



Photo: Jiří Ludvík

In Memoriam ...

Petr Zuman

1926-2021

It is very sad news that Prof. **Petr Zuman** (born on January 13, 1926, in Prague, Czechoslovakia) passed away early in the morning on June 24, 2021 (at the age of 95). He passed peacefully in his sleep at his home in Potsdam, New York, with his son John Zuman and his home-carer Regina Randall in attendance.

Petr Zuman was the personal pupil and collaborator of Prof. Jaroslav Heyrovský, who won the 1959 Nobel Prize in Chemistry for the invention of DC polarography, a new branch of electrochemistry and the first quantitative electroanalytical methodology developed for solution chemistry. Petr began his career at Charles University in Prague as Heyrovský's teaching assistant (1948-1950). From 1950 to 1966 Petr worked with Prof. Heyrovský in the newly established Polarographic Institute (later part of the Czechoslovak Academy of Sciences), where he created the organic polarography research group together with Prof. Jiří Volke. From 1966 to 1970, he spent four years at the University of Birmingham as a Senior Visiting Research Fellow. Due to ongoing political upheaval in his home country, he did not feel it was safe to return there with his family. So, in 1970, he accepted the invitation of Prof. Louis Meites to become Professor of Chemistry at Clarkson University in Potsdam, New York. After thirty years of research, teaching, and lecturing he retired and was declared Distinguished Emeritus Research Professor. He remained active as a scientist and teacher until 2015. Even beyond that time, he periodically gave informal lectures to the Clarkson chemistry department that were widely attended.

During his 45 active years at Clarkson, Petr taught 27 different courses in analytical, organic, and general chemistry, supervised 14 PhD, 12 MSc, and 24 BS theses as well as many postdocs and visiting young scientist colleagues. Petr Zuman published over 484 papers and authored or co-authored 15 books in the fields of physical organic electrochemistry and polarography. The most important ones are cited below. His two famous compendia, *Handbook Series in Inorganic Electrochemistry* (6 volumes) and *Handbook Series in Inorganic Electrochemistry* (8 volumes, with Louis Meites and others), published between 1977 and 1988 by CRC Press, Boca Raton, Florida, which covered the development of electrochemistry up to the 1980's, remain as fundamental opuses in electrochemistry.

Petr's special field of research was organic electroanalytical chemistry with a focus on elucidation of electrode-initiated reaction mechanisms using polarographic, voltametric, and kinetic techniques. Since his "beloved" electrode material was mercury, his research was oriented mainly toward reduction and hydrolysis processes with applications in pharmacy, medicine, and the environment. Examples include reduction and hydrolysis of oximes and hydrazones; acid-base, hydration-dehydration, and tautomeric equilibria involving 1,3,5- and 1,2,4-triazines; reduction, (de)hydration, and follow-up reactions of aromatic diketones; reactions of bile acids, cholesterol, and other sterols in strongly acidic media; additions of nucleophiles, such as glutathione, to nitrosobenzene, and ring formation of selected 2-amino-1,4-benzoquinones. Most of his studies involved biologically important compounds

and his investigations were essential both for development of analytical methods and for better understanding of their biological activity. Specific attention was paid to lignin, not only for his interest in environmental research, but mainly for the future use of lignin, a renewable raw material, as a natural source of aromatics for industrial applications.

As for his international scientific contacts, Petr had long-term common research activities with Turkish, Italian, and Serbian electrochemists. His extensive collaboration with University of Bologna resulted not only in a number of publications but also in a doctorate *honoris causa* in Chemistry and Pharmaceutical Technology. Nevertheless, his dream was to re-establish close collaboration with his colleagues from his homeland, namely with his original laboratory in the J. Heyrovský Institute in Prague. This became possible after 1989, when he could return to Czechoslovakia after more than 20 years in exile. His first visits resulted in thirty years of close cooperation with the team of Molecular Electrochemistry at the J. Heyrovský Institute of Physical Chemistry. In this time, Petr participated in three Czech-US research grant projects focused on the intramolecular electronic interactions between two (or more) electroactive centers in a molecule. He visited Prague and the J. Heyrovský Institute at least once every year until 2015. After that, scientific as well as personal email contacts continued until his last days.

