

*In memoriam*

*Dr. Sc. Pavao Mildner, professor emeritus  
(June 6, 1918 – February 20, 2012)*

At the age of 93 of his fruitful life, on 20 February 2012 Pavao Mildner, professor at the Faculty of Food Technology and Biotechnology, *professor emeritus* of the University of Zagreb, left us forever. The passing of every person leaves emptiness but also a mark, and the mark that Professor Mildner left with his professional activities as a scientist and teacher, as well as with his strong personality is deep and everlasting.

Professor Pavao Mildner was born on 6 June 1918 in Zagreb. After secondary education, he enrolled at the Chemical Department of the Technical Faculty of the University of Zagreb in 1936 and graduated in 1940. Already then he showed strong desire and motivation to achieve wider knowledge, which in 1942 led him to the Faculty of Pharmacy of the same University, from which he graduated in 1944. After graduating from the Technical Faculty he volunteered at the Organic Chemistry Department of the Technical Faculty, and in 1941 he moved to the Research Laboratory of *Kaštel* factory (now *Pliva*), which was then run by a Nobel laureate to be, Prof. Vladimir Prelog. After a brief employment in the *Dyestuff Factory* in Zagreb, he worked at the Institute for Industrial Research, where he stayed until 1957.

As a British Council fellowship holder, from 1951 to 1952 he stayed at the prestigious Imperial College of Science and Technology in London, at the Department of Organic Chemistry. There he started work on his doctoral thesis, and with his mentor, Prof. B.C.L. Weedon, published his first scientific paper in 1953. He obtained his doctorate in natural sciences in 1956 at the Faculty of Science, University of Zagreb.

The academic career of Prof. Mildner began in 1957, when he became lecturer in biochemistry at the Department of Biotechnology of the Faculty of Technology, University of Zagreb. While holding this position, he was also entrusted with a task of forming a new laboratory for biochemistry within the Chemistry Department, and was also elected Head of the laboratory, which he ran until his retirement. He became assistant professor in 1961, and a full professor in 1964. For years, until retirement in 1988, he was Head of the new Department of Chemistry and Biochemistry. Aware of the importance of continuous scientific learning, he went twice, once in 1967 and second time in 1969, to the University of Frankfurt as a DAAD scholarship holder.

Owing to his great engagement and high reputation that he enjoyed among his colleagues at the Faculty as well as in the wider academic community, Prof. Mildner succeeded in giving biochemistry an important role in the curricula of the studies of biotechnology and food technology, the role it deserves as the basic scientific and professional discipline. Thus a large number of biotechnologists and food technologists were able to obtain a better quality education. The letter of recommendation by Prof. Mildner was a special treasure when applying for a job in the research institutes of *Pliva* or *Podravka*, and many of these students came back to the Laboratory of Biochemistry and worked on their MSc or PhD theses.

Prof. Mildner's contribution to the teaching of biochemistry at the University of Zagreb and to the development of Croatian scientific and professional nomenclature in biochemistry was exceptionally important. He translated seven consecutive editions of Peter Karlson's *Biochemistry*, which was accepted as a standard textbook for students of the Faculty of Food Technology and Biotechnology, as well as for students of the Faculties of Medicine, Pharmacy and Biochemistry, Agriculture, and Veterinary Medicine. Prof. Mildner was a longtime teacher and Head of the post-graduate study of Biochemistry at the Faculty of Science, until his retirement. As Head of the study, he made sure that the teaching programme followed the dynamic growth and development of biochemistry. Prof. Mildner's activity as a teacher and mentor is best illustrated by the fact that about 50 MSc and PhD theses were completed under his guidance.

As a professor at the then Biotechnological Department of the Faculty of Technology, Prof. Mildner had extraordinary reputation, not only as a founder of a new scientific discipline, an internationally renowned scientist, or as a distinguished teacher with remarkable pedagogical skills, but also as a learned person with wide interests, so in 1975

he was elected Dean of the Faculty of Technology. During his term of office he stood up for the quality of scientific research as a crucial criterion for the selection of teachers, and also for strict adherence to academic principles in collaboration and communication with colleagues and students.

Scientific work of Prof. Mildner is extremely rich, especially considering the times in which he was active and his pioneering role in the creation and organization of the conditions for research in the field of biochemistry. He is the author of more than 70 scientific papers, mostly published in renowned scientific journals, or as chapters in books, including many outstanding biochemistry publications, and five patents. Through 32 years of his leadership of the Laboratory of Biochemistry, the scientific work of Prof. Mildner and his associates embraced entire spectre of research projects, from the essentially applied chemical research in the early years, to the modern basic and applied biochemical research within the newly developed areas, such as enzyme engineering. If we follow the chronology of the published papers, we can clearly see his gradual and successful transformation from an organic chemist to a completely distinctive protein biochemist. He can be considered as one of the most significant founders of modern biochemistry in our country. The main area of his research was the study of the structure and activity of enzymes. Almost half of his scientific papers deals with this topic, from the first paper on this subject published in 1963 to his last published paper in 1989. With this work he achieved a full international recognition, which was also confirmed by about a dozen of invited lectures he held on this subject at international congresses and European universities or institutes.

