

THE BECKMAN CENTER FOR THE HISTORY OF CHEMISTRY

MELVIN S. NEWMAN

Transcript of an Interview
Conducted by
John H. Wotiz and Milton Orchin
at
Ohio State University
on
3 and 4 March 1979

CENTER FOR HISTORY OF CHEMISTRY ORAL HISTORY PROJECT

This manuscript is based on a tape-recorded interview conducted for the ACS-AIChE - University of Pennsylvania Center for History of Chemistry, the tape and the manuscript being the property of the Center. I have read the manuscript and made only minor corrections and emendations. The reader is, therefore, asked to bear in mind that this is a transcript of the spoken word rather than a literary product.

I wish to place the following condition upon the use of this interview, and I understand that the Center will enforce that condition to the fullest extent possible:

(Check One)

X

OPEN. This manuscript may be read and the tape heard by scholars approved by the Center. The scholar pledges not to quote from, cite, or reproduce by any means this material except with the written permission of the Center.

MY PERMISSION REQUIRED TO QUOTE, CITE, OR REPRODUCE. This manuscript and the tape are open to examination as above. The scholar pledges not to quote from, cite, or reproduce by any means this material except with the written permission of the Center, in which permission I must join. Upon my death this interview becomes Open.

MY PERMISSION REQUIRED FOR ACCESS. I must give written permission before the manuscript or tape can be examined (other than by Center staff in the normal course of processing). Also, my permission is required to quote from, cite, or reproduce by any means. Upon my death this interview becomes Open.

Melvin S. Newman
(Signature)

1/21/84
(Date)

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:

Melvin S. Newman, interview by John H. Wotiz and Milton Orchin at Ohio State University, 3 and 4 March 1979 (Philadelphia: Chemical Heritage Foundation, Oral History Transcript # 0004).



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.

MELVIN S. NEWMAN

1908 Born in New Orleans, Louisiana, 10 March

Education

1929 B.S., chemistry, Yale University
1932 Ph.D., chemistry, Yale University
1933 National Tuberculosis Association Fellow, Yale University
1934 National Research Council Fellow, Columbia University
1934-1936 Research Fellow, Harvard University

Employment

Department of Chemistry, Ohio State University
1936-1939 Instructor
1940-1944 Assistant Professor
1944-1965 Professor
1965-1978 Regents Professor
1978- Emeritus Professor
1957&1967 Fulbright Professor, University of Glasgow
1944 Consultant to the United States Bureau of Mines
1945-1978 Consultant to the Upjohn Company

Honors

1939-1940 Howald Scholar, Ohio State University
1949&1951 Guggenheim Fellow
1956 Elected member of National Academy of Sciences
1961 American Chemical Society Award for Creative Work in Synthetic Organic Chemistry
1965 Honorary D.Sc. degree, University of New Orleans
1970 Wilbur Cross Medal, Yale University
1975 Joseph Sullivant Award, Ohio State University
1978 Honorary D.Sc. degree, Bowling Green State University
1979 Roger Adams Award of American Chemical Society
1979 Honorary D.Sc. degree, Ohio State University

ABSTRACT: This interview covers the education, teaching, and research of Melvin S. Newman, an eminent organic chemist. Initially, Newman discusses his family, childhood, and early education. He then elucidates his undergraduate and graduate activities at Yale and describes his initial experiences at Ohio State University, where he has spent most of his academic career. The interview continues with Newman's remarks about his early consulting and doctoral advising. The central portion of the interview contains Newman's reflections about his research at Ohio State and his approach to teaching in the classroom and in the laboratory. His publications, use of the innovative "Newman Projection," later consulting, patents, and awards are also discussed. The interview concludes with Newman's views about research funding, former students, and philosophies of teaching and administration.

INTERVIEWERS: John H. Wotiz is an organic chemist. Born in Czechoslovakia in 1919, he attended Furman University, the University of Richmond, and Ohio State University, where he received his Ph.D. degree in organic chemistry. He has since taught at six universities. Most recently, he has been professor of chemistry and chairman of the department of Chemistry and Biochemistry at Southern Illinois University. In 1982, he received the American Chemical Society's Dexter Award in the History of Chemistry.

