Background information:

**Sir Joseph Whitworth**

Greatest contributions to engineering:

\* The Whitworth thread: Obsessed with precision, Sir Joseph Whitworth pushed for a standard screw thread system, which allowed for interchangeable parts to be made separately, accurately and in large quantities, forever changing manufacturing and mass production.

\* The measuring machine: Defying the limitations of human sight, Whitworth built a bench micrometer that allowed engineers to measure a millionth of an inch. At the time, measuring one sixteenth of an inch was considered accurate. He also created his own system of standard gauges.

\* True planes: Inspired by engineers like Henry Maudslay and Joseph Clement, Whitworth invented a new system to achieve a perfectly flat surface through hand-scraping and comparing three matching planes (instead of grinding together two planes, as was the norm).

\* Rifles and canons: Whitworth researched the accuracy of 19th century rifles, refined them and created the Whitworth Rifle. He also contributed to the evolution of casting and forging steel, used in ordnance.

\* Whitworth founded the Whitworth Scholarship (still running 150 years later) and left £500 000 to the advancement of science and engineering in his will. Throughout his life, he supported universities and led engineering institutions, such as the Institution of Mechanical Engineers.

*“The world has record of very few lives that have contributed more largely than Whitworth’s towards what he conceived to be the great task of humanity - to establish the supremacy of intelligence over the material universe.”*

- Institution of Civil Engineers, 1888

The life of an “engineering genius”:

Whitworth was born on 21 December 1803 in Stockport, Cheshire, near Manchester.

Following the death of his mother, and with some basic education, a 14-year-old Whitworth was sent to work at his uncle’s cotton-spinning mill in 1818. Four years later, having made manager, he decided to leave and to learn how to make his own machines.

For about a decade, Whitworth worked in the Manchester and London workshops of legendary engineers like Henry Maudslay and Joseph Clement. It was here that the young Whitworth became obsessed with accuracy and was infused with ideas about interchangeability and standardisation.

At the age of 30, Whitworth broke away and moved back to Manchester to open his own business. “Joseph Whitworth, Tool-Maker from London” read the sign on Chorlton Street. By returning to Manchester in 1833, Whitworth found himself inside Britain’s industrial heartland during the age of the railway and a “glorious time for engineers”.

In 1841, Whitworth presented his system of standard screw threads. Ten years later, his “millionth of an inch” measuring machine was displayed at the Great Exhibition. During this time, his business grew into a world leading manufacturer of machine tools. It would eventually hire over a thousand workers and export into Europe and South America.

Whitworth had a reputation for being a perfectionist, who was intolerant of imperfection. Some described him as a difficult man, unwilling to compromise but always prepared to make important decisions.

In the 1850s, Whitworth was approached by Britain’s War Office to consult on the manufacture of the Enfield rifle. His research and innovation in this field were never formally adopted by government, but they led to the creation of the renowned Whitfield Rifle and advancements in the forging of steel.

In 1862, a quarter of all machine tools being displayed at the Great Exhibition were built by Whitworth’s firm. At about the same time, Whitworth began to lead the Institute of Mechanical Engineers, became a fellow of The Royal Society and, determined to leave a lasting legacy, formulated plans for his scholarship.

On 18 March 1868, Whitworth wrote to then Prime Minister Benjamin Disraeli to propose the creation of the Whitworth Scholarship. The scholarship soon opened to candidates “of sound bodily constitution and of good character”. The big idea behind the programme was to allow those with hands-on experience to widen their outlook through academia. Queen Victoria supported the scholarship and formally dubbed the benefactors “Whitworth Scholars”.

The following year, in 1869, Whitworth was created a Baronet.

During his career, Sir Joseph Whitworth registered dozens of patents, won numerous awards and dabbled in the creation of everything from horse-drawn street sweepers to knitting machines. He received honorary degrees from universities in England and Ireland, was awarded the Legion of Honour in France and the Royal Medal in Spain and was made a commander of the Brazilian Imperial Order of the Rose.

By 1880, Whitworth’s thread and gauges systems were in such common use, they were adopted by the Board of Trade. He earned his place in history as one of the founding fathers of manufacturing and mass production.

Whitworth married twice but had no children from either marriage. Late in life, he found some new passions, including agriculture and gardening. He took long walks, played billiards and spent winters in the French Riviera. He died in early 1887, aged 83, leaving a large portion of his wealth to charitable causes.

Additional Information:

In 1923, the Whitworth Society was founded to support all Whitworth Scholars and to promote engineering in the UK.

The Whitworth Scholarship is now 150 years old and has benefited over 2400 engineers. Currently, between 10 and 15 scholarships are awarded annually.

The Whitworth Society takes pride in the fact that 14 Whitworth Scholars have served as presidents of the Institution of Mechanical Engineers, while 17 have been fellows of the Royal Society.

*“His fame is written in iron and steel, and the daily practice of Whitworth’s men and women.”*

- The Royal Society of London

More detailed information can be found at: [www.whitworthsociety.org](http://www.whitworthsociety.org)