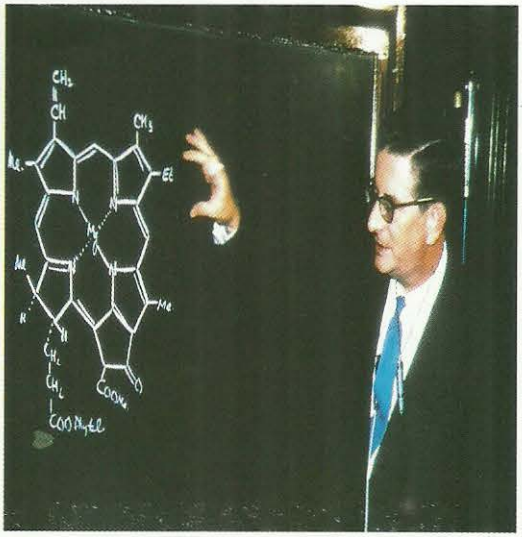
Robert Burns Woodward

PAST MASTER SERIES

Robert Burns Woodward was born in Boston on April 10th, 1917, the only child of Margaret Burns and Arthur Woodward.

Woodward was attracted to chemistry at a very early age, and indulged his taste for the science in private activities throughout the period of his primary and secondary education in the public schools. In 1933, he entered the Massachusetts Institute of Technology, from which he was excluded for inattention to formal studies at the end of the Fall term, 1934. The Institute authorities generously allowed him to re-enroll in the Fall term of 1935, and he took the degrees of Bachelor of Science in 1936 and Doctor of Philosophy in 1937. From there, his whole career was spent at Harvard where, starting as a postdoctoral fellow in 1937, he became Morris Loeb Professor of Chemistry in 1953.

Recognizing that physical measurement revealed molecular structure better than chemical reaction, in 1940 – 42 he developed "Woodward's rules" for determining structure by ultraviolet spectroscopy. In 1944 Woodward, with William von Eggers Doering, synthesized quinine from the basic elements. This was an historic moment for it was the quinine molecule that William Perkin had first, somewhat prematurely, attempted to synthesize in 1855. In 1945 his methods finally clarified the structure of penicillin and of many more complex natural products. He proposed the correct biosynthetic pathway of steroid hormones.



Professor Woodward describing the structure of chlorophyll.

Woodward and his school later succeeded in synthesizing an impressive number of molecules, many of which are important far beyond the field of chemistry. Thus among the most important were cholesterol and cortisone in 1951, strychnine and LSD in 1954, reserpine in 1956, chlorophyll in 1960, a tetracycline antibiotic in 1962, and vitamin B_{12} in 1971. The work on the synthesis of B_{12} led Woodward and Roald Hoffman to introduce the principle of conservation of orbital symmetry. This major theoretical advance has provided a deep understanding of a wide group of chemical reactions.

He synthesized complex organic compounds, including quinine (1944) and vitamin B_{12} (1971, in more than 100 reactions), a task that led to the fundamental concept of conservation of orbital symmetry. He received the Nobel Prize for chemistry in 1965.

During the Nobel Prize Banquet speech, Woodward said, "Can anyone deserve so concentrated an accolade? That concern for me is lessened if it is not suppressed by my awareness that my work has been done in close association with more than two hundred and fifty men and women. With them I have shared many challenges, surprises and pleasures, and their hands, their minds, and their hearts have brought me here tonight. Alfred Nobel intended his prizes to be awarded for personal achievement. If I search for my personal achievement, it may be that I have led these men and women - and perhaps in some measure all organic chemists - to the higher ground of a greater appreciation of the power, and above all of the beauty of their science."

(Condensed from www.NoblePrize.org and Encyclopedia Brittanica)

"Alfred Nobel intended his prizes to be awarded for personal achievement. If I search for my personal achievement, it may be that I have led these men and women - and perhaps in some measure all organic chemists - to the higher ground of a greater appreciation of the power, and above all of the beauty of their science."