Austenite, Pearlite, Martensite

How did these names come into being?

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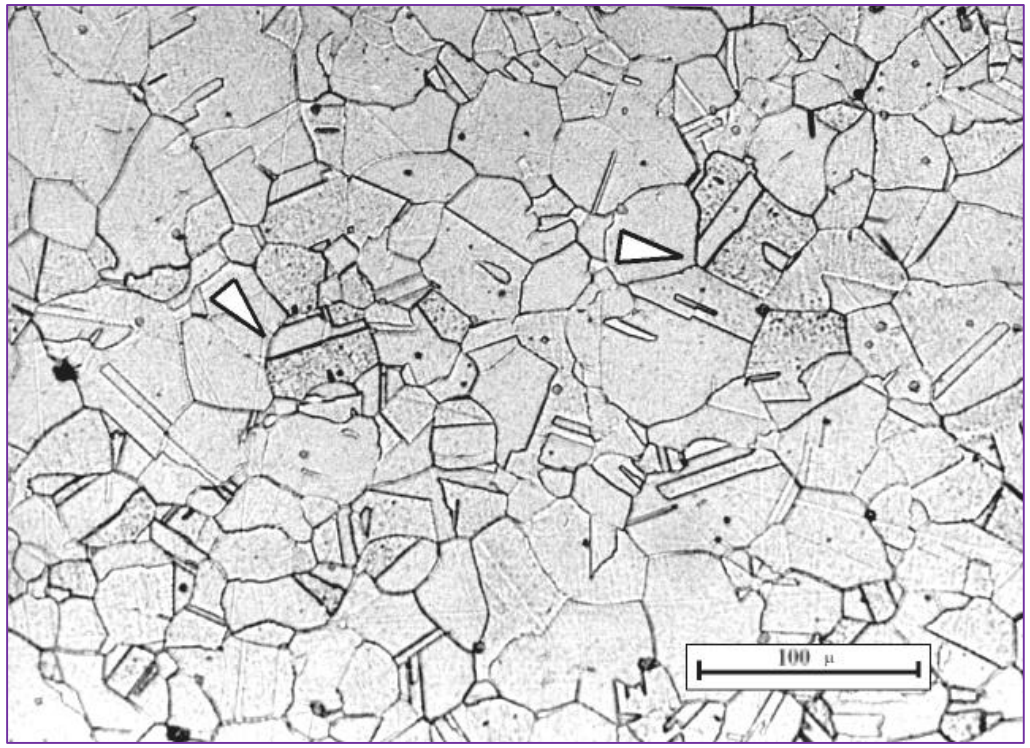
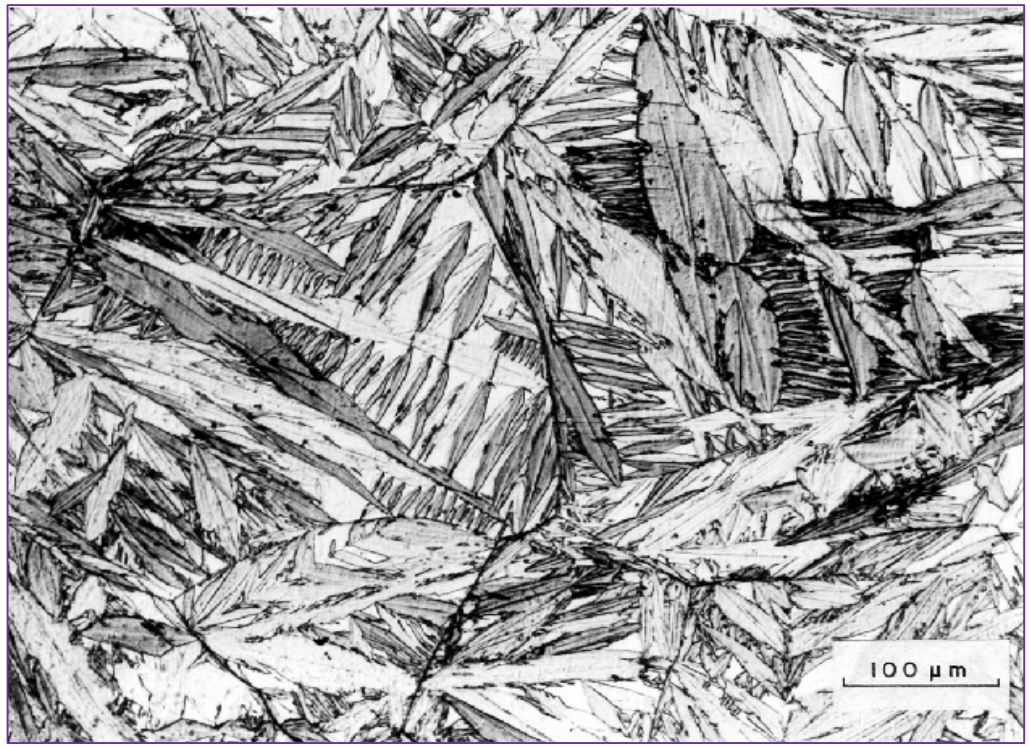
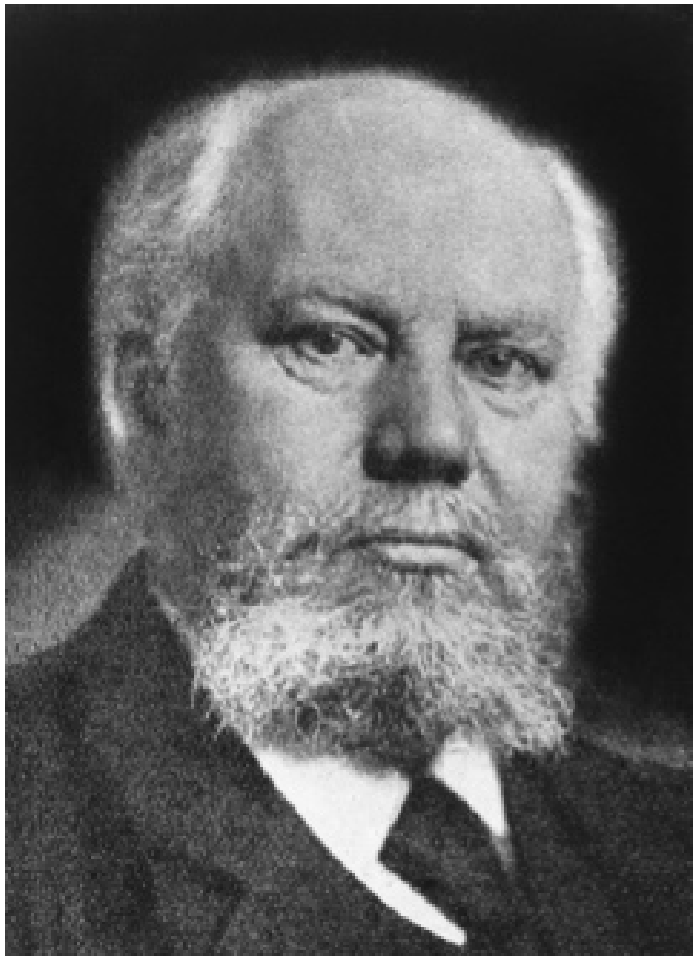
Austenite was named after Sir William Chandler Roberts-Austen, a British metallurgist (1843–1902).

