

CHEMICAL HERITAGE FOUNDATION

JAMES R. FAIR

Transcript of an Interview
Conducted by

James J. Bohning

at

University of Texas at Austin

on

19 February 1992
(With Subsequent Corrections and Additions)

THE CHEMICAL HERITAGE FOUNDATION
Oral History Program

James R. Fair

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JAMES R. FAIR

1920 Born in Charleston, Missouri, on 14 October

Education

1938-1940 The Citadel
1942 B.S., chemical engineering, Georgia Institute of Technology
1949 M.S.E., chemical engineering, The University of Michigan
1955 Ph.D., chemical engineering, The University of Texas at Austin

Professional Experience

Monsanto Chemical Company
1942-1943 Junior Engineer, St. Louis, MO, and Karnack, TX
1943-1945 Technical Service Engineer, Texas City, TX
1945-1947 Development Specialist, St. Louis, MO
1947-1950 Process Engineer, Texas City, TX
1950-1952 Project Manager, Boston, MA, and Texas City, TX

1954-1956 Process Engineer, Shell Development Company, Dayton, OH

Monsanto Chemical Company
1956-1961 Research Section Leader, Dayton, OH
1961-1963 Development Manager, St. Louis, MO
1963-1968 Engineering Manager, Corporate Engineering Dept., St. Louis, MO

1964-1979 Affiliate Professor of Chemical Engineering, Washington University,
St. Louis, MO

Monsanto Chemical Company
1968-1969 Manager, Engineering Technology, St. Louis, MO
1969-1979 Director of Corporate Technology, St. Louis, MO

The University of Texas at Austin
1979-1985 The Ernest and Virginia Cockrell Chair in Engineering
1983-1996 Head, Separations Research Program
1985-1992 The John J. McKetta Centennial Energy Chair in Engineering

Honors

1965-1967	Elected Director and Member of Council, AIChE
1968	Personal Achievement Award, Chemical Engineering Magazine
1971	Elected to Fellow Grade of Membership, AIChE
1973	William H. Walker Award, AIChE
1974	Elected to National Academy of Engineering
1975	Chemical Engineering Practice Award, AIChE
1975	Andre Wilkins Award, Tulsa AIChE Section
1976	Founders Award, AIChE
1976	Distinguished Engineering Graduate, The University of Texas at Austin
1977	D.Sc., Washington University, St. Louis, MO
1979	Institute Lecture Award, AIChE
1979	CACHE Committee Educational Award
1981	Distinguished Advisor Award, The University of Texas at Austin
1983	Eminent Chemical Engineer Award, AIChE Diamond Jubilee
1984	Engineering Foundation Faculty Award, The University of Texas at Austin
1984	Best Applied Paper Award, South Texas AIChE Section
1984	Founders Award, Balcones Fault AIChE Section
1987	Joe J. King Professional Engineering Achievement Award, The University of Texas at Austin
1987	D.Hum., Clemson University
1991	Malcolm Pruitt Award, Council for Chemical Research

ABSTRACT

This interview with James R. Fair begins with a discussion of Fair's childhood in the Midwest, highlighting high-school experiences in Little Rock, Arkansas, and early interests in science. Fair attended The Citadel as a chemistry major for two years before transferring to Georgia Institute of Technology, where he studied chemical engineering. He discusses general and chemical engineering programs at Georgia Tech, early interest in unit operations, and effects of World War II on studies and career options. In 1942, he began work with Monsanto Chemical Company, where he advanced through several positions, focusing on work with TNT nitration process, ethylene and styrene, and set-up of a synthetic rubber plant. Fair discusses early involvement with the AIChE in South Texas, Monsanto's post-war entry into petrochemical production based on acetylene and ethylene, and work on an ethylene plant joint venture with Socony Vacuum Oil Company. In April 1947, Fair witnessed the explosion of the *Grandcamp* and Monsanto's Texas City polystyrene facility, which killed numerous employees and others and led Monsanto to rebuild and center its petrochemical ventures in Texas City. Fair contributed to redesigning and rebuilding the plant, heading process design of ethylene before taking academic leave to pursue coursework in reactions, separations, thermodynamics, and mathematics at the University of Michigan. He returned to Monsanto and was again involved in ethylene- and acetylene-based work. In 1952, he entered a Ph.D. program at The University of Texas, working with Howard Rase on catalysis and reaction engineering and upon completion accepting a basic research position at Shell Development in Southern California. In 1956, Fair returned to Monsanto to start an engineering research program, doing basic research in chemical engineering and serving as company consultant for ethylene and hydrocarbon pyrolysis. He traces Monsanto's ventures in petrochemicals through the fifties and early sixties to the formation of a corporate engineering department. From 1964 to 1979, Fair headed corporate Monsanto's technology function and increased involvement with academia, particularly Washington University. In 1979, he took early retirement and accepted an engineering chair at The University of Texas, where he was well received by faculty and students. Throughout the second half of the interview, Fair emphasizes changes in chemical engineering curricula and need for industry/academia collaborations in research and funding. He discusses research collaborations, publications, and efforts to develop and license computer programs for process simulation/computer-aided design. The interview closes with discussion of student research and careers, involvement in the AIChE, consulting activities, and family.

