



PERSONALIA

Professor Ferdinand Herčík A Man of Remarkable Merits

(7. 5. 1905-20. 1. 1966)

Exceptionality attended Ferdinand Herčík throughout all his life, starting from his secondary school years. Born in Prague, he was the son of a very good fin-de-siècle artist painter. At about the date of his birth, his father was designated to the position of a professor of painting at the Technical University in Brno; hence his family moved there. Here young Ferdinand (he earned this Christian name from his father) completed the Classical Gymnasium (a sort of classical grammar school). The talented student found much pleasure in physical, chemical, and biological experiments, contriving also some fancy ones. As a well-mannered child, he visited a Sunday school and the natural children's curiosity gradually grew into a professional, science-oriented attitude towards biology. Though he kept interest in artistic

painting for all his life (the family inclination was obvious), his student years decided that his interest in searching for the scientific truth prevailed.

As early as in his seventh gymnasium form, he found his way to the Department of Plant Physiology at the Brno Faculty of Science, at that time headed by the personality of Prof. Vladimír Úlehla. It would have been hardly imaginable to find a more suitable tutor to get acquainted with mysteries of the life science in practice. Having passed the maturita examination (General Certificate of Secondary Education) in 1923, he enrolled in Plant Physiology at the Faculty of Science, Masaryk University. At that time, F. Herčík published his first scientific paper, concerning the impact of pH on growth manifestations of plants. As an undergraduate student, he accumulated considerable knowledge also abroad. In 1926 he visited reputable universities in northern Italy (Bologna, Firenze, Milano, Pisa), he received scholarships to work at the maritime biological stations in 1927: in Villefranche sur Mer (France) and in San Sebastian (Spain) and, in 1928, to work in Pasteur Institute in Paris – in the Department of Molecular Biophysics (directed by Prof. Lecomte du Noüy); he also returned to continue his research there later, in 1930–1931.

In the meantime, in 1928 he successfully defended, at the Faculty of Science, a dissertation thesis entitled “On the effect of light on some qualities of the cell juice”, finished his studies there, received the title of RNDr. – and immediately received an Assistant Professor position at Vl. Úlehla’s Department. Still in the same year, his exceptional career got a further impulse: he also enrolled in the Faculty of Medicine and was able to be bestowed the title of MUDr. as early as in 1932. During his medical studies, he completed the above-mentioned second stay in Pasteur Institute as holder of a scholarship of the French government. Here he studied physical impacts on living matter, photocapillary reactions, and general effects of superficial tension both in biology and in medicine. Hence, he got confronted with a brand-new science – biophysics. In 1932, he also habilitated in Plant Physiology at the Brno Faculty of Science. His German thesis “Die Oberflächenspannung in der Biologie und Medizin” was edited as a monograph in Dresden two years later. His biophysical attitude with special interest in photoeffects directed him to radiology. And his sheer rise continued.

Already as a young assistant professor of Prof. V. Úlehla (in 1931) he was charged with leadership of the Radiological Station of the Faculty of Medicine, which was responsible for taking on (into capillaries of various lengths), activity measuring and distribution of radon for therapeutic needs in the South Moravian region. In 1935 he also habilitated at the Faculty of Medicine in Medical Biophysics. In the years 1935–1936 he worked (again as a scholarship holder) in the Rockefeller Institute in New York – and again, it was a mission of fate: he had there an opportunity to work in the Biophysical Laboratory headed by Dr. Ralph W. G. Wyckoff. A lifelong friendship of both men was commenced and, at the same opportunity, Herčík met his second lifelong research topic: electron microscopy of bacteriophages.

In 1936 he was promoted an extraordinary professor of General Biology and in 1937 an ordinary one. Following this, he was appointed Head of the Department of

General Biology at the Faculty of Medicine, Masaryk University. His arrival at this post finished the 3 years' period (since 1934) when – after the leave of Prof. Jan Bělehrádek for Charles University in Prague – physiologists (Prof. Vilém Laufberger and Prof. Ludvík Drastich) were charged with holding this position. (F. Herčík had continued to head this Department – with a six years' war interruption – until the year 1961.) Immediately in 1945, Herčík joined the Radiological Station administratively to his Department of Biology and his young assistant professors continued to perform the duties concerning radon.

During his second official journey to USA in 1947, Herčík succeeded in gaining and bringing to his Institute in Brno an invention – a brand-new one at that time: an electron microscope, the first and for some time the only one in all Czechoslovakia. Thus, two parallel main research routes of his life were started: (1), study of radiation effects, mainly of the corpuscular radiation α , on living matter; and (2), study of the formation and structure of bacteriophage, as of a molecular object on the borderline between living and non-living matter. In this way, he succeeded in assisting the birth of two avant-garde branches of biology: biophysics and molecular biology.

Ferdinand Herčík was extremely active and hard-working. Being a direct active participant in the explosive development of biology in the first half of the 20th century, he disseminated enthusiasm for science among his medical students; in this respect too, he was a true fellow to Jan Bělehrádek. The laboratories of his Institute kept steadily their doors open for students who – inspired by his own enthusiasm and striking scientific success – took courage to step in and set their own shoulders to assist in detecting hidden mysteries of life, of living matter... Dozens of students populated the roomy labs of the Biological Institute every year; the most competent of them remained for the following years of their studies and kept continuing and developing their experimental experience. From these, Herčík kept selecting his assistant professors, forming the “young blood” of his Institute and – later on – also the founder generation of the Institute of Biophysics of the Czechoslovak Academy of Sciences.

However, before arriving at this important point of his activity, let us recall a few other important characteristics of his personality.