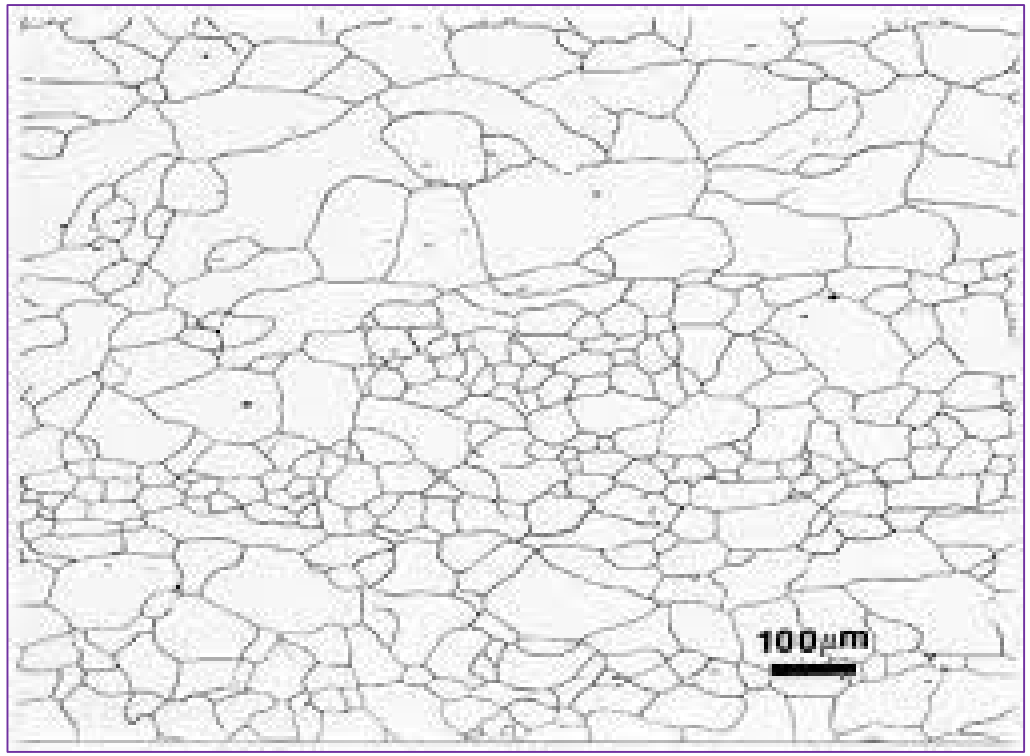


Martensite was named after German scientist and metallographer Adolf Martens (1850 - 1914).

