

CHEMICAL HERITAGE FOUNDATION

MANSON BENEDICT

Transcript of an Interview  
Conducted by

James J. Bohning

at

Naples, Florida

on

24 January 1991

(With Subsequent Additions and Corrections)

THE BECKMAN CENTER FOR THE HISTORY OF CHEMISTRY  
Oral History Program

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## MANSON BENEDICT

1907 Born in Lake Linden, Michigan on 9 October

### Education

1928 B. Chem., Cornell University  
1930-1931 University of Chicago  
1932 M.S., physical chemistry, MIT  
1935 Ph.D., physical chemistry, MIT

### Professional Experience

1929-1930 Research Chemist, National Aniline and Chemical Co.  
1935-1936 National Research Council Fellow, Harvard University  
1936-1937 Research Associate in Geophysics, Harvard University  
1937-1938 Research Chemist, National Aniline and Chemical Co.  
1938-1943 Research Chemist, M. W. Kellogg Company  
1943-1951 Director, process development, Hydrocarbon Research  
Inc.  
1951-1952 Chief, Operational Analysis Staff, Atomic Energy  
Commission  
1951-1957 Scientific Advisor, National Research Corporation  
  
Massachusetts Institute of Technology  
1951-1969 Professor of Nuclear Engineering  
1958-1971 Head, Nuclear Engineering Department  
1969-1973 Institute Professor  
1973- Institute Professor Emeritus  
  
1979-1985 Director, Burns & Roe, Inc.

### Public Service Activities

1948-1958 Reactor Safeguard Committee (later Advisory  
Commission on Reactor Safeguards), U.S. Atomic  
Energy Commission  
1958-1968 General Advisory Committee, U.S. Atomic Energy  
Commission  
1964-1988 Advisory Council on Radiation Protection,  
Massachusetts  
1973-1975 Energy Research and Development Advisory Council,  
Federal Energy Administration

## Honors

- 1947 William R. Walker Award, American Institute of  
Chemical Engineers
- 1963 Industrial and Engineering Chemistry Award, American  
Chemical Society
- 1966 Perkin Medal, Society of Chemical Industry, American  
Section
- 1966 Founders Award, American Institute of Chemical  
Engineers
- 1968 Robert E. Wilson Award, American Institute of  
Chemical Engineers
- 1969 Arthur Holly Compton Award, American Nuclear Society
- 1972 Enrico Fermi Award, U.S. Atomic Energy Commission
- 1975 John Fritz Medal, American Institute of Chemical  
Engineers
- 1976 National Medal of Science
- 1976 Founders Award, National Academy of Engineering
- 1983 Glenn Seaborg Award, International Platform  
Association

## ABSTRACT

Manson Benedict begins the interview with a discussion of his family background, including the highlights of his father's career in chemistry. He recalls how his early enthusiasm for chemistry was promoted both by his father's work and his summer jobs with Calumet and Hecla Copper Company. He then tells of his dissatisfaction with his Cornell University education, his year at National Aniline, and his decision to enroll at the University of Chicago to obtain a broader liberal education during which he explored economics and socialism. After a colorful description of a summer's work on a fruit farm in Washington state, Benedict describes his enrollment in a graduate physical chemistry program at MIT. He then discusses his National Research Fellowship at Harvard and his decision to work at Kellogg, where he developed the Benedict-Webb-Rubin equation. He describes his significant role in the Manhattan Project, and touches on his subsequent appointment to the Atomic Energy Commission. He concludes with his return to MIT to develop a nuclear engineering curriculum, the accomplishment of which he is most proud.

## INTERVIEWER

James J. Bohning, Assistant Director for Oral History at the Chemical Heritage Foundation, holds the B.S., M.S., and Ph.D. degrees in chemistry. He was a member of the chemistry faculty at Wilkes University from 1959 until 1990, where he served as chair of the Chemistry Department for sixteen years, and chair of the Earth and Environmental Sciences Department for three years. He was Chair of the Division of the History of Chemistry of the American Chemical Society in 1986, and has been associated with the development and management of the Foundation's oral history program since 1985.

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Parents attend Cornell University. Father discovers process for copper extraction. Exposure to chemistry through summer jobs at Calumet and Hecla Copper Company.
- 3 Cornell University
- 3 Cornell University  
Enrolls in academically limited chemistry program. Frustrated by research supervisor's inflexibility. Summer jobs at Camulet and Hecla.
- 8 National Aniline and Chemical Company  
Works on the nitro and indigo benches. The Great Depression heightens realization that he lacks a liberal arts education to deal with social problems.
- 10 University of Chicago  
Enrolls in philosophy program with hope to discover a personal philosophy. Studies literature, economics, and other disciplines which he finds useful later in life. Takes advantage of Chicago's cultural offerings. Makes several close friends. Explores socialism and union organizing. Hitchhikes to Washington to work for a summer on a friend's family's fruit farm while resolving indecision over his career path.
- 25 Massachusetts Institute of Technology (MIT)  
Enrolls in graduate program in physical chemistry. Works on temperature measurement methods. Marries a fellow physical chemist.
- 29 Harvard University  
Receives National Research Fellowship. Wife receives Ph.D. and works at Harvard Medical School. Studies PVT properties of nitrogen and argon. Appointed to the Harvard Committee on Geophysical Research to study solubility relations of aqueous solutions at high temperatures.
- 34 National Aniline and Chemical Company  
Studies kinetics of oxidation of benzene to maleic anhydride.
- 37 M. W. Kellogg Company/Polymerization Process Corporation (POLYCO)  
Develops Benedict-Webb-Rubin equation of state for gases and continuous flow calorimeter. Works on separation of hydrogen from gas mixtures.

- 46 Manhattan Project  
Works for Kellogg, a subsidiary of Kellogg, as head of process development. Charged with developing gaseous diffusion cascade and designing a plant for separating uranium at Oak Ridge. Also involved in building and operating the plant.
- 54 Hydrocarbon Research, Inc.  
When the war ends, decides to remain with colleagues from Oak Ridge rather than return to a more limited position at Kellogg. Obtains patents for mass diffusion and gas absorption. Works on extraction of deuterium
- 57 Atomic Energy Commission  
Member of the Reactor Safeguard Committee. Connections lead to return to MIT.
- 60 Massachusetts Institute of Technology  
Organizes nuclear engineering courses within chemical engineering department. Separate nuclear engineering department is established. Serves as department head for thirteen years. Opportunities for graduates expand as time progresses. Works on General Advisory Committee of Atomic Energy Commission. Wishes to be remembered for his role in educating others.
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## NOTES

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