Internationally recognized results of his scientific work enabled Prof. Mildner to link his Laboratory, through the international cooperation, with a number of renowned institutes and university departments in Munich, Padua, Trieste, Regensburg, Zurich and St. Petersburg, which enabled continuous exchange of ideas and research results with renowned scientists who worked in the same or related fields. Apart from that, many of his young associates took the opportunity of scholarships to work in these laboratories, where they mastered modern techniques, and returned with new ideas, hence constantly improving the quality of research in the Laboratory.

In spite of his many activities and obligations, Prof. Mildner dedicated a lot of time to his PhD students, his future associates. He patiently read through the first drafts of our dissertations or scientific papers and wrote in his corrections; they were not mere corrections but a lesson in scientific literacy. He taught us how to openly express our hypotheses and how to defend them strictly with scientific arguments; and how to respect the opinions of our peers even when we do not agree with them. In planning our experiments he gave us complete freedom and treated us as equals in discussions and when presenting arguments. He was always open to new ideas. When choosing his associates he was following clear criteria, the most important were the achieved results and a complete dedication to science and research, knowing that only in this way the Laboratory can be fully recognized internationally.

At that time, in the late 70s and in the 80s, the Laboratory was very busy. A large number of postgraduate students were working on their theses, the lights in the laboratory were on long into the night, sometimes until dawn. Saturdays and Sundays were just like any other day of the week. The door to the laboratory was always open, welcoming researchers from our but also from other faculties or industrial institutes who came across a biochemical problem or who used biochemical methods, so they came to seek advice or help in conducting experiments. Also, a number of researchers who conducted experimental part of their theses abroad turned to Prof. Mildner for mentorship. He would gladly accept, but only if the obtained results were up to the standards of good scientific research, otherwise he would require additional experiments. On the invitation by Prof. Mildner or some of his associates, the laboratory was often visited by scientists from abroad, and the Laboratory of Biochemistry was high on the address list for visiting scientists who came to Zagreb on invitation by other scientists, not only biochemists, but also biotechnologists. It could be said that the intensity and the level of scientific activity in the Laboratory and the well-known European biochemistry laboratories were on a par. The only limitations for a greater scientific productivity were the lack of financial resources and equipment needed to introduce modern biochemical methods and to conduct ever more expensive experiments.

Equally important to the role of Prof. Mildner as a scientist and teacher working for the development of biochemistry is his engagement in building the network of Croatian biochemists within scientific and professional societies in the country as well as in international associations. At the time when Prof. Mildner started his career as a biochemist, few Croatian biochemists gathered in the Section for Biochemistry within the Croatian Chemical Society, founded in 1957. Prof. Mildner was Head of the Section from 1965 to 1976, and at the same time he was president of the Biochemical Committee of Yugoslavia. While the Committee was still under the auspices of the Chemical Society, with his persistence and innate diplomatic skills, in 1965 he succeeded in having it admitted to the membership in the Federation of European Biochemical Societies (FEBS), founded only a year earlier. This achievement opened new possibilities for growth and strengthened the position of biochemistry as an independent modern discipline. In 1970 Prof. Mildner was entrusted with the organization of FEBS course *Catalytic and regulatory properties of enzymes*, which was successfully organized in Zadar. That was the first international biochemical school organized in Croatia and an exceptional opportunity for younger biochemists to meet and learn from the eminent scientists from Europe and the USA.

He believed that the biochemists from this region needed a society of their own, independent from the Chemical Society, so together with a group of colleagues he initiated the foundation of biochemical societies in the former Yugoslav republics, and in 1976 joined them into a Union of Biochemical Societies of Yugoslavia (SBDJ), which became a member of FEBS, and in 1977 also a member of International Union of Biochemistry (IUB). Prof. Mildner, held

in high respect among the biochemists of the former state, was elected President of the Union, and remained on that duty until 1987. With his dedicated work on the development of biochemistry and above all his patience and listening to the opinions of all his colleagues, Prof. Mildner successfully coordinated the activities of the Union through all those years and firmly tied it with the most relevant international biochemical organizations. With his appearance and tactful manners, and his ability to communicate in several languages, he was the right person to represent the country and the societies, a true gentleman and a scholar. He made valuable international contacts and friendships with biochemists from foreign countries for the benefit of all he represented. Taking a stand that the cooperation among biochemists and scientists from similar disciplines needs to be expanded geographically to the neighbouring countries, he contributed greatly to the organization of biannual meetings within the Balkan region and the meetings of Alps-Adriatic region.



