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Tribute/Hommage

François Garin: The man and the researcher, or to be, above all, in search of an absolute

François Garin : l'homme et le chercheur, ou être, avant tout, à la recherche d'un absolu

1. Research interests

His research interests were in the fields of preparation and characterization of catalysts, as well as the mechanistic and kinetic investigations of catalytic reactions of critical importance in the areas of energy, petrochemicals, pollution prevention, and environmental control. Above all, the study of kinetics was his primary passion.

In his scholarly life, François Garin was the first researcher to conduct experiments on the isomerization of alkanes on single crystals and vicinal surfaces of platinum using ^{13}C -labeled molecules. He used an ultra-high-vacuum (UHV) chamber to perform experiments, seeking to observe the rearrangement of hydrocarbon molecules on single crystals. These elegant experiments showed that specific molecular orientations favoured displacement reactions at bonding sites that were dependent upon the crystallographic plane of the substrate. Subsequently, he developed important insights into catalysis, which he applied to various types of catalytic reactions.

Among his many achievements, the following stand out as particularly exceptional:

- the first manipulation of marked hydrocarbons on single crystals (1975–1976);
- the first manipulation at LURE with ^{13}C -labeled hydrocarbons (1980–1981);
- the first manipulation on sulphated zirconia using ^{13}C hydrocarbon solid-acid catalysts (1996–1997);
- early studies on three-way catalysis (1982);
- transient redox catalysis (1988);
- DeNO_x catalysis using ^{18}O , ^{15}N , and ^{15}NO (1995);
- pioneering work on photocatalysis at Strasbourg (1998);
- catalysis of oxides with controlled porosity in a reducing environment (2007);

- studies on “power to gas” (2010);
- studies of water pollution (2011);
- he proved that only metal complexes have the ability to isomerize and/or crack an alkane;
- he proved that a monomolecular mechanism is solely responsible for the isomerization of hydrocarbons in solid-acid catalysis at low conversion;
- he proved that in the presence of hydrogen at low temperature and low conversion, “carbynes” on the surface are responsible for some reactions of carbon-carbon bonds, mainly with bimetallic catalysts;
- he demonstrated the two mechanisms responsible for the reduction of nitrogen oxides by hydrocarbons;
- he proved that the “metal–proton” site adduct can account for the results obtained in bi-functional catalysis, indicating that the metal is not the only site of hydrogenation reactions during rehydrogenation.

Great effort has been expended in recent years to prepare the new catalysts, a *de novo* design relevant to modern catalytic challenges.

2. Teaching

While the dominant interest of his scientific life was the elucidation of problems related to the kinetics of hydrocarbon chemistry, he combined the gifts of a successful teacher with the mental perspective of an explorer discovering knowledge. He gradually developed his teaching prowess in the instruction of heterogeneous catalysis, photocatalysis, electrocatalysis, physicochemical characterization of solids, catalyst preparation, nanomaterials, and physical chemistry.

He was born to be a teacher, and in that role, François Garin has few equals! He has always taken a highly active and hands-on approach to the supervision of his students'

research at all levels. His lectures were appreciated by advanced and elementary students alike. He possesses the keen ability to offer logical and lucid expositions of chemical phenomena and will be remembered by many generations of students as a friendly guide through the intricacies of a difficult subject, who spared no effort in promoting their progress and welfare. François' students received rigorous scientific training and were held to high standards. The successes of François' former students and postdoctoral associates in their subsequent careers in academic, national laboratories, and industry are a testament to his skills in mentoring young scientists. François Garin is among the best and most dedicated teachers we have known.

As an excellent lecturer and citizen of the world, he has been invited to numerous conferences and meetings, which has given him the opportunity to teach globally; however, he has always remained closely connected to his native France and to the city of Strasbourg.

3. Administrative responsibilities

François Garin has all the qualities of a leader, and he knew it from an early age. After his appointment as director of LMSPC, departmental responsibilities and administrative duties placed considerable demands on his spare time, although his primary interests remained the advancement of research on heterogeneous catalysis at LMSPC.

He held a number of positions in international institutions and organizations.

For a number of years, he served as a member of the governing boards of ELCASS (European Laboratory for Catalysis and Surfaces Sciences), PNIR, MPG, CNRS, and Italian CNR, CNRS/DGRSRT (French–Tunisian Cooperation), and the IDECAT (Integrated Design of Catalytic Nanomaterials for a Sustainable Production) Network of Excellence. He was also a member of the COST framework, of GECAT, UFAS (Sétif–Unistra), Project No. 110–International Science and Technology Centre (ISTC), DivCat, EFCATS, and REALISE.

François Garin was a member of several national and international commissions. He took a keen interest in his duties on the committees for master degrees, PhD degrees, or “habilitations à diriger des recherches” (HDR). He participated as a reviewer in several journals. He was co-editor of several special issues of prestigious journals in the world of catalysis.

He displayed his organizational talent through his participation in the organization of GECAT, Paul-Sabatier Conference, Leiden, and other conferences and symposia. He also played an important part in many senate committees, where he offered good judgment, an even temper, and detachment that gained him the respect and admiration of his colleagues. He did not allow these other activities and interests to limit his scientific work on heterogeneous catalysis.

4. Collaborations

The collaborations of François Garin, or *the embodiment of nobility of spirit* . . .

François Garin has a most gracious personality. He is considerate, courteous, and charming. He has never regarded the people working with him as subordinates. He often asks about their families and is genuinely sorry to hear of illnesses and misfortunes. He does not reprimand, but suggests and teaches in a most unobtrusive manner. He has never felt compelled to assert his authority; he inspires cooperation and encourages independent thought.