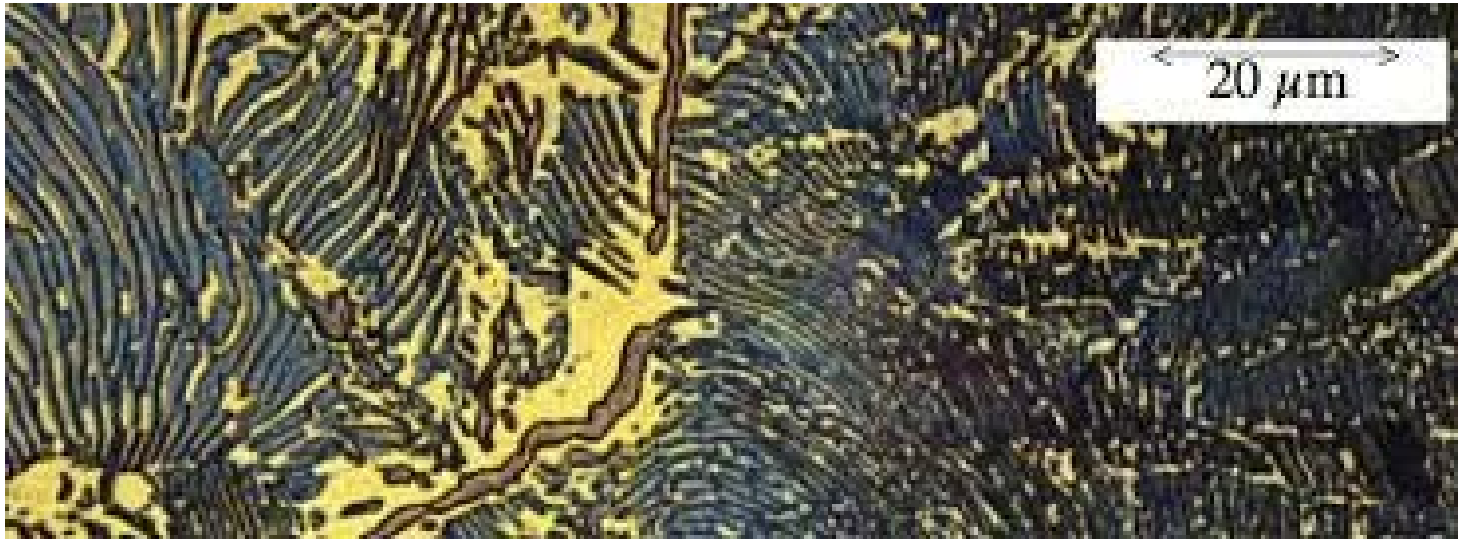




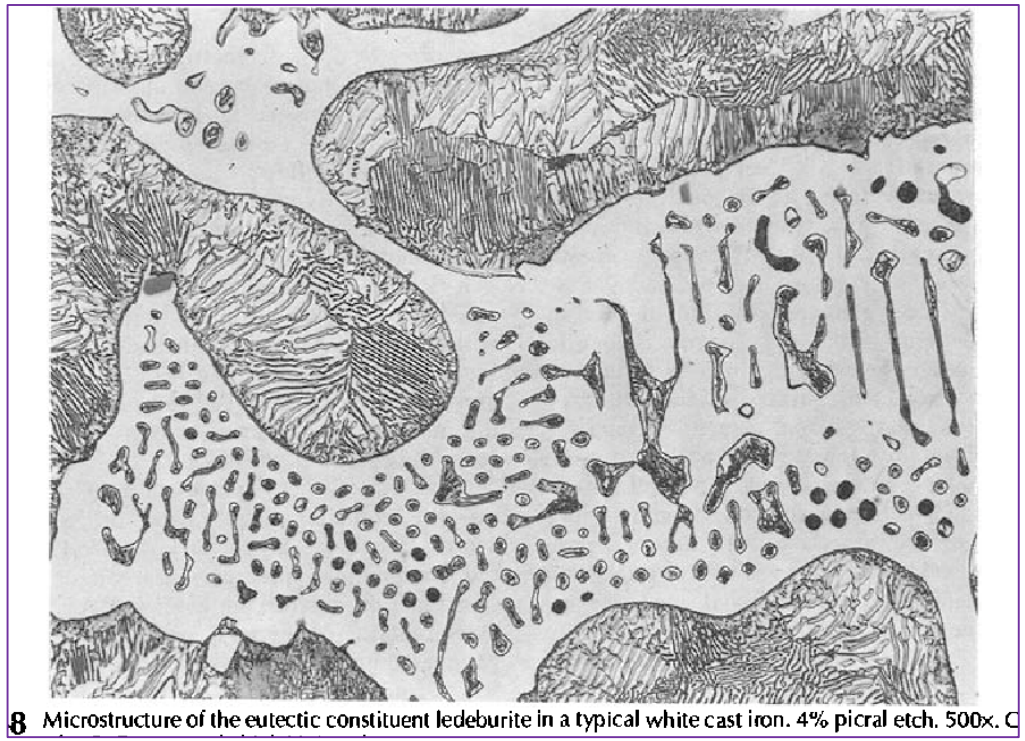
Ferrite is practically self-explaining: Ferrum is the Latin root for many modern words around iron and iron compounds. The word ferrum is possibly of Semitic origin.



