

Smelting Science



This collection of modules is mostly based on **John E. Rehder's** [remarkable book](#): "*The Mastery and Uses of Fire in Antiquity*". It was a real eye-opener for me.

What will be covered is.

- **1. [Furnace and Fire](#)**
How hot can it get? Containing heat flow and making the best out of bio fuel.
- **2. [Charcoal Technology](#)**
Are all charcoals created equal? What makes a charcoal fueled fire different from a wood fire? How about producing carbon monoxide?
- **3. [Smelter Technology](#)**
Basics of CO production and smelter design. The role of the tuyere. Why do we have several important temperatures in efficient smelting?
- **4. [Supplying Air to Smelters](#)**
Supplying air by blow pipes, natural draft, wind, and bellows. Why bellows make the difference.
- **5. [Slag and Different Ways of Smelting](#)**
Limits to the size of a smelter. Is hotter always better? Why is slag so good for you? How did the "messy and inefficient" very early smelting work? Smelting in crucibles.
- **6. [Getting Serious about Smelting Iron](#)**
Boudouard equilibrium and Baur-Graessler diagram. Why theory shows that smelters can only produce carbon-lean wrought iron, and why real smelters produce everything including high carbon steel and cast iron.