

ery in Cottrell Treaters, phenomenal extractions having been made with this scheme on a large laboratory scale.

Gold and silver we can always recover, if the cost is justified, by cyaniding, sometimes as in the case of gravity or flotation concentrate from gold or silver ores, only after roasting however.

Now in most cases these hydrometallurgical methods neither require nor justify centralized plants, provided any one mine or district can supply sufficient ore to ensure the minimum tonnage necessary for economical operation. The great advantage which lies in mixing ores for smelting does not apply to hydrometallurgy at all. In fact, each ore is likely to require slightly different treatment and the plant treating the ore from one mine is likely to have the simpler problem. Coke supply—always a bug bear to the lead and copper smelter need no longer be considered, cheap fuel can be used for roasting if indeed the ore does not practically furnish sufficient heat for its own roasting. In zinc, and in copper to a less extent, probably also in lead as its hydrometallurgy is developed, there will be need for abundant and cheap electric power, this, however, can be transmitted to any point readily if it can not be developed near at hand as is usually the case except in the desert regions.

There is a further general advantage possessed by hydrometallurgical methods, namely, that the residue or tailing is readily amenable to further treatment, a condition not true of slag, the pyrometallurgical residue.

For these reasons therefore I believe we face an era of decentralization in metallurgy and that in view of what has been said concerning flotation and hydrometallurgical development, I am convinced that the next 25 or 30 years will witness a renaissance of home treatment. This will, of course, by no means make the large centralized plants, such as Trail, superfluous, far from it, for they will have more to do than ever although the nature of the material they are called upon to treat may be somewhat different.

The net result will of course be the treatment of more ore, of lower grade ore, and the production of more gold, silver, lead, copper and zinc on both sides of the 49th parallel, for these problems are common to Canada and the United States, and they are being solved co-operatively, and with the freest interchange of information and ideas.

H. M. COMMISSIONER REPORT ON ONTARIO'S MINERAL INDUSTRY.

In the report of the British Trade Commissioners on the Trade of Canada and Newfoundland for the year 1918, the mining industry of Ontario receives attention. Mr. F. W. Field, who was a short time ago appointed His Majesty's Trade Commissioner at Toronto points out that the production of minerals is large and varied, and that the prospects for increasingly large outputs are good, the greater part of the undeveloped areas of the province being of pre-Cambrian formations, which are the chief productive rocks in this part of Northern America.

Mr. Field is an Englishman who has resided for several years in Ontario. He is well informed on financial and industrial conditions, and can be depended upon to furnish reliable information concerning the trade of the province. Much of the information in this report will prove of interest to all Canadian as well as to the British manufacturers who are specially served by the activities of the Trade Commissioners.

SAND AND GRAVEL IN ONTARIO.

Report by A. LEDOUX.

Part Two of the Ontario Bureau of Mines Report for 1918 consists of a monograph on the sands and gravels of Ontario by A. Ledoux.

The Report, it is explained, should be considered only as a preliminary one, deposits in over forty counties having been visited during four months of field work, thus allowing only a very short time for detailed examination of any deposit. Under these circumstances, the extended scope of the monograph, and the very full and detailed information it contains, is evidence that no time was wasted by its author.

The Report begins with a review of the characteristic properties of sand and gravel, and the methods of testing applied. These properties have been divided into morphological, physical and chemical. The origin and occurrence of the sands and gravels are explained, such considerations being of practical interest, as there is a close relation between the geological origin and the qualities of sands and gravels. In numerous cases continuous lines of deposits, marking ancient lake shores, may be followed in southern Ontario. An interesting map is included in the Report, showing the trace of the ancient shore lines and channels of Lake Iroquois and Lake Algonquin, which occur within the Province of Ontario.

"Most of the sand and gravel deposits in southern and eastern Ontario are very closely connected with the geological history of the Great Lakes. Just as the present shore lines do not show continuous deposits of sand and gravel, the old shore lines are marked by isolated zones or areas more or less parallel to the present shore lines."

On the shores of existing lakes certain parts are marked by extensive beaches containing abundant reserves of good building material.

Attention is also directed by the Report to some artificial sands made by crushing soft sandstones, suitable for special purposes such as glass-making and iron-smelting.

Moulding sands are found in the vicinity of Hamilton and Ontario. It is seldom more than two or three feet thick, appearing generally as a deposit under the superficial soil, when this soil comes in contact with an underlying sand formation. It seems to owe its origin to the circulation of water and to the action of vegetable and other organic life. It occurs in different grades of fineness, the coarsest material being used for large and rough castings, while very fine moulding sand is used for brass and copper castings. As, says the Report, this is a high-priced sand which can be exploited without expensive equipment, "there is a possibility of developing a considerable industry in this material for Canada."

Glass sand, which should be as pure as possible, is sometimes obtained directly from the pits, and sometimes as at the plant of the Oneida Lime & Sand Company near Hagersville, is prepared by crushing a more or less disintegrated sandstone. This particular product is prepared from Oriskany sandstone of Devonian age, which after crushing and washing contains sometimes as high as 99.5% of pure silica.

Some of the Ontario sands appear to be suitable for the manufacture of silica bricks, a product that is badly needed in Canada, but no instance of their manufacture in Ontario was noticed in the Report, although the suitability of the sands for this purpose is pointed out, and analyses of typical quartz sands are given.