Milton Orchin is also an organic chemist with an interest in the history of chemistry. He received his bachelor's degree in chemistry at Ohio State University. One of Newman's first graduate students, he earned the doctorate at Ohio State in 1939. Since then he has combined research in federal laboratories, especially for the United States Bureau of Mines, with university teaching both home and abroad.

NOTE: The following table correlates the tapes of the Newman interview with the pages of this transcript.

Tape 1, side 1.....p.	1-10
side 2.....	blank
Tape 2, side 1.....p.	10-24
side 2.....p.	24-34
Tape 3, side 1.....p.	34-43
side 2.....p.	43-53
Tape 4, side 1.....p.	53-58
side 2.....p.	58-67
Tape 5, side 1.....p.	67-78
side 2.....p.	78-79

TABLE OF CONTENTS

- 1 Childhood and Family
Siblings. Father's occupation. Relocation from New Orleans to New York City. Early love of sports. Tutoring by an organic chemist.
- 4 Undergraduate Years at Yale
Preoccupation with golf. A major in chemistry.
- 5 Graduate Years at Yale
Parental pressure to go into business. Graduate work in chemistry. R. J. Anderson as thesis director and lessons that he taught. The thesis topic.
- 11 Initial Encounters at Ohio State University
Prof. William Evans. Salary. Teaching assignments. The chemistry faculty at Ohio State. Promotion to assistant professor.
- 18 Consulting Work at Upjohn
Hired as a consultant. The vitamin A synthesis. Liquid ammonia syntheses.
- 21 Early Doctoral Advising
Lloyd Joshel. Milton Orchin. Harold Vivian.
- 23 Methodology and Innovative Aspects of Teaching
Initial experiences in the classroom. "Teach a few things well rather than a lot of things poorly." Importance of showing students the worth of organic chemistry to society. Emphasis upon independent study. The program to acquaint outstanding high school students with the enterprise of chemistry.
- 29 Research at Ohio State
Polycyclic hydrocarbon work. The general synthesis of benzantracene derivatives. Pseudoesters and sterifications. Work with sulfuric acid. The application of physical chemistry to specific problems.
- 34 Newman Projections
The genesis. Its advantages. Three dimensional representation on a flat surface.
- 37 Philosophy of Laboratory Instruction
Independent work stressed. Accountability for ninety percent yield of products.

- 38 More Research and Publishing
Steric Effects in Organic Chemistry. Optical activity in hydrocarbons. Aromatic electrophilic substitution. Work with 4,5-dimethylacridine.
- 45 Additional Consulting
Continental Oil Company. Diamond Alkali. International Flavors and Fragrances. The National Academy of Sciences.
- 47 Activity in the Laboratory
An eclectic approach. Unsaturated carbonium ions. Work with vinylene carbonate.
- 50 Patents
A decision that allowed researchers at universities to patent their discoveries. Several patents mentioned.
- 54 Awards
Modesty. The true award: chemistry well done.
- 56 Advice to Students
The value of persistence. Give graduate students the opportunity to use individual initiative. The Rule of Six is a qualitative aid.
- 59 Research and Funding
Monomethyl ether. The necessity to research "useful" topics.
- 62 Graduate and Postdoctoral Students
Advice about career orientation. The students' success and commitment. Students from varied backgrounds. Foreign students.
- 66 Philosophy of Administration
Advocacy for strong departmental chairmen. Separate teaching and administration on the departmental level. Considerations about tenure. Abuses in the granting of tenure.
- 72 Philosophy of Teaching
Encourage independence and initiative on the part of students. A unique lab course. The teaching of chemistry stresses lectures at the expense of laboratory work.

