Acceptance Speech of

PROFESSOR SIR JAMES FRASER STODDART

Winner of the 2007

King Faisal International Prize for Science

Monday 16 April 2007 (28.3.1428H)

Your Royal Highness, Prince Sultan Ibn Abd Al Aziz
Crown Prince, Deputy Premier,
Minister of Defense and Aviation and Inspector General
Your Highnesses
Your Excellences
Distinguished Guests

The roster of scientists who have won the King Faisal Prize for Science is a dauntingly impressive one. If I limit the roll call to only those scientists who have expressed their creativity through the medium of Chemistry, then I come across the names of Zewail and Al-Sayyid, of Cotton and Lemieux, of Noyori, Seebach and Sharpless, and of Hawthorne and Nakanishi. In the past few decades, they shaped Chemistry's history and now they populate its pantheon. What an honor it is to join their company! I extend my thanks most warmly to the Board of the King Faisal International Prize for choosing me in the year 2007 as the sole winner in the category of science.

My approach to Chemistry as the central science has been far from a traditional one. Some would say it has been iconoclastic. It has highlighted my passion, working both independently and collaborative as circumstances have dictated, for making, measuring and modeling, all performed at one and the same time, in order to contribute significantly to its intellectual challenge and societal value at this time in history. More than a millennium ago, Jabir Ibn Hayyan was a prominent Arab alchemist and has been referred

to as “the father of Chemistry.” He is widely credited with the introduction of the experimental method into alchemy, and with the invention of numerous important processes still used in modern chemistry today. “The first essential in chemistry,” he said, “is that you should perform practical work and conduct experiments, for he who performs not practical work nor makes experiments will never attain the least degree of mastery.” I couldn’t agree more. As one of Jabir Ibn Hayyan’s most fervent disciples these past 35 years, I have been a sculptor of matter at the ultimate of size levels that equates with being a chemist – namely the molecular level. I have faced formidable challenges, yet derived no end of pleasure from designing and synthesizing molecular compounds of a somewhat bizarre kind. These exotic compounds have contained, in addition to the classical chemical bonds, a mechanical bond. Hence, I first made molecules called catenanes and rotaxanes, then introduced bistability into both of them and these smallest of machines are now making their way, by dint of collaboration with other scientists, into information processing systems and artificial molecular motors. Essentially, these minute switches and tiny engines have been designed and built with the intent of elevating molecular nanotechnology from being mainly, if not solely about form, to being largely about function. It has taken me the best part of 25 years to get within sight of a molecular computer.

A major facet of scientific progress lies in the training of young scientists to carry the torch of discovery and invention in the sciences onwards and upwards into the next generation. Perhaps the most satisfying part of my life's experience as an academic researcher has been as a mentor to close on 300 graduate students and postdoctoral scholars. I have been immensely privileged to have had the opportunity to carry out my research on a daily basis alongside some of the most brilliant minds and talented pairs of hands in that age bracket between 18 and 28. It is sheer magic. I know that everyone of them would happily join with me in thanking the King Faisal Foundation most warmly for giving its seal of approval to the quality and significance of the science done by the Stoddart group.

I have something to add that is rather personal and deeply felt. I lost my wife, Norma, in early 2004 from the ravages of breast cancer. Her struggle with that insidious disease was to occupy 12 years of her life from 1992 to 2004, that is, a fifth of her own life and one-third of our married lives. Herself a Ph D chemist, Norma was the matriarch of the Stoddart group for a quarter of a century, as well as the proud mother of two daughters, Fiona and Alison, who also subsequently graduated with Ph D degrees in Chemistry, Fiona from Imperial College London, and Alison from the University of Durham in the UK. It is with more than a tinge of sadness that we, as a closely knit family, reflect upon the massive contribution Norma made to my and their accomplishments, and yet was not spared to share in them. It is just one of those slings and arrows of outrageous fortune that we have had to bear and accept in the knowledge that she would surely have been an immensely proud spouse and contented mother today if she had lived to see it. The prize stands as a monument to her life and work.