

SCIENCE HISTORY INSTITUTE

ROALD HOFFMANN

Transcript of an Interview
Conducted by

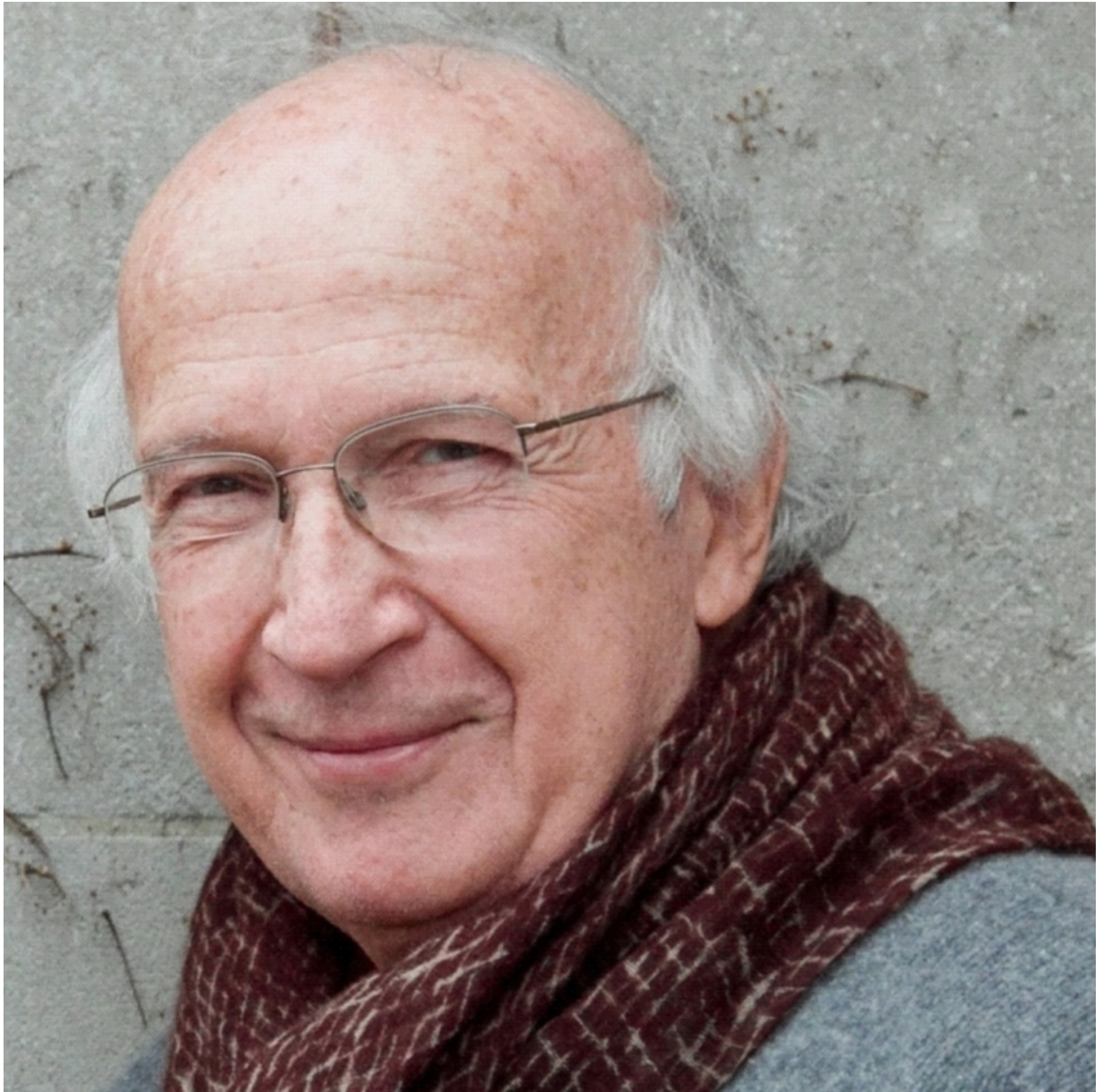
David J. Caruso and Carsten Reinhardt

Cornell University, Ithaca, New York and
Chemical Heritage Foundation, Philadelphia, Pennsylvania

on

16 and 17 October 2014 and 21 March 2015

(With Subsequent Corrections and Additions)



Michael Grace-Martin

Roald Hoffmann

SCIENCE HISTORY INSTITUTE
Center for Oral History
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Roald Hoffmann

(Date) _____

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Roald Hoffmann, interview by David J. Caruso and Carsten Reinhardt, Cornell University, Ithaca, New York, 16 and 17 October 2014 and 21 March 2015 (Philadelphia: Science History Institute, Oral History Transcript # 0925).



