SCIENCE HISTORY INSTITUTE

ROALD HOFFMANN

Transcript of an Interview
Conducted by

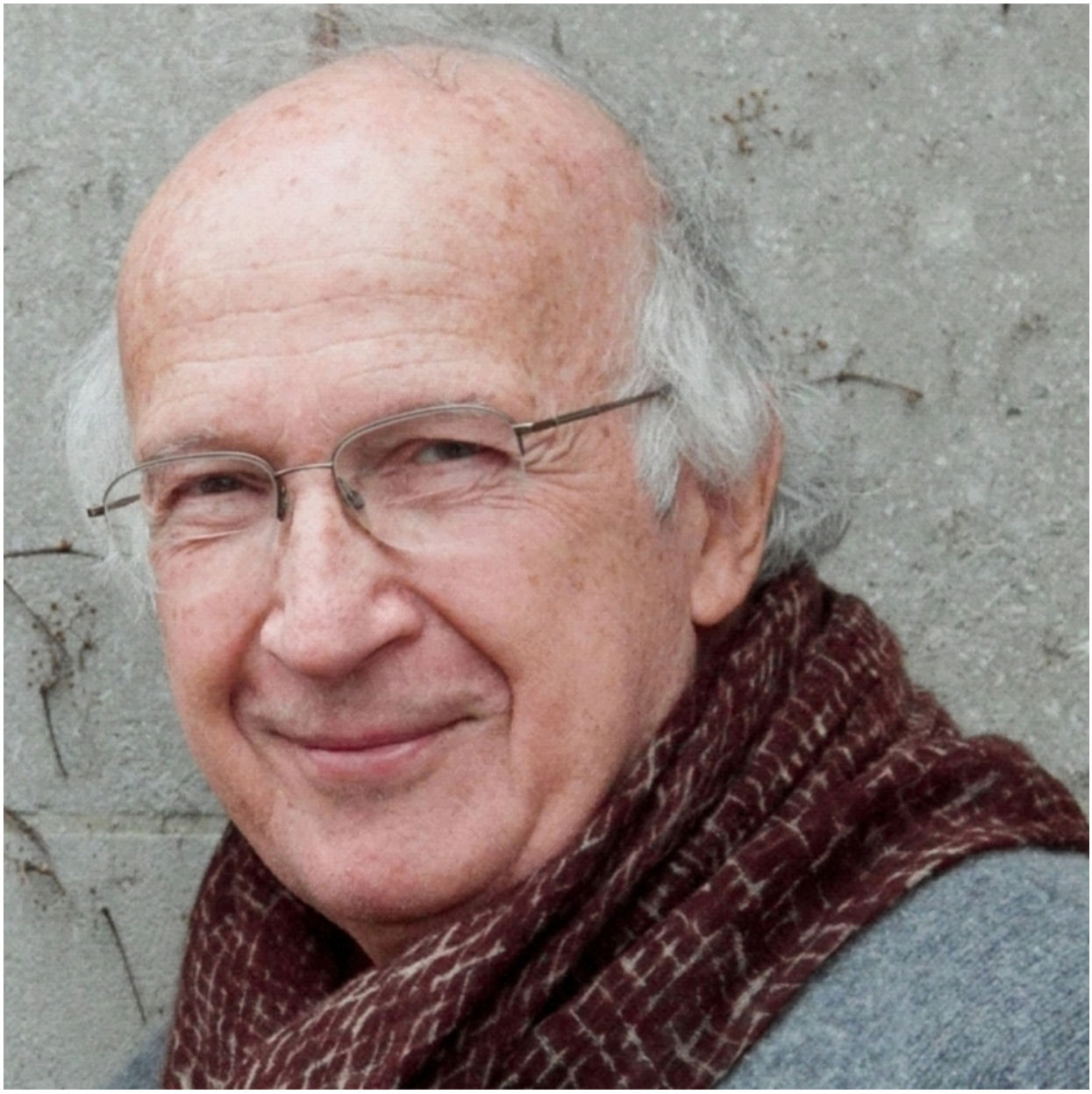
David J. Caruso and Carsten Reinhardt

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
FINAL RELEASE FORM

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Roald Hoffmann

(Date) July 2, 2019

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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 Scientarum 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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