

Harry Brearley and the History of Stainless Steel, 1913 - 2013

Over the course of the 19th century many experiments were made with iron and steel to develop new alloys and investigate their properties. Many of these trials concerned resistance to corrosion. By the early 1900s, metallurgists in Germany, France and the United States were getting close to developing what we now know as stainless steel. But one man in Sheffield was ahead of them.

Harry Brearley was born in Sheffield in 1871, the son of a steel melter. He left school at the age of twelve and got a job as a labourer in one of Sheffield's steelworks, later transferring to the post of general assistant in the company's chemical laboratory. For several years, as well as his laboratory work, he studied at home and in formal evening classes, in steel production techniques and chemical analysis methods.

By the time he was 30, Brearley had earned a reputation as an experienced professional and for being able to resolve practical, industrial and metallurgical problems. In 1908 two of Sheffield's principal steelmaking companies agreed to jointly finance a common research laboratory (Brown Firth Laboratories), and Harry Brearley was asked to lead the project.

In 1912 he was given a task by a rifle manufacturer who wanted to prolong the life of his gun barrels which were eroding away too quickly. He set out to create erosion-resistant steel (not corrosion-resistant) by developing steel alloys containing chromium. He made several variations of alloys, ranging from 6% to 15% chromium with different measures of carbon.

On 13th August 1913 Brearley created steel with 12.8% chromium and 0.24% carbon, which is thought to be the first ever stainless steel. It is said that he had to etch his steels with nitric acid to examine them under a microscope and analyse their potential resistance to chemical attack. He found that his new steel resisted these chemical attacks and so he tested the sample with other agents, including lemon juice and vinegar. Brearley was astounded to find that his alloys were still highly resistant, and immediately recognised the potential for his steel within the cutlery industry.

Brearley struggled to win the support of his employers for this new outlet, and teamed up with local cutler R. F. Mosley. Brearley was going to call his steel 'Rustless Steel' but Ernest Stuart, Cutlery Manager at Mosley's Portland Works, called it 'Stainless Steel' after testing the material with vinegar, and the name stuck.

Harry Brearley, one of Sheffield's greatest sons, died in 1948 and is buried in Sheffield Cathedral.