

ternal lustre, and the transparency; but as it advances, it also changes even the structure, hardness, solidity, and weight of the mineral. The oxidation of the iron and manganese destroys the weak combination of these metals with the carbonic acid, and there is formed a hydrate of iron, sometimes also an oxide of iron, and hydrate of manganese. The whole mass is disintegrated by the escape of the carbonic acid, this acid combining with percolating water dissolves the small portion of lime in the ore, and also portions of the still undecomposed carbonate of iron and oxide of manganese. A knowledge of these changes enables us to understand the very different results obtained in the analysis of specimens more or less weathered or decomposed, and also throws some light on the different results obtained in the smelting of sparry ironstone more or less decomposed.

4. The analysis of Hielm, published under the sanction of Bergmann, is the earliest we possess of this ironstone: it gives as the constituent parts, 22.38 Oxide of Iron: 24.28 Oxide of Manganese: 29.43 Carbonate of Lime; and 6.9 Water. The errors of this analysis have been pointed out and corrected by the labours of Drappier, Descotils, Berthier, Klaproth, and Bucholz.

13. Clay Ironstone.

Thoneisenstein, Werner.

This species is divided into the following subspecies, viz. Reddle, Columnar Clay-Ironstone, Lenticular Clay-Ironstone, Jaspersy Clay-Ironstone, Common Clay-Ironstone, Reniform or Kidney-shaped Clay-Ironstone, and Pea-ore or Pisiform Clay-Ironstone.

First