Here, it is not possible to omit the 65 years of married life of Petr and Radmila, their two children and 6 grandchildren. Radmila was a profession teacher, artist, and internationally known lace maker; she taught courses in this art all over the world. She accompanied Petr all of their life together and completed the family environment that was so important to him

Besides electrochemistry, Petr's interests were focused on sports and culture. It is not generally known that he was a very good basketball player as a young man, and later an international basketball referee, aided by his voice that was always so loud. He also loved volleyball and cross-country skiing, and when teaching in the winter often crosscountry skied to Clarkson. He was a fan of literature, theater, and opera. When he visited Prague, he attended a theater performance or a concert every evening of his stay. In addition, his knowledge of history was remarkable, and he spoke five languages fluently.

Personally, I have known Petr well for over 30 years; hence I could see that Petr served as an excellent mentor for young electrochemists, both in his own institutions and in the research community at large. As a sportsman and YMCA member he was a fair and kind personality with deep spiritual background. So, for many younger colleagues and students he was something like a "second father".

Now, we can only be grateful for his long and fruitful life, and remember him as an excellent scientist, teacher, mentor, colleague, and friend. Many of us (including me) are especially grateful to have known him for a long time scientifically as well as personally.

This notice was contributed by Prof. Jiří Ludvík, J. Heyrovský Institute, Prague, Czech Republic.

From Jim Rusling, University of Connecticut, USA:

"This is a very sad day, and we and our profession have lost a Giant of Electrochemistry, a real scientific pioneer, who was also an old school, very friendly man profoundly interested in the welfare of students. He changed the course of my life for the better, as well as that of many others."

From Kevin Moeller, Washington University in St. Louis, USA:

"I have very fond memories of Petr at ECS meetings always keeping me on my toes and always helping me learn electrochemistry the 'right way'. Just a gem of a scientist and a gem of a man."

From Flavio Maran, University of Padova, Italy:

“Petr was a great person and a true ‘electrochemical’ inspiration. Kevin rightfully wrote that he made us learn electrochemistry the ‘right way’. His old-way scientific rigor is something that nowadays has become way too rare.”

From Dan Little, University of California Santa Barbara, USA:

“Terrific scientist and a wonderful human being.”

From Jim Burgess, former OBE division chair:

“I’m sorry to hear of his passing. It’s amazing how close-knit our academic families stay (within and between) in our discipline (maybe more so than some others I think).”

From Chris Jannuzzi, ECS Executive Director and CEO:

“I am very sorry to hear of Prof. Zuman’s passing. I did not have the pleasure of meeting him, but reading the comments, and knowing the folks who offered them, clearly he was revered as a scientist and, most importantly, as a dear and trusted friend to many.”

From Toshio Fuchigami, Professor Emeritus, Tokyo Institute of Technology, Japan:

“Very sad news for me and our society. When I started my own project related with organic electrochemistry long time ago, I used to read his books many times. Polarography was useful to understand the mechanistic aspects of organic electrochemical reactions. I met him many times at ECS Meetings and I learned a lot from him.”

From Gopan Krishnan, Oklahoma State University, USA, current OBE division chair:

“Petr Zuman is my mentor’s (Prof. Jim Rusling) mentor, and therefore my scientific grandpa. Jim used to tell a lot of stories about his graduate time in the Zuman lab at Clarkson University: the importance of confirming results from various independent techniques for ‘rigor’ (a much-emphasized benchmark presently in all research), Zuman as an extraordinary research mentor and great person, and Zuman’s pioneering early work on polarography and other electroanalytical methods that influenced the field for several decades and many electrochemists like me along the way.

Some of Prof. Zuman’s Most Important Books:

- J. Heyrovský and P. Zuman, *Introduction to Practical Polarography*, Academic Press, London (1968).
- M. Brezina and P. Zuman, *Polarography in Medicine, Biochemistry and Pharmacy*, Interscience, New York (1958).
- P. Zuman, *Organic Polarographic Analysis*, Pergamon, London (1964).
- P. Zuman, *Substituent Effects in Organic Polarography*, Plenum Press, New York (1967).
- P. Zuman and I. M. Kolthoff (Eds.), *Progress in Polarography*, Vols. I and II, Interscience, J. Wiley, New York (1962).
- P. Zuman, L. Meites, and I. M. Kolthoff (Eds.), *Progress in Polarography*, Vol. III, J. Wiley, New York (1972).
- P. Zuman, *The Elucidation of Organic Electrode Processes*, Academic Press, New York (1969).
- P. Zuman and C.L. Perrin, *Organic Polarography*, Interscience, J. Wiley, New York (1969).
- P. Zuman and R. Patel, *Techniques in Organic Reaction Kinetics*, J. Wiley, New York (1984), Krieger Publ. Co. (1992).