

## REVIEWS

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**Geological Atlas of Africa, with Notes on Stratigraphy, Tectonics, Economic Geology, Geohazards, Geosites and Geoscientific Education of Each Country. 2<sup>nd</sup> Edition.** THOMAS SCHLÜTER. Pp 308, with CD-ROM. Springer-Verlag, Berlin, Germany. 2008. ISBN 9787 -3-540-76324-6. Price USD249.00.

*Geological Atlas of Africa, with Notes on Stratigraphy, Tectonics, Economic Geology, Geohazards, Geosites and Geoscientific Education of Each Country* is a four-color, revised and enlarged second edition, first published in 2006. Brief reviews of “Aims and Concepts of the Atlas” (6 pages), “Early Geological Maps of Africa” (4 pages), and “Tectonostratigraphic Synopsis” (15 pages) are followed by the heart of the book, 246 pages in which 58 individual African countries are covered.

The “Tectonostratigraphic Synopsis,” listed above, is a geologic synthesis that covers all of Africa in 15 pages. As such, it is very broad, reflecting the very variable quality of data that are available on the countries of Africa. However, it is a useful overview for those unfamiliar with African geology. The assorted six maps provide a useful background and would have been even more useful if country borders had been shown for geographic reference. The “Selected References” mainly predate 2000, reflecting the broad-based nature of the synopsis, in which few recent geochronological studies are reviewed.

For each African country, arranged in alphabetical order from Algeria to Zimbabwe, there are sections entitled Summary of Geology, Stratigraphy and Tectonics, Economic Geology, Geohazards, Geosites, Geoscience Education, and References. The quality of the geologic data is variable, reflecting the level of political stability, the quality of geoscience departments in university and government surveys, and the presence or absence of mainly European aid programs in those countries. For some countries, there are references to studies post-2000, whereas for others there appears to have been little progress since the 1970s. Despite this constraint, the book portrays the level of current knowledge and presents an interesting photographic record of some of the geologic, geographic, and/or cultural highlights of the countries.

An important aspect of the book is a geologic map of each country, the quality of which reflects a combination of the degree of cover and the maturity of geologic mapping in that country. These maps are very useful in terms of gaining an

initial impression of the geology and the potential mineral deposits the country may contain. They would have been more useful if more geophysical information (towns, major mining centers, major rivers, etc.) was shown for location of geologic features, although coordinates on the digital versions in the CD-ROM partly compensate for this. As the geology of Africa is dominated by Precambrian rocks, it would also have been useful to have had more color variations for Precambrian geologic units, as they are difficult to distinguish on some maps. Red, purple, and pink colors for greenstone or metasedimentary belts are counter-intuitive.

In terms of the economic geology sections for each country, the brief reviews give a good overall description of the importance of mining, particularly for metallic resources, hydrocarbons, coal, gemstones, diamonds (kimberlite occurrences shown on some maps), and industrial minerals (including fertilizers). The precise information for each country varies, with quite specific information about some deposits, although general statements are the norm. The information probably predates 2005-2006, as comments are made about falling commodity prices and do not reflect the boom in many commodity prices in the past two years, despite some recent decline. In only a few places is there information on the size of resources for particular deposits, and there are no systematic lists of the world-class deposits in each country, although there is reference to many of them or to the group of deposits to which they belong (e.g., Witwatersrand gold, Bushveld PGE, Copper Belt).

For the economic geologist, the book is most useful as an introductory guide to the geologic evolution of Africa, the geology of its constituent countries, and a broad overview of their potential in terms of mineral resources. The title *Geological Atlas of Africa* accurately reflects its main benefit as a book to have on the bookshelf as a first point of reference for a country of potential economic interest in a continent that is clearly very immature in terms of modern mineral exploration. The “Geographical, Subject and Author Indexes” add to its value in this respect.

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**The Occurrence of Diamonds in South Africa.** M.G.C. WILSON, N. MCKENNA AND M.D. LYNN, WITH CONTRIBUTIONS BY T.R. MARSHALL AND A. VAN DER WESTHUIZEN. 2007. Pp. 105. Soft cover, South Africa Council for Geoscience, Mineral Resources Series 1. ISBN 978-1-920226-00-8. US\$68.

For anyone who has been fortunate enough to visit the diamond mines and deposits of South Africa, perhaps on a trip with students or conference participants with the likes of John Gurney, Bill McKechnie, or John Ward, among many others, this book will be a treat, a collection of all the notes not taken, of all the details and background and information over 130 years of diamond exploration and mining in this geologically rich, beautiful, and unique part of the world. This book provides detail for the primary, secondary, and tertiary diamond deposits in South Africa in a clear format, organized by political province, with information presented in a logical way. Readers of this journal will find it a highly useful guide to the well-documented kimberlites and alluvial deposits of the country, as well to the emplacement and depositional environments that are a source of diamonds. Within these 100 pages is a densely described, wide array of information from diamond genesis and magmatic-volcanic facies, to alluvial, coastal, and offshore deposits. The book is highly recommended to anyone with even the most remote interest in diamonds and their distribution.

