

# Book Reviews

Susan B. Johnson & Jana E. Miyahira-Smith, Editors

## THE MICROWORLD OF DIAMONDS

By John I. Koivula, 157 pp., illus., publ. by Gemworld International, Northbrook, IL, 2000. US\$95.00\*

John Koivula has very successfully created a text that should excite all gemologists, especially lovers of diamonds. In addition, for those interested in gemstone photomicrography, there are more than 400 beautiful and fascinating color photographs.

The opening chapters discuss the virtues of diamonds and the 4 Cs, followed by a brief glossary of diamond properties. Chapter 4 starts with the origins of diamonds, and then proceeds to a detailed discussion of diamonds in ancient times, chemical formulas, crystal structure, and optical and physical properties; it ends with geologic and geographic locations. Chapter 5 covers inclusion identification, breaking the topic down into a number of levels. The author begins by discussing the importance of the microscope to gemology. He then delves into the laboratory use of such sophisticated techniques as X-ray diffraction, laser Raman microspectrometry, and structural and chemical analysis for research and identification.

Chapter 6 begins with the evolution of the microscope from simple lenses to the modern instruments we have at our disposal today. Also discussed are the various lighting techniques used in photomicrography. Later chapters are devoted to micro-features of natural diamonds, diamond enhancements, gem-quality synthetic diamonds, and diamond simulants. The book ends with a comprehensive list of diamond-related definitions. One somewhat unusual feature is that a bibliography is

found at the end of each chapter rather than at the back.

It is difficult to find fault with this book: It is very readable, and the author's marvelous photomicrographs are a feast for the eyes. Readers of *Gems & Gemology* will, I am sure, appreciate the time and effort that have gone into the production of *The MicroWorld of Diamonds*.

ANTHONY DE GOUTIÈRE

Victoria, British Columbia, Canada

## GEMSTONES: QUALITY AND VALUE, Volume 1

By Yasukazu Suwa, 143 pp., illus., publ. by Sekai Bunka Publishing, Tokyo (2nd ed., English translation), 1999. US\$84.00\*

So you've determined that the stone you're looking at is a natural alexandrite. Now the question is, "Where does it fit in the world of gemstones?" Is it the finest quality? If not, what does a finer quality look like? How rare is it in the marketplace? Comparing two alexandrites, which one is more valuable? How much more valuable?

The answers to these questions usually emerge from years of experience in the colored stone industry. But even with experience, there are often gaps in our knowledge. Unless we are constantly working with a large range of sizes and qualities of gemstones, it can be difficult to know this information and even more difficult to communicate it to others. For 24 of the more popular gemstones, this book does an amazing job of drawing us into their marketplace. Included are four-page sections on aquamarine, amethyst, alexandrite, round brilliant diamond,

melee diamond, Colombian emerald, Zambian emerald, Sandawana emerald, jadeite, lapis lazuli, moonstone, "light" opal, black opal, peridot, Mogok ruby, Thai ruby, rhodolite, Sri Lankan sapphire, Kashmir sapphire, pink topaz, tanzanite, green tourmaline, Paraíba tourmaline, and turquoise. Additional sources also are mentioned in some of the sections (e.g., turquoise has descriptions for material from Arizona, Iran, and China). Some additional varieties or species are briefly mentioned as well (e.g., almandite and grossularite in the rhodolite section).

Highlighting the book are color photographs of more than 500 different loose stones or pieces of stone-set jewelry, with more than a quarter of these listing carat or gram weight and value in U.S. dollars. For each stone except Kashmir sapphire, Mr. Suwa has provided a Quality Scale grid with five beauty grades across the top and seven levels of tone along the side, for a total of 35 possible combinations. Many of these combinations—from three (for melee diamond) to 28 (for jadeite)—are illustrated by color photos of individual stones. For most of these gems, these are the best visual representations of quality ranges this reviewer has ever seen. An additional chart shows which of these examples would fall within one of three grades of gem quality, jewelry quality, or accessory quality. These three grades also are used in two other charts: One shows what percentage of each grade in a

\*This book is available for purchase through the GIA Bookstore, 5345 Armada Drive, Carlsbad, CA 92008. Telephone: (800) 421-7250, ext. 4200; outside the U.S. (760) 603-4200. Fax: (760) 603-4266.

particular carat weight would be found in the fashioned stone market, and the other gives a value index for three different carat weights and the three different quality grades, to illustrate the relative values of different weights or grades.

The color printing in *Gemstones: Quality and Value* is excellent, with the possible exception of the aquamarine chapter, where the stones shown in the "country of origin" section appear very different in color and saturation from those reproduced on the quality scale.

