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Address of the honorary president of ISNA'92 Professor Ivo Babuška

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ADDRESS OF THE HONORARY PRESIDENT OF ISNA'92
PROFESSOR IVO BABUŠKA

Your Magnificence, Spectabilis, Mr. Chairman, Honorables:

First, I would like to say that I am very honored and happy to be the President of the International Symposium on Numerical Analysis. I am happy for personal reasons too to stand here on the grounds of the historic Charles University in the beautiful historical town of Prague, the town where I was born. If somebody had told me three years ago that today I would be standing here, my answer would be "You are crazy". Nevertheless, my personal feelings are not important. Important is that the border of Czechoslovakia is once more open and that Czechoslovak science has become once more part of the world's international science with all aspects of collaboration, challenges, and friendly competition.

Symposia, such as ISNA, are very important part of international science. Today's explosion of scientific information makes such symposia essential for getting the latest results and scientific information and giving the opportunity for scientific discussion of ideas still in the beginning stage. As example of such an explosion, let me mention that in the narrow field of finite elements addressing solid mechanics, about 3,000 papers appear yearly.

Numerical analysis is a field which has an interscience character. It has close relations to the quick development of computers and modern mathematics. Numerical mathematics is essential for engineering, physics, chemistry, medicine, etc. Today we are able to numerically analyze problems we did not dare to dream about a few years ago. Numerical analysis often allows the avoidance of making costly and time consuming experiments. For example, I have been told that proper numerical analysis allows the design process of a new car to be shortened by one year or more. The essential importance of such shortening in today's competitive market is obvious.

As I have said, the opening of the Czechoslovak border is essential for science in general and Czechoslovak science in particular. It is important not only because of the new possibilities for attending conferences, but also for access to scientific literature and collaborations. It is also very important because it gives young, talented people the opportunity to study abroad. For example, universities in the United

States are offering positions for teaching and research assistantships and fellowships for Ph.D. studies. Many foreign students are applying for these positions, and the best are selected on a competitive basis. I am sorry to say that, in my opinion, too few Czech and Slovak students are taking this opportunity. Your Magnificence, please encourage the young talented students to go abroad to obtain Ph.D. degrees. Encourage them to go “na vandr”, as described in the classical Czech literature of the Nineteenth Century*). Encourage them to go “na vandr” to get experience and to see life and science in other countries. Your Magnificence and Spectabilis, please encourage the students to learn English and to do the TOEFL exam as well as possible. The score of the TOEFL exam plays an important role in the selection process at U.S. Universities.

In today’s world, the financial resources are much more scarce than expected. The wise and efficient governmental support of science is essential. A policy based on competitiveness and peer review, etc. is likely the best way to decide how to spend financial resources in the most effective way. This is not only the experience and basic practice of large countries such as the United States but also of small ones such as Australia. For small countries, it is essential the review be made also abroad. I believe that, in general, scientists feel it is a part of their professional duty to make such reviews, as well as reviews of papers for scientific journals.

I would like to express my opinion about another important question. Should the university be mostly only a teaching institution with a heavy teaching load for the faculty, or should the faculty be involved in research and have a reduced teaching load (say, typically, six hours per semester)? In the United States there are national laboratories where targeted research is performed, but a very important place of research is also the universities where research is also supported by competitive governmental grants. I think that this system is the right one. Let me also say that experience shows that, on the average, active researchers are also very good teachers.

Let me end on the note I started with. The Charles University and Czechoslovakia have a great tradition in numerical analysis. Křišťan, from Prachatice, professor and six-time rector of Charles University at the end of the 14th and beginning of the 15th Centuries, wrote, among others, the first book on numerical analysis, *Algorithmus Prosaicus*, where, among other, he explains how to find numerically the root of the cubic equation. He also explains in his work *Computus Cyrometricalis* how to use fingers and joints to compute the sun cycles, etc.; i.e., he described a computational tool.

*) In Czech, “na vandr” in 18–19 century meant young journeymen’s travelling abroad for further training and gaining experience.

Another Prague resident, Jos Birgi, constructed the logarithmical tables before Napier, although the tables appeared in print in 1620, a few years after Napier's. (Hence a long printing period after submitting—which we complain about today—is nothing new!!)

As we have seen, the topic of ISNA has a firm foundation beginning in the middle ages. But not only this, but also what Czechoslovak numerical analysis and mathematics accomplished not only before World War II but also under difficult conditions during the time of the Communist totalitarian regime.

I am very happy to be here with all of you and to witness the effects of the year 1989. I have no doubts that the difficult heritage will be overcome in a reasonable time. I have no doubts that at ISNA we will hear important lectures giving excellent representation of today's state of the art and trends in numerical analysis. I also have no doubts that all participants will thoroughly enjoy not only the meeting, but also the atmosphere, beauty, and abundant cultural possibilities offered in Prague. I would like to wish all of you a very rewarding week scientifically and otherwise.