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Palaeoenvironmental reconstructions: a tribute to the career of Jef Vandenberghe (editorial)

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Professor Jef Vandenberghe retired on the 1st of March 2011 after a long-lasting career at the Vrije Universiteit Amsterdam. He played a very important organisational and scientific role at our Faculty of Earth and Life Sciences and as a tribute to his career we organised a symposium for him entitled: 'Palaeoenvironmental reconstructions – fluvial, eolian, periglacial – Evolution of ideas and approaches in the past 35 years'. The symposium on 1st April 2011 was well-attended, and colleagues, friends and former PhD-students filled this day with scientific presentations. To further highlight the scientific achievements of professor Vandenberghe, it was also decided to publish a special issue in the Netherlands Journal of Geosciences. As guest editors, we invited the participants of the symposium and other colleagues to contribute to this special issue. Because of the many contributions we received in the past year, a double issue has been produced. The content of this issue reflects the research interests of professor Vandenberghe over the last decades, focussing on the reconstruction of Quaternary sedimentary environments (fluvial: brooks and rivers; aeolian: coversands and loess), climate change (permafrost and periglacial structures) and modelling. The papers in this special issue have been arranged according to these themes.

Vandenberghe started his career at Leuven University where he graduated in 1973 on the Geomorphology of the Zuiderkempen region in Flanders, Belgium (Vandenberghe, 1977). All the research elements and proxies used in his later work were already present then: morphology, stratigraphy, grain-size analyses, vegetation reconstruction, periglacial features (Vandenberghe, this issue). In many of his studies radiocarbon dating has provided the time control to reconstruct the evolution of landscapes (Van der Plicht, this issue).

In 1976 he started his career at the Vrije Universiteit. Fluvial research on river behaviour in relation to climate and vegetation change started on brooks (e.g. the Mark) in the southern Netherlands and northern Belgium (Vandenberghe et al., 1984). Later this research on climate and man-driven fluvial system change expanded to larger river systems like the Maas in the Netherlands (Busschers et al., 2007; De Moor et al., 2008), the Warta in Poland (Vandenberghe et al., 1994), the Tisza in Hungary (Kasse et al., 2010) and the Tagus in Portugal (Vis et al., 2008). Detailed case studies continue to enlarge our knowledge of fluvial systems and forcing factors at various time scales ranging from the Late Pleistocene (Janssens et al., this issue; French & Demitroff, this issue), Middle Pleistocene (Gibbard et al., this issue) to the Quaternary (Gabris et al., this issue) and even to the Archaean (Van Loon et al., this issue).

In addition to fluvial case studies, Vandenberghe has constructed conceptual models of river behaviour over glacial-interglacial climatic cycles. Especially the importance of the short-lasting climatic transitions on channel pattern and incision-aggradation cycles has been a long-lasting interest (Vandenberghe, 1995, 2003, 2008). The studies by Bridgland & Westaway (this issue), Demoulin et al. (this issue) of the Ardennes and Harmand and Cordier (this issue) of the Moselle catchment contribute to the understanding of the interplay of uplift, knick-point migration, climate cyclicity and terrace formation.

Besides fluvial studies, Vandenberghe's career is characterised by the study of aeolian sediments and environments in relation to climate change. Starting on sandy aeolian coversand deposits in the Netherlands and Belgium, and their relation to climate change during the Late Weichselian (Vandenberghe, 1991), his focus expanded rapidly to silty aeolian sediments in the famous archaeological site of Belvédère in the southern Netherlands (Vandenberghe et al., 1993). Meijs et al. (this issue) presents the state-of-the-art Middle and Late Pleistocene loess stratigraphy, correlation with the marine isotope record and latest archaeological finds in the Dutch-Belgian border region.

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In the 90's Vandenberghe was one of the first to start research on the long loess records in China, to establish a grain-size based chronology (Vandenberghe et al., 1997), using the technical improvements of grain-size analysis by laser diffraction (Konert & Vandenberghe, 1997). Grain-size analysis has proven to be a powerful tool in the reconstruction of depositional changes in lacustrine (Vriend et al., this issue) and aeolian environments (Prins et al., 2007). The research on loess sequences has expanded over Asia and Europe in order to reconstruct atmospheric circulation patterns at an almost northern hemisphere scale (Vandenberghe et al., 2006; Bokhorst et al., 2011). The contributions by Varga et al. (this issue), Markovic et al. (this issue) and Lu et al. (this issue) demonstrate the scientific importance of loess records as archives of climate change.

The study of fossil periglacial features, often encountered in fluvial and aeolian successions, has been another long-lasting research topic of Vandenberghe. He reported on their cryostratigraphic position (Vandenberghe, 1985), genesis (Vandenberghe, 2006) and relation to climate and climate change in several papers, not only dealing with western and central Europe (Vandenberghe, 1992), but also in Asia (Vandenberghe et al., 2004). Czudek (this issue) and Van Loon et al. (this issue) demonstrate the importance of permafrost and periglacial processes on landscape evolution in Central Europe during the Quaternary.

Despite the fact that Vandenberghe's main contributions are related to the study of the geological archives, he acknowledged the importance of modelling as a tool in understanding earth system changes. Verstraeten (this issue) reviews the evolution of combining field and modelling approaches. Climate and fluvial modelling have become more important in Vandenberghe's research group in order to better understand the effect of different parameters and forcing factors in landscape evolution (Bogaart et al., 2003; Renssen et al., 2007; Ward et al., 2009; Vandenberghe et al., 2012; Keesstra et al., this issue).

More recently, Vandenberghe has stressed the importance of earth sciences for society. He has encouraged and facilitated the development of the Bachelor educational track Earth and Economics at the Vrije Universiteit. Vermaat and Bokhorst (this issue), deal with the opportunities of the integration of Earth Sciences and Economics. In the last decades more and more earth scientist are employed in the field of geoarcheology. As a consequence of the Valetta treaty the number of archeological excavations has strongly increased and the importance of earth-scientific knowledge in landscape reconstruction related to human occupation is more and more acknowledged (Isarin & Aalbersberg, this issue).

We hope that Jef Vandenberghe will continue to contribute to earth sciences and we wish him the best in the coming years.

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