The relationships forged over the years have endured and have shaped the ties that still exist between his laboratory and industry. He has collaborated on research projects with numerous important companies with interests in catalysis, including PSA, DMC-OMG, Renault, Total-Fina-Elf, General Electric–Energy Products, Alpea Hydrogène, Ademe, Ecodev, Sonatrach, the Kuwait Petroleum Institute, the French Petroleum Institute (IFP), and CEA, among others. These collaborations are a testimony to the relevance of his research and scientific efforts. A number of these collaborations are exemplified by the list of his publications in this issue.

Notably, he has remained a lifelong friend of Gilbert Maire, Paule Girard, Dominique Bazin, François Fajula, Patrick Gilot, Orfan Zahraa, Philippe Turek, Monique Wechsler, and Jean-Louis Schmidt.

5. Family life

François Garin has been fortunate, too, in his family life; beyond his work, his family is his other great joy. He is married to the beautiful, intelligent, and charming Anny, who is his constant companion in all undertakings. They have been blessed with two amazing daughters, Hélène and Aude. This happy home circle, or *tabulae affinitatum*, has formed a backdrop to a life devoted wholeheartedly to science and to the service of his university and laboratory.

6. Symposium honouring François Garin – a remembrance of past things

François Garin, an outstanding scientist, leader, mentor to many generations of French chemists, and a remarkable organizer of research, was honoured at a two-day symposium held at the “Collège doctoral européen” at Strasbourg on 19 and 20 March 2013. The symposium, entitled “*Progress in the kinetics and mechanisms of chemical reactions at the atomic and molecular levels*”, was well attended by national and international contributors. Over two days, attendees were treated to talks by 93 friends of François Garin and to a concert of classical music performed by the Orchestra of the University of Strasbourg under the baton of Corinna Niemeyer. I would like to gratefully acknowledge Corinna Niemeyer and all the students composing this magical orchestra. Corinna Niemeyer expresses true visionary zeal and talent as the conductor of the Orchestra of the University of Strasbourg, who invested their hearts in this concert. We were overwhelmed by the program and the perfect execution by the students of the orchestra.

On 20 March 2013, the symposium was elegantly opened by Jean-Marc Planeix, who thanked François Garin for his service to the university. The excellent plenary

speakers were Francine Agbossou-Niedercorn (University of Lille), Dominique Bazin (Collège de France), Daniel Duprez (University of Poitiers), Francesco Di Renzo (University of Montpellier), Laurent Piccolo (IRCE Lyon), Frederic Thibault-Starzyk (University of Caen), Valentin Valtchev (University of Caen), and Jacques C. Védrine (“Université Pierre-et-Marie-Curie”, Paris). These respected researchers discussed a number of topics relevant in modern catalytic research. The scope of the presentations and discussions reflected the far-reaching impact that François Garin has had on the catalysis community. I would like to express special appreciation to all the speakers who graciously offered their time to participate in this symposium.

The chairs of the symposia were likewise outstanding. My sincere thanks extend to Veronique Pitchon, Dominique Bazin, and Jacques C. Védrine.

Because François Garin was born on 15 February, fifteen prizes were awarded for the best posters. The best poster award winners were A. Alatrache, Loubna Arab, Nabila Bensacia, Brandusa Andrea Dranga, Vincent Escande, Anaïs Garnier, Alina Marcu, Asma Mayoufi, Alexandre Piquet, Tiphaine Poux, Vincent Rogé, Marlène Rouhet, Mira Skaf, Alexandre Westermann, and Dongliang Wu. Their efforts were rewarded with a membership in the Chemical Society of France for the year 2013.

I express my gratitude to the following students composing the local organizing committee: Saida Debbih-Boustila, Olga Ischenko, Housseinou Ba, Vincent Rogé, and Julien Ducamp. Each displayed exceptional organizational talents, availability, friendly attitudes, courtesy, and charm. Thank you all for always being there and being the foundation of our efforts. I gratefully acknowledge this wonderful team; their work in organizing these two days saved us moments for eternity.

I know few ways to express my gratitude and affection toward the administrative secretary, Francine Jacky.

I would like to thank my dear Francine for her help in several very important situations. She has excellent erudition, good organizational talents, great honesty, charm and elegance, fluency in French, Alsatian, and English, a friendly attitude toward all, and social grace in establishing contacts. All these qualities make Francine a valued member of the organizational meetings for this symposium in honour of François Garin, as well as with other meetings, such as the “Conference Paul-Sabatier” 2011, ANR, etc. Francine is a popular secretary and a gracious model for the many who are fortunate to know her.

I am very grateful to the Home Graduate College team (“College doctoral européen”, Strasbourg) who helped us organize this symposium. Their invaluable assistance, honesty, advice, professionalism, and availability allowed us to provide the 93 friends of François Garin with a good environment.

I take great pleasure in thanking all those who participated in the symposium, and I also thank all those who could not participate for various reasons, but were nevertheless considered by François Garin to warrant inclusion. I appreciate the graciousness shown by all friends of François Garin who gave their time to participate in this symposium. Their moral elegance will never be forgotten.

*Beatitudo non est virtutis praemium,
sed ipsa virtus – Spinoza*

Ioana Fechet
*Institut de chimie et procédés pour l'énergie,
l'environnement et la santé-ICPEES, UMR 7515 CNRS,
Université de Strasbourg, 25, rue Becquerel,
67087 Strasbourg cedex 2, France
E-mail address: ifechete@unistra.fr*