FIRST ANNUAL REPORT

by three young engineers of the Aktiebolaget Elektrometall of Ludvika. Sweden, who succeeded, after repeated trial constructions, and an expenditure of \$102,000 in building a furnace which has proved satisfactory. To anyone who has seen a blast furnace, the construction of this furnace will easily be comprehended. The general design is similar to that of a blast furnace, with the tuyeres replaced by electrodes.

The fact that the output per electric horse-power year with the Swedish furnace did not reach our best results at Sault Ste. Marie is not due to faulty construction, but to want of the proper amount of energy. The capacity of the furnace was at least 1,200 H.P., whereas only about half that amount was available.

Several very important facts have been demonstrated during the summer run with this Swedish furnace. It has been found that it was possible to make an iron containing only 2% of carbon. The essential difference between pig iron and steel is that the former contains up to 4% of carbon, while any iron classed as steel contains from 0.6%to 2.3% of carbon. It will be seen, therefore, that the Swedes have succeeded in producing in the Domnarfvet furnace a high carbon steel direct from iron ore. It has, moreover, been demonstrated that, in the electric furnace, the process for producing iron of different compositions is under more exact control than in other processes. Mr. Yngstrôm, Vice-President of the Copparbergs Aktiebolag of Falun, and a distinguished ironmaster, in his report on the performance of the Swedish furnace after a three month's run, declares that, judging from the tests made at Domnarfvet, the production of iron from iron ore in electric furnaces is successfully accomplished, both technically and economically.

Shortly after the publication of my report on the investigation of an electric shaft furnace at Domnarfvet, Sweden, in December, 1908. I was informed that, at Tysse, Norway, a contract was let for the establishment, on a commercial scale, of an electric smelting plant consisting of two electric shaft furnaces of 2,500 H.P. capacity each, two steel furnaces of 600 H.P. capacity, and a rolling mill. This plant is to be increased by two additional shaft furnaces and two steel furnaces.

Some two months ago the Jernkontorets, an association of the ironmasters of Sweden, acquired the patents for the electric shaft furnace of the Domnarfvet type, and are erecting a 2,500 H.P. furnace of similar design, with a probable output of 7,500 tons annually, at Tröllhatten, Sweden, for the purpose of demonstrating to the iron ore owners and ironmasters the class of iron which can be produced from the different Swedish ores, and at what cost.