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THE ELECTROTHERMIC PRODUCTION OF IRON AND STEEL.

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The commercial possibility of producing iron and steel in the electric furnace is a question of considerable interest at the present time in view of the attempts which have recently been made in this direction. These attempts, which are still being continued, include the production of iron and steel by processes similar to those usually adopted, but in which the heat necessary for enabling the chemical reactions to take place and for fusing the metal and accompanying slag is furnished by means of electric power instead of by the combustion of carbonaceous fuel as at present.

At first sight this idea appears to be quite absurd in view of the high degree of efficiency already attained in the metallurgy of iron and steel, and of the much greater cost of electrical heat than of coal heat; but the fact that commercial attempts to produce iron and steel electrically have actually been undertaken shows us that it is advisable to reconsider this conclusion.

Although the electric furnace is still in its infancy and its full powers are unknown, it is quite obvious that the possibility of applying heat exactly at the required point, of producing a temperature which may be as high as that of the electric arc, and of doing this without being obliged to blow through the furnace a stream of air and other gases is one that, in certain cases, may outweigh the greater cost of electrical energy. A very high temperature can easily be produced by electrical heating in a furnace containing strongly reducing gases, and this fact has already been utilized in the production of certain alloys of iron such as ferro-chrome, ferro-tungsten, ferro-silicon, etc.* in which cases the value of the alloy and

* Keller, Journ. Iron and Steel Inst., 1903, I., p. 161.