## THE NICKEL ORES OF SUDBURY.

entire mass of metal remains homogeneous throughout the operation, the impurities being gradually oxidised until it is all converted into steel. And the total amount of the impurities is only 5 or 4 per cent., so that the mass of fluid metal operated upon is not perceptibly lessened.

"But in Bessemerising a mixture of the sulphides of iron, copper, and nickel, the number of different chemical compounds having differing specific gravities and tending each to form its separate stratum in the converter, is too great to even enumerate. As soon as sufficient sulphur is removed to correspond to the iron present, we shall have a layer of oxide of iron (combined with silica from the converter lining) on top, while below the sulphides of nickel and copper will remain comparatively unaltered. Then may come a period when we have the same silicate of iron on top, followed by a little silicate or oxide of nickel, whilst some metallic nickel has formed and sunk to the bottom, and the rest of the nickel, in its original condition  $c^{c}$  sulphide, forms a stratum below the unaltered sulph<sup>3/2</sup> Lopper.

"These react: Id products increase in number and complexity as the operation advances; and remembering the great difficulties encountered in Bessemerising even so simple a substance as copper matte, one cannot help feeling some curiosity as to the practical success of this operation.

"That nickel and copper can be rapidly reduced from the condition of a matte to that of separate metals,

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