

History

Iron epitomises the modern world. Iron is used to make steel, and steel has been the foundation for modern civilisation. Without steel there would be no cars or trains, no container ships or high rise buildings, no great bridges or railways.

Humanities relationship with iron began thousands of years ago when prehistoric humans first encountered meteoric iron - iron within meteorites. It is difficult to determine time frame for when this began for two reasons. Firstly because iron oxidises, iron objects disintegrate over time. Secondly, meteorites have fallen to earth since the planet's formation so it has existed and has been around waiting to be discovered and transformed. What is known is that meteoric iron is rare and when it was found it appears to have been common for these pieces to have been recognised as extremely useful and utilised in any way possibleⁱ.

Geology

Iron is found in a large number of mineral formations thanks to its abundance in the earth's crust. The most commercially important iron ores are the minerals hematite (70% Fe), goethite (63% Fe), limonite (up to 60% Fe), and magnetite (72% Fe)ⁱⁱ.

The vast majority of the world's significant iron ore deposits occur as iron-rich sedimentary rocks known as banded iron formations (BIFs). These formations are nearly exclusively of Precambrian age (i.e. older than 600 million years) and occur on all continents. Banded iron formations are the source rocks for most of the large high-grade iron ore deposits currently mined throughout the worldⁱⁱⁱ.

Iron ore is present across Australia, although the vast majority (almost 93 per cent) is found in Western Australia which has a total identified resource of approximately 64 billion tonnes. The Hamersley Province alone accounts for almost 80% of Australia's identified iron ore resources and is one of the world's major iron ore provinces^{iv}.

Use

The real story of our love affair with iron began when the knowledge and technology required to smelt iron was first developed. It is believed that this took place over 4000 years ago, however, iron objects would remain the possessions for only the privileged few for millennia, as the much easier to work metals such as tin and copper (and their alloys) were the most common source for tools and weapons^v. The use of iron slowly increased over the centuries as metallurgists and blacksmiths became more adept smelting and working the metal, which was difficult due to its strength, hardness and high melting temperature of 1,538 °C.

Today, iron represents some 95 per cent of global metal production, so is by far the most dominant metal to both the global economy and human civilisation.

Victoria

In Victoria exploration work is underway to assess the commercial viability of developing the State's iron ore resources which are predominantly surface ironstone formations of limonite. These deposits could provide great economic opportunities and benefits to the State^{vi}.

ⁱ Buchwald, V.F. (2005) *Iron and Steel in Ancient Times*; Volume 29 of *Historisk-Filosofiske Skrifter*; Kgl. Danske Videnskabernes Selskab.

ⁱⁱ GeoScience Australia, Australian Mines Atlas, Iron http://www.australianminesatlas.gov.au/education/fact_sheets/iron.html

ⁱⁱⁱ Ibid GeoScience Australia.

^{iv} Ibid GeoScience Australia.

^v Ibid Buchwald, V.F.

^{vi} Victorian Department of Primary Industries (DPI) (2012), Earth Resources, Iron <http://www.dpi.vic.gov.au/earth-resources/minerals/metals/iron>