



Prof. Petr Beckmann

Beckmann Memorial Lecture

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“Electromagnetic Aspects of Selforganization in Biology”
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This brief article is written not only for memorialization of Professor Petr Beckmann, DrSc, who died in Boulder on August 3, 1993, but for acknowledgement of his contribution to human knowledge, for his critical independent thinking, for his will and courage to proclaim the truth, and for his general contribution to humanity. His life was predetermined by the historical events in the Europe in the middle of the twentieth century. Born on November 13, 1924 he was a youngster when nazi wave gradually flooded the Europe. At that time the Beckman family lived in Liberec and the family languages were German and Czech. After Munich Agreement when the boundary parts of the Czechoslovakia were annexed to nazi Germany the Czech population had to leave this territory. The Beckmann family - father Rudof, mother Katherine and two children - fled from Liberec to Prague. But the idyllic life at Bořislavka in Prague lasted only several months. A telephone call in the early morning on March 15, 1939 notify the Beckmann's of the nazi occupation of the country. Petr had obtained 50 crowns banknote (the greatest amount of money he ever had gotten) to provide taxi. After feverish packing of some suits and also of all the documents of his father's lawyer profession (as the documents - if had taken by nazi forces - might endanger those named in) the family left the flat just in time before nazi secret police Gestapo searched them as the family was on the Gestapo list of undesirables. The nazi occupation forced the family to leave the protectorate of “Böhmen und Mähren” and to flee to Great Britain. In 1942 Petr in his seventeens volunteered for military service and served as radar mechanic in the 311th Czechoslovak squadron of the British Royal Air Force. He obtained two war medals, one of them for personal bravery in fight.

After the war he was discharged from the army and returned to Czechoslovakia, graduated from the Technical University in Prague in 1949, obtained a M.Sc. degree, and than he joined the military research institute. But before he was allowed to start his scientific career he had to face the “peoples democracy entertainments” of the newly established political order. He was dismissed from the military research institute as a politically unreliable person with recommendation “to cleanse himself in mines”. It was the beginning of the dictatorship of the proletariat. He taught English in a public language school, wrote a nice textbook “Technical English”, and eventually he succeeded and was accepted for CSc. (Ph.D) study in a research institute of electrical engineering. After some time in the middle of the fifties he was accepted as a scientist into the Institute of Radio Engineering and Electronics of the Czechoslovak Academy of Sciences and defended his thesis and obtained the CSc. degree. He headed department on electromagnetic waves. This was important change in his life that enabled him to start bright scientific career. The main scientific activity of the department at that time was connected with the propagation of ultra short radio waves over long distance. The main problems were connected with physical

conditions causing scattering and with determination of the result of the multipath propagation, i.e. with the result of interference of randomly scattered waves. At that time it was assumed that the scattering is caused by the atmosphere turbulences assigned to variations of temperature. Dr. Beckmann found that the main cause of scattering is variation of water vapour content in the air, in particular that the scattering takes place at the upper surfaces of clouds. But the main contribution in this field was connected with a general analysis of superposition of scattered waves. Theoretical treatment of the scattering from rough surfaces can be important in many branches of science, e.g. for analysis of the endogenous field in living cells too. Dr. Beckmann applied principles of the theory of probability in propagation of radio waves and generally in electrical engineering. He solved problems with deep understanding of their physical background and searched for physically justified simplifications of mathematical description to the degree that explicit solution was possible. At the end of the fifties and in the beginning of the sixties he was the most significant scientist in the institute. In 1962 he obtained the DrSc. degree.

In connection with development of lasers he wanted to focus the research of the department he headed on optical communications. At that time the research on optical communications started in the most developed western countries. But at the end of the year 1962 the official organs of the Academy canceled the department in the Institute and decided to transfer the staff to the Geophysical Institute.

On the basis of his published works Dr. Beckmann was invited to the University of Colorado in Boulder in 1963. He accepted invitation, got a year permission to leave the country for the USA, started the scientific and pedagogical activity at the University, forgot to return, and remained at the University of Colorado as a Professor of electrical engineering until his retirement in 1981. In the published papers and books he further developed his ideas on probability theory in solving fundamental tasks in electrical engineering.

