

in which not more than three hundred weight of coal is consumed for each ton of ore, is the only furnace-operation required to obtain the metallic copper in a precipitated form known as *cement copper*. An important item of cost in wet processes is the metallic iron employed to separate the metallic copper from its solutions. The same amount of iron is required to precipitate a ton of copper whether extracted from a poor or a rich ore, but as for the smelting of the latter much less fuel is required, it follows that rich ores are generally treated by smelting rather than in the wet way, any saving of fuel in the latter being more than compensated for by the cost of iron. No general rule however can be laid down to determine what grade of ore can be more profitably treated by one method or the other, inasmuch as circumstances of locality, affecting the cost of fuel and the price of iron, must in each case be taken into account.

The various other wet methods of copper-extraction may be divided into two classes: those in which the previously oxydized ore is treated with hydrochloric or sulphuric acid to dissolve the oxyd of copper, and those in which sulphuretted ore, generally after a preliminary roasting, is calcined with an admixture of sea-salt or of sulphate of soda, by which the copper is converted into chlorid or into sulphate. All of these methods, when properly applied, effect a pretty thorough extraction of the copper, but the cost of the reagents which have to be added to every charge of ore, preclude altogether the use of some of these methods, except in certain favored localities, and render them in almost all cases, it is believed, less economical than the present one with the Hunt and Douglas bath, for which the following advantages are claimed:

I. It is a general method adapted to all compounds of copper, while that by calcination with salt is only applicable to sulphuretted ores.

II. It does not require the addition of reagents such as acids, salt or sulphate of soda to each charge of ore, since in the regular course of the operation the solvent required for the treatment of the ore is constantly reproduced.