INDEX

<u>Accounts of Chemical Research</u>	32
acridine	44, 45
Addor, Roger	51
administration, philosophy of	68-71
alcohol	26, 40, 48
American Chemical Society (ACS)	50, 76
American Cyanamid	51
American Petroleum Institute	24,
Anderson, R. J.	5-10, 57
antimalarials	45
Army (United States)	45, 46, 47
arylbenzoic acids	10
atomic bomb	47
Bachman, Bryant	14, 15, 16, 21
Barton, Derek H.	33, 34, 66
baseball	3
Beacon, New York	7
benzanthracene	21, 29, 42, 52
benzene	42
benzoic acid	30, 31, 56
biochemistry	8, 9, 17
Boord, Cecil E.	19, 20, 21, 23, 24, 27
boric acid	34
Bristol, University of	65
Brode, Wallace R.	21
bromine	40, 42, 43, 44
Brown, H. C.	44, 45
butenes	24, 52
Cambridge, Massachusetts	14
Campbell, Arthur W.	28
cancer research	10, 18
carbene ions	32, 33, 49
carbohydrate research	14, 15
carbonium ions	25, 31, 32, 33, 48, 49
Cella, James	61
chelates	47
<u>Chemical Abstracts</u>	51
chemical analysis	8, 9, 10
<u>Chemical Physics</u>	71
chemical synthesis	9, 10, 18, 19, 20, 29, 38
Cincinnati, University of	1
Columbus, Ohio	1, 11, 16, 27
Conant, James B.	26
Continental Oil Co.	46
Cornell Medical School	7
Cornell University	2, 7
Council of Chemical Research	31

cyclization reactions	10
cyclopropane	56
Dauben, William G.	36
DDT	47
deuterium	31
Dewar, William J.	42, 44
Diamond Alkali	46
dianions	61
diastereomers	40
diborene	26
dimethylacridine	44, 45
diols	34
dioxin	47
distillation	9-10
Division of Organic Chemistry of the ACS	55
Donleavy, John J.	4
Du Pont de Nemours & Co., E.I.	46, 50
Eastman Kodak Co.	14
Eglinton, Jeff	65
electrical conductivities	33-34
electrophilic substitution	42, 43
Eli Lilly Co.	11
Eliel, Ernest L.	36
ergosterol	9
esters	29, 47, 56, 62
Escher, Maurits C.	36
ethylene carbonate	49, 50
Evans, William L.	11, 14-16, 21
Fernelius, W. Conrad	14, 17, 19, 20
Fieser, Louis R.	10, 11, 15, 29, 57
Fleischmann Yeast Co.	5, 6, 9
Foulk, Charles W.	14
Fones, William S.	19
free radicals	32
"Frontiers in Chemistry"	34
gasoline	24, 25
Geneva, New York	8
George, M.V.	54
Gershwin, George	2
Gilman, Henry	54
Ginsberg, Helen	18, 19
Glasgow, University of	66
glycerin	8
Goodrich Co.	46
Greenlee, Kenneth W.	19, 20
Grignard reactiond	10, 19
Grignard reagents	10
Guggenheim Fellowship	12
gutta-percha	54

Hammett, Louis R.	29, 49, 60
Hantzsch, Arthur R.	29
Harvard University	10, 11, 15, 21
Hausen's Principle of Dianions	61
Hayashi rearrangement	31
Henderson, William E.	13
Henne, Albert L.	22, 47
hexahelicene	39
Hill, J. A.	15
Hine, Jack	49
Honors Program	78
"hot carbons"	33
Huisgen, Rolf	65
Hung, William	66
hydrolyzation	48-52
hydroquinone, monoalkylation of	61
Illinois, University of	20
industrial chemistry	72
inorganic chemistry	15, 19
International Flavors and Fragrances Co.	46
ions	30, 31, 32, 33
isomers	24, 31, 33, 40, 45
isoprene	54
Jones, E. R.	66
Joshel, Lloyd	11, 20, 22, 23
<u>Journal of the American Chemical Society</u>	62, 71
<u>Journal of Chemical Education</u>	28, 35
<u>Journal of Medical Chemistry</u>	58
<u>Journal of Organic Chemistry</u>	61, 62
Kamm, Oliver	20
Karnes, Harold	54
keto acids	29, 31
ketones	33, 59
Kohler, Elmer P.	15
lipids	5, 7, 8, 9
liquid ammonia	10
Lutz, Arthur L.	19, 74
	41
Mack, Edward	17
Macmillan	37
Manchester, University of	66
Marcus, Joseph K.	10
Massachusetts, University of	66
McCarthy, Maurice	4
McPherson, William	13, 14, 16, 17
McPherson and Henderson (text)	13
Meerwein-Wagner rearrangements	33
mechanisms, chemical	29, 30, 31, 32
mesitoic acid	30