The interests of Petr Beckmann were rather wide but always with understanding and with deep penetrating insight. For a long time he was interested in the theory of relativity. He wanted to describe the interaction between electromagnetic field and the gravitational field as a primary physical force effect. He replaced the Second Postulate of the special theory of relativity that the velocity of light is constant with respect to all observers, regardless of their velocities relative to the source, by a postulate that the velocity of light is constant with respect to the local gravitational field through which it propagates. All his ideas about this problem are in the book "Einstein plus two". History of science and its evolution is reflected in the book "History of π (Pi)" translated in several languages and even into the Czech. In the USA he was nationally known supporter of nuclear power and frequent speaker on this subject at public meetings. He explained and defended importance of nuclear power in the book "The Health Hazards of Not Going Nuclear". He spoke fluently several languages. His mother tongue was Czech and German. He learned English during the war in England. Then he learned French and Russian too. He published papers in these languages. He published interesting ideas on languages based on the theory of probability and information and developed a theory of error-correction in language. He was a talented active musician who liked classical music. He played piano, violin, accordion, clarinet, basoon, and organ. In 1989 he wrote and published a book "Musical Musing" - a humorous potpourri about classical music and its composers. He prepared

a computer programs Humit and Whatisit for identification of about 800 themes of classical orchestral music. He painted nice pictures too. He was publisher and editor of the “Pro-Science, Pro-Technology, Pro-Free-Enterprise” monthly newsletter “Access to Energy, published regularly for some 6000 readers, from 1973 up to his death. In 1980 he was appointed to the Energy Task Force by president Ronald Regan. Ronald Regan sent a congratulation letter to the readers of the newsletter “Access to Energy” on the tenth anniversary of its publishing. Petr Beckmann was talented in many areas – a real Renaissance human. He enjoyed life, but above all he was thinking in order to disclose unknown, to explain yet unexplained. He fought for the right of critical and independent thinking in all branches of human activity, for refusing myths, and for making every endeavor to find truth. He believed that the truth conquers.

When he was dying of cancer he took leave from the readers of the “Access to Energy” and – just at death’s door – he described last days of his life. At the end of the departing this life letter he wrote: Dear readers, I would like to take leave of you with the words of a great Czech, Jan Hus, a religious reformer 100 years before Luther. He voluntarily went to defend his views before the Ecclesiastic Council in Constance (on the border of Germany and Switzerland), but the Council condemned him as a heretic and he was burned at the stake on 6th July 1415. In his last letter from his dungeon in Constance sent to his people (“via a good German”) he wrote: “Love the truth and be generous in letting everybody benefit from the truth!”

At the end a short information about scientific publication of Professor Petr Beckmann. He published about 60 original scientific papers and a number of scientific books greater than published any other scientist in the Institute of Radio Engineering and Electronics since its foundation.

Published scientific books not mentioned in the text

1. The Scattering of Electromagnetic Waves from Rough Surfaces (co-authored with A.S. Spizzichino). Maxmillan, New York, Pergamon Press, London, 1963.
1. Republished by Norwood , Artech House, 1987.
2. Die Ausbreitung der Ultrakurz Wellen. Akad. Verlagsgesellschaft, Leipzig, 1963.
3. Probability in Communication Engineering. Harcourt, Brace & World, New York, 1967.
4. Elements of Applied Probability. Harcourt, Brace & World, New York, 1968.
5. Introduction to Elementary Queuing Theory and Telephone Traffic. 1st ed., Golem Press, 1968; 2nd ed. Lee’s ABC of the Telephone, Chicago, 1997.
6. Depolarization of Electromagnetic Waves. Golem Press, 1968.
7. The Structure of Language. Golem Press, 1972.
8. Orthogonal Polynomials for Engineers and Physicists, Golem Press, 1973.

Nejvýznamnějšími vědci v Ústavu Radiotechniky a elektroniky Československé akademie věd po jeho založení byli nesporně matematik Dr. Antonín Špaček a elektroinženýr Dr. Petr Beckmann.

Dr. Špaček založil a vychoval významnou pracovní skupinu kybernetiky, a to již v době, kdy se v r. 1952 na ideologické konferenci v Brně prohlásila kybernetika za buržoázní pavědu sloužící k většímu vykořisťování pracujících. Dr. Špaček tehdy prohlásil: Kybernetika je věda a budeme ji dělat. (Na uvedené ideologické konferenci stihl genetiku obdobný osud. Genetika se totiž stala kněžourským lhářstvím.) Po založení ústavu byla kybernetická skupina přijata do ÚRE a tvořila samostatné oddělení. V tomto oddělení byli vědečtí pracovníci K. Winkelbauer, A. Perez, M. Ullrich, O. Hanč, J. Nedoma, J. Křepela, O. Šefl, p. Driml, p. Pantelopulos. Oddělení zabývající se kybernetikou bylo v ÚRE až do konce roku 1958. Začátkem r. 1959 bylo toto oddělení převedeno do nově založeného ústavu Teorie informace a automatizace a Dr. Špaček se stal zástupcem ředitele. Dr. Špaček zemřel na zhoubný nádor na podzim r. 1961 ve věku 50ti let.

Dr. Petr Beckmann pracoval v ÚRE od jeho založení do r. 1963, kdy odjel na pozvání do USA na University of Colorado v Boulderu. Bližší informace jsou v textu Memorial Lecture z r. 2000.