



Appreciation of scientific achievements of Jozef Hus.

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In 2004, the Geophysical Centre of the Royal Meteorological Institute of Belgium (RMIB) in Dourbes (south Belgium) celebrated its 50th anniversary. Fifty years of top research to which Jozef Hus contributed considerably. When he started his career in this governmental institution more than 40 years ago, palaeomagnetic research was absent at the RIMB.

After finishing studies in condensed matter physics at Ghent University (Belgium) in 1963, he became an assistant at the RMIB and developed with Prof. Dr. A. De Vuyst, in charge of the geomagnetic observatory, a method for absolute measurements of all geomagnetic field elements with a proton magnetometer. Wishing to extend the record of geomagnetic field observations in time, Jozef began to set up a laboratory of his own and started to construct and develop instruments for palaeomagnetic research with competence, great enthusiasm and concentrated passion. This world-class laboratory was constructed between 1976 ad 1980. In 1981, he received the title *Doctor of Sciences* from the Free University of Brussels based on his thesis entitled "*De indirecte meting van de seculaire verandering van het geomagnetisch veld*".

Palaeomagnetism of Quaternary sediments and archaeo- and rock magnetism have been Jozef's most important research fields. In fact, a short sojourn in Prof. E. Thellier's Laboratory of Geomagnetism at Saint-Maur-de-Fossés (Paris) in 1965, raised Jozef's interest in archaeomagnetism. He formed a solid basis for the detailed establishment of reference curves for declination and inclination for the Belgian territory for historical and archaeological times. He studied the suitability of burned archaeological materials to record the Earth's magnetic field as well as effects which influence accurate field registration in archaeological materials, such as magnetic refraction and magnetic anisotropy. During his career, Jozef promoted archaeomagnetism as a valuable dating tool and strengthened the cooperation with the archaeological community in a way that is almost unique in Europe.

Jozef investigated loess/palaeosol deposits in Belgium, south-east Europe, central and eastern Asia and contributed to magnetostratigraphic dating and to a better understanding of the magnetisation process in these sediments. He mentioned for the first time that different post detrital remanence lock-in conditions could be responsible for the inconsistently observed stratigraphic position of the Matuyama-Brunhes boundary (MBB) on the Chinese Loess Plateau, which not always occurs in an interglacial period as expected from marine sediments.

Sediment formation and its progressive transformation into soil are controlled by wind strength, temperature and humidity and alter the magnetic mineral content of the source material. Analysing the magnetic mineral content and texture of loesses and palaeosols he found that both lithologic units contain mainly the same magnetic mineral types, but that soil magnetic minerals were much more oxidised and of smaller grain sizes than in loess. He found also that the primary sedimentary fabric is in general only moderately modified in the soils.

Jozef investigated also magnetic properties of weathering products and showed particularly that siderite, present in marine Quaternary sediments, alters when in contact with air forming haematite. He studied the acquisition of crystallisation magnetisation during the transformation of a paramagnetic (in ambient temperature) mineral into a mineral with ferromagnetic properties. He showed further that manganese could substitute iron in the goethite crystal lattice during crystal growth, hence decreasing the crystallinity degree. Besides the typical rock magnetic investigation for magnetic mineral characterisation Jozef often used Mössbauer-spectroscopy to corroborate interpretations.

Jozef also promoted rock magnetism as a service to the environmental management community. Even, after retire-

ment he remains active and proposed the application of magnetic methods for pollution detection within the frame of the project “Magnetic Valley” which aims at socio-economical development of the area around the Geophysical Centre.

Jozef has always been searching for new applications of magnetic methods and aimed at collaboration with scientists from different research areas such as geochemistry, geology, archaeology and physics. Numerous transdisciplinary publications in internationally approved journals resulted from this activity. Besides his lecturing duties at the Free University of Brussels, he shared his experience by teaching young scientists such as for instance at the International Post-Graduate Training course on Fundamental and Applied Quaternary Geology and became a leading member of the European Research Training network AARCH (Archaeomagnetic Applications for the Rescue of Cultural Heritage).

Together with the aerial photographer Charles Léva, Jozef promoted in his free time the application of geophysical prospection methods for searching archaeological structures in the subsurface and determining the archaeological nature of “marks” discovered by aerial photography. This fruitful work resulted for instance in the investigation of the Roman road system in Belgium. Both were the founders of the Interdisciplinary Centre for Aerial Photography and organised international symposia.

A kaleidoscope of archaeo- and enviromagnetic topics will be presented, responding to the cornerstones of Jozef’s successful and intensive research career as interdisciplinary archaeo-, rock- and enviromagnetist.