

MR. CHRYSLER—I refer to this as authority at page 292 of the same article, column 1, line 43 (Encyclopedia Britannica)

"To carry out this operation the blast furnace is employed, the ore, flux and fuel being charged in at the top of the erection, and air being blown in at the base, so that a mixture of carbon oxide and nitrogen is formed at the lower levels, which, passing upwards, effects the deoxidation of the ore, the heat produced at the base fuses the reduced iron and the earthy matters &c., which accumulate in two layers (the former being the heavier), and are drawn off from time to time, the one as cast or pig iron, into moulds for the market, the other as cinder or slag, usually of little or no value. Fresh materials are added at the top, so that the furnace works continuously."

Then at page 295.

MR. ALESWORTH—I think my learned friend is doing the very thing he was not to do. I do not know that is objectionable at all, except that it is taking time uselessly.

HIS LORDSHIP.—If objected to I could not allow Mr. Butcher to extend that on his notes. When you come to argument you can read it. You are simply putting in the text.

MR. CHRYSLER.—There are some passages of this as to which I wish to ask the witness the meaning of the technical terms.

HIS LORDSHIP.—If Mr. Alesworth objects I do not think Mr. Butcher would be allowed to put that on the notes.

MR. CHRYSLER.—Then how am I to use this book when the witness is gone?

HIS LORDSHIP.—You can use it as a matter of argument.

MR. CHRYSLER.—I desire to ask about the meaning of the passage in the next page, page 295, column 2, at the bottom, "Flux and cinders—When a very pure iron is smelted, such as Cumberland haematite or Swedish magnetite, the amount of silicious and earthy matter present relatively to the iron oxide is but small, and in consequence the amount of flux requisite to be added is also small. By proper combination of ores of different kinds the necessity for the addition of flux may be almost or altogether avoided; thus a high aluminous ferric oxide known as bauxite (valuable as a source of aluminium and its compounds, as well as servicable as a source of iron and flux in the blast furnace) and silicious haematite smelted together, with the addition of a little limestone or quicklime, furnish a cinder consisting mainly of calcareous aluminium silicate which readily melts and separates from the pig iron"

Q.—What is bauxite? A.—Bauxite is a mineral that is rich in alumina and the alumina is an element that is hard to handle in the blast furnace. It requires a special slag to carry it off, to make a fusible material with, or a fusible substance with.

Q.—What he is dealing with there is a mixture of ores apparently? A.—Yes. Some ores are difficult to smelt, and some are smelted easily. Those difficult to smelt require a special flux added to carry off the impurities, otherwise they form an infusible mass in the furnace, and the fusing operation is stopped.

Q.—Is the bauxite a flux then? A.—It is not ordinarily called a flux. The term "flux" depends upon what kind of a smelting operation is being carried on. What is a flux in one operation would not be in another operation. A flux is a material added which combines with the impurities and forms a fusible mass, a mass that will fuse at the temperature you maintain in your smelting operation.

MR. CHRYSLER.—I do not wish to persist in this if my learned friend objects.

HIS LORDSHIP.—I am afraid I will have to rule with Mr. Alesworth if he does object.

MR. CHRYSLER.—It only involves that inconvenience. We have these passages and shall rely upon them at the argument. It seems to me it is a convenient way to enable Mr. Aylesworth to cross-examine the witness if he desires to do so.

MR. AYLESWORTH.—I do not think it is convenient to argue the case now.

HIS LORDSHIP.—Of course Mr. Aylesworth on cross-examination will be able to refer to texts and to authors which you cannot do at present. You can on re-examination refer to the same thing if he opens it on cross-examination.

MR. CHRYSLER.—Then I will reserve the remainder of that. That article is a most instructive article from beginning to end, and there are a large number of passages I will read later on the argument. I will ask now as to some of the books we have here.

(Adjournment 1 until 2 p.m.)

MR. CHRYSLER resuming.

Q.—We have a set of photographs which I was not aware of. We will put them in for the information of the Court. What is that photograph?

A.—This print shows the entire plant, that is except the coke oven. (Exhibit 5.)

Q.—Shewing in photograph the structures that are shewn in Exhibit No. 1? A.—Yes.

Q.—You have written upon the face what it represents—the three principal structures shewn there? A.—Yes.

Q.—These are the blast furnaces, the open hearth and the blooming mill? A.—Yes.

Q.—Now, what is Exhibit No. 6? A.—Exhibit 6 shews the plan of furnace, shewing four blast furnaces, the boiler house and engine house and stock house. Also the cast houses.

Q.—Do the run-ways for the skips appear in this? A.—It shews half of the skip-way on which the skip travels which fills the furnace.

Q.—And Exhibit 7? A.—Shews in detail on a larger scale the side of the casting house and the spout projecting through which the liquid pig is run into the ladles.

Q.—Which are there shewn standing? A.—Four of them shewn standing upon small trucks.

Q.—Then Exhibit No. 8? A.—Exhibit 8 shews the front of the open hearth furnaces, and the methods of charging the cold pig into these furnaces

Q.—It shews one of the charging boxes with the metal in it? A.—Yes.

Q.—It is a piston or ram? A.—Yes.

Q.—Then Exhibit 9? A.—Shews the interior of the open hearth building, the opposite side from the other Exhibit, and shews the crane holding a ladle of steel and steel being tapped into the ingot moulds on trucks.

Q.—A question has been raised, I don't know how it came up, whether in discussion or examination, whether the molten pig as you have figured it there and described it in these ladles is a merchantable article capable of being sold? A.—Yes, we would sell it if we had a plant located here and wanted to buy it. It is capable of being sold all right. It is possible to sell it, I mean.

Q.—To a concern under a different establishment? A.—If there was a foundry establishment here, and they wanted to get pig iron from us direct, and we had a portion of our product that was not needed in the steel plant, we would be glad to sell to them, the same as we are selling the pig we do not need in our steel plant now in general markets.

Q.—How far in practice has this molten metal been carried in ladles of that nature? A.—About six miles is the longest distance I know of it being handled in large quantities regularly. That is at Cleveland.

Q.—And it is actually being carried that distance there? A.—It is carried by an independent railway in Cleveland.

Q.—By railway not belonging to the works? A.—Shipped as freight under all the regulations of freight traffic.

Q.—And is it shipped to a different concern? A.—No, this concern has a plant of furnaces located a long distance away from these mills.

Q.—But not owning the railway which connects them? A.—No; they have to pay freight on this commodity. That is the Newburg Steel works of Cleveland.

Q.—Supposing you were selling it as you say to a foundry plant who were using hot metal for castings, what would be the name of the material? A.—It would be called liquid pig.

Q.—Liquid pig what? A.—Liquid pig iron.

Q.—Are there pigs of any other metal besides iron? A.—Pig lead and pigs of copper; a great many different metals are run into moulds and called pigs.

Q.—So that the name "pig" is not used exclusively in connection with iron? A.—No, it is not.

CROSS-EXAMINED BY MR. AYLESWORTH:—

Q.—This Company, the Dominion Iron and Steel Company, had been in practical operation before for some months you came, I understand? A.—Yes the blast furnaces were in operation.

Q.—They had not begun to make the steel commercially yet? A.—They had not at that time.

Q.—At the time you came? A.—No.

Q.—But the blast furnaces had been in operation in sending out pig iron for some six months? A.—Yes, about six months.