Memorial of Dionýz Ilkovič

Academician *D. Ilkovič* passed away on August 3, 1980. On that day the Czechoslovak scientific community suffered a grievous lost.

D. Ilkovič has been known the world over as one of those to whom we owe the development of polarography. His outstanding achievements in the field of physics are matched by his merits in helping to organize and build up the research institutes of the Slovak Academy of Sciences and by his effort to create an efficient system of education for young Slovak scientists and technologists. Seen in the complexity of his manifold activities and achievements, D. Ilkovič is one of the most fascinating personalities of the Czechoslovak science.

D. Ilkovič was born on January 18, 1907, in Šarišský Štiavnik in eastern Slovakia. After graduating from the Faculty of Natural Sciences of Charles University in Prague in 1930, he joined the staff of this faculty as assistant of Professor *J. Heyrovský*, one of the greatest scientists in the recent history of Czechoslovak science, who was to become later Academician and Nobel prize winner. Under the guidance of Professor Heyrovský a team of young enthusiastic people, mostly assistants and graduate students working towards their doctoral theses, concentrated on an intensive research into theoretical and experimental aspects of polarography, then a new branch of science. His scientific work from this period resulted in a doctoral thesis for which he obtained the RNDr. degree, and some years later, in a habilitation at Charles University in Prague.

His paper *The Dependence of Limiting Currents on the Diffusion Constant, on the Rate of Dropping and the Size of Drops* which he published in the journal *Collection of the Czechoslovak Chemical Communications* in 1934 at the age of 27, has been highly appreciated as a milestone in the development of polarography. Owing to this work he ranks, next to Heyrovský, with the classics of polarography. In this paper Ilkovič published a formula expressing the dependence of the limiting polarographic current on the concentration of the depolarizer, diffusion coefficient, on the rate of dropping and the size of mercury drops which form the electrode. This formula has become to be known the world over as the 'Ilkovič equation', though the author himself objected to the term 'equation', and several years later, was declared by Heyrovský to constitute the fundamental law of polarography. It is not without interest that in his paper Ilkovič published solely the mathematical expression, the theoretical principles underlying this derivation were published four years later in *Journal de Chimie Physique*.

D. Ilkovič, first a young assistant, later associate professor at Charles University, and simultaneously teacher at several grammar schools in Prague, continued his work in the field of polarography and succeeded to achieve remarkable results, though these did not attain the degree of public recognition as the 'Ilkovič equation' had. Thus, *e.g.*, he proposed together

with *G. Semerano,* later a professor in Padua, Italy, an arrangement with the aid of which the analytical sensitivity of the polarographic method was considerably increased. He derived an analytical description of the course of the polarographic wave and introduced the notion of the half-wave potential as a basic polarographic characterization, offered a theoretical explanation of its physical value, and together with professor Heyrovský, performed the experimental verification. He was the first to give a theoretical explanation of the maxima on current voltage curves based on the effect of nonhomogeneous electric field around the dropping electrode. He dealt with measurements of the polarization capacity, with temperature coefficients of diffuse currents, and many other topics. This era of his work in the field of polarography culminated with the publication of a book on polarography (*Polarografie,* 1940) which, highly spoken of by Professor Heyrovský, has become a widely used methodological handbook in this field.

The fruitful cooperation with Professor Heyrovský was interrupted after more than ten years by the events of World War II. At this time, the process of building up the Slovak Technical University and the Faculty of Natural Sciences at the Komenský University in Bratislava was in progress, and skilled and experienced people were badly needed. D. Ilkovič took part in these activities after he, like many other Slovak scientists who were educated and worked at Czech Universities, moved to Bratislava in January 1940. The tasks with which he was confronted comprised the organization and building up of two institutions: the Institute of Technical Physics at the Slovak Technical University in Bratislava and the Institute of Physics at the Faculty of Natural Sciences at the Komenský University in Bratislava. The Institute of Technical Physics was later transformed into the Department of Physics at the Electrotechnical Faculty of the Slovak Technical University and Ilkovič was to remain joined with it all his life. The young professor devoted a great deal of zeal and energy to his new tasks.

Ilkovič was an inspiring teacher and a prodigious reader. His lectures on various topics in the wide field of physics and physical chemistry were notable for their original presentation and excellent organization. Dogma and routine had no place in his teaching. For the benefit of his students he wrote a textbook on a method he used on the vector calculus. In our country this book has become the basic source in this special field.

In the fifties the Czechoslovak Academy of Sciences and the Slovak Academy of Sciences were founded. In 1952 D. Ilkovič was elected Corresponding Member of the Czechoslovak Academy of Sciences, and one year later, 1953, he was nominated one of the twelve Foundation Members — Academicians of the Slovak Academy of Sciences. At the same time he became chief Scientific Secretary of the Slovak Academy of Sciences. As a member and officer of the Academy D. Ilkovič initiated the formation of a Commission for Mathematics and Physics from which later two scientific institutes developed: the Institute of Mathematics and the Institute of Physics at the Academy. He was one of the founders, and up to 1958 Editor-in-chief of *Matematicko-fyzikálny časopis* (Journal of Mathematics and Physics) which, in 1967, split up into two journals, *Matematický časopis* (Journal of Mathematics) and *Fyzikálny časopis* (Journal of Physics). In the latter Ilkovič published several papers dealing with various problems of theoretical physics, such as the expression for the divergence and curl of a vector in curvilinear generalized coordinates, and the contribution to the formulation of fundamental laws of electrodynamics in the Minkowski space-time.

D. Ilkovič authored the first Slovak textbook on physics, *Fyzika,* which appeared first in 1957 and which has been published so far in five editions. A masterful presentation of the

subject matter, well known also from his lectures, shows that Ilkovič excelled in the art of pedagogy. Elegance of mathematical derivations, an exact and masterful application of the vector method belong to the characteristic features of this book.

The merits of Academician Ilkovič were recognized and many awards, honours, and distinctions were bestowed upon him. In 1969 he received a high distinction, the Order of Labour; for his pedagogical merits he received the Medal of J. A. Komenský in 1977. In 1945 he was awarded the Prize of the Slovak National Council for merits in the development of natural sciences, 1952 he received the Prize of the City of Bratislava, in 1970 the National Prize of the Slovak Socialist Republic. He was honorary doctor of the Komenský University in Bratislava, winner of the Silver and Bronze Honorary Plaque of the Czechoslovak Academy of Sciences for merits in science and for humanity, of the Golden Heyrovský Plaque for merits in chemical sciences, and of many other prizes, awards, conferred on him by many scientific institutions and universities from this country and from abroad.

An overall evaluation of the work and personality of a scientist like D. Ilkovič cannot be attempted in a short memorial. This is a task to be fulfilled by our historians, especially since it is impossible to give an account of the developments in physics and physical chemistry in Slovakia without writing a personal history of D. Ilkovič.

We wish to express here the esteem in which we hold this modest man, remarkable for his energy and perseverance, a man who was absolutely honest in all his professional and personal dealings. Academician Ilkovič will be mourned and missed by all who knew this excellent scientist and noble man.

V. Kellö