

OPHTHALMOLOGY AND PHILATELY

III. SCIENTISTS WHO CONTRIBUTED TO OPHTHALMOLOGY

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Numerous scientists have contributed to the development and advancement of ophthalmic science and practice. Among them could be illustrated: Vesalius, Roentgen, Curie, etc. We are showing only those who had a direct bearing on ophthalmology.

1. Sir Isaac Newton (1642–1727) (Fig. 1)

A natural philosopher, mathematician and astronomist. Working at Trinity College in Cambridge he described gravity, cosmogony and the integral calculus.

For ophthalmology he is important because of his contributions to optics and to the nature of light and color. The stamp illustrates one of his drawings on refraction.

2. Benjamin Franklin (1706–1790) (Fig. 2)

An American philosopher, statesman and man of letters. He was born in Boston, but later lived in Philadelphia.

He was active in many scientific fields, founded the American Philosophical Society and the University of Pennsylvania. He became extremely active in politics, was the American minister to France and finally president of the Commonwealth of Pennsylvania.

He described bifocal glasses for the first time in a letter to his friend in 1784.

3. Jan Evangelista Purkinje (1787–1869)

(Fig. 3)

He was born in Bohemia but then the family moved to Moravia where he started his education. He entered the Piarist Order in 1804, but left it again in 1807. He then went to the University of Prague and first studied philosophy, but in 1813 he began his study of medicine. He stayed on after his graduation working primarily in physiology. In 1823 he was appointed by King Frederick III of Prussia as professor of physiology and pathology in Breslau. At that time he got acquainted and quite friendly with Johann Wolfgang Goethe. He established a physiologic institute in Breslau, but became involved in Czech and other Slavic endeavors. In 1849 he returned to Prague as professor of physiology.

He became very active as a Czech nationalist. He was one of the founders of the first Czech medical journals and in 1861 was elected to the Czech parliament.

Purkinje was an eminent visual physiologist. He first described the catoptric images of the eye (independently found by Louis Joseph Samson in 1837 in Paris). He described the brightness shift of colors when the retina is dark-adapted and entoptic phenomena. As an anatomist his name is connected with ganglion cells in the cerebellum and the conduction system of the heart.

Purkinje is also presented on a painting by Josef Manes (Fig. 4). The painting is called "Midwife Presenting a Newborn Child to Its Father". Manes was a good friend of the Purkinje family and especially of the son, Karel Purkinje, who himself was a well-known painter.

4. Hermann L.F. von Helmholtz (1821–1894)

(Fig. 5 A, B)

He was born in Potsdam and received his M.D. in 1842 at the University of Berlin. His mother's maiden name was Penne and she was a direct descendant of William Penn.

He first served in the military medical corps and then worked in physiology. At that time he was interested mainly in thermodynamics.

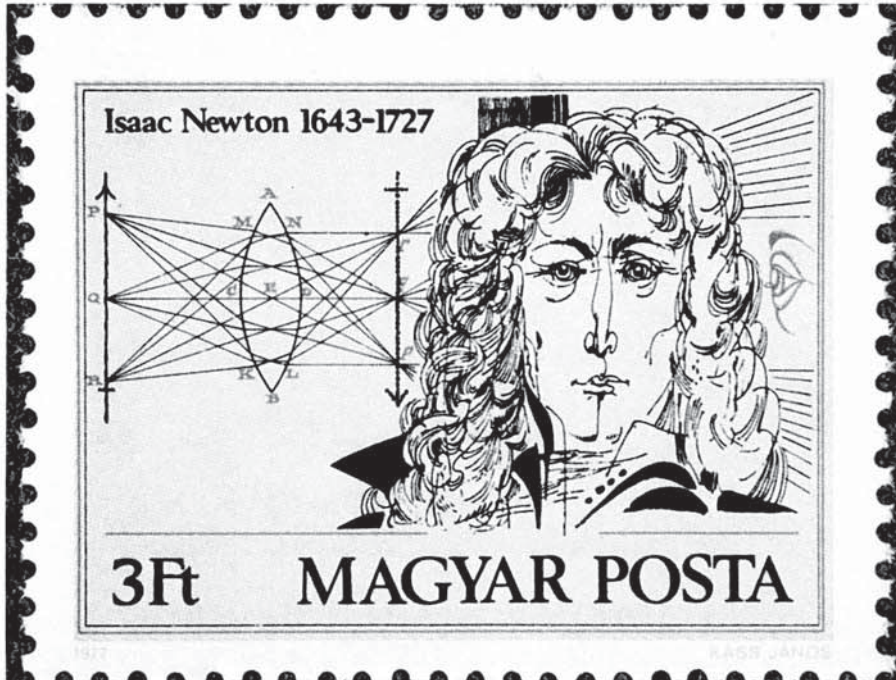


Fig. 1



Fig. 2



Fig. 3



Fig. 4A



Fig. 4B

Ever since his student days in Berlin he was greatly influenced by the eminent German physiologist, Johannes Müller. A number of fellow students were also under Müller's influence. Among them were: Du Bois-Reymond, Brücke, Virchow, Claude Bernard, Bowman and Donders.

