



**North American Catalysis Society**  
**20<sup>th</sup> North American Catalysis Meeting**  
**Houston, Texas**  
**June 17-22, 2007**

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## ***“Celebrating Catalysis Texas Style”***

### **Special symposium in honour of Dr. Heinz Heinemann**

**Title: “Dr. Heinz Heinemann: a gentleman, a friend and a solid support for catalysis research in Spain”**

**Author: Antonio Cortés Arroyo**

President of the Spanish Catalysis Society  
Institute of Catalysis and Petroleum Chemistry  
Spanish Council for Scientific Research  
Marie Curie, 2  
28049 Madrid

This is the second symposium in honour of Dr. Heinz Heinemann (in short Heinz) that I attend after the first one celebrated a number of years ago in Salt Lake City (Utah), when he was still alive. If there is any person present in the audience who attended that first symposium he or she may also remember of the painting exhibition of his first wife Elaine in the hotel we were staying and the beautiful concert during the banquet by Clarence D. Chang (piano) and Susan Goodenough (flute).

I strongly believe that I should not make this time a regular presentation about any piece of my last research, but rather take a few minutes to illustrate the personal attributes of Heinz as a petroleum chemist, a gentleman, a good friend to his friends and a solid mentor to catalysis research in Spain over the years.

Let me summarise first his professional achievements and personal honours by quoting the press release (December 6, 2005) made by Robert Sanders of the University California at Berkeley:

*“During a 60-year career in industry and academia, Heinemann contributed to the invention and development of 14 commercial fossil fuel processes, received 75 patents and was the author of more than 150 publications. He published the majority of his papers and received most of his patents in the field of catalysis and petroleum chemistry while working for Houdry Process Corp., the MW Kellogg Co. as director of chemical and engineering research and the Mobil Research and Development Co. as manager of catalysis research. During his 40 years with industry, he actively participated in the research and development of 14 commercial processes, including the process for converting methanol to gasoline. After retiring from industry in 1978, he joined LBNL as a researcher and became a lecturer in the Department of Chemical Engineering at UC Berkeley. His research involved coal gasification, catalytic coal liquefaction, hydrodenitriification, nitrogen oxide emission control and the development of a special catalyst that enables methane, the major component of natural gas, to be used to make petrochemicals. The research team he led invented and patented a process known as catalytic oxy-dehydrogenation.*

*He was a co-founder of the Philadelphia Catalysis Club, the Catalysis Society of North America and the International Congress of Catalysis, serving as its president from 1956 to 1960. He was the founder of the journal Catalysis Reviews and worked as its editor for 20 years. He also was consulting editor for over 90 books in the Chemical Industries Series, published by Marcel Dekker, Inc.*

*He received many honours, among them election to the National Academy of Engineering , the Houdry Award of the Catalysis Society, the Murphree Award of the American Chemical Society, the H. H. Lowry Award presented for research he pursued in his seventies, and a Distinguished Scientist/Engineer award from the U.S. Department of Energy. In addition, he was elected a Member of Honour of the Spanish Council for Scientific Research for his support in the foundation of its Institute of Catalysis and Petroleum Chemistry in Madrid.*

The story of Heinz and of what we can call “Heinz’ Spanish Connection” started in 1955 when he was travelling back to the States and his plane had to make a non-scheduled landing in Madrid, where he had to stay for a couple of days. While in the hotel he was placed he reminded of the phone number of a Spanish colleague who had worked with Prof. Gardner in England. This first getting together was the beginning of an ever lasting strong friendship between Heinz and Prof. Juan Francisco Garcia de la Banda (in short Juan), my Ph.D. supervisor now 85 and happily retired with his second wife Annette by the seaside in the south of Spain. After he received the call, Juan went to the hotel, invited Heinz for a good Spanish lunch (which included octopus for the horror of Heinz when he was told at the end of the meal!) and took him for a tour to the city of Madrid and surroundings.

In 1956 Heinz invited Juan to attend the First International Congress on Catalysis in Philadelphia and then and in future occasions he introduced Juan to a number of distinguished and truly pioneers researchers in catalysis, both from academia and industry: Paul H. Emmett, Herman Pines, Hugh Taylor, John Turkevich, Paul Wise, De Boer, Alex Oblad, Terry Milliken, Harry Leftin, Vladimir Hansel, Robert Burwell Jr., Sol Weller, Keith Hall, Frank Ciapetta, Dennis Dowden, Charles Kemball, Marcel Prettre, Haldor Topsøe, George M. Schwab, Michel Boudart, etc., just to mention a few names and most of whom I also got to know personally in future years. Heinz also arranged for Juan a tour to visit the most important research laboratories in the East Coast. In this way and always with the help of Heinz, Juan got to know and become friend to almost all catalysis senior research scientists in America and Europe. Most of them visited later (and in some cases spent part of their sabbaticals) the laboratory of Juan in Madrid, at that time the Section of Catalysis of the Institute of Physical Chemistry of CSIC (Spanish Council for Scientific Research), which later became Department of Catalysis and, eventually, the present Institute of Catalysis and Petroleum Chemistry.

