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## Review: Why Geology Matters: Decoding the Past, Anticipating the Future

By Doug Macdougall

Reviewed by Byron Anderson

DeKalb, Illinois, USA

Macdougall, Doug. *Why Geology Matters: Decoding the Past, Anticipating the Future*. Berkeley, CA: University of California Press, 2011. xv, 285 pp. ISBN: 9780520266421, US\$29.95, cloth. Printed on 100 percent post consumer waste, recycled, de-inked fiber. E-book available.

*Why Geology Matters* pursues two goals: to better understand how Earth works and to provide clues to the future of the planet. Macdougall, Professor Emeritus of Earth Sciences at Scripps Institution of Oceanography, University of California San Diego, hopes “that this book will, in some small way, stimulate a deeper interest in the field among its readers, and perhaps help improve this situation” (p. xiii). Geology is defined as “an intellectual pursuit that encompasses studies of the atmosphere, the oceans, the solid earth, and even other planets of the solar system” (p. 249). It is interdisciplinary incorporating mathematics, physics, chemistry, engineering, and biology, and has spun off a number of related studies, for example, astrogeology and biogeochemistry. Interspersed chapters explore Earth’s history with specific events and processes, for example, the Chicxulub Crater in the Yucatan Peninsula. Geoscience studies natural processes, for example, volcanic dust, tsunamis, and earthquakes, and addresses areas, such as sustainable management of water, mineral, and energy resources. The book emphasizes the importance of greenhouse gases, particularly carbon dioxide, as a primary agent driving widespread environmental change.

The geological timescale is introduced covering epochs, periods, eras, and eons all the way back to the Hadean eon which started at Earth’s formation about 4.6 billion years ago and ended roughly 3.8 billion years ago, though most of the book deals with the Phanerozoic eon, approximately 540 million years ago to the present. Geoscientists look for clues about Earth’s past by examining evidence, for example, the presence or absence of different types of fossils which shed light on the record of changing environments. This evidence is then combined with inferences from theory. The “Wandering Plates” chapter does an excellent job in explaining why most natural phenomena are influenced by plate tectonics. Study of these plates has led to a better understanding of volcanoes, earthquakes, and other phenomena that affect living things. While analytical tools for decoding the past have become very sophisticated, for example, x-rays and three dimensional images, geoscientists still find it necessary to use of terms, such as, “may have” and “perhaps” particularly in determining certain conditions that occurred billions of years ago. From the beginning of Earth’s formation through the Proterozoic eon, many details will never be known.

Macdougall drives home the importance of geology, an understudied subject, and concludes somewhat ominously that “to a considerable extent, the immediate future of our planet is now in our own hands” (p. 248). The book is for students of geology and educated laypersons. It could be used as an introductory textbook, and is recommended for all libraries with a geology collection. The text is nicely supplemented with over thirty illustrations, a bibliography and future reading section, and a subject index.

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