

evolved, a much better figure than the one obtained would result.

The modern blast furnace, and the different methods for the making of steel as at present employed, are the result of a hundred years of experience, and have reached their present perfection through many modifications, which, in many instances, were accepted and introduced into practice only after much hesitation and opposition. The process of the electric reduction of iron ore must yet be regarded as in the experimental stage; in fact, no plant exists at the present time where iron ore is commercially reduced to pig by the electric process. The more remarkable, therefore, it appears, and the more gratifying it is regarding the future of electric smelting, that experiments made off-hand, so to say, in furnaces not at all designed to be used for the production of pig should give a figure of cost which would enable the experimental plant employed to compete with a blast furnace in regions where electric energy can be had for \$10 per E.H.P. year, and where coke is quoted at \$7 per ton.

I am credibly informed that the water-power at Chats Falls can be developed at a cost to produce an E.H.P. year at the rate of \$4.50. There are probably many water-powers favorably situated as regards good bodies of ore in the Provinces of Ontario and Quebec, which can be developed as cheaply. When such power is owned by the company intending to use it for electric smelting, and peat coke or briquetted charcoal, made from mill refuse (in the Ljungberg continuous kiln refuse wood is burnt into charcoal at 33 per cent. less cost than in heaps and with 22 per cent. higher yield), which would probably not cost more than \$4 per ton, is employed for reduction, the cost of two of the heaviest items entering into the cost of producing pig by the electric process is reduced to one-half.

When it is considered that the electric process is applicable also to the smelting of ores, such as copper, etc., and that the furnaces are of simple construction, the temperature available 1,000 deg. C. above that of the blast furnace, and the regulation of the heat supply under perfect control, it is reasonable to expect that the near future will witness great strides in the application of electric energy to the extraction of metal from its ores, and that familiarity with handling large currents and experience gained in electric smelting will result in solving the difficulties encountered in the smelting of ores, which up to the present time have proven refractory to all economical processes known.



RAILWAY NOTES.

The Grand Valley Electric Railway ran their first car from Brantford to Galt on November 15th.

The Scarboro Electric Railway, Toronto, is being extended to Highland Creek, fourteen miles from the city.

The Government has secured from the Nova Scotia Steel Co. the right of way for the extension of the Intercolonial Railway to Sydney Mines.

The Grand Trunk is not at present considering the building of a third track from Toronto to Hamilton, as was reported some time ago.

The Canadian Pacific is negotiating for the Bruce Mines and Algoma Railway, owned by a Buffalo syndicate.

The Preston and Berlin Street Railway Co. has installed a storage battery of about 300-h.p. hour capacity. The battery was supplied by the Gould Storage Battery Co., Depew, N.Y.

Rhodes, Curry & Co., Limited, have received a contract from the Intercolonial Railway for the building of a round-house at Truro. The building will cost in the vicinity of \$110,000.

The C.P.R. recently made a contract to carry 10,000 tons of English spiegel from Liverpool to Sault Ste. Marie, the first contract of its kind made by a Canadian company. The spiegel has been purchased by the Algoma Steel Co.

The first twenty miles of the International Railway from Campbellton, N.B., have been completed. The line is to run west through the northern part of the province to the St. John river. Thomas Malcolm is the contractor in charge of construction.

The C.P.R. will build a line from Stratford to Conestoga, connecting the latter place with the Guelph and Goderich line. It is stated that the company will build a branch from Goderich to Stratford, paralleling the Grand Trunk. A line south from Goderich, making connection with Chicago, is also proposed.

The C.P.R. has about finished the new piece of track between Wild Rice and Emerson, Man., which will give it, in connection with the "Soo" line, a direct air line between Winnipeg and St. Paul, a distance of something like five hundred miles. This work was carried out by Mr. William Whyte, second vice-president.

It is expected that the portion of the Halifax and South-western Railway, between Halifax and Bridgewater, N.S., will be in running order this month. The rails are laid to Liverpool, but it is not likely the line will be operated till spring. The bridgework of this railway is divided between the Canada Foundry Co. and the Dominion Bridge Co.

A number of contractors are now figuring on the work of double tracking the C.P.R. main line between Winnipeg and Fort William. The date for the opening of the tenders has not yet been fixed, but it is the intention to try and begin work this fall. The plans and specifications for the rock and earth cuts and the fills have been in the hands of the company's engineers for some time past, and there will be no delays when once construction has started.

The new railway engineering department of McGill University, Montreal, is now being organized. It will have a council of administration composed of Charles M. Hays, president of the Grand Trunk Pacific Railway; Sir Thomas Shaughnessy, president of the Canadian Pacific Railway; E. B. Greenshields, R. B. Angus, and C. J. Flett. These gentlemen will determine upon the curriculum, but their chief regular functions will be of an advisory character.

An automatic brake, designed to prevent engineers running their trains past closed semaphores, has been invented by James Doyle, U.S. customs officer at Niagara Falls. The brake is operated by a trip, which, when the semaphore is closed, strikes a projection on the brake of the passing engine. A successful test was recently made in the Niagara, St. Catharines and Toronto Railway. It is said that the brake costs only about \$30 per appliance.

A company, known as the Toronto and York Radial Railway Co., has been organized with chief officers as follows: President, William Mackenzie; general manager, W. M. Moore; assistant superintendent, John McCarty. The company is an amalgamation of the Metropolitan, the Mimico, and the Scarboro electric railways, and is independent of the Toronto Railway Co. The new company controls nearly fifty miles of railway. J. W. Moyes has been retained by the company as superintendent of the Metropolitan.

Railroad development in Prince Edward Island has taken quite a jump in the last few months. A new line of railway from Emerald on the P.E.I. Railway, through the New London district to the North shore, a distance of thirteen miles, has been surveyed. Two preliminaries were run. This road will likely be built next summer and will open up an old, thriving agricultural settlement, badly in need of railway accommodation. A survey of a railway from Souris, eastern terminal of P.E.I. Railway, to Elmira, near East Point, a distance of 13 $\frac{1}{4}$ miles, through a partly wooded country, was made in October by J. Ruel, chief; J. A. Macdonald, S. Can. Soc. C.E. and J. McLean. This road has been agitated by the people of that section for more than twenty years, and is to be built the coming year. The location survey of the Montague-Cardigan branch line was recently completed by A. T. Wilson, H. T. Emmerson, and J. A. Macdonald, engineers, and bids called for immediate construction. Mr. Willard Kitchen has secured the contract, and work will go on through the winter. The preliminary line for this road was run last winter by H. J. McKenzie, chief, with Messrs. Black and Owen, assistants. An amount of money had been placed in the estimates last session by the Dominion Parliament for the running of a preliminary line from, at, or near O'Leary, P.E.I. Railway, to the West Shore, but the line has not been yet run. The contract for Vernon River branch has been awarded to Willard Kitchen.