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Preface

A tribute to Prof. André Michard for his jubilee of works in Morocco

We offer this thematic issue as a tribute to our colleague and friend, Professor André Michard, for his 50 years of remarkable geological works in Morocco. André Michard is today Emeritus Professor at the University of Paris-Sud (Orsay, France), and an internationally renowned scientist whose works on Moroccan and Alpine geology have led to more than 120 international publications, highly cited within the scientific community.

André Michard discovered Morocco in 1966. He was then Professor at the Mohamed-V University, Rabat, and he fell in love immediately with the geology of the country. His first works concerned the higher-grade metamorphic massif of the Variscan Meseta, the Rehamna Massif, halfway between Rabat and Marrakech. Two years later, André Michard got a permanent position in France, Professor at the University of Strasbourg. Yet he continued working on the Moroccan geology, while also developing research on the geology of the Alpine chain of Europe and the Middle East, from the Western Alps to Oman. During the 1970–1990s, André Michard supervised eight doctoral PhD students conducting research on the Moroccan Meseta and the Rif Alpine belt. Seven of those students (Yves Cailleux, Christian Hoeppfner, Ahmed Chalouan, Mohammed Ouazzani-Touhami, Driss El Azzab and Omar Saddiqi) have since then became renown Professors at the Rabat, Tetouan, Fes, Casablanca and Strasbourg Universities. In 1976, André Michard published a first landmark overview of the Moroccan Geology: *Éléments de géologie marocaine* (the third edition has been released in 2001). This book rapidly became, and is still, the bedside book of Moroccan geology students, and has since then been translated into English and Japanese.

From the 1970s on, André Michard established tight collaborations with several important Moroccan geological institutions, such as the Moroccan Ministry of Energy and Mines, the "Office national des hydrocarbures et des mines", and the Moroccan Association of Petroleum Geologists, and conducted research in the framework of these collaborations (such as several mapping projects). After the year 2005, André Michard focused most of his research activity on Moroccan geology, conducting intensive and remarkable researches on the Atlas, the Anti-Atlas, and the Moroccan Sahara. In 2008, André Michard and his collaborators (Omar Saddiqi, Ahmed Chalouan, and Dominique Frizon de Lamotte) published an updated synthesis of the Moroccan geology: *Continental evolution: the Geology of Morocco*. This book, published in English, has become a landmark international contribution on Moroccan geology. In 2011, André Michard created and co-edited a collection of nine field guides on the various regions of Morocco and their most significant mines (*Nouveaux Guides géologiques et miniers du Maroc*). Beyond the 1976, 2008, and 2011 landmark books, André Michard co-authored in his career more than 70 scientific publications dealing with the structural geology, geodynamics, stratigraphy, paleontology, or geoheritage of the various regions of Morocco.

Among the most significant results obtained in Morocco by André with his students and young coworkers, we may firstly recall, for the period between 1967–2007, (i) the first modern synthesis of the structural evolution of the Western Meseta metamorphic zone (Rehamna, Jebilet); (ii) the description of the structure of the whole Meseta domain, including that of its south boundary thrust over the Anti-Atlas domain; (iii) the evidencing of the two-phase metamorphic evolution (pre- and post-Visean) of the Ghomaride Paleozoic terrane in the Rif Belt, and of its partial resetting by the Alpine thermal event at ca. 20 Ma; iv) the role of the Late Jurassic rifting in the exhumation of both the Beni Bousera (Alboran terrane) and Beni Malek (African margin) peridotites prior to their Neogene tectonic emplacement; v) the occurrence of a subduction-related high-pressure, low-temperature recrystallization phase in some of the Northern Rif-Western Betic units (in collaboration with Bruno Goffé). During the last decade, André developed the concept of Mesorif Suture Zone (a string of oceanic units transported onto the African margin units; see Michard et al., this issue). In the High Atlas, he

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demonstrated the importance of salt tectonics in the central part of the belt. In the Anti-Atlas, we owe him the idea of an Early Ediacaran basin connecting the Moroccan part of the Pan-African belt to its Trans-Saharan part. Eventually, at the western margin of the West African Craton, he proposed an analysis of the Variscan structures in the frontal units of the Oulad Dlim allochthonous massif, which allowed him to include the latter and the Meseta domain in a unique geodynamic interpretation of the Moroccan Variscan belt.

The international Dakhla workshop that took place in Dakhla, Morocco Sahara, in April 2017, and which the present Thematic Issue results from, was an opportunity for many of his former Moroccan students and other colleagues to celebrate and thank Professor André Michard for his remarkable long-lasting investment in the geology of Morocco. We are deeply honored and pleased to renew such a tribute to him in this thematic issue, entitled "The West African Craton and its margins" of the *Comptes rendus Geoscience*.

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