

CHEMICAL HERITAGE FOUNDATION

PHILIP E. EATON

Transcript of an Interview
Conducted by

James G. Traynham

at

Chicago, Illinois

on

22 January 1997

(With Subsequent Corrections and Additions)

Philip Eaton

CHEMICAL HERITAGE FOUNDATION
Oral History Program
FINAL RELEASE FORM

_____ ment contains my understanding and agreement with Chemical Heritage Foundation with respect to my participation in a tape-recorded interview conducted by _____ James G. Traynham _____ on _____ 22 January 1997 _____.

I have read the transcript supplied by Chemical Heritage Foundation.

1. The tapes, corrected transcript, photographs, and memorabilia (collectively called the "Work") will be maintained by Chemical Heritage Foundation and made available in accordance with general policies for research and other scholarly purposes.
2. I hereby grant, assign, and transfer to Chemical Heritage Foundation all right, title, and interest in the Work, including the literary rights and the copyright, except that I shall retain the right to copy, use, and publish the Work in part or in full until my death.
3. The manuscript may be read and the tape(s) heard by scholars approved by Chemical Heritage Foundation subject to the restrictions listed below. The scholar pledges not to quote from, cite, or reproduce by any means this material except with the written permission of Chemical Heritage Foundation.
4. I wish to place the conditions that I have checked below upon the use of this interview. I understand that Chemical Heritage Foundation will enforce my wishes until the time of my death, when any restrictions will be removed.

Please check one:

a. _____

No restrictions for access.

NOTE: Users citing this interview for purposes of publication are obliged under the terms of the Chemical Heritage Foundation Oral History Program to obtain permission from Chemical Heritage Foundation, Philadelphia, PA.

b. _____

Semi-restricted access. (May view manuscript. My permission required to quote, cite, or reproduce.)

c. _____

Restricted access. (My permission required to view manuscript, quote, cite, or reproduce.)

This constitutes my entire and complete understanding.

(Signature) _____

(Date) _____

2/7/99

This interview has been designated as **Free Access**.

One may view, quote from, cite, or reproduce the oral history with the permission of CHF.

Please note: Users citing this interview for purposes of publication are obliged under the terms of the Chemical Heritage Foundation Oral History Program to credit CHF using the format below:

Philip E. Eaton, interview by James G. Traynham in Chicago, Illinois, 22 January 1997 (Philadelphia: Chemical Heritage Foundation, Oral History Transcript #0152).



Chemical Heritage Foundation
Oral History Program
315 Chestnut Street
Philadelphia, Pennsylvania 19106



The Chemical Heritage Foundation (CHF) serves the community of the chemical and molecular sciences, and the wider public, by treasuring the past, educating the present, and inspiring the future. CHF maintains a world-class collection of materials that document the history and heritage of the chemical and molecular sciences, technologies, and industries; encourages research in CHF collections; and carries out a program of outreach and interpretation in order to advance an understanding of the role of the chemical and molecular sciences, technologies, and industries in shaping society.

PHILIP E. EATON

1936 Born in Brooklyn, New York, on 2 June

Education

1957 B.A., chemistry, Princeton University

1960 M.A., chemistry, Harvard University

1961 Ph.D., chemistry, Harvard University

Professional Experience

1960-1962 Assistant Professor, University of California at Berkeley

The University of Chicago

1962-1965 Assistant Professor, Department of Chemistry

1965-1972 Associate Professor, Department of Chemistry

1972-present Professor, Department of Chemistry

1963-1969 Research Fellow, Alfred P. Sloan Foundation

1983-present President, Eaton Associates

1965-1977 Consultant, E. I. du Pont de Nemours & Co., Inc.

1968-1972 Consultant, National Institutes of Health

1983-1989 Consultant, Dow Chemical Company

1984-present Consultant, U. S. Army ARDEC

1985-1994 Consultant, Enichem Synthesis

1986-1991 Consultant, Fluorochem, Inc.

1996-present

1986-1991 Consultant, SRI International

1988-present Consultant, Geo-Centers, Inc.

1990-1991 Consultant, Displaytech Corporation

1992-1995 Consultant, Steroids, Ltd.
1996-1997 Consultant, DAS Group, Inc.
1998-present Consultant, Eastman Chemical

Honors

1963 Alfred P. Sloan Foundation Fellow
1975 Research Award, Rohm & Haas Company
1985 Alexander von Humboldt Prize
1995 Alan Berman Research Publication Award, Naval Research Laboratory,
 U.S. Navy
1997 Arthur C. Cope Scholar Award, American Chemical Society

