# HALL OF FAME
## Meet the Nobel Laureates (10th)

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**1924**

The Nobel Prize in Physiology or Medicine 1924 was awarded to **Willem Einthoven** *"for his discovery of the mechanism of the electrocardiogram"*.

**Willem Einthoven** was awarded the Nobel Prize *"for his discovery of the mechanism of the electrocardiogram"*.

**Background**

**Born:** 21 May 1860, Semarang, Java, Dutch East Indies (now Indonesia)
**Affiliation at the time of the award:** Leiden University, Leiden, the Netherlands
**Died:** 29 September 1927, Leiden, the Netherlands

**Prize motivation:** "for his discovery of the mechanism of the electrocardiogram"
**Field:** cardiovascular physiology

**Biography**

**Willem Einthoven** was born on 21 May, 1860, in Semarang on the island of Java, in the former Dutch East Indies (now Indonesia). His father was Jacob Einthoven, born and educated in Groningen, the Netherlands, an army medical officer in the Indies, who later became parish doctor in Semarang. His mother was Louise M.M.C. de Vogel, daughter of the then Director of Finance in the Indies. Willem was the eldest son, and the third child in a family of three daughters and three sons.

At the age of six, Einthoven lost his father. Four years later his mother decided to return with her six children to Holland, where the family settled in Utrecht.

After having passed the "Hogere Burgerschool" (secondary school), he in 1878 entered the University of Utrecht as a medical student, intending to follow in his father's footsteps. His exceptional abilities, however, began to develop in quite a different direction. After being assistant to the ophthalmologist H. Snellen Sr. in the renowned eye hospital "Gasthuis voor Ooglidders", he made two investigations, both of which attracted widespread interest. The first was carried out after Einthoven had gained his "candidaat" diploma (approximately equivalent to the BSc degree), under the direction of the anatomist W. Koster, and was entitled "Quelques remarques sur le mécanisme de l'articulation du coude" (Some remarks on the elbow joint). Later he worked in close association with the great physiologist F.C. Donders, under whose guidance he undertook his second study, which was published in 1885 as his doctor's thesis: "Stereoscopie door kleurverschil." (Stereoscopy by means of colour variation) – one of Einthoven's teachers was the physicist C.H.D. Buys Ballot, who discovered the well-known law in meteorology.

That same year, 1885, he was appointed successor to A. Heynsius, Professor of Physiology at the University of Leiden, which he took up after having qualified as general practitioner in January 1886. His inaugural address was entitled "De leer der specifieke energieen" (The theory of specific energies). His first important research in Leiden was

published in 1892: "Über die Wirkung der Bronchialmuskeln nach einer neuen Methode untersucht, und über Asthma nervosum" (On the function of the bronchial muscles investigated by a new method, and on nervous asthma), a study of great merit, mentioned as "a great work" in Nagel's "Handbuch der Physiologie". At that time he also began research into optics, the study of which occupied him ever since. Some publications in this field were: "Eine einfache physiologische Erklärung für verschiedene geometrisch-optische Täuschungen" (A simple physiological explanation for various geometric-optical illusions ) in 1898; "Die Accomodation des menschlichen Auges" (The accomodation of the human eye) in 1902; "The form and magnitude of the electric response of the eye to stimulation by light at various intensities", with W.A. Jolly in 1908.

Up till now, his talents had not yet been developed to the full. This opportunity came when he began the task of registering accurately the heart sounds, using a capillary electrometer. With this in view, he investigated the theoretical principles of this instrument, and devised methods of obtaining the necessary stability, and of correcting mathematically the errors in the photographically registered results due to the inertia of the instrument. Having found these methods he decided to carry out a thorough analysis of A.D. Waller's electrocardiogram – a study which has remained classic in its field.

This investigation led Einthoven to intensify his research. To avoid complex mathematical corrections, he finally devised the string galvanometer which did not involve these calculations. Although the principle in itself was obvious, and practical applications of it were made in other fields of study, the instrument had to be precisioned and refined to make it usable for physiologists, and this took three years of laborious work. As a result of this, a galvanometer was produced which could be used in medical science as well as in technology; an instrument which was incomparable in its adaptability and speed of adjustment.

He then, with P. Battaerd, took up the study of the heart sounds, followed by research into the retina currents with W.A. Jolly (begun earlier with H. K. de Haas). The electrocardiogram itself he studied in all its aspects with numerous pupils and with visiting scientists. It was this last research which earned him the Nobel Prize in Physiology or Medicine for 1924. In addition to this the string galvanometer has proved of the highest value for the study of the periphery and sympathetic nerves.

In the remaining years of his life, problems of acoustics and capacity studies came within the sphere of his interests. The construction of the string phonograph (1923) could be considered as a consequence of this.

Einthoven possessed the gift of being able to devote himself entirely to a particular field of study. (His genius was actually more orientated towards physics than physiology.) As a result he was able to make penetrating inquiries into almost any subject which came within the scope of his interests, and to carry out his work to its logical conclusion.

Einthoven was a great believer in physical education. In his student days he was a keen sportsman, repeatedly urging his comrades "not to let the body perish". (He was President of the Gymnastics and Fencing Union, and was one of the founders of the Utrecht Student Rowing Club.) His first study on the elbow joint resulted from a broken wrist suffered while pursuing one of his favourite sports, and during the somewhat involuntary confinement his interest was awakened in the pro- and supination movements of the hand and the functions of the shoulder and elbow joints.

