

# Beyond Borders – History of Nobel Prizes

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## Alfred Nobel

There are few individuals that are so well known to the worldwide scientific community as Alfred Nobel. He was born in 1833 in Stockholm. His father, Immanuel Nobel, was a chemist and inventor. Alfred and his three brothers, Robert, Ludvig and Emil, grew up in Stockholm but parts of their teens were spent in St Petersburg, Russia. Alfred Nobel developed into a cosmopolitan. Throughout his adult life, he lived in many places.

In 1867 Alfred Nobel discovered that nitro-glycerine mixed with silica, kieselguhr, resulted in a paste-like material, dynamite, that was not explosive until it was ignited. Alfred Nobel's first dynamite patent was filed in Hamburg, Germany, 1867. It was then to be followed by several other dynamite patents in other countries.

During his last 10 years, Alfred Nobel lived in San Remo, Italy. In these years he suffered from angina pectoris and was prescribed, by his doctors in Paris, to take nitro-glycerine for his chest pain. He could not envision how this substance could be taken internally!! He refused and did not follow his doctor's orders. Alfred Nobel died on December 10, 1896. This is the reason why the Nobel Prize Ceremony is still held on December 10 and that the decorations of the Concert Hall and the City Hall in Stockholm are made up of flowers from San Remo.

## The testament

In his will and testament he states that the majority of his fortune (31 out of 33 million Swedish kronor) should be used for five prizes to those who "have conferred the greatest benefit on mankind". The five areas that should get equal parts were:

- ❖ Physics; for the most important discovery or invention,
- ❖ Chemistry; for the most important chemical discovery or improvement
- ❖ Physiology or Medicine; for the most important discovery
- ❖ Literature; for the most outstanding work of an idealistic tendency
- ❖ Peace; to the person(s) or organizations who have done the most or the best work for fraternity between nations, or for the reduction of standing armies, or for holding peace congresses.

## The Nobel Prize in Physiology or Medicine

Nobel Assembly and Committee

The Nobel Assembly, 50 professors at Karolinska Institutet in Stockholm, decides based on the scientific material presented to the Assembly by the Nobel Committee. Hence, it is the Nobel Committee that carries the responsibility for the in-depth scientific evaluation of each candidate or group of 2 to 3 candidates. The Nobel Committee has 5 regular members. Each member can sit no more than two times three years. In February every year, after the nomination deadline, the Nobel Committee selects 10 other professors at Karolinska Institutet as adjunct members. This way the most appropriate expertise matches the nominations to guarantee competent scientific evaluations.

## The Selection Procedure

In order to be awarded the Nobel Prize in Physiology or Medicine the candidate must have been **nominated during the year**. The **moment of discovery** is the most important scientific criterion. The discovery must have resulted in a paradigm shift proven to be **good for mankind**. All these three criteria must be fulfilled.

### **Some Nobel Prizes Statistics**

Over the 101 years, there were 9 years during which Nobel Prizes were not awarded. For the Prizes in Physiology or Medicine, Chemistry and Physics the US has been the dominating country during the last 50 years. Prizes awarded in Literature and Peace has, however, a different geographical distribution.

### **The 10 first and the 10 latest Prizes in Physiology or Medicine**

#### *A comparison*

Immunology was of interest in the beginning of the 20<sup>th</sup> century and the first Nobel Prize in Physiology or Medicine was given to Emil Adolf van Gehring, in 1901, for his work on serum therapy with regard to diphtheria. A few years later, 1908, another prize in immunology was awarded to Ilya Mechnikov and Paul Ehrlich “in recognition of their work on immunity”. Today, immunology continues to be an important field of research illustrated by the fact that Peter Doherty and Rolf Zinkernagel were awarded the Nobel Prize, in 1996, “for their discoveries concerning the specificity of cell mediated immune defence”. Another area of initial interest was infectious diseases. Sir Ronald Ross showed how parasites could cause malaria, in 1902, and Charles Laveran was, in 1907, awarded the Nobel Prize for showing how schistosoma parasites caused the African sleep disorder. Perhaps the most important discovery in relation to infectious diseases at this time was done by Robert Koch who got the Nobel Prize in 1905 for his studies of tuberculosis. These new principles for infections in the early 20<sup>th</sup> century are indeed paralleled by the 1997 award to Stanley Prusiner for his discovery of prions. Prions constitute a new biological principle of infection that occurs without the presence of DNA or RNA in the infectious agent. Camillo Golgi and Santiago Ramon Y Cajal were in 1906 awarded the Nobel Prize for the understanding that the central nervous system was not only a chaotic network but consisted of separate neurons that were in contact with each other via synapses. Almost 100 years later Arvid Carlsson, Paul Greengard and Eric Kandel were awarded the 2000 Nobel Prize for their work on how signals in the nervous system were transduced, with particular reference to dopamine, its cytoplasmatic activation of phosphorylation and for the learning process via nuclear transcription. Finally, there are close bonds, also between the 1910 Nobel Prize award to Albrecht Kossel for his work on proteins, including the nucleic substances, with the 1999 award to Günther Blobel who discovered that proteins have intrinsic signals of importance for their transport and localization within the cell.

### **An Idea Lives On**

The Nobel Prizes award:

- extra ordinary achievements in natural sciences
- promotion of peace
- idealist in literature

that are being publicly recognized worldwide in December each year. Most importantly, however, the Nobel Prizes stimulate freedom of thought, fantasy and creativity in the young generation. Key factors for continued development and for the making of new discoveries of importance for mankind.