Pearlite has its name from the pearl-like luster and iridescence of its appearance.

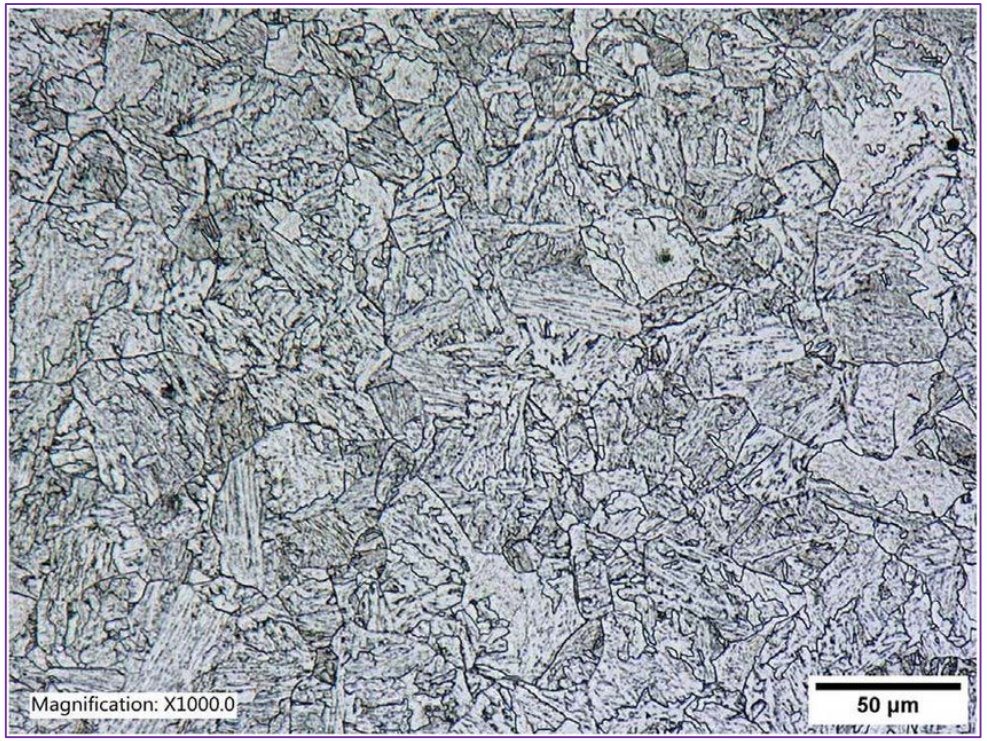


Ledeburite is named after German Metallurgist Karl Heinrich Adolf Ledebur (1837-1916).