In 1849 he became professor of physiology at the University of Königsberg and in 1851 he published the first report on the ophthalmoscope. He continued working on visual physiology, on the accommodation mechanism using catoptric images, on color vision, on the horopter and on ocular movements.

From 1856–1859 he was professor of physiology and pathology at the University of Bonn and from 1859–1871 professor of physiology and anatomy at the University of Heidelberg. During that time he published his handbook on physiologic optics and started his work on the physiology of hearing.

From 1871–1887 he was professor of physiology at the University of Berlin and then the first director of the Institute of Physics and Technology of the University of Berlin-Charlottenburg. This institute was founded due to the influence of von Siemens.

In 1886 he received the first Graefe medal from the Ophthalmological Society in Heidelberg. This medal is now awarded every 10 years. In his acceptance speech he compared himself to the smith who invented a chisel out of tempered steel which he handed to the famous Greek sculptor, Phidias. This enabled Phidias to make statues out of marble whereas before that he could only mold them out of clay or carve them out of wood.

5. Rudolf Virchow (1821–1902)

(Fig. 6)

He was born in Pommern, a province of Prussia, and attended the military medical academy in Berlin. In 1846 he became pathologist at the Charité and in 1847 he founded the "Archiv für pathologische Anatomie" which now bears his name. In 1849 he became professor of pathology in Würzburg and in 1856 he returned to Berlin.

He was not only a pioneer in pathology (his "cellular pathology" of 1858 is the foundation of modern pathology), but also an anthropologist and an archeologist. He soon became interested in politics. He became a representative of the liberal bourgeoisie. In 1848 he was reprimanded for his role in the revolution. Later he became a member of parliament and fought the autocratic politics of Prince Otto von Bismarck.

For ophthalmologists he is of special interest because of his three volume work on malignant tumors (1863–1865), in which he deals with orbital and intraocular neoplasms coining the term “glioma of the retina”.

His son, Hans (1852–1940), became the most prominent German anatomist of his time. He was professor of anatomy and taught at the Institute of Fine Arts in Berlin. His professional thesis was on comparative anatomy of the eye (1882). He contributed the volume on anatomy on the external coats of the eye and on the lids to the second edition of the Graefe-Saemisch Handbook.

6. Carl Zeiss (1816–1888)

(Fig. 8)

He was born at Weimar and studied in Stuttgart. In 1846 he started a workshop for optical instruments in Jena. From this developed a large optical industry.

He was soon joined by Abbe who helped in the design and development of numerous optical instruments.

7. Ernst Abbe (1840–1905)

(Fig. 7)

He was professor of physics and optics in Jena and later became a partner of Carl Zeiss. Upon the latter's death he was the sole owner of the company. However, he formed a cooperative endeavor with the son, Roderick Zeiss. The “Zeiss Foundation” was jointly owned by the management, workers and the University of Jena. At the present the plant is owned by the State (VEB).

8. Camillo Golgi (1844–1926)

(Fig. 9)

He received his M.D. degree at the University of Pavia in 1865. He soon turned to neuroanatomy and described first the application of the silver carbonate stain to neural tissue. He never, however, recognized the independence of individual axons and always believed in the “network” arrangement of nerve fibers in the central nervous system.

He rose quickly at the University of Pavia and became the rector of the university for several years. He became a senator in the new United Kingdom of Italy and received the Nobel Prize for his neuroanatomic work in 1906. He shared the prize with Cajal. Golgi never recognized Cajal's findings on the axons and remained hostile toward Cajal. He never spoke, nor wrote to him.



Fig. 5A



Fig. 5B



Fig. 6



Fig. 7



Fig. 8



Fig. 9

9. Santiago Ramón y Cajal (1852–1934)

(Fig. 10)

He was born in a small town in Aragon. His father was a physician. He first worked as a barber and a shoemaker before he entered medical school and graduated in 1873 from the University of Zaragoza. He then entered the army as a military physician and served in Cuba.

