ACKNOWLEDGEMENT

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(Signature) Dr. Frederick J. Karol

(Date) July 16, 1997

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Frederick J. Karol, interview by James J. Bohning at Bound Brook, New Jersey, 10 January 1995 (Philadelphia: Chemical Heritage Foundation, Oral History Transcript # 0125).

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FREDERICK J. KAROL

1933 Born in Norton, Massachusetts, on 28 February

Education

1949 B.S., chemistry, Boston University
1962 Ph.D., organic chemistry, Massachusetts Institute of Technology

Professional Experience

Union Carbide Corporation
1956-1959 Chemist, Chemical and Plastics Group
1962-1965 Chemist, Chemical and Plastics Group
1965-1967 Project Scientist
1967-1969 Research Scientist
1969-1978 Group Leader, Chemical and Plastics Group
1978-1981 Research Associate and Group Supervisor
1981-1984 Corporate Fellow
1984- Senior Corporate Fellow

Honors

1982 Thomas Edison Patent Award, R&D Council of New Jersey
1987 Excellence in Catalysis Award, Catalysis Society of Metropolitan New York
1988 Chemical Pioneer Award, American Institute of Chemists
1989 Perkin Medal, Society of Chemical Industry
1989 Conley Award for Plastics/Engineering Technology, Society of Plastics Engineers
1990 International Award, Society of Plastics Engineers
1990 Collegium of Distinguished Alumni, Boston University
1991 Award for Creative Invention, American Chemical Society
1991 50th Anniversary Recognition Award, Society of Plastics Engineers (Newark)
1992 New Jersey Inventors Hall of Fame
1992 Outstanding Presentation Award, American Institute of Chemical Engineers Meeting, New Orleans
This interview with Frederick J. Karol begins with a short discussion of Karol’s family background and childhood near Boston, Massachusetts. Following an early interest in chemistry, Karol in 1946 enrolled at Boston University and graduated with a B.S. in chemistry before enlisting for two years of military service. He worked for Union Carbide from 1956 to 1959, began a family, and then entered a graduate program at MIT, studying statistical thermodynamics and organic chemistry under Gardner Swain and conducting thesis research on isotope effects. He continued catalysis research upon his return to Carbide in 1962, eventually developing a variety of proprietary catalysts for use with a high density polyethylene gas phase process. Karol’s contributions to the development of a gas phase process for making polyethylene products under low pressure helped to revolutionize the industry, as Union Carbide next developed this technology to commercial operations. The interview describes the worldwide licensing of the linear low density polyethylene process, its economic and environmental advantages, and the extension of this technology into synthetic rubbers; also discussed are the technical and management necessities for such innovative developments. Karol contributed to Carbide’s collaboration with Shell Chemical Company, which produced polypropylene, improved the catalytic system to make a wider spectrum of polypropylenes, and eventually led to process licensing. Here Karol discusses kinetic and analytic studies to understand the fundamental principles and mechanisms of polymerization; catalyst requirements and testing involving screening of reactions, analysis of property indicators, and use of pilot plants for testing; and his role in guiding development. After describing Karol’s education and subsequent research, the interview focuses on Union Carbide’s history and work environment, support for R&D and publishing, and Karol’s career progress and professional philosophies on management and scientific innovation. Karol describes the history of linear low density polyethylene, the development of both the Ziegler-Natta process and the UNIPOL process, and Union Carbide’s licenses and worldwide ventures. The interview closes with a discussion of the future of R&D and the chemical industry, and the significance of the Perkin Medal.
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