IRON PROPER.

It is a curious fact in connection with the history of iron that whilst it is so extremely ductile as to admit of being drawn out into a wire smaller than a human hair that it cannot, like gold, be beaten into very thin leaves. It is the most tenacious of all known metals, inasmuch as a wire of only the 787 of a line in diameter is capable of sustaining a weight of 550 lbs. It is peculiar to iron to assume a pasty consistence below the melting point. It is forgeable at a bright red heat, whilst at a white heat it will admit of union by pressure alone without forging. This process is called welding. Iron altogether free from carbon cannot be welded without great difficulty, as may be illustrated in what is known in the trade as burnt iron.

Such is the affinity which iron has for oxygen gas that a piece of the metal at welding heat cannot be exposed for a single moment to the atmosphere (even during the instant of time intervening between its leaving the fire and reaching the anvil) without its acquiring a scale of oxide of iron and which always acts as an impediment to the welding process. To obviate this obstacle smiths are in the habit of thrusting the heated metal instantly on withdrawing it from the fire into silecious sand, which, by its chemical affinity, acts as an excellent flux.

Iron may be volatalized by exposure to volcanic action and combustion in oxygen gas, and at a white heat will readily burn in the atmosphere. After fusion iron is rendered crystalline and the larger the crystals the more readily can the metal be fractured, whether by concussion, by vibration, or by frost. One of the most remarkable characteristics of iron is instanced in its susceptibility to magnetism, and such is the influence over the metal by this agent that the passage of an electric current through iron wire that its tenacity is said to be augmented more than 300 in 2,500. When reduced to the condition of steel, iron admits of being rendered permanently magnetic, which quality, however, is destroyed entirely by the immersion of the magnetized metal into boiling Almond Oil. Melting heat of iron not ascertained but supposed to be about 1,550. Having now described most of the peculiarities proper to iron, we proceed to speak of the principal conditions under which it is found. As iron in its pure native form is almost entirely referrable to a meteoric origin, and as it is our present intention at some future day to read an essay before the Ottawa N. H. Society on Ærolites, and in which it will be duly represented, we reserve what we have to say regarding it, especially as it serves little or no economic purpose; nor shall we now, as it is foreign to the subject of this essay, which is intended to be purely practical, enter into any digression in connection with either the chemistry or the chemical affinities of iron, but at once proceed to describe the circumstances under which this all-important metal is met with in nature.

MAGNETIC OXIDE OF IRON.

Synonoms: Magnetite, Black Oxide of Iron, Oxydulous Iron, Octahedral Iron.

In pure metal this oxide is the richest of all the ores of iron, and the one with which in Canada we have by far most to do, its formula being Fe 3. O 4, leaving 73 per cent of pure iron. It is this variety of iron ore which produces the native loadstone; it is infusible before the blow-pipe, but is soluble in nitric acid, and is the only ore of iron which exercises polaric influence. It occurs in dark, heavy masses or black octahedral cryatals, and is found in the older primary rocks, with us in the Laurentoids, which begin at Gaspe and end in the Rocky Mountains. The Dannemora Swedish iron produced from this ore is looked upon as the best in Europe, but there can be no sort of question that within fifty miles of the city of Ottawa we have an equally pure and rich material, which, for reasons easily understood, it would be better not to particularize at this individual moment. The rock formations in which the magnetic oxide of iron is found never contain coal, and this amongst other reasons, no doubt, accounts for the iron produced from it being ever of a superior quality, inasmuch as all the furnaces have to be worked by wood charcoal, which agent as is well known does not contain sulphur, an elemental constituent always detrimental to metallurgic operations. The Magnetic Oxide of Iron is also, and not unfrequently, found largely distributed from oceanic action in the form of Black Sand, and our friend, Robert Bell, has been fortunate enough to obtain the title deed of a deposit of this description, which sooner or later, unless we mistake, as a direct producer of Steel, will