As a consequence of this acquaintance of Juan with such relevant catalysis men most of his students had the opportunity to work in foreign laboratories for a number of years:

- ✍ Gojko Kemenic in Baltimore with Paul H. Emmett,
- ✍ Jesus Pajares in Mobil R&D Laboratories outside Princeton with Paul Wise,
- ✍ Enrique Hermana in the Institute of Catalysis in Lyon with Marcel Prettre and MW Kellogg Co. in Piscataway, NJ, with Harry P. Leftin,
- ✍ Antonio Gamero in MW Kellogg Co. with Heinz,
- ✍ Jesus Blanco in MW Kellogg with Heinz,
- ✍ Antonio Lopez in the University of Bristol, UK, with Frank Stone,
- ✍ Javier Soria in the University of Cambridge, UK, with Philip Bowden and in the University of Princeton with John Turkevich,
- ✍ Antonio Ballesteros in the National Institute of Health in Bethesda, Md, with Christian B. Anfinsen,
- ✍ Antonio Cortes in Edinburgh University with Charles Kemball and MW Kellogg Co. with Harry P. Leftin.

Over the years these former students of Juan, who later became his collaborators as permanent staff members, developed their own research activities and formed their own research groups, which were the basis of the present Institute of Catalysis and Petroleum chemistry. Today the institute has about 250 persons including a number of Ph.D. students. In 2002 we celebrated the 25<sup>th</sup> anniversary of the institute in which we paid a tribute of acknowledgement and gratitude to Heinz, who came to Madrid for such occasion.

It is also worth mentioning that a number of researchers of the institute led by my former student Avelino Corma, together with some professors from the departments of organic chemistry and chemical engineering of the Polytechnic University of Valencia, created the Institute of Chemical Technology in Valencia, a world known centre for good research in catalysis nowadays.

Now it is appropriate to mention some of my personal experiences and memories of Heinz. When I decided to leave Edinburgh and go to Kellogg in the US, Heinz sent a limousine to J.F. Kennedy Airport to take me to the

Kellogg central offices in New York City for the medical check up and the signing of the secrecy agreement. From New York I was then driven to my temporary residence in Princeton and Heinz also took care of:

- ✍ Providing me with 3,000 US \$ the day after my arrival to face the initial expenditures,
- ✍ Asking Clarence D. Chang to take me in his car pool from Princeton to Kellogg R&D Labs in Piscataway until I could get an apartment,
- ✍ Asking Harry Leftin to help me in finding a place to live not far from Kellogg,
- ✍ Asking Frank Hwa and Chris Gwinn to help me in getting adequate furnisher for the apartment, whether new or from garage sales.

During my stay at Kellogg, Heinz also invited me and my wife to his house in Princeton several times and took care of sending me to the Gordon Conferences in New London, New Hampshire, and the meeting of the North American Catalysis Society in Atlantic City, New Jersey. In other words, I felt that he treated me not just like an excellent mentor because I was one of Juan's students, but really like a father. Ever since I've had the feeling that I was not able to show him enough gratitude which, honest to say, he did not ask for. I am sure that Heinz was the kind of person who did find satisfaction and tribute just in his own way of behaviour.

To illustrate the exquisite personality of Heinz I can say that due to the limitations with the English language of some of my Spanish colleagues, his first wife Elaine sometimes had some difficulty in communicating with her neighbour at the table while having a meal together. Heinz was always alert to help her and after a while we came to a sort of non-written agreement that I should seat by her because I was capable of communicating with Elaine perfectly well and then he could feel relaxed during the entire meal.

It is absolutely necessary to mention also that Heinz was a very proud father of his daughter Sue and his son Peter.

This short but very warm story about Heinz would not be complete if I do not say that he failed over the years in one thing, because despite his intention to learn some Spanish he did not. Fortunately, his second wife Barbara is an expert in Mexican history and could help him with a very good Spanish while travelling in Spain.

To finish up I can say that it was because of Heinz and many more good friends I made in those days, plus the fact that my third daughter was born in Plainfield, New Jersey, that I really felt like at home and I have always remained very grateful to America, a beautiful country which I do love. Thank you very much for your attention.