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Linus Pauling vis

Anyone present to hear American Nobel Laureate chemist Dr. Linus Pauling speak to Council scientists last June 6, 1980, at NRC's Sussex Drive Laboratory, could just as well have watched the audience to take the man's measure. The conversations and moving about, the usual prelude to such an event, were missing. Instead, the scientists simply looked at him in silence, an unintended tribute to one of the few men of science who need no introduction. Here was a colleague who occupied center stage over the last half century of science, a researcher whose ideas did much to shape the disciplines of the chemists and biological scientists in the room. His great work on the nature of the chemical linkages that bind the elements—for which he received the Nobel Prize in 1954—was done before many of the people in the audience were born.

When he spoke briefly on a chemical bonding problem that intrigued him, it was with a power and precision that belied his 79 years. There were hints in his delivery of the renowned Pauling self-confidence, a trait that earned him the enmity of the nuclear weapons' makers in postwar America and a second Nobel Prize in 1963, this one for Peace. The talk was short because Pauling sensed that the crowd wanted to converse with him directly, to get to know him off the lectern.

The pattern of the conversation pretty much followed the unfolding of Pauling's career, beginning where he began back in the 1930's with questions about chemical bonding. The chemists in the group knew that his application of quantum theory to classical chemistry in those early days revolutionized the perception of how atoms bond together to form the myriad substances found in nature. His concept of resonance, that matter bound together in certain ways can behave as if it is in several forms at once, was a leap of intellectual boldness comparable to Einstein's outlandish assertion that time and space are pliant.

Pauling was one of the first of a group of chemists and physicists who invaded biology in the '40s and '50s, transforming it beyond recognition. Of Pauling, it is said that he virtually created the field of molecular biology. Early on, he sensed (rather than discovered) the vital first rule of this new discipline—that the biological function of molecules in living systems derives from their physical structure and the distribution of electrical charges.

With Dr. Robert Corey in the early 1950's, Pauling worked out the physical structure of the red blood cell protein hemoglobin, a feat that led him to the concept of molecular disease later on when he detected a minor, but devastating, alteration in the hemoglobin structure of people with sickle cell anemia. From molecular medicine, Pauling progressed to molecular psychiatry. Schizophrenia, which is cured in some cases by large doses of vitamin B, could, according to Pauling, be due to a metabolic malfunction, a biochemical disorder in which production of some vital cell substance has gone awry.

This avenue of thought pointed to the current controversy surrounding Pauling and the link between vitamin C and cancer. In an inductive leap characteristic of the man, Pauling took the schizophrenia results as an example of what he calls orthomedicine, where ortho means the right or correct amount of therapeutic substance in medicine. Simply put, there is a right level of vitamin B to combat pellagra, a deficiency disease, and quite another, much higher dose needed to cure schizophrenia. Vitamin C, says Pauling, has a comparable therapeutic relationship to scurvy and cancer.

The meeting ended with sustained applause from the NRC scientists who, while divided on their opinions of orthomedicine, were unanimous in their regard for Linus Pauling. □

Wayne Campbell