phosphate, emery and all hard and refractory ores, and practical mill superintendents who have used it on all descriptions of ores have attested to its unquestionable merits. The "Sturtevant" is a crusher and stamp-mill combined, and it is of extremely simple construction. It is arranged to grind to any fineness desired, from one and one-half inch mesh to an *impalpable powder*, and is so compact in its construction that it occupies less space than any other mill we know of having the same capacity. It is a powerful, efficient and durable machine, and can be operated with great economy, which, in addition to its simplicity, execution and capacity, should recommend it to people who are engaged in crushing and grinding ores. We would advise those who contemplate engaging in grinding phosphate to examine the "Sturtevant" mill, as we deem it a very suitable machine for this purpose.

We are indebted to Mr. Chas. W. Willimott, Curator of the Geological Museum, for a copy of his paper on the *Minerals of the Ottawa District*, read before the Ottawa Field Naturalists' club. In dealing with this interesting subject, Mr. Willimott confines himself to the three neighbouring townships, Templeton, Hull and Wakefield, as his own observations had extended only over that portion of the county of Ottawa. He enumerates the various minerals that occur within that area, and gives an intelligent, general outline of the more important characters of each, dwelling more particularly on the features of the deposits of Apatite, Iron and Graphite. Mr. Willimott informs us that about sixty minerals are known to occur in the three townships referred to, many of which are unrivalled in the Dominion, and adds that it is doubtful if the same extent of country elsewhere in Canada can claim one-half that number.

THE PHOSPHATE TRADE.

There is no disposition on the part of mine owners to check the output of their mines—on the contrary, they are working their properties to their utmost capacity, and many thousands of tons of ore are now awaiting transportation. The present appearance of the mines and the activity which has characterized operations since the close of the shipping season of 1885 justifies us in predicting, as we did in our last month's issue, that the quantity of phosphate that will go forward this year will be several thousand tons in excess of the shipments of any former year since this industry was inaugurated in Canada. The accumulation of ore at the various mines also indicates that this will be the case, and close inspection of the contents of the ore-lbins leads to the conviction that this year's shipments will be of superior grade, and will average, as they did for 1885, over 80 per cent. Careful dressing of the ore is a

sine qua non to the success of Canadian phosphate mining, and mine owners having learned by experience how necessary such precaution is, if they wish to obtain high prices for their output, it is not likely they will retrograde and become careless on this essential point.

The principal contributors to the general output of Ottawa county for this year will be The Phosphate of Lime company, the Union Phosphate company, the Dominion Phosphate company, the Ottawa Phosphate company, W. A. Allan, Ottawa, the Du Lièvre River Phosphate company, the Glasgow-Canadian Phosphate company, and Messrs. McLaren & Blackburn. Of these it is not improbable that the Dominion Phosphate company will be the heaviest producers, while all the others will undoubtedly send forward large shipments. Another powerful corporation, the Anglo-Canadian Phosphate Company, will engage in active operations in Ottawa county and in the Perth district early in the spring, and will help to swell the general output. This company has been recently organized in England under most favourable auspices, and will henceforth engage extensively in phosphate mining in Canada. Every day, we might say, brings us fresh evidence of the expansion of this important industry, and a few remarks from us on

THE FUTURE OF CANADIAN PHOSPHATE

may interest our readers.

When Canadian phosphate first entered the English market, it encountered much disfavor and some serious objections. Its hardness made it difficult to grind; the fluorine that it contained gave out offensive odors and injured the workmen's throats; after being made soluble by sulphuric acid it became partially insoluble again, or in technical phrase "went back;" in fact every manufacturer had his pet grievance against it, and for some years it was difficult of sale. Its high quality and comparative cheapness after awhile enforced attention, and the assurance of steady supplies, owing to enlarged working and the low rates of freight obtainable by vessels that required ballast under their dead cargoes, made it an object for manufacturers to overcome the difficulties connected with its use. The result is that although the shipments for the past year were the largest ever known, a month after the season had closed there was not a ton of Canadian phosphate to be had in England in answer to the demands of buyers, the whole having gone at once into the hands of consumers. The largest manufacturer in England states that he now uses as much Canadian as Carolina rock. He not only uses it largely with Belgian and other low grade phosphates to serve as an enricher, but he makes a high class superphosphate from Canadian rock alone. His chemist is said to have a "wrinkle" by which he gets better results than some others obtain and his success leads to further experiment.

In Germany Canadian phosphate has likewise been winning its way and all the 80 per cent. phosphate that Canada can produce with the present facilities can be readily sold in that market.

In spite of the favor it has gained, prices are exceptionally low; this is partly due to the competition of Caracua and Aruba phosphates from the West Indies, but chiefly is owing to the intense agricultural depression that now prevails. Much land has been thrown out of

cultivation and many farmers are too poor or too discouraged to buy fertilizers. This leads the numerous manure manufacturers into sharp competition to dispose of their products; the prices they sell at leave no profit and their efforts become intensified in the direction of cheapening the raw material. It is, however, significant that the Chemical Manure Manufacturers' Association, which is a combination of all the leading manure makers in Great Britain, at its annual meeting proposed combined action, not to buy cheaper, but "to keep phosphates at their present low level," showing that in their opinion bottom prices for raw material had been reached.

In Europe Canadian phosphate must always meet with strong competition, but there is a hitherto neglected field where it is destined to reign without a rival. The report of the National Fertilizer Association of the United States shows that over a million tons of fertilizers were made in the United States in the past year and that the output is increasing at the rate of 100,000 tons per annum. About three-fourths of the whole was used in the States adjoining the Carolina phosphate beds, while but little was used in the extreme Northern States, although the lands there equally demand it, and almost none was used in Canada in spite of the utter impoverishment of the once prolific wheat fields of Quebec. As knowledge of scientific farming extends, artificial fertilizers will be largely used in these sections and Canadian phosphate is the natural source of supply. By the return grain vessels from Kingston phosphate can be sent through the great lakes to the northern cities of the United States for a freight of \$1.50 to \$2 per ton, whereas the Carolina phosphate must pay \$5 to \$6 per ton by rail to these points, besides which the Carolina contains only about 55 per cent. of phosphate of lime as against 80 per cent. in Canadian phosphate.

The establishment of fertilizer works in Canada and the Northern States will doubtless be speedily accomplished, and a large market must open for Canadian phosphate in addition to the expanding demand in Europe. These facts and considerations show that a good future awaits this industry, and as the output of Carolina phosphate has grown from 20,000 tons in 1870 to over 430,000 tons in 1885 with an ever widening market, so we may expect a similar increase in the output of Canadian phosphate.

Phosphate Quotations.

The most recent advices from abroad report the phosphate market sluggish, although 1s. 3d. is freely offered for future delivery for 80 per cent, with *one fifth of a penny rise*. The present condition of the phosphate market is owing to the depression in all branches of trade, but it is expected to be more buoyant after the opening of navigation, and when shipments begin to arrive at Liverpool, London and European ports.

Large Phosphate Contracts.

Two weeks ago we reported sales of Canadian phosphate for spring shipment, and we have now to note contracts to the extent of 8,000 tons for shipment at this port (Montreal) during the coming season. It is understood that these large contracts have been made by the Dominion Phosphate Company, through Messrs. Lamer, Rohr & Co., mostly for Continental ports. The prices are strictly private, but it is believed that the sales of Canadian apatite mentioned in the *Trade Bulletin* of March 5th had reference