◀ Former TWAS President C.N.R. Rao

SHAPING THE FUTURE THROUGH CHEMISTRY

by **Cristina Serra**

Former TWAS President C.N.R. Rao of India offered a passionate view on the power of chemistry, past and future.

When you think about chemistry, forget about boring formulas and reactions. Think instead of what surrounds you – environment, energy, new materials – because chemistry is everywhere.

Chemistry has impacts across a range of disciplines, TWAS Founding Fellow C.N.R. Rao said in a vibrant lecture at the TWAS General Meeting in Rwanda. But its early steps were simple, such as Antoine-Laurent de Lavoisier's discovery some 250 years ago that oxygen allows combustion.

From that seminal discovery, Rao surveyed the extraordinary progress that followed: from the dissection of atoms at the nanoscale dimension to the possibility of using smart, innovative materials that change properties under specific conditions. "Who would have imagined knowledge could come so far, so fast?" he asked.

Rao's lecture offered a passionate overview of major discoveries and the chemists who made them.

Rao, a former TWAS president, is an undisputed authority whose knowledge encompasses chemistry and extends far beyond. He currently is Honorary President & Linus Pauling Research Professor at Jawaharlal Nehru Centre for Advanced Scientific Research in Bangalore, India.

In the past, he has been a professor in the most prestigious universities worldwide: King's College, Cambridge, UK (1983-84); Université Joseph Fourier, Grenoble, France (1990); and the University of California, Berkeley (2008 - 2011).

Rao is also a polished communicator, and in Kigali he ranged easily through the history of chemistry, complex scientific ideas and the men and women who have driven progress.

Starting with Lavoisier, the father of chemistry, Rao mentioned other giants who shaped the history of the field: John Dalton, who studied the behaviour of gases, and Friedrich Kekulé who discovered that carbon could make four bonds. He did not forget Dmitri Mendeleyev, the father of the Periodic Table of elements that remains a cornerstone of chemistry today.

However, Rao explained, it was the dawn of the 20th century that witnessed a remarkable burst of discovery that made it "the century of chemistry".

As he moved from Einstein to Linus Pauling's molecular studies that helped elucidate the structure of proteins, the passion seemed to build in Rao's narration. This is no surprise, as Rao has been a contemporary of world leaders in chemistry, including Pauling, who died in 1994. And Rao himself has made significant contributions to emerging fields such as solid-state chemistry, developing innovative research on metal oxides, graphene and nanomaterials.

"Chemistry is everywhere," he said, and there remain vast opportunities for progress. "Even if we stand on the shoulders of giants, we still have much to explore ahead." ◘

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