

CHEMICAL HERITAGE FOUNDATION

JAMES A. MCCLOSKEY, JR.

Transcript of Interviews
Conducted by

Michael A. Grayson

at

the McCloskeys' Home
Helotes, Texas

on

19 and 20 March 2012

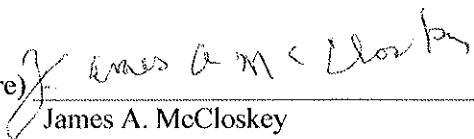
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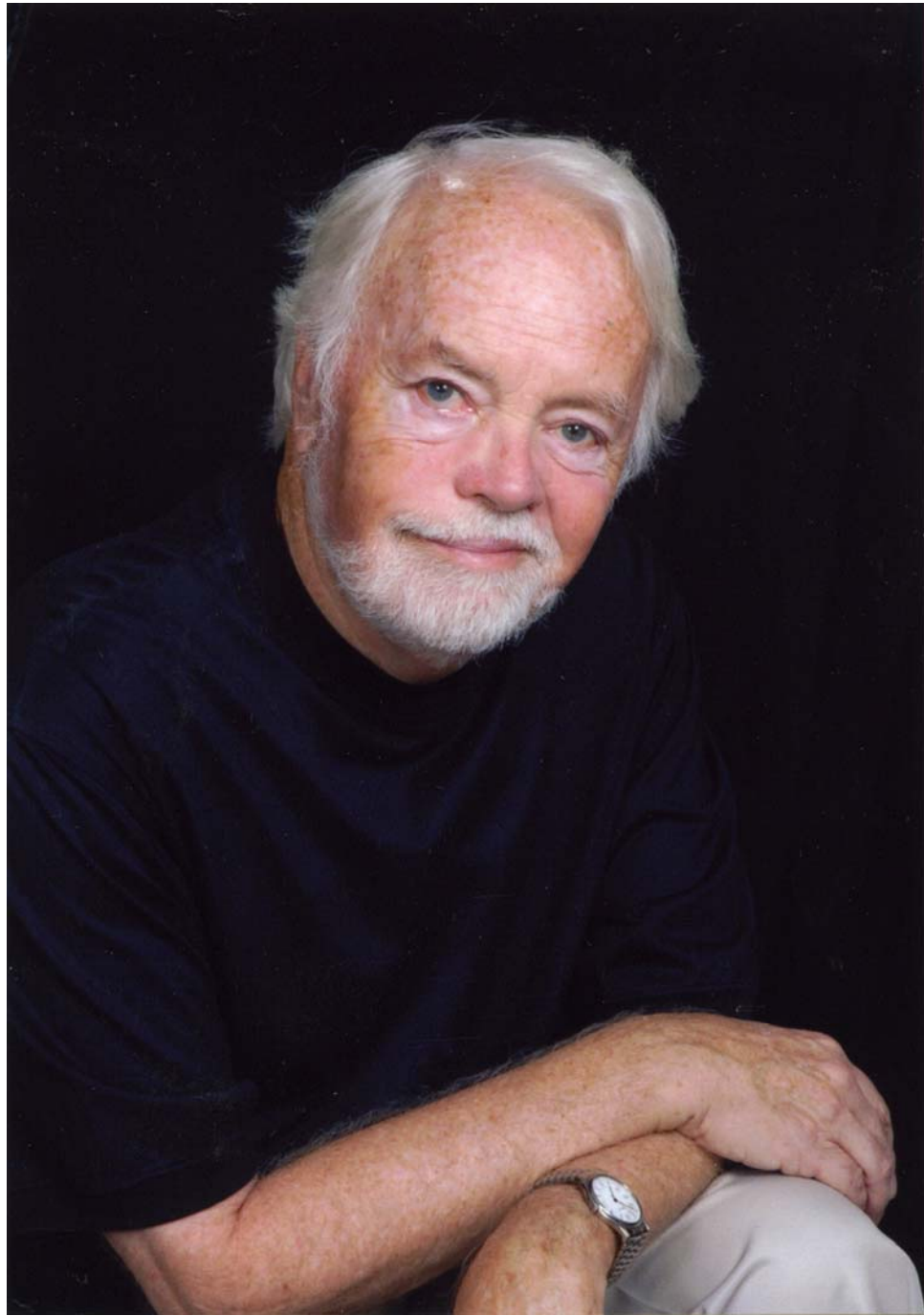
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James A. McCloskey, Jr.

ACKNOWLEDGMENT

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This project is made possible through the generous support of the
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JAMES A. MCCLOSKEY, JR.