ABSTRACT

Philip Eaton begins the interview with a description of his childhood, parents, and early education in Brooklyn, New York. At age seven, Eaton and his family relocated to Budd Lake, New Jersey, where he attended Roxbury Grammar School and later Roxbury High School. Eaton displayed a great interest in science during his high-school years, and his parents' and teachers' encouragement strengthened his desire to major in chemistry. He attended Princeton University, receiving his B.A. in 1957. After graduating from Princeton, Eaton attended Harvard University for both his M.A. and Ph.D. degrees. While at Princeton and Harvard, Eaton worked during the summers at Allied Chemical, where his group leader, Everett Gilbert, had a profound effect on his career. There, he first became involved with cage chemistry, specifically Kepone. In his final years as a graduate student at Harvard, Eaton accepted a postdoctoral assistant professorship at the University of California, Berkeley. There he taught introductory organic chemistry with Melvin Calvin. In 1962, he joined the faculty of the University of Chicago, where he remains a professor today. Shortly after his arrival at Chicago, Eaton began researching chlorocarbon compounds, which led him to cubane synthesis. With the assistance of his postdocs, Eaton synthesized on several other cubane-based compounds. Other projects included photochemistry work and dodecahedrane synthesis. Eaton's students praised his teaching methods and his dedication to excellence in education. His research accomplishments have earned him several awards, including the Humboldt Award and the Arthur C. Cope Scholar Award. Eaton concludes the interview with a discussion on the future of scientific research, maintaining excellence in chemistry education and research, and thoughts on his wife, Phyllis.

INTERVIEWER

James G. Traynham is a Professor of Chemistry at Louisiana State University, Baton Rouge. He holds a Ph.D. in organic chemistry from Northwestern University. He joined Louisiana State University in 1963 and served as chemistry department chairperson from 1968 to 1973. He was chairman of the American Chemical Society's Division of the History of Chemistry in 1988 and is currently councilor of the Baton Rouge section of the American Chemical Society. He was a member of the American Chemical Society's Joint-Board Council on Chemistry and Public Affairs, as well as a member of the Society's Committees on Science, Chemical Education, and Organic Chemistry Nomenclature. He has written over ninety publications, including a book on organic nomenclature and a book on the history of organic chemistry.

TABLE OF CONTENTS

1	Early Years	Growing up in Brooklyn, New York and Budd Lake, New Jersey. Early interest in science. Encouragement of teachers and parents. Decision to attend Princeton.
4	College and Graduate Education	Research work at Princeton. Kepone. Working with Peter Yates. NMR work. Working at Allied Chemical. Attending graduate school at Harvard. Assistant professorship at University of California, Berkeley. Teaching with Melvin Calvin.
11	University of Chicago	Leaving University of California for the University of Chicago. Michael J.S. Dewar. Quadrupole spectroscopy. Cage compounds. Cubane research and synthesis. Thomas W. Cole, Jr.
24	Synthetic Chemistry Research	Propellane molecules. Ph.D. and postdoc assistants. Dodecahedrane. Horst Prinzbach and Leo Paquette syntheses.
28	Chemistry Education	Interaction with students. Research excellence. Education opportunities outside of the classroom. Setting high standards. Teaching methods. Winning Humboldt Award. Research funding.
34	Conclusion	Future of chemical discoveries. Research and development costs and support. Phyllis Eaton. Good science versus bad science.
42	Notes	
43	Index	

NOTES

1. Philip E. Eaton, "Giant Ring Di-Ether Ketones: Applications and Confirmational Analysis" (Princeton: Princeton University, 1957).
2. Philip E. Eaton, "Isomerizations in the Dicyclopentadiene Series; Accelerations of the Diels-Alder Reaction by Aluminum Chloride; and Studies in the Chemistry of Perchloro Compounds" (Cambridge: Harvard University, 1961).
3. "Notable Books of the Year 1996," *New York Times Book Review*, December 8, 1996.
4. John Horgan, *The End of Science: Facing the Limits of Knowledge in the Twilight of the Scientific Age* (Reading, MA: Helix Books/Addison-Wesley Publishing Company, 1996).
5. Francis Fukuyama, *The End of History and the Last Man* (New York: Free Press, 1992).

INDEX

A

Abbott Laboratories, 37
Adam, Waldmar, 32
Aldrich Chemical Company, 23
Aldrichemica Acta, 28-29
Allied Chemical, 4, 6, 8, 14-15, 19, 39
 General Chemical Division, 19
American Chemical Society (ACS), 9, 17
 Cope Scholar Award, 32
Aromatics, 21
Atlanta University, 16, 19
Atlantic City, New Jersey, 3

B

Bartlett, Paul, 6, 29
Beek, Peter J., 21
Borden, Wesley T., 24
Boston, Massachusetts, 8, 12
Brooklyn, New York, 1-2
 P.S. 102, 1
Brown, Weldon, 16
Budd Lake, New Jersey, 1
Buffalo, New York, 8

