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Gas Circulation in Electric Pig Iron Furnaces

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A paper, by Dr. Jos. W. RICHARDS, of Lehigh University, dealt with "gas circulation in electric reduction furnaces" as practiced at the Joernkontoret's electric pig iron furnace in Trollhättan (see Mr. Leffler's report in our vol. IX., pp. 368 459, 505, also page 631). As described before, this circulation of gases is chiefly employed for the purpose of cooling the roof of the crucible.

Dr. Richards points out that the advantages of this cooling system are offset by serious disadvantages. He recommends that the artificial circulation of the gas should be entirely dispensed with. The arch of the crucible of the furnace should be protected by water-cooled plates, as is common in open-hearth furnaces.

Among other recommendations made by Dr. Richards on the method of working at the Joernkontoret furnace is one to the effect that the limestone flux should be calcined before putting into the furnace.

Further the shaft of the furnace should be provided with auxiliary heating to maintain its contents at or above 400 deg. C., to permit of reduction of Fe_2O_3 by the slow current of CO gas.

Under these conditions an amount of carbon equal to one-fifth of the weight of iron produced should be sufficient, producing gas containing two volumes of CO_2 to one of CO.

Eliminating the expense of circulating and purifying the gas, and reducing the amount of fuel required for reduction, would both simplify and cheapen the operation of the furnace in Dr. Richards' opinion.

There were several communicated discussions of this paper, one by Mr. Leffler of Sweden, and another by Mr. Noble of the Noble Electric Steel Company of California. Mr. Leffler wrote that if the artificial gas circulation could be dispensed with, nobody would like it better than those who have to run the furnace. Mr. Noble stated that in their electric pig iron furnace in California only calcined limestone is used as flux and no artificial gas circulation.