Preface

In Honor of the 80th Birthday of Professor Ronald Breslow

Dr. Ronald Breslow

We are very pleased to have the opportunity to make a dedication in this issue to mark the 80th birthday of Dr. Ronald Breslow, S. L. Mitchill Professor of Chemistry and University Professor of Columbia University, USA, and to honor his many contributions to chemistry, education, and China-US scientific exchanges over the years. Three articles by Drs. LIU Lei of Tsinghua University [1], XU Ruo of Merck Research Laboratory [2], and ZHANG Biliang of the Guangzhou Institutes of Biomedicine and Health, Chinese Academy of Sciences (CAS) [3], and their coworkers are dedicated to this occasion.

Professor Breslow is one of the best known scientists in the world. As an award citation stated, he is “an individual of multifaceted talents and great achievements” [4]. Among the major research areas that he pioneered are biomimetic systems and nonbenzenoid aromatic chemistry. Professor Breslow has been on faculty at Columbia since 1956, teaching and training many undergraduate and graduate students, postdocs, and visiting scholars. He was in the US

Delegation in Pure and Applied Chemistry that visited China in May to June 1978 prior to the establishment of diplomatic relationships between the People’s Republic of China and the USA [5]. The visit helped lay the foundation for scientific and educational exchanges between the two countries since the late 1970s, including the studies of Chinese graduate students and visiting scholars in the USA to this date.

Born to a family of a physician father, Breslow’s interest in chemistry was sparked in middle school when he was given a textbook of college organic chemistry. He often conducted chemistry experiments in the family basement, including trying to make aromatic compounds with silicon instead of carbon [6]. At times compounds young Breslow made sent a tremendous smell to the house and his father’s office which was attached to the house, often making his father’s patients go screaming. Results of these studies, however, led to a finalist spot in the 1948 Westinghouse Science Talent Search, the predecessor of the current Intel Science Talent Search.

Breslow went to Harvard University for both undergraduate and graduate studies in chemistry, receiving Ph.D. with Robert Woodward. After a brief postdoctoral study at Cambridge University, he started his independent career at Columbia University in 1956. His main research interests are in design and synthesis of new compounds with interesting properties, and the study of these properties.

Professor Breslow’s major work includes the cyclopropenyl cation, the simplest aromatic system and the first aromatic compound prepared with less than six electrons in a ring. He also discovered the chemical mechanism used by vitamin B₁ in biochemical reactions. His emphasis in recent years has been biomimetic systems including, e.g., synthesis and study of molecules that imitate enzymatic reactions. These studies led to the development of remote functionalization reactions and artificial enzymes. The Breslow group

has recently developed a new group of cytodifferentiating agents with potential use in cancer chemotherapy. Professor Breslow has published over 400 papers. One review of his recent studies in artificial enzymes, cancer chemotherapy, conjugation and nanoelectronics, and prebiotic chemistry [7] has been published as a contribution to a special issue of this journal on the International Year of Chemistry 2011.

Over his career at Columbia University that span over 55 years, Professor Breslow has directed studies of many graduate students, postdocs, and visiting scholars, including 127 who have completed their graduate work. His former Ph.D. student Professor Robert H. Grubbs received Nobel Prize in 2005 for work in catalytic olefin metathesis [8]. Many of his graduate students, postdocs, and visiting scholars were from China: 21 Chinese students received Ph.D. degrees with him. Some twelve Chinese postdocs and a number of visiting scholars have conducted their studies in the Breslow lab. The Chinese graduate students, postdocs, and visiting scholars have contributed to teaching and research in both China and the USA. The papers in this issue dedicating to Professor Breslow's birthday are good examples. Drs. LIU Lei, XU Ruo, and ZHANG Biliang all received their Ph.D. degrees under direction of Professor Breslow. Dr. LIU is now a professor at Tsinghua University in Beijing, Dr. XU is a principle scientist at Merck in New Jersey, USA, and Dr. ZHANG is a researcher at the Guangzhou Institutes of Biomedicine and Health.

Professor Breslow has received many honors and awards. He was a recipient of a US National Medal of Science in 1991, the highest honor bestowed by the US government on scientists, and the Priestley Medal in 1999, the American Chemical Society's highest honor. Professor Breslow was elected to the US National Academy of Sciences at the age of 35 (Chairman of the Chemistry Division in 1974–1977), and he holds an honorary membership in the Royal Society of Great Britain. He is also an Honorary Professor at the University of Science and Technology of China. The Ronald Breslow Award for Achievement in Biomimetic Chemistry, awarded annually by ACS, is named in his honor. Professor Breslow was elected and served as ACS President in 1996.