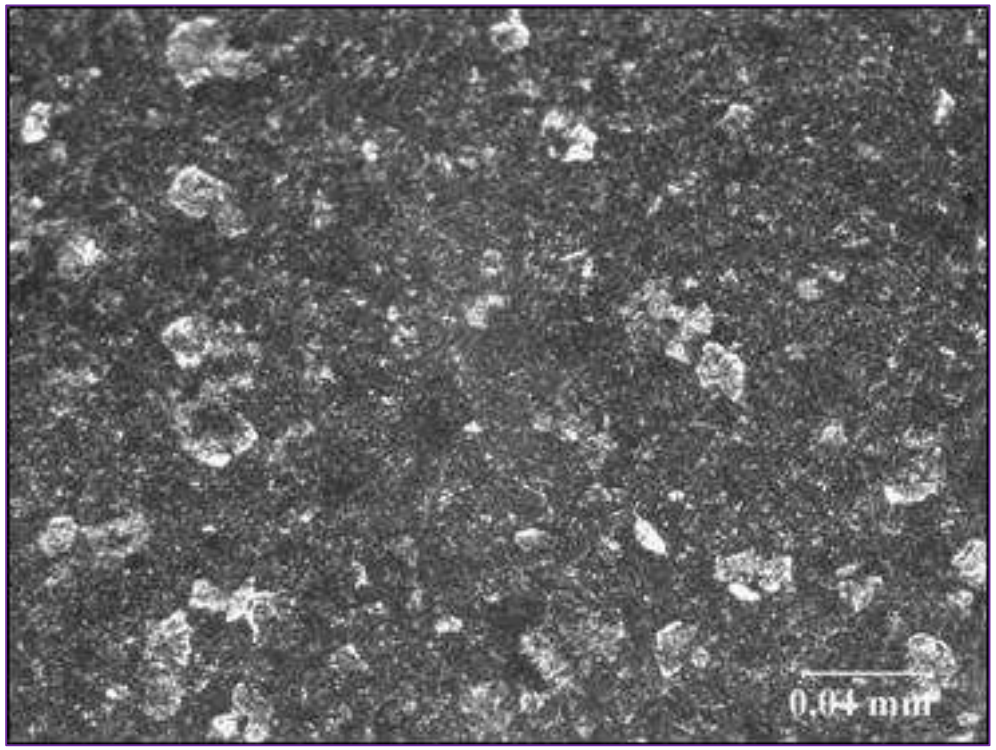


8 Microstructure of the eutectic constituent ledeburite in a typical white cast iron. 4% picral etch. 500x. C

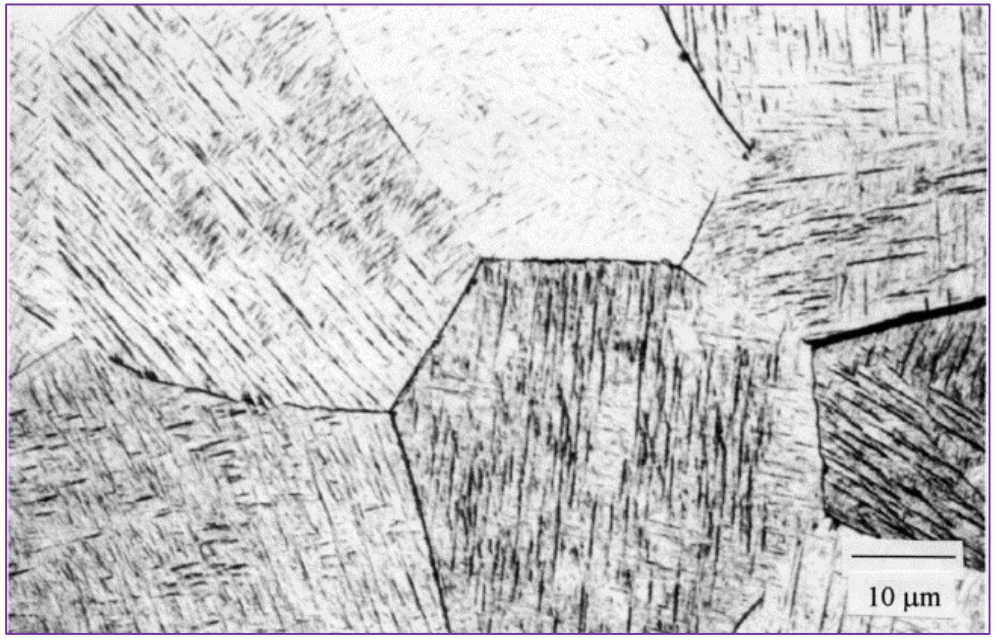
Bainite is named after the American metallurgist Edgar Collins Bain (1891-1971).

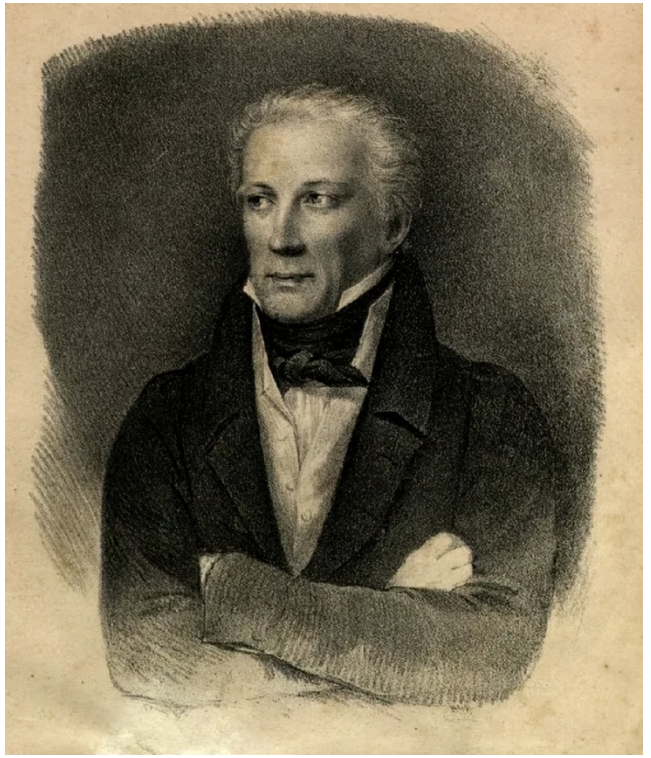


Sorbite is named after the English microscopist and geologist Henry Sorby (1826-1908).