1936 Born in San Antonio, Texas, on 25 June

Education

1957 B. S., Chemistry, Trinity University
1963 Ph.D., Chemistry, Massachusetts Institute of Technology

Professional Experience

1959-1961 United States Army Biological Laboratories, Fort Detrick, Maryland
Chemist, United States Army Chemical Corps

1963-1964 Institut de Chimie des Substances Naturelles, Gif-sur-Yvette, France
Postdoctoral Fellow (National Institutes of Health)

1964-1967 Baylor College of Medicine, Houston, Texas
Assistant Professor of Chemistry

1967-1971 Associate Professor of Chemistry

1971-1974 Professor of Chemistry and Professor of Biochemistry in the
Institute for Lipid Research and the Department of Biochemistry

1971-1972 Tokyo University, Tokyo, Japan
Visiting Professor

1971-1992 National Cancer Center Research Institute, Tokyo, Japan.
Visiting Investigator

1972 University of Utah, Salt Lake City, Utah
Visiting Professor, Departments of Chemistry and
Biopharmaceutical Sciences

1976-2003 Director, Mass Spectrometry Facility

1976-2007 Professor of Biomedical Chemistry, Medicinal Chemistry,
Department of Medicinal Chemistry

1976-2007 Adjunct Professor of Chemistry, Department of Chemistry

1993-1995 Director, Interdepartmental Biological Chemistry Program

2007-present Professor Emeritus, Departments of Medicinal Chemistry,
Chemistry and Biochemistry

Honors

- 1972 National Institutes of Health Special Fellow, University of Utah
1989 Distinguished Research Award, University of Utah
2005 Award for Distinguished Contribution in Mass Spectrometry, American
Society for Mass Spectrometry
2009 Fellow, Section on Chemistry, American Association for the
Advancement of Science

ABSTRACT

James A. McCloskey, Jr., grew up in San Antonio, Texas, an only child. His father, a doctor in the US Army Medical Corps, was the first regular army medical doctor killed in World War II, at which time James's name was changed from Robert. He attended public high school, where he was also in Reserve Officers' Training Corps (ROTC). It was always expected that he would attend college, and he entered Trinity University in San Antonio, where he majored in chemistry and continued in ROTC, paying his way with scholarships and with money he earned in summers.

McCloskey realized that he would go nowhere with just a bachelor's degree, so he earned a PhD in analytical chemistry from Massachusetts Institute of Technology. He fulfilled his ROTC commitment by working for the US Army Chemical Corps; he published his first paper there. He also married while in the Army and fathered a daughter while still at MIT. He returned to Klaus Biemann's lab at MIT, where he began his lifelong interest in and study of nucleosides/nucleotides, necessitating different types of mass spectrometers. After finishing his PhD, McCloskey persuaded the National Institutes of Health (NIH) to send him to Paris, France, for a year. He turned down the Karolinska Institutet for a job at Baylor College of Medicine in Houston, Texas. At Baylor he continued his funding relationship with the NIH, getting a number of spectrometers for the College. He began a twenty-year collaboration with Susumu Nishimura in Tokyo, Japan, and made his first of many trips there. He learned the biology of tRNA; Pamela Crain began working for him; his lab discovered the nucleoside Q. He began his part of the search for the roots of the tree of life, which consists of bacteria, eukaryotes, and archaea.

McCloskey spent six months of a sabbatical at the National Cancer Research Institute in Tokyo before going to the University of Utah as a visiting professor. He decided to accept a full professorship there, citing common interests, funding, and research freedom. Pamela Crain moved with him, continuing to collaborate on many papers. In addition to running his lab, heading the mass spec facility, and teaching, McCloskey became secretary, vice president, then president of the American Society for Mass Spectrometry (ASMS). He continued collaborating with mostly scientists outside the United States, especially from Japan; his work was primarily with ribonuclease T1 and T2; he studied how organisms modify in reaction to increase in temperature and found that they also modify below freezing.

McCloskey talks about his grants, all of which were approved by NIH and which remained constant; the different types of spectrometers and their uses; collision-induced dissociation (CID); polarity; importance of mass accuracy; his funding and funding in general; Carl Woese and the tree of life; synthesis of a new molecule he named archaeosine or G⁺; closing down his grants and lab when he retired and moved back to Texas; changes in the field of chemistry, in mass spec, and in students. He explains his editorship of *Methods in Enzymology* and his collaboration or lack thereof with several scientists the interviewer asks about. He laughs over the Prochaska scam. He modestly claims that his contribution to mass spectrometry was "not that great," meaning that he answered difficult questions in a narrow area. He has retired completely but remains interested in the field of chemistry, marveling at its sudden and rapid expansion.