In 1928, the young Czechoslovak Republic celebrated its 10th anniversary by a Jubilee Exposition on the Brno exhibition grounds; obviously, it was intended to show also the importance of Masaryk University for cultivating not only science but mainly the general cultural level of the nation which had found its liberty. For this purpose, Herčík with Bělehrádek arranged a modern exposition on medicine, social care, technologies, and on the pharmaceutical industry in Czechoslovakia.

In the following years, he visited some important scientific institutes in Germany and France. At the World Radiological Congress in 1938 (arranged on the occasion of the 40th anniversary of the discovery of radium by Pierre and Marie Curie), he participated with a paper on the effects of radiation on living organisms. Through

his experimental research he founded Czechoslovak radiobiology. Applying the hit theory of biological effects of radiation, he opened the way for quantum biology, which signified an important physical resource of the oncoming molecular biology; in this respect, he developed the ideas of Prof. Jordan. He steadily maintained scientific contacts with leading personalities all over Europe as well as in USA, India, and Japan.

During the Second World War, he could continue his radiological research only in the Provincial Radiotherapeutical Institute (today's Masaryk Oncological Institute) in Brno, exploring both soft and hard, wave and corpuscular (especially α) radiations.

Herčík was endowed with a capability of philosophical generalisation; though using research methods based on the analytical principle, he always felt the necessity to synthesise the results reached. This necessity led him to philosophical breakthroughs. He was an adherent of holism and enriched it by the quantum theory. He accepted the time dimension of dynamic actions as a fourth dimension of the existence of the universe. With his friend and colleague, the mathematician Prof. Otakar Borůvka, he formulated a four-dimensional model of life. He did not admit any sharp edge between biology and physics: hence his conception of biophysics as a theory on physical principles of life. He pleaded for "metapsychic" ways of recognising the world, parallel to its recognition by means of sensual experience. With merit, his entry was included in *the Encyclopedia of Czech Philosophers* in 1998.

Unfortunately, February 1948 changed his official profile profoundly. Under the influence of the totalitarian regime, he turned a Marxist with all concomitant complements. In this way, his official political position was reinforced – which he never misused. On the contrary, he had to resist being blamed for his previous philosophical orientation; he was "not Marxist enough" for the Communist Party organs (he joined the party). Nevertheless, he did not hesitate to shield all his young collaborators from the dangers of the regime. And, chiefly, it was in this position that he could realise his dream: in 1954, he founded the Biophysical Laboratory of the Czechoslovak Academy of Sciences (ČSAV), which was the necessary starting stage of the Institute of Biophysics of the ČSAV in Brno, for which a brand-new building was erected and opened in 1955. Of course, Herčík became the first director of this Institute, a position which he held continuously until his death in 1966. (In 1961, he handed his leading position in the Department of Biology, Faculty of Medicine, over to his successor, Professor Oldřich Nečas.)

Ferdinand Herčík was – again in the Brno footsteps of Vladimír Úlehla and Jan Bělehrádek – extremely active in popularising biology. He presented dozens of lectures for the general public, he participated in public discussions with Vlad. Úlehla and Živan Vodseďálek, many lectures of his were broadcast, he published many biological papers in *Vesmír*, *Věda a život*, *Lidové noviny*, etc., but – chiefly – he wrote splendid biological science popularising books: *Mladý biolog [Young Biologist]* (1941, 1945, 1954, in Slovak 1955), *Záření a život [Radiation and Life]* (1941, 1946, 1957, in

Slovak 1959), *Život naruby [Life Inside Out]* (1945, 1946, 1948), *Život člověka [The Life of Man]* (1947, 1949), *Na hranicích života [On the Boundaries of Life]* (1963). All of them are famous and vivid until now – even more than are his scientific monographs: *Od atomu k životu [From the Atom to Life]* (1946), *Úvod do kvantové biologie [An Introduction into Quantum Biology]* (1949), *Problém bakteriofága [The Bacteriophage Problem]* (1953), and *Biophysik der Bakteriophagen [Biophysics of the Bacteriophage]* (Berlin 1959).

Professor Herčík passed through very important scientific functions. In Brno, he was Dean of the Faculty of Medicine (1949–1950) and later Vice-rector of Masaryk University (1953–1959). He was a member of the Scientific Board of the ČSAV, for years he presided over the Editorial Board of the journal *Věda a život [Science and Life]* (issued in Brno), he was in the chair of the Czechoslovak Biological Society. Concerning public functions, in 1945–1946 he was chairman of the City of Brno National Committee, after February 1948 he was a member of the Central Action-Group Committee in Prague, then in 1948–1949 a member of the Provincial National Committee in Brno. Even more outstanding were his functions on the international level. He was active as an expert (for radiobiology) of the World Health Organization (WHO) in Geneva, as an expert of UNESCO in Paris, and also – gradually – as a supervisor, Governor, Vice-chairman of the Board of Governors of the International Agency for Atomic Energy in Vienna, and – since 1963 – a member of the Committee of the International Association for Radiation Research. Since 1956 he was a member, in 1960–1961 Vice-chairman, and in 196–1962 Chairman of the Scientific Committee of UNO in New York for research on radiation effects. In this function he initiated, formulated, and presented to the 13th UNO General Assembly a report, which was used by the Assembly as a basis for the International Agreement on the Ban of Supraterrestrial Experimental Nuclear Tests.

The more engaged – day after day – in his duties, the more enthusiastic he was for whiles that he could spend in the beautiful nature of the Tatra Mountains: in summer under the tent in Javorová dolina and as a mountain climber (with experienced mountaineers), in winter as a skier. Always and everywhere, he found time for documentary photos and for his painting experiments.

Professor Ferdinand Herčík arrived at the end of his life on 20 January 1966 in Brno as a victim of the lethal effects of penetrating radiation – a phenomenon for whose exploration he offered all his life.

Jan Šmarda and Věra Linhartová