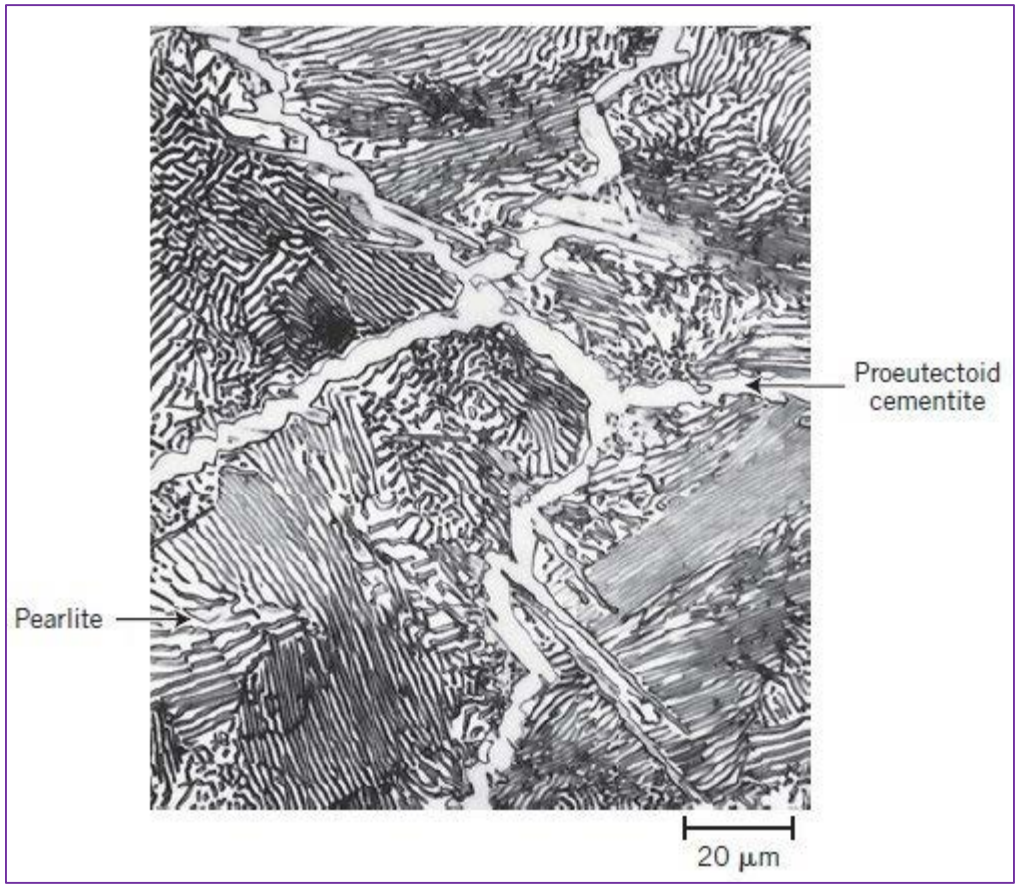
Widmanstätten structure was named in 1808 after the recognition of this pattern by Count Alois von Beckh Widmanstätten, an Austrian mineralogist, who worked in Vienna. (1754 –1849)



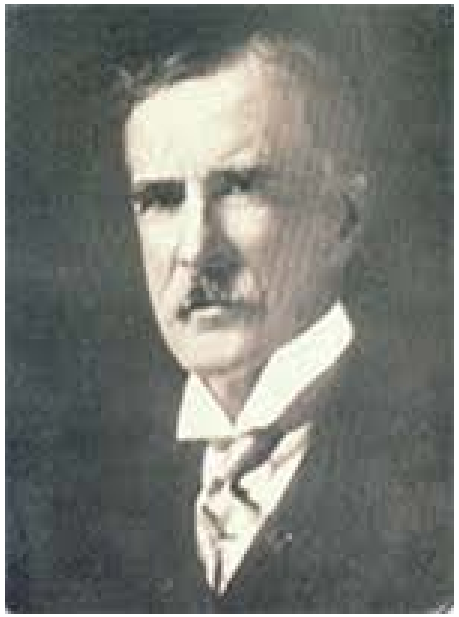


The name cementite has something to do with the English word "cement", meaning something that binds or glues things together in this context.