*The Occurrence of Diamonds in South Africa* is well illustrated, with informative figures and useful fold-out maps within the text. The main part of the book systematically describes the diamond deposits of each province, focusing on the Limpopo Province in the north of the country, and the Northern Cape, Gauteng, Free State, and North West Provinces. Primary deposits in kimberlites are described first in each section, followed by the secondary alluvial deposits. The central section on the Northern Cape Province is the largest, as that region contains the most diamond deposits in the country and is the only area in the world that contains primary kimberlitic as well as secondary and tertiary alluvial and fluvial onshore and offshore diamond deposits. This is a function of the unique geologic history of the region during the past 3 billion years and, in particular, the uplift and erosional history during the past 100 million years. Detailed descriptions of historical and modern deposits are presented, with grades and production numbers where possible. A wealth of information on sedimentary processes is presented, including river dynamics, terrace formation, bedrock morphology, and controls on deposition. The forensics of the source regions is fascinating.

Some interesting facts are sprinkled throughout the book. For example, whereas Premier (Cullinan) is the largest known kimberlite in South Africa (32 ha), small Swartruggens has reported locally the highest grade (as much as 500 cpht), and the Lichtenburg alluvials have produced the highest

priced stones (as much as \$600/c) compared to the more well-known, high-value coastal stones (\$200-300/c). Common themes occur throughout the volume, notably the importance of rock type and cobble size to determining grade in alluvials, the importance of structures to primary and secondary deposits, and the bedrock type needed to create suitable trap sites. Paleorivers, such as the the Oliphants River and the postulated Karoo and Kalahari Rivers, played an important early role in coastal deposits prior to the emergence of the dominant Orange River system. One wonders why there are few indicator minerals in alluvial settings except near a source, when these are used extensively for exploration programs for kimberlites, and how a 211-c stone made it to the mouth of the Orange River.

The beginning of the book also provides a very useful summary of diamonds, the market, deposit types, and exploration methods for primary and secondary deposits. Anyone who has attempted to summarize these topics in a course will appreciate the contribution. References to the early studies of Wagner (1914) and Williams (1930, 1932), as well as to the current expertise in the region, theses, conference publications, and De Beers internal reports, provide an excellent resource.

Two full-size maps are included as additions to this volume. "Diamond Deposits and Kimberlites, South Africa, Lesotho, and Swaziland" (C.J. Vorster, 2003, Council for Geoscience) is a detailed documentation of alluvial-diamond deposits, diamondiferous kimberlites, and concession holders, superimposed on a simplified geologic and political map of southern Africa, with an inset of the Kimberley area. "Alluvial-Diamond Occurrences of the North West Province" (K. Guzek, C.J. Vorster, M.G.C. Wilson, G. Henry, and J. Cole, 2005, Council for Geoscience) shows the distribution of farms in the North West Province that are currently under license (2004) or have been past producers of diamonds. Both maps contain an abundance of information. The book is highly readable, and, apart from a few minor typographical errors and some places where the flow of text is not entirely smooth, it is generally well written. The format, as a heavy-bond paperback in a clear plastic case, with two folded maps, makes it very portable. It will carry well in the field and, in fact, I have taken it with me everywhere. De Beers was a major contributor for much of the information contained in this book, which is a good thing, considering the company's role in developing and dominating the diamond industry in South Africa for so long. Perhaps even better is the role of De Beers' former employees, not only in contributing to the book, but also in creating the current vibrant junior diamond mining sector that flourishes in the country today.

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## BOOKS RECEIVED

**Cambridge University Press, 100 Brook Hill Drive, West Nyack, NY 10994-2133.** Tel. 845-353-7500; Toll free: 800-872-7423; Fax: 845-353-4141; Email: <newyork@cambridge.org>; Website: <www.cambridge.org/us>.

**Komatiite.** Nicholas Arndt, C. Michael Lesher, Steve J. Barnes, 488 p., 2008, ISBN: 978-0521874-748, Price CDN\$150.00.

**Mineralogical Association of Canada, 490, rue de la Couronne, Québec, QC G1K 9A9, Canada.** Tel. 418-653-0333; Fax: 418-653-0777; Email: <office@mineralogicalassociation.ca>; Website: <www.mineralogicalassociation.ca>.

**SP 9. Atlas of Migmatites.** Edward W. Sawyer, 386 p., 2008, ISBN 978-0-660-198787. Price Members US\$112.00/CDN\$112.00, Price Non-members US\$140.00 (outside Canada), CDN\$140.00(in Canada).

**SP 10. Pegmatites.** David London, 368 p., 2008, ISBN: 978-0-921294-47-4. Price Members US\$100.00/CDN\$100.00, Non-members (outside Canada) US\$125.00, Non-members (in Canada) \$125.00.

**SC Vol. 38. Working with Migmatites.** Edward W. Sawyer, Michael Brown (eds.), 158 p., 2008, ISBN 978-0-921294-46-7. Price Members US\$32.00/CDN\$32.00), Non-members US\$40.00 (outside Canada), CDN\$40.00(in Canada).

**SC Vol. 40. Laser Ablation ICP-MS in the Earth Sciences: Current Practices and Outstanding Issues.** P. Sylvester (ed.), 356 p., 2008, ISBN 9-0-921294-49-8. Price Members US\$44.00/CDN\$44.00, Price Non-members US\$55.00 (outside Canada), CDN\$55.00 (in Canada).

**Springer New York, LLC, 233 Spring Street, New York, NY 10013, USA.** Tel. 212-460-1500; Fax: 212-473-6272; Email: <service@springer-ny.com>.

**Geological Atlas of Africa, with Notes on Stratigraphy, Tectonics, Economic Geology, Geohazards, Geosites and Geoscientific Education of Each Country.** Thomas Schlüter, 2nd ed., 2008, XII, 308 p. 442 illus., 417 in color, with CD-ROM., Hardcover, ISBN 978-3-540-76324-6. Price USD249.00.

