

CENTENARY OF PROFESSOR JAROSLAV ČÍHALÍK

This article is dedicated to the 100th anniversary of the establishment of the Department of Analytical Chemistry at the Faculty of Science, Charles University in Prague.

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Received 15.7.24, accepted 20.8.24.

On the occasion of the 100th anniversary of the birth of Prof. Dr. Jaroslav Číhalík (1924–2005), an outline of the life and work of this important teacher and scientist of the Faculty of Science of Charles University is presented. His teaching activities, including the establishment of the new field of Environmental Protection, are summarized and his most important publications in analytical chemistry are recalled. Also, the personal dimension of his work at the faculty is presented.

Keywords: analytical chemistry, history of science, didactics

It seems almost unbelievable that, due to the speed of time, this year we are commemorating the centenary of the birth of an important figure of the Faculty of Science of Charles University, Prof. RNDr. Jaroslav Číhalík, CSc. In addition to his many years of teaching and scientific activity in the field of analytical chemistry, his unforgettable merit is the establishment of the field of Environmental Protection, which is still being developed at the faculty. On this occasion, it is fitting to look back and leave at least a few details of his rich life for human memory.

After the establishment of Czechoslovakia in 1918, a number of Czech intellectuals went to the Slovak part of the republic to help in the development of education there. Therefore, the birthplace of Jaroslav Číhalík became Trnava, the workplace of his father-teacher, where on 21 November 1924 he saw the light of day^{1,2}. He subsequently attended primary school in Trnava and Kremnica, but turbulent times led the family to return to Bohemia, so he received his secondary education in Prague and completed it in Havlíčkův Brod. It was only after the end of World War II that Jaroslav Číhalík was able to enroll in Chemistry and Plant Physiology at the Faculty of Science of Charles University, and he completed his studies *summa cum laude* with a PhD in Natural Sciences in 1948 under the supervision of Prof. Tomíček³. Already as a student, he was an auxiliary researcher at the Institute (now the Department) of Analytical Chemistry, where he became an assistant professor after graduation. In his teaching activities, he

was intensively engaged in lectures and laboratory exercises in analytical chemistry, so that he was appointed Associate Professor of Analytical Chemistry as early as 1 August 1959 and less than ten years later, on 1 July 1968, Professor of the same field. In addition to his teaching activities, he was involved, in today's terms, in the management of the faculty, having been its vice-dean for practically all of the 1960s.

The scientific focus of Prof. Číhalík was based on the traditions of Department of Analytical Chemistry. He published his first scientific paper on the bromometric determination of arsenic and antimony in this Czech journal in 1950 (ref.⁴). In addition to new volumetric



Fig. 1. Title pages of Prof. Číhalík's electroanalytical books



Fig. 2. Professor Číhalík (on the right with glasses) and his Cuban PhD student Arnaldo Aguiar Castro (1938–2022), later professor of analytical chemistry at the Universidad de La Habana, in the potentiometric titration laboratory (early 1980s)

determinations, especially of pharmaceutical substances, his further interest was in electroanalytical methods, ranging from polarography through polarometry to potentiometry⁵. In this field, his seminal work is extensive, nearly six-hundred-page monograph *Potenciometrie* (Potentiometry) from 1961 (Fig. 1), which is still a valuable source of data today. Číhalík's second and still sought-after work is the 1975 book *Průručka měření pH* (Handbook of pH Measurement, co-authored with J. Dvořák and V. Suk; Fig. 1).

As part of his teaching activities, Prof. Číhalík also participated in UNESCO courses in the 1960s, which enabled students from developing countries to study in the then Czechoslovakia (Fig. 2). This participation, in turn, enabled him to work abroad at the Universidad de Oriente–Santiago de Cuba in 1963 and 1969–1971.

In the early 1970s, Prof. Číhalík was commissioned by Department of Analytical Chemistry to focus on the analytical control of various aspects of the environment, which was more than innovative at the time. With his proverbial enthusiasm, he took this direction and introduced environmental lectures for undergraduate students and subsequently postgraduate courses for practitioners. The popularity of these courses, their obvious necessity, and Prof. Číhalík's efforts led in the academic year 1977/1978 to the independence of the field of Environmental Protection, which has been taught at the Faculty ever since and for which a separate department (now the Institute for Environmental Studies) was established. In this field, in addition to a number of scientific papers, he published one of the first popular science works, the book *Člověk a životní prostředí* (Man and the Environment), in 1987 (co-authored with V. Císař and J. Havránek; Fig. 3). Even after his retirement, he

frequently visited the faculty at both of his former workplaces. His life course came to a close on 24 December 2005 at the blessed age of 81 (ref.⁶).

