MEMORIAL RESOLUTION
LINUS PAULING
(1901 - 1994)

Linus Pauling died on 19 August, 1994, at his ranch in Big Sur at the age of 93. Pauling was regarded by many as the greatest chemist of this century. Pauling did not come to Stanford until late in his illustrious career; he served on the Stanford faculty from 1969 to 1975 before moving to the Pauling Institute of Science and Medicine, a research center that he founded in Palo Alto. The Pauling Lecture, an annual event in the Stanford Medical School, was created in honor of Linus Pauling; Linus delivered the inaugural Pauling Lecture. Many honors came to Pauling in his lifetime. Pauling won two Nobel Prizes: Chemistry in 1953 and the Peace Prize in 1962. He received over 50 medals and awards and almost as many honorary degrees from universities.

Pauling's scientific work centered on the structure of matter -- the structure of just about everything. As a youth, he was interested in the shapes of minerals. In graduate school at the California Institute of Technology, he initiated studies of the structures of crystals, using X-ray diffraction, with Roscoe Dickinson as supervisor. This was in 1923. Thereafter Pauling was continuously involved in the elucidation of crystal structures. Soon after the development of quantum mechanics by Schrodinger, Heisenberg and Bohr in 1926-1927 Pauling initiated a far-ranging effort to understand the structures of crystals, and of molecules in terms of this quantum mechanics. Here again structure was the main theme - the directions in space of hybrid electron orbitals, and valence bond structures. Pauling was the central figure in developing these ideas, which are in universal use by chemists today. Pauling's book, "The Nature of the Chemical Bond," was first published in 1940. This world famous book on the structure of molecules and crystals represented in considerable degree a synopsis of Pauling's own extensive work in this area. This book has probably had more influence on chemical thinking than any other, and Pauling's approach as exemplified in this work was influential in the discovery of the structure of DNA, according to Watson and Crick.

In the early 1940s Pauling and collaborators at Cal Tech began an attack on the structure of proteins, first through investigations in immunochemistry. In this connection the idea of structural complementarity was introduced, which is a commonly accepted concept today for understanding the interactions of macromolecules with one another and with smaller molecules. In the early 1950's Pauling and Cory published a series of historic papers on the structure of peptides -- the alpha helix and the beta pleated sheet. These structures are now known to be components of virtually all protein structures.

In the mid 1960s Pauling introduced his model of nuclear structure. This model is based on the idea of the close packing of spherical subunits of nuclear particles, such as the helion. The ideas for this model doubtless grew out of his work on the structure of alloys. Comparison with experiment was made using data on nuclear rotational energy levels.

Pauling was not infallible as a scientist. This is not surprising as he was constantly theorizing at the forefront of knowledge on major problems. Instances where his proposals have turned out to be incorrect include the origin of antibody diversity, the structure of DNA, and the structures of quasicrystals. These failures were never total -- his concept of structural complementarity grew out of his interest in molecular recognition in biological systems, and served as a guide for others. His ideas on quasicrystal alloys certainly encouraged the physicists to refine their data. Pauling's stature as a scientist is measured by the difficulty and significance of the problems he attacked, and is not marred in the least by occasional misses. Not surprisingly Pauling's theories in the area of medical sciences have had a lower success rate than his work in structural chemistry. His early characterization of sickle cell anemia as a "molecular disease" of hemoglobin was an early success. His public advocacy of vitamin C and other vitamins would have a mixed review today. He was successful in convincing the medical establishment to take seriously the subject of larger doses of vitamin C. His work on mental disease led to no substantial results but served as an inspiration to others. Without doubt Pauling's greatest success relevant to medicine was in the area of prevention. His tireless, courageous and effective campaigns against nuclear bombs, their testing as well as their use, have contributed significantly to the prevention of nuclear war.

As a person, Pauling was outgoing and congenial. His happy spirit was evident to everyone who met him. He was a great scientist, and an advocate for peace. He was often controversial, and he was often right and far ahead of his peers.

James P. Collman
Harden M. McConnell
Henry Taube