

cobalt, is roasted in reverberatory furnaces, and being mixed with the richer schlichs, which have also been calcined in the same way, forms what is called zaffre, containing about 30 per cent cobalt oxide. This is sent to market in England, where it is manufactured into cobalt oxide and smalt. A small quantity of the former product is manufactured on the spot in the humid way, but this quantity does not exceed one sixth of the whole amount of the cobalt oxide here produced in manufactured and unmanufactured products.

The fahlbands in the neighbourhood of Ertelien, and Ringerike, have not been so carefully studied as those of Kongsberg and Skuterud; nevertheless it admits of no doubt, that the nickel mines of the former locality occur on impregnated zones of rock like the fahlbands. The deposits are irregular masses of magnetic iron pyrites containing two per cent of metallic nickel. Although a definite veinstone is not observable, it appears from the presence of selvages in various places, that the deposits partake of the nature of veins. Besides the nickeliferous pyrites, copper pyrites is produced at the mines in some quantity, but so contaminated with the former, as to be altogether useless as a copper ore. Occasionally, beautiful crystals of iron pyrites (pentagonal dodecahedrons), have been found, containing two per cent of metallic cobalt. The nickeliferous pyrites is sorted out at the mine, very pure, almost entirely free from rock. It is then roasted in heaps, and smelted in a shaft furnace with the addition of a little limestone. The resulting products are a very heavy slag, with is a basic silicate of ferrous oxide; a regulus of sulphuret of iron, containing about six per cent nickel, and iron swine, which collect in the interior of the furnace during the smelting, and interfere very much with its proper working. The regulus is again roasted in heaps and smelted, a more concentrated regulus with thirty per cent of nickel, resulting. The regulus, as well as the iron swine produced in both smeltings, are farther refined on a hearth similar to that used on the continent for refining copper. A farther scorification of iron takes place in this operation, and a regulus with fifty per cent of nickel and fifteen per cent of copper results, which after being ground to powder, is sent to market. It is mostly sent to Hamburg and sold to German nickel refiners. These mines were formerly wrought, and the pyrites roasted for the manufacture of copperas; it is only during the last fourteen years that they have been wrought for nickel.