Prof. Mildner in the company of his colleagues at FEBS meeting in Warsaw, 1966



Prof. Mildner delivering a lecture at the 1st Slovenian Congress on Food and Nutrition, Bled, 1996

A sign of great recognition to the Union of Biochemical Societies of Yugoslavia, and to Prof. Mildner in particular, was the entrustment of the organization of *Special FEBS meeting on enzymes*, held in Cavtat in 1979. Prof. Mildner was president of the Scientific and Organizing Committees, and in spite of many difficulties, including a severe earthquake that hit Dubrovnik area only two days before the meeting, he presided over the meeting with calm and composure. The Congress with about a thousand participants was a complete success and according to many, including the FEBS officials, surpassed all Special FEBS meetings so far. High scientific standards of the meeting were ensured with the participation of a great number of most respectable world scientists, including a Nobel Prize winner Feodor Lynen, in large part thanks to Prof. Mildner's personal contact and friendship. The successful organization of that FEBS meeting set grounds for the organization of a regular FEBS meeting, which in 1987 took place in Ljubljana, and Prof. Mildner chaired the Scientific Committee. The meeting was attended by about 2000 participants and was also evaluated as one of the most successful FEBS congresses. The contacts that our scientists made with eminent scientists at those meetings opened the door to the most prestigious laboratories for our young biochemists for their doctoral studies, and many a valuable collaborative research project was established.

Aware of the fact that intense international cooperation is a key prerequisite to keep up with the world science, Prof. Mildner directed a significant part of his activity towards this aim and thus earned the gratitude of all Croatian biochemists. Their appreciation was shown by holding a special meeting for the occasion of his 75th birthday, which was organized by the Croatian Society for Biochemistry and Molecular Biology and his closest associates. Besides Croatian biochemists, his closest friends and colleagues with whom he had worked for many years on the development of biochemistry, the meeting was also attended by his friends from abroad, the highest ranking officials of FEBS and IUB. On this occasion he was presented with a special award for longtime activity for the advancement of biochemical science and its application, and the development of teaching biochemistry at the University of Zagreb. He was voted honorary member of the Society.

Prof. Mildner was very active in a number of scientific journals. He was a member of the Editorial Board of *Croatica Chemica Acta* and *Kemija u industriji (Chemistry in Industry)*, and a member of Advisory Board of *Croatian Journal of Food Science and Technology*. Yet his most valuable contribution remains the increase of reputation of our journal *Food Technology and Biotechnology*, where from 1963 to 1972 he was Head of the Editorial Board, then until 2009 editor-in-chief, and finally honorary editor. It is his great merit that the journal has become one of the leading journals in Croatia, and that it has achieved international recognition and citation in major world databases with steadily growing impact factor.

Among many awards and certificates, honorary acknowledgements by home and international institutions and societies, Prof. Mildner was elected *professor emeritus* by the decision of the Senate of the University of Zagreb for his international merits for educational and scientific excellence especially in biotechnical area. In 2001 Faculty of Food Technology and Biotechnology, University of Zagreb, awarded him a golden plaque for his successful longtime work and contribution to the reputation of the Faculty and the journal *Food Technology and Biotechnology*. The crown of his

awards was the Life Achievement Award given to him by the Government in 2004 for his entire scientific and research work in the biotechnical sciences, in particular for pioneering the development of basic and applied biochemical research.

Prof. Mildner stood out not only as a skilled biochemist, scientist and teacher, but also as a man of great knowledge, who loved art and culture. He was especially fond of classical music. His free time he would spend in the company of his dear friends in long walks in the nature or taking a ride on his horse. Another great love of his was the sea. There was no match for his summers on the Island of Krk with his family and friends. He loved to be among people, and people loved his company because he enjoyed talking about numerous subjects, from the less serious every-day topics to the more serious ones about science, politics, or culture, and he discussed all that with great charm and optimism he spread among his listeners.

Those of us who had the pleasure of not only working, but also socializing with him, cherished those moments also after his retirement, until his unfortunate fall from which he never recovered. We will continue our gatherings, but it will never again be the same without our professor. The grief that we share with his family remains, but so does the feeling of pride for having known, worked and socialized with a man whose legacy is much greater than what can be read in a rich scientific biography.

The passing of Prof. Mildner is a great loss not only for Croatian biochemistry, but also for the entire academic community; both gained plenty from his versatile and tireless activities lasting over 50 years. The greatest tribute to him will be our continued promotion of the highest academic principles in scientific and educational work, as well as the pursuit of excellence, skilfulness and diligence, which he so persistently cultivated through his entire life.

Slobodan Barbarić