methyl benzanthracenes	21
methyl groups	5, 9, 29, 34 39, 43, 45
Midgley Foundation	22
Miller, Harry F.	21
mineral oil	9
monomethyl ether	59-60
Moyer, Harvey V.	17
naphthalene structure	9, 35, 42
naphthalic anhydride	20
naphthaquinone	9
National Academy of Sciences	46, 66
National Intercollegiate Golf Tournament	4
National Science Foundation (NSF)	29, 43, 46, 74, 78
Navy (United States)	46, 47
New Haven, Connecticut	8
Newman, Alice	1
Newman, Bea	14
Newman, Melvin	
awards	55
chemical consultant	18
father	1, 3, 10
foreign students	64-66
golf	3-4, 5, 6
health	67
jazz music	2
program for gifted high school students	27, 28, 29
siblings	1-2
teaching philosophy and methodology	37, 38, 54, 55 56, 57, 63, 64, 72-80
tenure system, comments on wine	69-70 7, 8
wrestling	3
Newman, Sophie	1
Newman Projections	34, 35
Newman Stopcock	53
New Orleans, Louisiana	1, 2, 7, 10
New York City	2, 3, 6, 10
New York State Agricultural Station	7
no-mechanism reactions	32
Nobel Prize	33, 45
octane	24
Ohio State University	1, 10, 12, 14, 16, 21, 23, 26, 27, 29, 37, 51, 52, 67, 69, 70, 75, 77, 78
Ohio State University Research Foundation	51
olefins	26, 53
optical rotation	41, 42

Orchin, Milton	1, 20, 21, 22, 67
organic chemistry	5, 8, 13, 15, 17, 24, 25, 32, 33, 55, 70, 71, 79
organometallic	42
overcrowded molecules	39, 42
Oxford, University of	66
Parke-Davis Company	20
patents	51, 52, 53
phenanthrene	10, 42
phenolphthalein	8
phenone	9
Phenonium	32
phenoxyacetic acid	47
Philadelphia, Pennsylvania	2
phthalic acid	9
phthiocol	8
physical chemistry	16, 30, 33, 70 71, 79
physical organic chemistry	29, 35, 60
<u>Physics</u>	71
Pitzer, Kenneth S.	36
polycyclic hydrocarbons	29, 41, 55
polymerization	48, 50, 52, 54
polynuclear hydrocarbons	10
Powell, Warren	44
Prohibition	8
pseudoesters	10, 29, 56
Purdue University	14
quantitative analysis	4
quenching	30
racemization	39, 40
Rafael, Ralph	66
Renoll, Mary	22
Research Corporation	46, 47
research funding	45, 46, 58
research, philosophy and methodology	48, 49, 57, 58, 60
Rice University	72
Riverdale Country Day School	3
Rockefeller Institute	9, 10
rubber, natural	54
Rule of Six	58-59
sabbatical leave	12
Saxton, Blair	4
Schaefer, John	56
Scott, Ian	65
sigma-rho relationship	60
Smiles arrangement	32
spectra	27

Southern Illinois University	1
spirocyclic intermediates	31, 32
St. Louis, Missouri	54
<u>Steric Effects in Organic Chemistry</u>	35, 36, 38
stereochemistry	10, 27, 34, 35, 36, 39, 43, 44, 45, 59
sulfuric acid	9, 26, 29-30
Sussex, England	31, 35, 42, 59 44
t-butyl groups	44
Taft, Robert	60
Taylor, Hugh S.	41
tetraethyl	24
tetranitro-fluorenone	40
Texaco (Texas Corporation)	6, 7
Texas, University of	72
toluene	19
triethyl	50, 51
trifluoroacetic acid	42
trifluoroacetoacetic ester	47
trimethylamine	50
tritium	42
tuberculosis bacteria	7, 8
Upjohn Co.	17, 18, 19, 46, 53, 68
urethane	48
"USA"	3
Van't Hoff I-factors	29, 60
vinylene carbonate	49, 50, 51, 53
vitamin A	18, 19
Vivian, Harold	22, 23
Walborsky, Harry	56
Wayne State University	34
Welch professorship	72
Werner, Louis F.	14
West, Robert	73
Westheimer, Frank	1
Whitmore, Frank C.	33
Wisconsin, University of	73
Wittig, Georg	65
Wolf from, Melville L.	14, 21
Woodward, Robert	57
Wotiz, John H.	1
Yale Golf Team	4
Yale University	3, 4, 6, 7, 8, 10, 12, 15, 16 66
yeast	5, 9, 10