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ROALD HOFFMANN

1937 Born in Złoczów, Poland (now Zolochiv, Ukraine) on 18 July

Education

1958 BA, Columbia University, Chemistry
1960 MS, Harvard University, Physics
1960 PhD, Harvard University, Chemical physics

Professional Experience

Harvard University
1962-1965 Junior Fellow, Society of Fellows

Cornell University
1965-1968 Associate Professor, Chemistry
1968-1974 Professor, Chemistry
1974-1996 John A. Newman Professor Physical Sciences
1996-2008 Frank H.T. Rhodes Professor of Humane Letters
2008-present Frank H.T. Rhodes Professor of Humane Letters Emeritus

Honors

1969 American Chemical Society Award, Alpha Chi Sigma
1969 Fresenius Award, Phi Lambda Upsilon
1969 Harrison Howe Award, American Chemical Society, Rochester Section
1970 Award of the International Academy of Quantum Molecular Sciences
1971 Member, American Academy of Arts and Sciences
1972 Member, National Academy of Sciences
1973 Inaugural Recipient of the Arthur C. Cope Award in Organic Chemistry,
American Chemical Society (co-recipient)
1974 Linus Pauling Award
1978 Member, International Academy of Quantum Molecular Sciences
1981 Nichols Medal of the New York Section of the American Chemical
Society
1981 Nobel Prize in Chemistry
1982 ACS Award in Inorganic Chemistry
1983 National Medal of Science

1983 Foreign Fellow of the Indian National Science Academy
1984 Foreign Member of the Royal Society
1984 Member, American Philosophical Society
1985 Foreign Member of the Royal Swedish Academy of Sciences
1986 Dickinson College Award
1986 National Academy of Sciences Award in Chemical Sciences
1988 Foreign Member of the Societas Scientiarum Fennica
1988 Foreign Member of the Academy of Sciences of the USSR
1990 Priestley Medal
1991 N.N. Semenov Gold Medal, Academy of Sciences of the USSR
1994 Centennial Medal of the Graduate School of Arts and Sciences of
Harvard University
1996 Pimentel Award in Chemical Education, American Chemical Society
1997 Inaugural Elizabeth A. Wood Science Writing Award, American
Crystallographic Association
1998 Jawaharlal Nehru Birth Centenary Award of India
1998 Corresponding Member, Nordrhein-Westfälische Academy of Sciences
1999 Honorary Member of the German Chemical Society
2000 Member, Deutsche Akademie der Naturforscher Leopoldina
2002 Honorary Member of the Chemical Society of Japan
2006 Gold Medal of the American Institute of Chemists
2010 Member, Mexican Academy of Sciences
2018 Member, Real Academia de Ciencias

ABSTRACT

Roald Hoffmann was born Roald Safran in Złoczów, Poland, in 1937. His father, Hilel Safran, was a civil engineer and his mother trained as teacher. Between 1939 and 1941, Złoczów was under Soviet occupation; when the Nazi Wehrmacht reached Złoczów in 1941, they rounded up the Jews of the town and many men and boys were killed. Roald's family went into hiding, then into a labor camp. His father bribed the guards to allow Roald, his mother, and several other family members to leave, but was himself executed soon after for leading a plot to break additional prisoners out of the camp. Roald's family spent the remainder of the war in hiding. At the end of the war, the family moved to Krakow, Roald's mother remarried, and they acquired the surname Hoffmann from bought identity papers they used to emigrate to Prague and, eventually, to the United States.

After graduating from Stuyvesant High School and exploring interests in the humanities and in chemistry as an undergraduate at Columbia University, Hoffmann went to Harvard University for a graduate program in chemical physics, planning to work with William E. Moffitt. Moffitt's death led Hoffmann to Martin Gouterman, then to William Lipscomb. In graduate school, Hoffmann continued to pursue a variety of academic interests, attending a summer school in Sweden where he met the woman he would marry, and spending a year in the Soviet Union on a government-sponsored exchange program. Upon his return, he settled into theoretical chemistry work focused on boron hydrides with Lipscomb and completed his PhD within a year.