He became interested in histology and was one of the first in northern Spain to own a microscope. He was appointed professor in Valencia in 1885 and later on in Barcelona and finally at the University of Madrid.

He remained interested in neuroanatomy and applied the silver bicarbonate stain of Golgi and then used hot silver nitrate. He first described the neuron as an independent unit and found that there was no “network” of axons in the central nervous system or in the retina. He could prove the chiasmal crossing of the optic nerves. Because of his devotion and enthusiasm for histology he was called “Don Quijote of the Microscope”.

He received the Nobel Prize in 1906. He shared his Nobel Prize with Camillo Golgi with whom he could never strike up a friendship, not even an acquaintanceship. In the same year President Theodore Roosevelt was awarded the Nobel Peace Prize.

One of his most famous students was Pio del Rio Hortega who was the first to describe the microglia cell.

10. Hideyo Noguchi (1876–1928)

(Fig. 11)

A bacteriologist who received his M.D. from the University of Tokyo and did pioneer work on yellow fever, syphilis and Oroya fever. He became associated with the Rockefeller Institute in New York.

In 1928 (*J. Exper. Med.* 48, suppl. 2) he described a “bacterium granulosis” which he had obtained from the conjunctiva of North American Indians who suffered from trachoma. This was a motile, aerobic, hemoglobinophilic organism, closely related to *C. xerosis*. It produced a follicular conjunctivitis in monkeys. His associates at the Rockefeller Institute and other microbiologists confirmed his finding and thought they were dealing with the infectious agent causing trachoma.

But contradictory evidence began to appear. This agent could not produce true trachoma in animals. Lindner in Vienna was so convinced that this agent could

not produce trachoma that he inoculated his own eyes (Graefes Archiv 122:391, 1929). After three weeks he experienced a mild follicular reaction in his conjunctiva. This disappeared after ten weeks.

11. Sergey Ivanovich Vavilov (1891–1951)

(Fig. 12)

He was a physicist and mathematician and a member of the U.S.S.R Academy of Science. Most of his research was devoted to optics and he was Director of the State Optical Institute.

Summary

Numerous scientist have contributed to the development and advancement of ophthalmic science and practice. Among them have been commemorated by stamps: Isaac Newton, Benjamin Franklin, Jan Evangelista Purkinje, Hermann von Helmholtz, Rudolf Virchow, Carl Zeiss, Ernst Abbe, Camillo Golgi, Santiago Ramón y Cajal, Hideyo Noguchi, Sergey Ivanovich Vavilov.

BLODI, F.C. – Ophthalmologie und Philatelie

III. Wissenschaftler, die Beiträge zur Ophthalmologie geleistet haben

Zusammenfassung

Zahlreiche Wissenschaftler, die selbst nicht Ophthalmologen waren, haben bedeutende Beiträge für die Entwicklung und den Fortschritt der experimentellen und klinischen Ophthalmologie geleistet. Einige unter ihnen wurden durch die Herausgabe von Sondermarken geehrt. Es waren Isaac Newton, Benjamin Franklin, Jan Evangelista Purkinje, Hermann von Helmholtz, Rudolf Virchow, Carl Zeiss, Ernst Abbe, Camillo Golgi, Santiago Ramón y Cajal, Hideyo Noguchi, Sergey Ivanovich Vavilov.



Fig. 10



Fig. 11



Fig. 12

BLODI, F.C. – Ophthalmologie et philatélie
III. Scientifiques ayant contribué à l'ophtalmologie

Resumé

De nombreux scientifiques ont contribué au développement et à l'avancement de la science et de la pratique ophtalmologique. Certains d'entre eux ont été illustrés par des timbres: Isaac Newton, Benjamin Franklin, Jan Evangelista Purkinje, Hermann von Helmholtz, Rudolf Virchow, Carl Zeiss, Ernst Abbe, Camillo Golgi, Santiago Ramón y Cajal, Hideyo Noguchi, Sergey Ivanovich Vavilov.

BLODI, F.C. – Oftalmología y filatelia
III. Científicos que han contribuido a la oftalmología

Resumen

Gran cantidad de científicos han contribuido al desarrollo y avance de la ciencia y de la práctica oftalmológica. Algunos de ellos fueron honrados con su imagen en sellos postales como Isaac Newton, Benjamin Franklin, Jan Evangelista Purkinje, Hermann von Helmholtz, Rudolf Virchow, Carl Zeiss, Ernst Abbe, Camillo Golgi, Santiago Ramón y Cajal, Hideyo Noguchi, Sergey Ivanovich Vavilov.

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