INTERVIEWER

James J. Bohning is Professor of Chemistry Emeritus at Wilkes University, where he was a faculty member from 1959 to 1990. He served there as chemistry department chair from 1970 to 1986 and environmental science department chair from 1987 to 1990. He was chair of the American Chemical Society's Division of the History of Chemistry in 1986, received the Division's outstanding paper award in 1989, and presented more than twenty-five papers before the Division at national meetings of the Society. He has been on the advisory committee of the Society's National Historic Chemical Landmarks committee since its inception in 1992. He developed the oral history program of the Chemical Heritage Foundation beginning in 1985, and was the Foundation's Director of Oral History from 1990 to 1995. He currently writes for the American Chemical Society News Service.

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- 5 College Education

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- 9 Wartime Career at Monsanto Chemical Company

Position with Monsanto and assignment at general headquarters in St. Louis, Missouri. Positions at Kankakee Ordnance Works and Longhorn Ordnance Works. Discussion of TNT nitration process. Civil engineering work. Involvement in set-up of synthetic rubber plant in Texas City. Work with ethylene cracking furnaces. Monsanto vs. Dow processes for styrene. Membership in AIChE.
- 19 Postwar Career at Monsanto Chemical Company

Postwar shift to commercial petrochemical production based on acetylene and ethylene. Work on ethylene plant joint venture with Socony Vacuum Oil Company. Styrene plant analysis. Texas City polystyrene plant destroyed in Grandcamp explosion and rebuilt as center of Monsanto's petrochemical business. Academic leave at University of Michigan. Work with BASF on German acetylene pilot plant.
- 24 Graduate School

Fellowship at the University of Texas. Ph.D. work on catalysis and reaction engineering with Howard Rase. Position with Shell Development Company.
- 26 Return to Monsanto Chemical Company

Work with Ralph Wenner at Central Research Laboratories. Heading engineering research group. Company consultant in areas of ethylene and hydrocarbon pyrolysis. Shift from emphasis on acetylene-based to ethylene-based derivatives. Work from 1964 to 1979 heading a technology function to serve corporate Monsanto.
- 28 Academic Career

Monsanto's continuing education program and affiliation with Washington University. Course in process design at Washington University. Offered first chair in engineering at

University of Texas [UT]. Discussion of Monsanto's attitude toward publishing, and papers on distillation technology, technical writing, and trace quantity engineering to protect the environment. Discussion of contribution to Perry's Handbook and international textbook on distillation. Discussion of chemical engineering degree requirements and need for collaboration with industry. Development of Monsanto's FLOWTRAN computer program for process simulation/computer-aided design. FLOWTRAN licensed to Department of Energy. Aspen Technology. Development of UT's Separations Research Program [SRP], with industrial support for fundamental and applied research. John McKetta chair, teaching, students. Research in separations, heat transfer, extraction, adsorption, and structured packings. Lecture for King Award. International collaborations and SRP publications. Importance and advantages of distillation processes and research. Discussion of graduate students, industrial vs. academic careers, involvement in AIChE Dynamic Objectives Committee and publications and continuing education committees. Consulting activities. Computer program design. Discussion of family.

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