Offered assistant professorships at Cornell and at several western universities, Hoffmann instead accepted a Junior Fellowship at Harvard, which afforded him three years to pursue research without any teaching responsibilities. He decided to apply the extended Hückel method he had developed for the boron hydride calculations to organic molecules. R. B. Woodward brought the frontier orbital explanation for the electrocyclic reaction to Hoffmann's attention. Hoffmann describes how the ensuing work on orbital symmetry brought together theoretical chemistry and organic chemistry, and spurred a significant change in the chemical community's perception of chemical reactivity.

In 1965, Hoffmann took up a faculty position at Cornell University. He describes the role of computers in his work, both at Harvard and at Cornell, and the importance of the Ithaca community, which encourages socialization across departments and disciplines. The remainder of the interview focuses on Hoffmann's approach to establishing and leading a research group, his interactions with colleagues, his second period of collaboration with R.B. Woodward, and the experience and impact of winning the Nobel Prize. He also discusses his writing projects, which include poetry, plays—including *Oxygen*, which he cowrote with Carl Djerassi—and popular works exploring science and religion. Throughout the discussion, Hoffmann returns to the themes of building bridges between branches of chemistry, between chemistry and physics, between science and the humanities, and between academia and the public.

INTERVIEWER

David J. Caruso earned a BA in the history of science, medicine, and technology from Johns Hopkins University in 2001 and a PhD in science and technology studies from Cornell

University in 2008. Caruso is the director of the Center for Oral History at the Science History Institute, president of Oral History in the Mid-Atlantic Region, and editor for the *Oral History Review*. In addition to overseeing all oral history research at the Science History Institute, he also holds an annual training institute that focuses on conducting interviews with scientists and engineers, he consults on various oral history projects, like at the San Diego Technology Archives, and is adjunct faculty at the University of Pennsylvania, teaching courses on the history of military medicine and technology and on oral history. His current research interests are the discipline formation of biomedical science in 20th-century America and the organizational structures that have contributed to such formation.

Carsten Reinhardt served as the Science History Institute's president from 2013 to 2016 (then the Chemical Heritage Foundation). He is currently a professor of the history of science at Bielefeld University, Germany. Reinhardt has extensively researched and published on the impact of chemistry on society through topics including the history of industrial research, the emergence of instrumentation, and chemistry's links to physics, biology, medicine, and technology. Reinhardt has received many awards and fellowships, including being named a fellow at the Max Planck Institute and a visiting professor in the Department of Philosophy, École Normale Supérieure, Paris. Reinhardt was an Edelstein Fellow at the Institute in 1998–1999 and at Hebrew University of Jerusalem in 1994.

ABOUT THIS TRANSCRIPT

The Center for Oral History, Science History Institute, is committed both to preserving the recording of each oral history interview in our collection and to enhancing research use of the interviews by preparing carefully edited transcripts of those recordings. The preparation of interview transcripts begins with the creation of a verbatim typescript of the recording and proceeds through review and editing by staff of the Center; interviewees also review the typescript and can request additions, deletions, or that sections be sealed for specified periods of time. We have established guidelines to help us maintain fidelity to the language and meaning of each recorded interview while making minor editorial adjustments for clarity and readability. Wherever possible, we supply the full names of people, organizations, or geographical locations mentioned during the interview. We add footnotes to the transcript to provide full citations for any publications that are discussed, to point to extant oral history interviews, and to clear up misstatements or provide context for ambiguous references in the transcript. We use brackets to indicate the addition of material that was not in the audio, and bracketed ellipses to indicate the deletion of recorded material. The transcript also includes time stamps at five-minute intervals. We omit without noting most instances of verbal crutches and all instances of nonlexical utterances. We also make small grammatical corrections where necessary to communicate interview participants' meaning. Finally, staff of the Center create the abstract, chronology, and table of contents. With the availability of online full-text searching of our transcripts, the Center for Oral History opted to discontinue the practice of preparing a back-of-the-book index for each oral history transcript in 2020.

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