In 1885, Osmond and Werth published their "Cell-Theory", in which not only the existence of allotropic forms of iron was proposed (now known as austenite and ferrite), but in which also a new look at carbide formation was given. Their research on high-carbon steels, showed that the matrix consisted of grains or cells of iron, encapsulated by a thin layer of iron carbide. During solidification, iron globules, or cells, are formed first and continue to grow. The remaining melt solidifies as iron carbide. In this way, the carbide phase actually glues or binds the previous formed cells together.

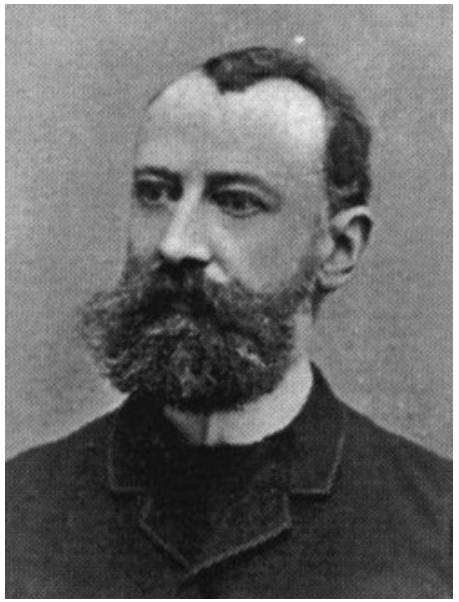


The names ferrite, austenite, pearlite, eutectoid, and martensite all were suggested by two men, an American, Henry Marion Howe and a Frenchman, Floris Osmond, in the time period of 1890 - 1903.



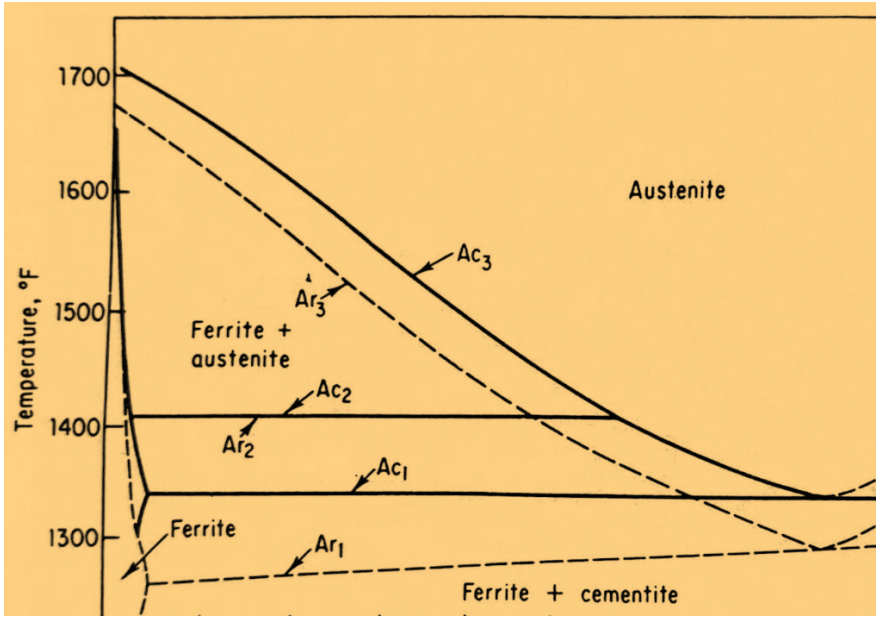
In the evolution of science the names suggested by researchers often fall by the wayside. An example of this is Howe's suggestion that martensite be called hardenite.

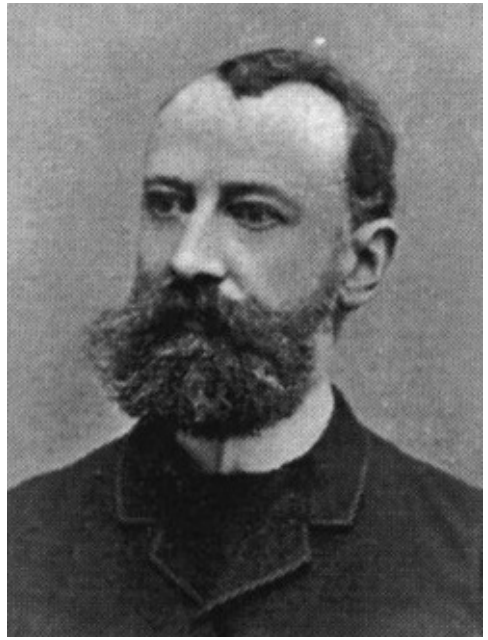
It seems unfortunate to this author that Osmond's preference for martensite was eventually adopted, as the term hardenite so aptly describes the outstanding property of the martensite phase.



