

Victorian Innovators

William Armstrong 1810 – 1900

Inventor, industrialist and scientist William Armstrong was the second son of a successful corn merchant who became mayor of Newcastle in 1850. His father William married Anne Potter. Her father was a colliery owner with a keen interest in government and with a wide circle of friends who contributed to the mercantile and industrial growth of Newcastle. All were keen to promote the intellectual life of Newcastle, notably via Literary and Philosophical Society. William's father wished his son to enter the professions rather than be 'in trade.' He introduced him to a friend, Andrew Donkin and, after training in London under brother-in-law William Henry Watson, he returned to Newcastle in 1833 to join the Donkin partnership.

The legal profession was not for William who yearned for a life devoted to science, industry and all things mechanical. His infectious enthusiasm rubbed off in experiments and research to achieve efficient and practical working models. This became known as The Armstrong Effect. Aged 36 he was elected a member of the Royal Society, an enormous achievement, especially as he was still practising in law. In 1847 he purchased land at Elswick on the Tyne and the partnership of W. G. Armstrong was formed.

Armstrong's first success was applying hydraulics to lifting massive weights. His biographer Peter McKenzie comments "the key to the general adoption of hydraulic systems" came in 1850-51 when he introduced a hydraulic accumulator, a means of increasing water pressure and therefore power. A water tower or otherwise high head of water was unnecessary. His success with dockside cranes led to more ambitious projects to move enormous objects that some felt impossible such as dry-dock gates and, in 1876, the Newcastle swing bridge and London's Tower Bridge in 1894.

His next achievement was in the application of small arms technology and manufacture of large guns almost half the weight of conventional guns but capable of projecting a missile three times as far with greater accuracy, using only half the charge. Knighted in 1859 he released his patents to the government after a series of accidents caused by incorrect closing of the breech. He continued to work technical prototypes and ten years later when the Army returned to breech-loading he was making some of the largest guns in the world - for export.

Armstrong's final achievement was building warships in partnership with Charles Mitchell in 1868. He was assisted by Andrew Noble who used his considerable expertise in hydraulics to develop even larger guns made with steel. The highpoint was 15 years from 1882 when the firms merged. Their worldwide reputation rivalled Krupps of Essen in Germany. Armstrong's achievements were further recognised in 1897 with the award of a peerage.

By the end of the 19th century the firm employed 25,000 people and the combined premises occupied 300 acres. The largest battleships of the time were built for customers around the world. This included half the ironclads in Japan's victorious war against Russia in 1902. Some were still in commission in 1941 when Japan attacked the USA fleet in Pearl Harbour.