Phoebus Aaron Theodor Levene Biography

Phoebus Aaron Theodor Levene

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Biography

Phoebus Aaron Theodor Levene made important contributions to the understanding of the nucleic acids. He identified the sugars in nucleic acid nucleotides and discovered the precise structure of individual nucleotides.

Levene was born in Sager, Russia, and soon moved with his family to St. Petersburg, where his father owned several custom shirtmaking shops. He interrupted his medical studies at the Imperial Military Medical Academy in St. Petersburg to come to the United States in 1891 with his parents and seven brothers and sisters. He returned to Russia that same year to complete his studies, then came back to New York in 1892. There he practiced medicine and at the same time studied organic chemistry at Columbia University and worked in the medical school's physiology laboratory.

Levene gave up his medical practice after contractingtuberculosis. He began performing research on the disease at the Saranac Lakes, NY, sanitorium where he recuperated. He continued his biochemical studies in Germany, working in Marburg with Albrecht Kossel and becoming interested in nucleic acids. He also studied protein composition with the organic chemist Emil Fischer in Berlin. In 1905, while working for the state of New York, he was asked to lead the biochemical section of the new Rockefeller Institute for Medical Research (now Rockefeller University).

Levene isolated and identified the carbohydrate portion of nucleic acid and defined the nucleotide as a phosphate--base--sugar. He showed that there are two nucleic acids by identifying (in 1909) ribose, the sugar in ribonucleic acid (RNA) and (in 1929) deoxyribose, the sugar in deoxyribonucleic acid (DNA). His work was the foundation for the later identification of nucleic acids' linear structure by the British organic chemist Alexander Todd.

Upon receiving a prestigious award from the American Chemical Society in 1931, Levene spoke of "the revolt of the biochemists" against any restrictions on knowledge, especially on the mysteries of life itself. He was certain that future biochemists would continue work to solve these mysteries, as indeed they have. Among Levene's numerous awards and honors was membership in the National Academy of Sciences.