The same French scientist, Floris Osmond, who is responsible for the name of martensite is also responsible for the use of the letters "r" and "c" for the shift in the A lines on cooling and heating. At the end of the 19th century, he was the first scientist to use thermocouples to measure the effect of heating and cooling rates.

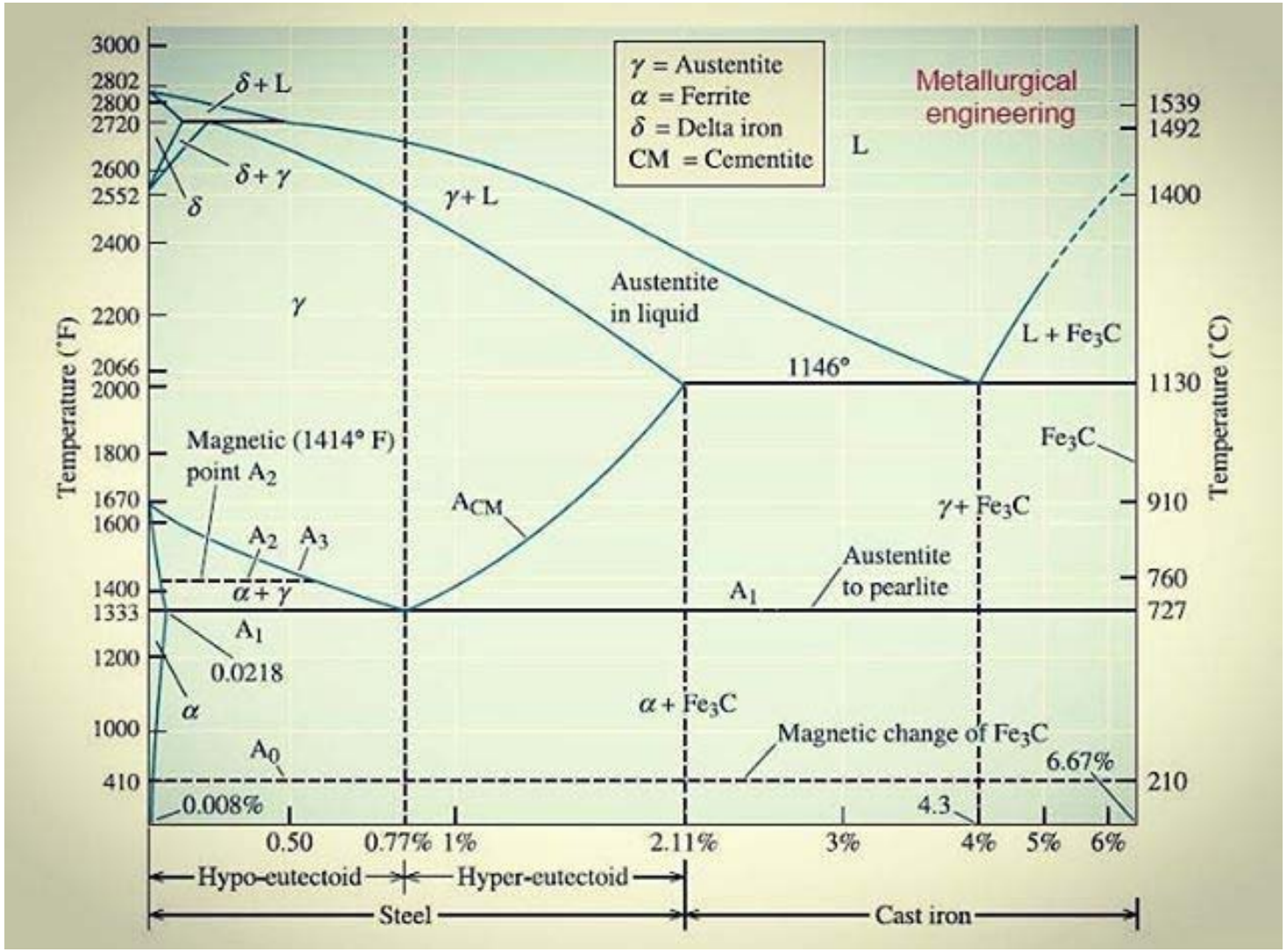
The letter "r" is from the French word for cooling, refroidissement, and the letter "c" is from the French word for heating, chauffage.





We are familiar with lines A1 and A3 in iron-carbon diagram, but it is good to know that there are also lines A0 and A2, the first of which shows the temperature of the change in the magnetic properties of cementite, and the second is the Curie temperature or 770 degrees Celsius, which refers to the temperature of the change of the magnetic properties of iron.

It is named after the famous French physicist Pierre Curie.



This presentation was developed by Kamran Khodaparasti.

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https://en.wikipedia.org

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