



Book Review

Meteorite impact! The danger from space and South Africa's mega-impact, the Vredefort structure, by W. U. Reimold and R. L. Gibson, with a chapter by A. Pelsner, M. Naudé, and K. Balkwill. Chris van Rensburg Publications (Pty) Ltd., Melville, South Africa, 2005, 319 pp., \$60.00, soft cover. (ISBN 1-919908-62-5).

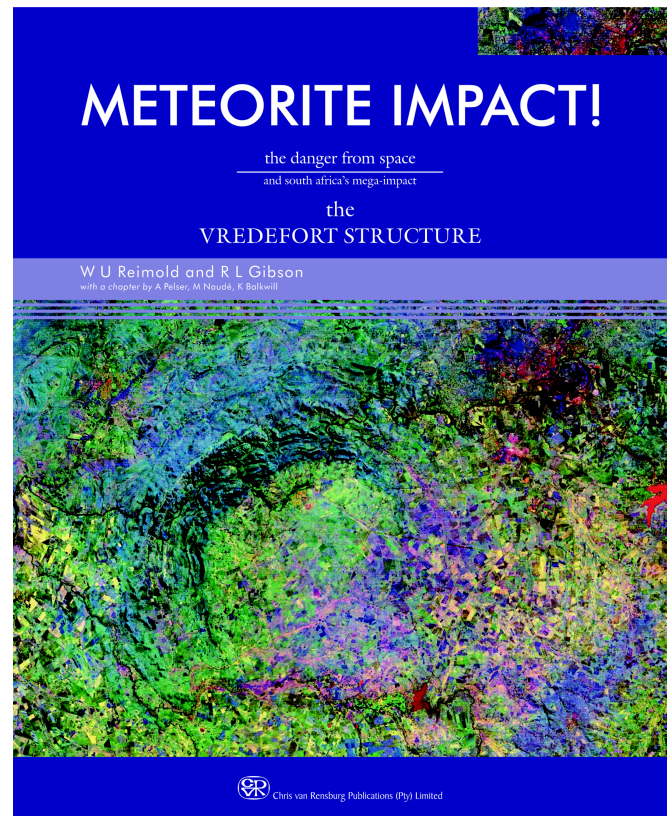
For meteorite impact researchers in general and anyone interested in South African geology and/or natural history in particular, this is another “must-have” book. Written principally by two geologists (Reimold and Gibson) whose untiring work helped establish the Vredefort dome as an unambiguous impact feature, this book contains an especially detailed look inside the investigative history, regional setting, and impact geology of the world's oldest impact structure. However, there is so much more to this book that its appeal and relevance extends far beyond Vredefort geology proper. Not only does the book deal eloquently with the early history of the solar system, Earth as a planet, plate tectonics (rifting, oceans, and volcanism), and features of the “old crust” for which South Africa is so well known, including the Kaapvaal craton, Bushveld complex, and Vredefort-related regional geology, but it also provides intriguing reading about the natural history and human heritage of the dome area. In addition, a detailed second part of the book, titled “Tour guide for the Vredefort Dome,” contains a description of numerous geologic stops that are pertinent to discussion in the book's chapters.

In a 30-page first chapter, the authors review geology, geologic change, early solar system history, impacts, the Big Bang, early continents (i.e., the Kaapvaal craton), rifting and volcanism, plate tectonics, and the Bushveld magmatic event. The text has something special in store for the beginner and the expert alike.

In a 40-page second chapter that is a fine primer on impact studies, the authors discuss impacts throughout the solar system, the nature of impactors, and what an impact crater is and how such craters form. The discussion shifts later in the chapter to focus on how we know that impact craters result from hypervelocity impacts of cosmic projectiles and on the nature of shock metamorphism.

In a 15-page third chapter, the authors review the impact geology of South Africa, including the Tswang (Salt Pan) crater, Kalkkop crater, Morokweng impact structure, and impact stratigraphy of the Karoo (i.e., the P/T boundary) and the Barberton (Archaean) impact spherule layers. This chapter also includes a section on the Roter Kamm impact crater of adjacent Namibia.

In a 45-page fourth chapter, “Vredefort: The largest and



oldest impact structure in the world,” is reviewed in detail. As the authors point out, Vredefort is “an open book about the history of Earth and the nature of Earth's interior.” In this chapter, the authors relate the early history of Vredefort investigations and give a firsthand history of the modern investigations that lead them to the “undeniable evidence” of impact at Vredefort—the shock metamorphic effects. This chapter is exceptionally well illustrated.

In a 50-page fifth chapter (written by the three other authors), the more recent history of the Vredefort dome area is discussed in three parts: archaeology of the Vredefort; settlement and frontier history of the Vredefort; and trees and plants of the Vredefort. Rarely is such careful study and appreciation given to an area of keen geologic interest and within a book devoted mainly to geologic discussion.

In a 20-page sixth chapter on tourism and the dome, the authors review touristic facilities for the Vredefort, a newly proclaimed World Heritage Site. In this presentation, they review frequently asked questions about Vredefort dome such as how large the bolide was and where the projectile is now.

In two brief (total of 14 pages) final chapters (number 7 and 8), the topics of the future of mankind and the future of the Vredefort from a human perspective are addressed. The narrative on the future of mankind reviews the impact hazard from space and the narrative on Vredefort reviews its vast bounty, both economic and touristic.

A 30-page section called “part II” is a tour guide (field trip guidebook) that reviews 22 stops where geology pertinent to the Vredefort impact and regional geology can be seen. These stops include pseudotachylitic breccias, Archean basement, gold mining, shatter cones, Transvaal stromatolites, granophyres (impact-melt rocks), greenstones, and the Inlandsee. Each stop is well illustrated and its relevance discussed.

There is an extensive, 10-page bibliography and a 20-page appendix. The appendix contains data on Vredefort plants and birds. A 15-page glossary, which follows the appendix, contains a few hundred terms (mainly geologic terms from the book) and is a very valuable aspect of this volume. The 10-page index is very detailed and quite useful.

As stated at the outset, this book is highly recommended to the professional and amateur alike for its eloquent descriptions and discussion of the Vredefort structure and the geology of South Africa.

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Note added after review was completed: the authors have informed colleagues that the first edition (reviewed here), which was published in early July 2005, is now sold out. The second edition, which has been revised to address minor issues, will be available as of late November 2005. The new ISBN will be 1-919908-70-6. The price for the second edition will be \$60, including postage and handling (R275.00 or EUR 50.00, including postage and handling). The publisher remains Chris van Rensburg Publications (Pty) Ltd., Melville, South Africa; e-mail: CvRpub@mweb.co.za).