The personal dimension of Professor Číhalík, due to the proximity of her work, is best summarized by the second author of this article (LP): When I came to the Department of Analytical Chemistry at the Faculty of Science of Charles University in 1976 as a chemical laboratory assistant, I was without a specific assignment for about three weeks. One day, however, the head of the Department, Prof. Václav Suk, came to me with one of his colleagues. He introduced him as Professor Číhalík and told me that from that day on I would be his laboratory assistant. Professor Číhalík seemed to me to be a very lively person. At the Department of Analytical Chemistry, he was mainly involved in potentiometric titrations, but he had already started promoting environmental protection. And that is how I actually got to the beginning of this field at the Faculty of Science of the Charles University. The professor was tireless in finding enthusiastic people not only at the faculty but also outside it. In addition, of course, he devoted himself to analytical chemistry and to his graduate and postgraduate students. There were also many from Spanish-speaking countries, then mainly from Cuba and South America. He knew Spanish because he had worked in Cuba for three years, and so he was preparing most of these students mainly to get their PhDs. The Cubans worked on both potentiometry and polarography. But the environment was not left out. Even before the founding of this study, the professor was already looking for literature, and so a library focused on environmental issues was gradually built. Finally, in 1977, the approval of a new degree course in Environmental Protection was granted, and the first year started. The preparation of the curriculum of this study and then the lectures was taken up by teaching staff from the Faculty of

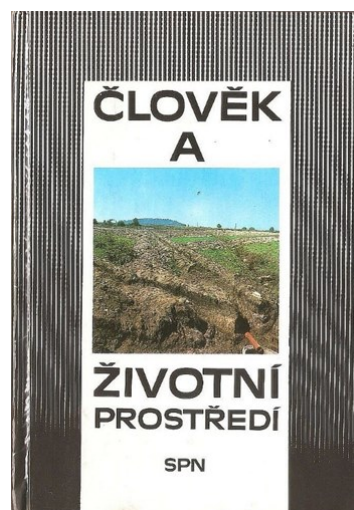


Fig. 3. One of the first popular science books on the environment, in which Prof. Číhalík made a significant contribution

Science of the Charles University and beyond. The study included lectures in various disciplines and practical exercises in laboratories. The professor tirelessly and with unceasing energy lectured, labored, conducted theses, went to conferences and various meetings. And he always found time to sit with his colleagues and students. He charged his surroundings with his energy. I never saw him as sullen, reluctant, or obnoxious. He would arrive at the Department very early in the morning, I think between 5:00–6:00 a.m., and was very fond of sipping coffee from small cups several times a day. He was always kind and hospitable to everyone, a few very rare exceptions. His wife, Mrs. Číhalíková, was a great and patient support. I still remember the years I spent in his presence. Among other tasks, I was also obliged to demonstrate chemical reactions in the professor's lectures. Sometimes it happened to me that the reaction tested downstairs in the laboratory did not work out in the lecture. However, the professor was quick to know his own advice and told the students that sometimes the "*colouration does not have to be pure white, but also yellowish, cream, beige... the light in the lecture room also has an influence on it.*" He just never left me as an inartist with experiments. I would also draw different pictures on the board or write equations before the lecture. Everything had to be prepared. During the lectures, I also heard various stories related to chemistry. Like when a professor's colleague wanted to poison herself with cyanide from the reagents in the laboratory out of unlucky love. Fortunately, the solution was already old and weak (it was bit actually poisonous cyanide anymore, but much less toxic cyanate), so when she went to "say goodbye" to the professor, he promptly poured a solution of ferric salt into her, and thus actually saved her. (An interesting question is: how many of today's chemically oriented graduates would immediately think of this solution in an era when the teaching of honest classical chemistry is being somewhat sidelined and replaced by modern and excellent, but less practical and applicable aspects.) For the curious, I should add that the unhappy love was not because of the professor. There was also a good joke about the fact that water is "very poisonous." Demonstrated on alcohols when carbon groups are removed from the molecule in the series of ethanol → methanol → water.

And finally, a memory of the first author (JB): When Prof. Číhalík told us at his lecture that most of us would one day be involved in environmental analytical chemistry, most of our class went to the dictionary after his lecture to look up what the word "environmental" actually means. The second recollection concerns the fact that the aforementioned *Potenciometrie* book cited virtually every available paper on this method that was available in Chemical Abstracts at the time. Today, when the keyword "potentiometry" is entered into the Web of Science database, there is the information that more than 8,200 publications have been published on the subject, which, of course, cannot be studied and evaluated even with the greatest effort. All the more reason to admire the insight and ability of our older teachers.

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J. Barek, L. Porazilová, and K. Nesměrák (*Charles University, Faculty of Science, Department of Analytical Chemistry*): **Centenary of Professor Jaroslav Číhalík**

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