Foreword

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The articles in this issue of *International Journal of Earth Sciences* are brought together as a tribute to Professor František Hrouda, who completed 65 years in 2009. I am honoured to write the *Foreword* for this issue. František's name is already very well known amongst the rock magnetic and magnetic fabric community for his pioneering studies and his development of most of the instruments used in such studies. He has lived most of his life in what is now the Czech Republic having been born in Prague in 1944—the son of a family devoted to post office work. He initially attended school in Oráčov (W of Prague) before moving to high school near Brno. After a period of 5 years, he graduated in 1966 from Masaryk University in Brno, where he studied both Physics and Geology, completing a thesis “Physical Properties of Rocks of the Eastern Part of the Brno Massif”. He joined *Geofyzika State Company* in Brno as a research scientist shortly before graduation, and this research led to his thesis “Magnetic anisotropy of deformed sedimentary and epimetamorphic rocks” for which he was awarded a Ph.D. (*Candidatus Scientiarum*) in Physics and Mathematics from the Academy of Sciences in Prague in 1975. He continued this research, with *Geofyzika*, moving from research assistant to eventually be the head of the Department of Physical Properties of Rocks. In 1995, František, with a group of researchers from *Geofyzika*, established a new company, AGICO, to develop and manufacture instrumentation for rock magnetism and palaeomagnetism. Initially, František was a Director of Research but was almost immediately appointed as Managing Director—a position he held until his retirement in

2009, although he still remains as a deputy director. His research interests had obviously inclined him to an academic career, but in those days, any advancement or research procurement required membership of the Communist Party. In the West, it is difficult to envisage the difficulties of František's early career. He was not willing to compromise his political views and so resigned. It was only after the collapse of communism in former Czechoslovakia that he could officially undertake university teaching in Petrophysics at Brno University. In 1994, he obtained a part-time research post in the renowned Charles University in Prague (Institute of Petrology and Structural Geology). He subsequently became an Associate Professor (1998) and since 2001 is a Full Professor at the Charles University.

By nature, František avoids the limelight, but throughout his life in research and development, he has always promoted the improvement of methods, techniques and instruments for studying the magnetic properties of rocks—particularly their magnetic anisotropy. He has applied these to all rock types—igneous, metamorphic and sedimentary—although he has mostly been interested in applying these to rocks with weak anisotropy for which the standard petrofabric techniques (such as measuring *c*-axes of quartz, 3-D grain shape fabrics, X-rays and seismic) are largely too imprecise or so time-consuming as to be essentially ineffective. However, the early techniques for making magnetic fabric measurements were also slow and cumbersome—usually requiring tedious torque measurements in strong DC magnetic fields. František brought together a group of specialists that developed a high-sensitivity AC-bridge to enable such measurements to be made that were not only vastly more rapid, but also more precise. It is also important to stress that such fabric measurements do not require ferromagnetic minerals to be present. This bridge is

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sensitive to the crystalline and shape anisotropies of all minerals present in the sample. The same group of specialists also developed a high-sensitivity spinner magnetometer for palaeomagnetic measurements—the sensitivity being comparable to that of the cryogenic magnetometers then available. As any interpretation of these data also required an understanding of mineral content of the samples, the same group went on to design and construct instruments for measuring compositions and, to some extent, grain sizes, by means of measurements at high and low temperatures, and in different field amplitudes and frequencies of the applied field, the use of AF, pulse and anhysteretic properties, etc. František was the main force driving all this development. Such rapid, precise measurements also required the development of analytical software that could present the results in a succinct understandable form. Software packages developed by František are in use in most rock magnetic laboratories, and their outcome appears in countless talks and papers—software development has been recently taken over by one of the František's successors in company research, Dr. Martin Chadima.

František has thus pioneered most aspects of rock magnetic fabrics, particularly as applied to structural geology, as well as primary fabrics in sediments and lavas. Clearly, he was not alone in such studies, collaborating in particular with Prof. Dr. Karel Schulmann (Charles University, Prague) and Prof. Dr. Klaus Weber (Göttingen University, Germany) and their research teams, but he was “the magnetic fabrics” of such studies. He inspired the fundamentally important work by his fellow-Czech, Vít Jelínek, to establish a framework for statistical analyses and their visual presentation. He worked with many others—notably the Newcastle (UK) group in 1982 and Brooks Ellwood (University of Texas) in 1987 and regularly cooperated with the research group of Prof. Dr. Reinhard O. Greiling (University of Heidelberg, Germany) that, at times, also included Prof. Dr. Helga de Wall and

Prof. Dr. Manish A. Mamtani before they established their own working groups—but the list is endless! He has published more than 100 articles, almost entirely in highly reputed International journals.

I will end this Foreword with a few comments about our co-authored book, *The Magnetic Anisotropy of Rocks* (Tarling and Hrouda 1993). We both recognized the enormous potential for magnetic fabric analysis within the geological–geophysical world, but this was not being fully developed, because the background information was difficult to access, with most of it appearing in disparate journals. Most of the scientific content for the book came from František. We drew on direct contributions from multiple international authors—requiring considerable re-writing and editing—sometimes having to disagree with the contributor's conclusions! Nevertheless, the main purpose had been to make readers aware of the potential hidden in this branch of scientific study and to facilitate them in commencing such studies. I feel we were successful in achieving this goal and the book brought together the basic concepts and applications of magnetic fabric analysis in a coherent, balanced manner. It provided a launch platform for the wide application of magnetic fabric studies that has taken place since the last quarter of the twentieth century. It is a delight to see the papers in this topical issue presenting the advances now being made in this subject. It is most fitting that this issue is dedicated to František Hrouda, who has made fundamental and pioneering contributions in the application of fabric analysis using magnetic methods.

Reference

- Tarling DH, Hrouda F (1993) *The magnetic anisotropy of rocks*. Chapman & Hall, London