The string galvanometer has led countless investigators to study the functions and diseases of the heart muscle. The laboratory at Leiden became a place of pilgrimage, visited by scientists from all over the world. For this, suffering mankind has much to owe to Einthoven. In electrocardiography the string

galvanometer is the most reliable tool. Although it has been superseded by portable types and by models utilizing amplification techniques used in radio communication (Einthoven has always mistrusted the use of condensers, fearing the distortion of curves), cardiograms from the string galvanometer have remained the standard of reference in numerous cases to this day.

Einthoven was a member of the Dutch Royal Academy of Sciences, the meetings of which he hardly ever missed. He frequently took part in the debates himself, and his sharp criticism frequently found weaknesses in many a lecture.

Einthoven married in 1886 Frédérique Jeanne Louise de Vogel, a cousin, and sister of Dr. W.Th. de Vogel, former Director of the Dienst der Volksgezondheid (Public Health Service) in the Dutch East Indies. There were four children: Augusta (b. 1887), who was married to R. Clevering, an engineer; Louise (b. 1889), married to J.A.R. Terlet, pastor emeritus; Willem (1893-1945) – a brilliant electro-technical engineer who was responsible for the development of the vacuum model of the string galvanometer and for its use in wireless communication, and who was Director of the Radio Laboratory in Bandung, Java; and Johanna (b. 1897), a physician.

He died on the 29 September 1927 after long suffering.

**1925**

No Nobel Prize was awarded this year. The prize money was allocated to the Special Fund of this prize section.

**1926**

The Nobel Prize in Physiology or Medicine 1926 was awarded to **Johannes Andreas Grib Fibiger** *"for his discovery of the Spiroptera carcinoma"*.

**Background**

**Born:** 23 April 1867, Silkeborg, Denmark

**Died:** 30 January 1928, Copenhagen, Denmark

**Affiliation at the time of the award:** Copenhagen University, Copenhagen, Denmark

**Prize motivation:** "for his discovery of the Spiroptera carcinoma"

**Field:** disease transmission, medical oncology, parasitology
*Johannes Fibiger received his Nobel Prize one year later, in 1927.*

**Biography**

**Johannes Andreas Grib Fibiger** was born at Silkeborg (Denmark) on April 23, 1867. His father, C. E. A. Fibiger, was a local medical practitioner and his mother, Elfride Muller, was a writer. Fibiger gained his bachelor's degree in 1883 and qualified as a doctor in 1890. After a period of working in hospitals and studying under **Koch** and **Behring**he was, from 1891 to 1894, assistant to Professor C. J. Salomonsen at the Department of Bacteriology of Copenhagen University. While serving as an Army reserve doctor at the Hospital for Infectious Diseases (Blegdam Hospital) in Copenhagen from 1894 to 1897 he completed his doctorate thesis on Research into the Bacteriology of Diphtheria. He received his doctorate of the University of Copenhagen in 1895, and was subsequently appointed prosector at the University's Institute of Pathological Anatomy (1897 – 900), Principal of the Laboratory of Clinical Bacteriology of the Army (1890 – 1905), and (in 1905) Director of the Central Laboratory of the Army and Consultant Physician to the Army Medical Service. After studying for some time under Orth and Weichselbaum, Fibiger was appointed Professor of Pathological Anatomy at Copenhagen University and Director of the Institute of Pathological Anatomy (1900).

Fibiger fulfilled a large number of official missions and took part in the direction of numerous institutions. He was First Secretary, and later President of the Danish Medical Society, Consultant to the Council of Forensic Medicine, member of the Planning Commission for the Construction of the Medical Institutes of the National Hospital; Vice-President, and later President of the Danish Medical Association's Cancer Commission, member of the National Radium Committee, member of the Administrative Council of the Rask-Ørsted Foundation, of the Northern Society to Promote a Biological Station in the Tropics, of the Pasteur Society; he was a founder-member and joint-editor of the *Acta Pathologica et Microbiologica Scandinavica*, co-editor of *Ziegler's Beiträge zur pathologischen Anatomie und zur allgemeinen Pathologie*, member of the International Commission for Intellectual Cooperation with Other Countries, representing his country at numerous congresses and meetings, and member of a great many academies and societies, both Danish and foreign. Fibiger was also Vice-President, and afterwards President, of «Die internationale Vereinigung für Krebsforschung», member of the Royal Academy of Science and Literature of Denmark, of the Swedish Medical Association, of the Finnish Medical Association, corresponding member of the Association française pour l'Étude du Cancer, of the Société de Biologie of Paris, of the Helmintological Society of Washington, founder-member of Van Leeuwenhoekvereeniging for cancer study by experiment, honorary member of the Royal Academy of Medicine of Belgium and of the Wiener dermatologischen Gesellschaft, member of the Royal Society of Physiography of Lund and of the Royal Society of Science of Uppsala, honorary doctor of the Universities of Paris and Louvain, etc. Fibiger was the winner of numerous prizes, among which should be mentioned the Nordhoff-Jung Cancer Prize and the Nobel Prize for Physiology or Medicine, 1927, for his work on cancer.

Fibiger died on 30 January 1928, at Copenhagen after a short illness (cardiac failure with multiple emboli and massive pulmonary infarcts; cancer of the colon: caecostomy), survived by his wife Mathilde, *née* Fibiger, whom he married in 1894.

Source: From ***Nobel Lectures**, Physiology or Medicine 1922 – 1941*, Elsevier Publishing Company, Amsterdam, 1965.

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