C

Caisson, James, 10
California, University of, at Berkeley, 9-13, 15
Calvin, Melvin, 10
Cassar, Luigi, 19
Castaldi, Graziano, 22
Chicago Institute for Psychoanalysis, 38
Chicago, Illinois, 8-9, 29
Chicago, University of, 1, 9-12, 14-16, 28, 30-32, 35, 39
 Jones Laboratory, 16
Chlorocarbons, 6, 8, 12-15, 27
Ciamician, Giacomo, 13
Cinnamic acids, 13
Clark Atlanta University, 16
Closs, Gerhard L., 17
Cole, Thomas W., Jr., 7, 16, 19
Cologne, University of, 32
Congedo, --, 2
Cope, Arthur C., 14

Corey, Elias J., 13
Cotton, F. Albert, 12
Cram, Donald J., 5
Cubanamide, 22
Cubane, 14-17, 19-28, 34, 38-39
 1,4 diamide of cubane, 22
 cubane amides, 22
 cubane diacid, 16, 19-20
 cubane diester, 19, 21, 23
 dinitrocubane, 20
 1,4-dinitrocubane, 20
 hexanitrocubane, 22
 idocubane, 22
 lithio cubane, 22
 nitrocubane, 23
 octanitrocubane, 19-23, 39
 structure, 24
 synthesis, 15-16, 18-19, 27-28
 tetranitrocubane, 23
Cubene, 23
 1,9- homocubene, 23
Cyclohexenone, 13
Cyclopentadienone, 14-15
 Tetrachlorocyclopentadienone, 14
Cyclopentenone, 11, 13
 2-cyclopentenone, 13

D

Dauben, William G., 10
De Paul University, 9
DeMeirer, Armand, 37
Depression, The, 1
DePuy, Charles, 14
Dewar, Mary, 9
Dewar, Michael J.S., 9-10
Dicarboxylic acid, 18
Diels-Alder reaction, 6-7, 14
Di-Grignard, 22
Dodecahedrane, 20, 26-27

E

Eaton, Philip E.
 father, 1-2, 38
 mother, 1, 3-4
 wife (Phyllis), 32, 37-38
Eiloff, --, 2
End of Science, The, 34
Enichem Montedison, 19, 23
Experiment in International Living, 3

F

Favorskii reaction, 14-19
Formula One Race, 28
Freiburg, University of, 32

G

Gehring, Peter, 26
Gilbert, Everett, 4, 19-21, 26, 39
Griffin, Gary, 19-20

H

Halpern, Jack, 19
Hammond, George, 13
Hand, Ellie Smakula, 18
Harvard University, 4-9, 11, 14-15, 18, 26
Hefcock, Clayton, 11
Hexachlorocyclopentadiene, 8, 17
Hill, Richard, 4-5
Hooker Chemical Company, 8-9
Horgan, John, 34
Hormann, Robert, 30
Humboldt Foundation, 32
 Humboldt Award, 32

J

Journal of Organic Chemistry, 34

K

Katz, Thomas, 7
Kepone, 4, 8, 14, 17

L

Leermakers, Peter, 13
Lehigh University, 35
Lehn, Jean-Marie, 5
Leipzig, Buddy, 25
Lewis acid, 7

M

Massachusetts Institute of Technology (MIT), 6, 12
Mayo, Paul, 13
Mendes, Celeste, 2, 30, 39
Meyers, Albert I., 21
Moscow State University, 36

N

National Institute of Standards, 26
National Institutes of Health (NIH), 40
New Orleans, University of, 20
New York Times Book Review, 34
Nuclear Magnetic Resonance (NMR), 7, 12-14, 16-17
 A-60 NMR spectrometer, 16
Nobel Prize, 5
Northwestern University, 23
Noyes, Don, 10

P

Paddlanes, 24-25
 2.2.2.2 paddlane, 24-25
Paquette, Leo A., 26-27
Pedersen, Charles J., 5
Peristylane, 26
Photochemistry, 24
2+2 photocycloaddition, 11, 13
Picatinny, New Jersey, 19
Princeton University, 3-6
 Firestone Library, 3
Prinzbach, Horst, 26-27, 32
Propellane, 24
 2.2.2 propellane, 24

Q

Quadracyclane, 28

R

Rappaport, Henry, 10
Roxbury Grammar School, 2
Roxbury High School, 2

S

San Francisco, California, 10
Scherer, Kirby, 11, 15
Seattle, Washington, 24
Silverman, Richard, 23
Sniekus, Victor, 21-22
Steroids Limited, 23
Succasunna, New Jersey, 1

T

Terephthalic acid, 17

U

U.S. Air Force, 23
U.S. Army, 19-21, 23
 Army Research Development and Engineering Command, 19

V

Vogel, Emmanuel, 32
Von Schleyer, Paul R., 25

W

Waterloo, University of, 21
West Virginia, University of, 16
Winstein, Saul, 17
Woodward, Robert B., 7, 15, 18

Y

Yale University, 6
 Sterling Laboratory, 6
Yates, Peter, 6-9, 18
Yildirim, Tanner, 26