INTERVIEWER

Michael A. Grayson retired from the Mass Spectrometry Research Resource at Washington University in St Louis in 2006. He received his B.S. degree in physics from St. Louis University in 1963 and his M.S. in physics from the University of Missouri at Rolla in 1965. He is the author of over forty-five papers in the scientific literature dealing with mass spectrometry. Before joining the Research Resource, he was a staff scientist at McDonnell Douglas Research Laboratory. While completing his undergraduate and graduate education, he worked at Monsanto Company in St. Louis, where he learned the art and science of mass spectrometry under O. P. Tanner. Grayson is a member of the American Society for Mass Spectrometry (ASMS), and currently is the Archivist for that Society. He has served many different positions within ASMS. He has served on the Board of Trustees of CHF and is currently a member of CHF's Heritage Council. He continues to pursue his interest in the history of mass spectrometry by recording oral histories, assisting in the collection of papers, researching the early history of the field, and preparing posters recounting historic developments in the field.

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Early Years	1
<p>Spent two early years in Philippines. Grew up in San Antonio, Texas. Father, in US Army Medical Corps, first regular army medical doctor killed in World War II. Mother raised him alone. Contracted polio. Paternal grandfather judge, former US Congressman. Name changed from Robert to James after father's death. Roman Catholic grade school, public junior high and high school. US Army Reserve Officers' Training Corps (ROTC) in high school. College always expected.</p>	
College Years	4
<p>Trinity University, small school in San Antonio, with only two chemistry teachers. Both influential; knew he needed graduate school. Scholarships. Summers working at American Lithium Chemicals, Inc. Continued ROTC.</p>	
Graduate School Years	9
<p>Entered Massachusetts Institute of Technology (MIT). Spent two year ROTC commitment in Chemical Corps; published first paper. Returned to MIT a married man. Analytical chemistry in Klaus Biemann's lab. First child born. Fathered two sons and two daughters. Nucleosides/nucleotides. Types of mass spectrometers. Funding. Shift technique. Electron ionization. Volatility. Fast atom bombardment (FAB). American Society for Testing and Materials (ASTM), Section 14E. meeting Joe Franklin, Field, Burnaby Munson; learning used of electrospray from "oil men." Changing focus to biological problems. CH₅⁺ one of most famous ions in analytical chemistry.</p>	
First Job	32
<p>Won National Institutes of Health (NIH) grant to study in Paris at Centre National de la Recherche Scientifique (CNRS). Six weeks at Karolinska Institutet. Accepted assistant professorship at Baylor College of Medicine in Houston, Texas. Evan and Marjorie Hornung. Good at getting funding for spectrometers from NIH. Published good papers. Derivatives; silanes. Collaboration with Susumu Nishimura at National Cancer Center Research Institute (NCCRI), lasting twenty years. Many trips to Tokyo, Japan. Learned biology of RNA; worked thereafter with tRNA. Pamela Crain. Nucleoside Q. tree of life: bacteria, eukaryotes, archaea. Karl Stetter and thermophiles. Structure/function. Six sabbatical months at University of Utah. Marvin Vestal. Funding almost exclusively from NIH Institute of General Medical Sciences.</p>	
Moving to Utah	59
<p>Full professor at University of Utah after sabbatical in Japan. Research freedom; funding; common interests. Synthesis of nucleosides. Pamela Crain persuaded to move also; completes PhD in biochemistry at Utah. Took no grants or instruments; began with CEC110 and densitometer. Initial grant continued for thirty years. Teaching and administrative responsibilities. Secretary, then vice president, then president of</p>	

American Society for Mass Spectrometry (ASMS). Advantages of liquid chromatography-mass spectrometry with electrospray. Became director of University's mass spectrometer facility. Few graduate students. Collision-induced dissociation (CID). Polarity. Ribonuclease T1 and T2. Use of several types of spectrometers. Resolution less important; mass accuracy crucial. Collaborations mostly with people outside United States. General funding strictures. Never interested in industry. Students and postdocs. How self-protected organisms work; increase in complexity with increase in temperature.

General Topics

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Thermophile work funded by NIH. No grants rejected; funding mostly constant. Never many scientists working in nucleosides/nucleotides. Carl Woese and tree of life; picture of Tree. Modifications of RNA unique to archaea; LC-MS good for analysis. New molecule named archaeosine or G⁺. Unique collection of nucleosides; given to colleagues upon his retirement. Archaea at low temperatures. Crain's collaborations most extensive. Antibiotic work in Isono's lab. Closing down grants and lab at retirement. Completely retired; moved back to Texas. Enjoys keeping up with field. Discussion of changes in science, students. Considered impact of his work "not that great" but found answers to difficult questions. Editor of *Methods in Enzymology*, continuing publication; much work. Hashezumi and cytokinins. Japanese system of retirement. Steven Pomerantz; Edmonds; Prochaska scam; Ronald Macfarlane; Klaus Biemann; wobble rule; tRNA.

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