

CHEMICAL HERITAGE FOUNDATION

**NICO M. NIBBERING**

Transcript of an Interview  
Conducted by

Michael A. Grayson

at

Home of Michael Gross  
St. Louis Park, Minnesota

on

7 and 8 June 2013

(With Subsequent Corrections and Additions)



**NICO M. NIBBERING**

## ACKNOWLEDGMENT

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## NICO M. NIBBERING

1938 Born in Zaandam, Netherlands on 29 May

### Education

1960 Kandidaatsexamen, Chemistry, University of Amsterdam  
1964 Doctoraalexamen, Chemistry, University of Amsterdam  
1968 PhD, Chemistry, University of Amsterdam

### Professional Experience

University of Amsterdam, Amsterdam, Netherlands  
1967-1975 Permanent staff member in charge of mass spectrometry  
1975-1988 Associate Professor of Organic Mass Spectrometry  
1980-1988 Full Professor of Organic Mass Spectrometry  
1988-2000 Scientific Director of the Institute of Mass Spectrometry  
1988-2001 Full Professor of Chemical Mass Spectrometry

### Honors

1964 Unilever Chemistry Prize  
1968 Shell Research Chemistry Prize  
1991 International Mass Spectrometry Thomson Medal  
1992 Johannes Marcus Marci Award

## ABSTRACT

**Nico M. Nibbering** was born in Zaandam, the Netherlands, one of eight children. . When school resumed after World War II, Nibbering did well and tested into high school, where he chose the science and mathematics track and where his physics and chemistry teachers influenced him to attend college. He entered the University of Amsterdam and majored in chemistry under Thymen de Boer. Nibbering also obtained his master's and PhD degrees there and became head of the mass spectrometry department.

Nibbering toured the United States, meeting a number of prominent scientists and learning more about mass spectrometers. He was especially interested in a drift cell ion cyclotron, and on his return to the Netherlands he persuaded de Boer to purchase a Varian Syrotron. This was only the first of his many instruments, as different types of spectrometers were needed for different types of problems. He refined his interest in gas phase ion chemistry during a few months spent in Fred McLafferty's lab at Cornell University and became entranced with a Fourier transform (FT) instrument. Back at home he and James Dawson transformed a drift cell ion machine into an FT spectrometer in just a year. When he considered leaving for Utrecht University, the University of Amsterdam established a research institute for him.

Throughout his interview Nibbering talks about his work and the variety of mass spectrometric problems and solutions. He gives examples of his many different kinds of spectrometers and their homemade modifications. He emphasizes the importance of his travel and his networking with other scientists around the world, calling his initial trip to the United States a highlight of his career. He discusses financing his expensive instruments and the research institute established for him. He gives credit to his many colleagues and collaborators. He believes that the most important of his very many publications is his master's thesis and that his important contributions have been in gas-phase ion chemistry study. He advises would-be scientists to do what they love and to do their best; enthusiasm is crucial. He says that there are three ingredients in mass spectrometry: fundamental research; development of new ideas and methods; and applications. Nibbering details some of the more important developments in mass spectrometry, especially its use in medical science. He thinks the future of the field includes smaller, easier-to-use instruments with more and almost universal applications.

Nibbering is retired, but his fascination with mass spectrometry continues undiminished. He is a member of the Royal Netherlands Academy of Arts and Sciences, and he is still editor of the *Wiley-Interscience Series on Mass Spectrometry*.

## INTERVIEWER

**Michael A. Grayson** is a member of the Mass Spectrometry Research Resource at Washington University in St. Louis. He received his BS degree in physics from St. Louis University in 1963 and his MS in physics from the University of Missouri at Rolla in 1965. He is the author of over 45 papers in the scientific literature. 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. Grayson is a member of the American Society for Mass Spectrometry (ASMS), and has served many different positions within that organization. He has served on the Board of Trustees of CHF and is currently a member of CHF's Heritage Council. He currently pursues his interest in the history of mass spectrometry by recording oral histories, assisting in the collection of papers, and researching the early history of the field.



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Early Years	1
<p>Born Zaandam, Netherlands, one of eight siblings. Family background. War years: malnutrition and suspension of school. Dispersal of children; he raised by aunt and uncle in 't Kalf. Chose science track at Hogere Burgerschool. Encouraged and promoted by headmaster; physics and chemistry teachers influential.</p>	
College Years	15
<p>Entered University of Amsterdam on a <i>renteloos voorschot</i>. High school good preparation for chemistry major, physical organic chemistry specialty. Thymen de Boer advisor through PhD. McLafferty rearrangement. Learning mass spectrometry. Publishing. De Boer's "sink or swim" style. Became head of mass spectrometry department during his PhD work. Royal Dutch Research Prize for PhD thesis. Prize was trip to United States for introduction to major scientists and their work. Frank Field. Graham Wanless. Details of trip and scientists.</p>	
Back to Amsterdam	39
<p>Intrigued by drift cell ion cyclotron. Report on trip persuaded de Boer to buy Varian Syrotron; difficulties with instrument. No <i>Habilitation</i>/postdoc because already had job. Two sons. Three ingredients in mass spectrometry: fundamental research; development of new ideas and methods; applications. Teaching and mentoring lab members. Chemical ionization; later electron impact. Huge variety of possibilities in chemistries. Lab composition. Funding, mostly from Netherlands Organization for Chemical Research. Joseph Huber. Gas chromatography and liquid chromatography. Funding for MAT instrument, electron ionization, and field ionization. Setup difficulties from nearby trams; homemade solution for electropollution. Modifying own machines with James Dawson and Frans Pinkse.</p>	
Continuing Career	67
<p>Many publications. Much traveling, many conferences. Complications, satisfactions with field desorption. Roel Fokkens' <i>Fingerspitzengefühl</i>. Collaborations. Positive and negative ion analysis. Several months in Fred McLafferty's lab at Cornell University. "Three Musketeers" with Takao Nishishita and Christian van de Sande. Gas-phase ion proof of principle. American Society for Mass Spectrometry (ASMS) paper from Fourier-transform (FT) experiment inspirational; with Dawson and newer technology converted drift-cell instrument; FT still working well. Importance of international interface and collaboration. Taught summer course at University of Colorado. Consultant for FOM. Helmut Schwarz. Recruited by Utrecht University; counteroffer of new research institute, staff members, funding. Added quadrupole, then four-sector JEOL, then Bruker FT. David Reinhoudt shared new time-of-flight (TOF) instrument paid for by University of Twente. More travel and international papers. Pyrolysis. Importance of cleanliness in instruments. Patents. Bernhard Linden and liquid injection field desorption (LIFDI).</p>	

## Thoughts and Evaluations

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Single most important publication his master's thesis; formation of phenol. Other highlights: trip to United States; building FT in one year and one day. Technical explanations of his work. Veronica Bierbaum, editor of Festschrift for Armentrout's sixty-fifth birthday, collaborated on exploration of Hund's rule regarding notch ejection technique on the FT. Major contributions in gas-phase ion study, especially mechanisms. More about colleagues and students from his lab, and where they are now. Interest in motorcycles. Using his instruments for both analysis and research. Editing *Mass Spectrometry Review*; also *Wiley-Interscience Series on Mass Spectrometry*. Organizing and financing international conferences. More about other colleagues. Advice: do what you like and do your best. Enthusiasm crucial. Mentoring. Competition. Women in science. Important changes in mass spectrometry include especially medical science. Future includes smaller, easier-to-use instruments with more applications.

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