

# Background Information on Alfred Nobel

Alfred Nobel was born in Stockholm on October 21, 1833. His father, Immanuel Nobel, was an engineer and inventor who built bridges and buildings in Stockholm. In connection with his construction work, Immanuel Nobel also experimented with different techniques of blasting rock.

Alfred's mother, Andrietta Ahlsell, came from a wealthy family. Due to misfortunes in the construction work caused by the loss of some barges of building material, Immanuel Nobel was forced into bankruptcy the same year Alfred Nobel was born. In 1837, Immanuel Nobel left Stockholm and his family to start a new career in Finland and in Russia. To support the family, Andrietta Nobel started a grocery store which provided a modest income.

Meanwhile, Immanuel Nobel was successful in his new enterprise in St. Petersburg, Russia. He started a mechanical workshop that provided equipment for the Russian army and he also convinced the Tsar and his generals that naval mines could be used to block enemy naval ships from threatening the city. The naval mines designed by Immanuel Nobel were simple devices consisting of submerged wooden casks filled with gun powder. Anchored below the surface of the Gulf of Finland, they effectively deterred the British Royal Navy from moving into firing range of St. Petersburg during the Crimean war (1853-1856). Immanuel Nobel was also a pioneer in arms manufacture and in designing steam engines.

Successful in his industrial and business ventures, Immanuel Nobel was able, in 1842, to bring his family to St. Petersburg. There, his sons were given a first class education by private teachers. The training included natural sciences, languages and literature. By the age of 17, Alfred Nobel was fluent in Swedish, Russian, French, English and German. His primary interests were in English literature and poetry as well as in chemistry and physics. Alfred's father, who wanted his sons to join his enterprise as engineers, disliked Alfred's interest in poetry and found his son rather introverted. In order to widen Alfred's horizons his father sent him abroad for further training in chemical engineering.

In Paris he met the young Italian chemist Ascanio Sobrero who, three years earlier, had invented nitroglycerine, a highly explosive liquid. Nitroglycerine was produced by mixing glycerine with sulphuric and nitric acid. It was considered too dangerous to be of any practical use. Although its explosive power greatly exceeded that of gun powder, the liquid would explode in a very unpredictable manner if subjected to heat and pressure. Alfred Nobel became very interested in nitroglycerine and how it could be put to practical use in construction work. He also realized that the safety problems had to be solved and a method had to be developed for the controlled detonation of nitroglycerine.

In 1852 Alfred Nobel was asked to come back and work in the family enterprise which was booming because of its deliveries to the Russian army. Together with his father, he performed



experiments to develop nitroglycerine as a commercially and technically useful explosive. As the war ended and conditions changed, Immanuel Nobel was again forced into bankruptcy. Immanuel and two of his sons, Alfred and Emil, left St. Petersburg together and returned to Stockholm. His other two sons, Robert and Ludvig, remained in St. Petersburg. With some difficulties they managed to salvage the family enterprise and then went on to develop the oil industry in the southern part of the Russian empire. They were very successful and became some of the wealthiest persons of their time.

After his return to Sweden in 1863, Alfred Nobel concentrated on developing nitroglycerine as an explosive. Several explosions, including one (1864) in which his brother Emil and several other persons were killed, convinced the authorities that nitroglycerine production was exceedingly dangerous. They forbade further experimentation with nitroglycerine within the Stockholm city limits and Alfred Nobel had to move his experimentation to a barge anchored on Lake Malaren. Alfred was not discouraged and in 1864 he was able to start mass production of nitroglycerine.

To make the handling of nitroglycerine safer, Alfred Nobel experimented with different additives. He soon found that mixing nitroglycerine with silica would turn the liquid into a paste that could be shaped into rods of a size and form suitable for insertion into drilling holes. In 1867, he patented this material under the name of dynamite. To be able to detonate the dynamite rods he also invented a detonator (blasting cap) which could be ignited by lighting a fuse. These inventions were made at the same time as the diamond drilling crown, and the pneumatic drill came into general use. Together these inventions drastically reduced the cost of blasting rock, drilling tunnels, building canals and many other forms of construction work.

The market for dynamite and detonating caps grew very rapidly and Alfred Nobel also proved himself to be a very skillful entrepreneur and businessman. Over the years he founded factories and laboratories in some 90 different places in more than 20 countries. Although he lived in Paris much of his life, he was constantly traveling. He focused on the development of explosives technology as well as other chemical inventions, including such materials as synthetic rubber, leather and silk. By the time of his death in 1896 he had 355 patents.

Alfred Nobel's greatness lay in his ability to combine the penetrating mind of the scientist and inventor with the forward-looking dynamism of the industrialist. Nobel was very interested in social and peace-related issues and held what were considered radical views in his era. He had a great interest in literature and wrote his own poetry and dramatic works. The Nobel Prizes became an extension and a fulfillment of his lifetime interests.

