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In memoriam Professor Jindřich Nečas

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# IN MEMORIAM PROFESSOR JINDŘICH NEČAS

On December 5, 2002, a prominent Czech mathematician Professor RNDr. Jindřich Nečas, DrSc., died after a long illness at the age of seventy three years.

Jindřich Nečas was born in Prague on December 14, 1929. Since 1932 he lived in the nearby town of Mělník, where he graduated from the secondary school in 1948. Then he studied mathematics at the Faculty of Science of the Charles University in Prague during 1948–1952. After a one year period at the Faculty of Civil Engineering of the Czech Technical University in Prague he started postgraduate study in the Mathematical Institute of the Czechoslovak Academy of Sciences. His supervisor, Prof. Ivo Babuška, influenced him to solve problems occurring in physics and engineering.

In 1956 J. Nečas obtained the scientific degree of Candidate of Science (an equivalent of PhD) and became a research worker of the Mathematical Institute. Since 1960 he headed the Department of Partial Differential Equations. He worked also at the Faculty of Mathematics and Physics of the Charles University in 1965–1972 as the head of the Department of Mathematical Analysis. In 1977 he passed from the Academy of Sciences to the Charles University and headed the Department of Mathematical Modeling. Since 1995 he has also been member of staff of Northern Illinois University in De Kalb, where ho got the Presidential Research Professorship in 1997.

He became Professor Emeritus of Mathematics at the Charles University in Prague and Doctor Honoris Causa at the Technical University of Dresden. In 1998 J. Nečas was honored by the Medal of Merit of the Czech Republic by President Václav Havel.

The most important contributions of J. Nečas belong to the theory of partial differential equations and to non-linear functional analysis. He contributed substantially to the development of modern functional analytic methods of solution to elliptic partial differential equations in his famous monograph Les méthodes directes en théorie des équations elliptiques (1967). He followed the modern Italian and French school and enhanced it by important results, for instance by a new "algebraic" proof of general inequalities of Korn's type and generalized regularity results.

In collaboration with S. Fučík, J. Souček and V. Souček, J. Nečas published the monograph Spectral Analysis of Nonlinear Operators (1973), which has aroused great interest. J. Nečas was attracted by the problem of regularity of solutions all the time.

Outstanding results in this field appeared in his book Introduction to the Theory of Nonlinear Elliptic Equations (1983, 1986).

Since the very beginning J. Nečas devoted great effort to applications in mathematical physics and engineering. In 1967 he founded a seminar on the problems of continuum mechanics which has not ceased working up to this time. It was the origin of the monographs Mathematical Theory of Elastic and Elastoplastic Bodies: An Introduction (1981, 1983) (in collaboration with I. Hlaváček) and Solution of Variational Inequalities in Mechanics (1982) (with I. Hlaváček, J. Haslinger and J. Lovíšek). The latter book was translated to Russian (1986) and English (1988). Both these monographs were directed also to numerical methods of solution based on the finite element method. Therefore P. G. Ciarlet and J. L. Lions invited J. Nečas to write an article Numerical Methods for Unilateral Problems in Solid Mechanics (1996) (with J. Haslinger and I. Hlaváček) for their Handbook of Numerical Analysis.

During the last decades the interest of J. Nečas passed from solid mechanics to mechanics of fluids, in particular to problems of transsonic flow. Using the method of entropic compactification and the method of viscosity, he achieved remarkable results published in his monograph Écoulements de fluide: Compacité par entropie (1989). Recent results of J. Nečas with the co-authors J. Málek, M. Rokyta and M. Růžička have been collected in the book Weak and Measure Valued Solutions to Evolutionary PDE's (1996).

Besides the above-mentioned monographs, J. Nečas initiated and published (mostly with co-authors) many papers in outstanding mathematical journals and in proceedings of conferences. Thus the database ZMATH contains 180 titles as well as the last papers that appeared in 2002.

Being an excellent teacher, J. Nečas influenced many students and colleagues by his never ending enthusiasm. He organized lectures, seminars, two series of Summer Schools and supervised many students to their diploma and PhD thesis. They all will remember him with gratefulness.

Let me add several personal remembrances. In contrast to some haughty famous mathematicians, J. Nečas was extremely kind, friendly and modest. All the time, and I have known him since 1959, he spread good mood. His strong sense of humour enabled him to make fun even of himself. He used to discuss mathematics, but also history and music—he liked to sing and to play violin. We all lost not only an outstanding expert in mathematics, but a good man as well.

Ivan Hlaváček