Professor Breslow has contributed to China-US scientific exchanges. I have in front of me the book "*Chemistry and Chemical Engineering in the People's Republic of China. A Trip Report of the US Delegation in Pure and Applied Chemistry*" published by ACS in 1979 [5]. The delegation, headed by Professor Glenn T. Seaborg, made extensive visits of universities, research institutes, and industrial activities in Beijing, Dalian, Shenyang, Fushun, Changchun, Harbin, Daqing, Lanzhou, Shanghai, Xi'an, Hangzhou, and Liujiaxia in May–June 1978 to assess and understand the status of research, development, and chemical education in China. Professor Breslow was the organic chemist in this 12-member delegation. Professor ZHOU Peiyuan (CHOU P'ei-yuan), then Director of China's Scientific and Tech-

nical Association and CAS Vice President, was the chief host of the visit, and Professor QIAN Ren-Yuan (CH'IENTEN Jen-yuan), then Deputy Director of Institute of Chemistry, CAS, escorted the delegation.

After the US President Richard Nixon's historical visit to China in the early 1970s, the two countries began such visits to provide an understanding of the two countries and people and to make suggestions to both countries that set a stage for the developments of the China-US relationships over the next several decades. This particular visit that Professor Breslow made was the first in chemistry and chemical engineering by a formal US delegation to the People's Republic of China.

Among the suggestions that this delegation made are cooperative programs such as joint symposia and exchanges of graduate students and other scientists. Similar suggestions were made by Chinese delegations visiting the USA. Adoption of the suggestions by both countries, especially China's "Open Door" policies, and the establishment of diplomatic relationships on January 1, 1979, have made large and long-lasting impacts. One particular area is studies of Chinese graduate students and visiting scholars in American universities. Late Professor William von Doering of Harvard University visited China in 1980 at the invitation of Professor SU Buqing, then President of Fudan University in Shanghai. During the subsequent visit in 1981, Professor Doering, together with Professor XIE Xide (HSIEH Hsi-Teh), then President of Fudan University, and the Ministry of Education in China, initiated the Chemical Graduate Program (CGP or Doering program) that sent 242 Chinese chemistry students to top universities in the USA and Canada [9–12]. The CGP program helped me enrolled at the University of California, Los Angeles, to start my Ph.D. studies. Such programs opened US-Canadian universities to other Chinese chemistry students, as demonstrated by thousands of Chinese students who have since attended US-Canadian chemistry graduate programs. Both China and the USA have greatly benefited from such exchanges.

Finally, as many of you know, Columbia University in New York City has trained many generations of Chinese students. Late Professors HOU Debang (HOU Te-Pang) [13], the pioneer of the Hou Pure Alkali Production Method and a founder of chemical industry in China, DAI Anbang (TAI An-Pang) [14, 15] of Nanjing University, a founder of coordination chemistry in China, and TANG Aoqing (TANG Au-chin) [16–18], the founder of theoretical chemistry in China (and chair of the CGP Exams Committee), as well as Professor XU Guangxian (HSU Kwang-Hisen) [19, 20] of Peking University, a winner of the China State Supreme Science and Technology Award in 2008 for the development of techniques to separate rare earth elements, all received Ph.D. degrees from Columbia in the 1920s–1950s. They helped lay the foundation for chemistry and chemical industry in China.

I would like to thank all authors of the three articles ded-

icated to Professor Breslow's 80th birthday in this issue, especially Drs. LIU Lei, XU Ruo, and ZHANG Biliang, for their contributions. Professor LI Lemin, Editor-in-Chief of our journal, provided valuable input about the preface. This dedication would not have been possible without the help of Dr. ZHU Zhaoning of Merck, a former Breslow postdoc, and Dr. ZHU Xiao-Wen at the Editorial Office of our journal.

We wish Professor Breslow a happy birthday!

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(薛子陵)

XUE Zi-Ling

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XUE Zi-Ling conducted his undergraduate studies at Nanjing University-Nanjing College of Pharmacy. He studied organometallic chemistry with Herbert D. Kaesz at the University of California at Los Angeles as a Chemistry Graduate Program (CGP or William von E. Doering Program) fellow, receiving Ph.D. degree in 1989. He then conducted postdoctoral studies with Kenneth G. Caulton and Malcolm H. Chisholm at Indiana University, and in 1992 accepted a position as Assistant Professor at the University of Tennessee. He is now a Paul and Wilma Ziegler Professor, and an associate editor of *Science China Chemistry*. Dr. Xue served in 1999–2001 as a member of the Executive Committee, ACS Division of Inorganic Chemistry, and is now the division Membership Chair. Dr. Xue has received several awards including US National Science Foundation Young Investigator and Special Creativity awards, Camille Dreyfus Teacher-Scholar Award, Changjiang Lecture Professor, and Distinguished Oversea Young Scholar Award (Chinese Natural Science Foundation). He is a *Fellow* of the American Association for the Advancement of Science (AAAS).