abundantly satisfied if attention other than professional is awakened to the responsibility attending its selection and use.

Starting then from the ore, which is simply the pure metal combined with different degrees of earthy impurities, we have, as the first result of the contact of the ore with the fuel, the product from the blast-furnace called pig-iron, which commercially has different grades, numbered 1, 2, 3, 4, etc., all produced through different proportions of the fuel used, the temperature, volume, and pressure of the blast in a given time.

The low numbers are always the most expensive to produce, and are used for foundry purposes, and are known as "foundry pig," while the high numbers are converted into wrought-iron through the medium of the puddling-furnace, and are called "forge-pig." The foundry irons are often termed grey irons, and the forge-pig, white iron. Pig-iron (disregarding impurities always present) is essentially a combination of carbon and metallic iron, which combination is partly chemical and partly mechanical. Foundry pig-iron may be recognized by its softness, and, when freshly broken, by its presenting a fracture of an open, crystalline texture, and of a dull grey color. Forge-pig is hard and fine grained, generally presenting a white-appearing fracture, and at other times a mottled one. The former flows readily in the moulds of the foundry, being very fluid when melted, while the latter, which