I was first introduced to this book by a student who was taking one of our Colored Stone Grading extension classes. She is a consumer who has the time, money, and passion to learn as much as she can about gemstone quality and value. She said that she constantly uses this book as a reference for making her buying decisions. Anyone in the trade who could not answer the questions posed in the first paragraph of this review when looking at any of these stones would also find this book invaluable.

DOUGLAS KENNEDY  
*Gemological Institute of America*  
Carlsbad, California

### **THE DIAMOND FORMULA— DIAMOND SYNTHESIS: A GEMMOLOGICAL PERSPECTIVE**

By Amanda S. Barnard, 166 pp.,  
illus., publ. by Butterworth-  
Heinemann, Oxford, England, 2000.  
US\$39.95\*

This book provides the gemologist with a convenient summary of the important concepts related to the synthesis of diamond, the identification of gem-quality synthetic diamonds, and the potential impact of synthetic diamonds on the jewelry industry. The author has surveyed the scientific and gemological literature to organize the relevant information into a convenient and readable format.

The book is divided into three

sections. The first deals with the history of diamond synthesis, which culminated with the successful growth of diamond in the early 1950s. The second section discusses the gemological aspects. Here a summary of the physical properties of diamond is followed by a discussion of the means to identify synthetic diamonds using both standard gem-testing equipment and the more advanced scientific instruments that are found today in many gemological laboratories. The information for much of this discussion was taken from articles published over the past two decades in the gemological literature. The third section briefly discusses the synthesis of thin films of diamond by chemical vapor deposition. (The products of this method have so far had little or no impact on the jewelry trade.)

The information presented in all three sections is complete and well organized. The text is illustrated by black-and-white photographs, line drawings, and several tables. There are no color photos. The one major drawback of the book is the lack of photos of some of the visual features that are key to the identification of synthetic diamonds, such as color zoning, grain-ing, metallic inclusions, and patterns of ultraviolet fluorescence. A number of such photos have been published in the gemological literature, however, and the book does contain a reference list of articles taken from the literature through 1997.

This book is a valuable resource for gemologists interested in a summary of information on synthetic diamonds. Since gem-quality synthetic diamonds continue to be grown from metallic catalysts in high temperature/high pressure equipment, the information on synthetic diamond identification presented here is valid and will likely continue to be so until other synthesis techniques are developed.

JAMES E. SHIGLEY  
*Gemological Institute of America*  
Carlsbad, California

### **GEMS AND GEM INDUSTRY IN INDIA**

By R. V. Karanth, 406 pp., illus., publ.  
by the Geological Society of India,  
Bangalore, India, 2000. US\$75.00  
(hardbound), US\$60.00 (paperback).  
E-mail: gsocind@bgl.vsnl.net.in

In dedicating this book to Peter Read, John Sinkankas, Basil Anderson, and L. A. N. Iyer (of Mogok gem-tract memoir fame), the author reveals that he was able to "pick up the threads of Gemmology" from their works. With this volume, Karanth has created a very readable general textbook of his own, for Indian gemologists in particular, while opening up the country's gem scene to non-Indian readers.

A short introduction is followed by an interesting historical account of the Indian gem industry, from pre-history to the present. Tables showing the imports and exports of gem and jewelry items between 1963 and 1996 illustrate the phenomenal growth in the country's diamond trade, by a factor of over 6,000 in terms of value within three decades! Subsequent chapters deal with the properties of gemstones, analytical methods, gem cutting—including a very good discussion of India's artisanal operations—and gemstone synthesis. The final chapters describe gem materials and their occurrences, with special reference to India (one of the book's strong points).

There are 119 black-and-white figures and eight full-color pages, each with six separate pictures. The black-and-white figures probably started out as reasonable photographs, but the printed reproductions leave a great deal to be desired. The color plates are better, but the objects often are too small within the frame. Typographical errors abound, but they are seldom serious and usually do not detract from the meaning of the text. There is a thorough international bibliography and a detailed appendix of Indian gemstone localities.

*Gems and Gem Industry in India* succeeds in producing a reasonably comprehensive gemology text for Indian students, and also in describing the modern Indian scene with localities and geological data for others. Readers will be alerted to India's potential in gemstone resources, and to the very rapid growth of its cutting and jewelry industries.

E. ALAN JOBBINS  
*Caterham, Surrey, England*

## BLACK OPAL

By Greg Pardey, hardcover, 204 pp., illus., publ. by GP Creations, Urungan, Queensland, Australia, 1999. With video (running time 1 hour 52 min.). US\$99.95.  
[www.gpcreations.senet.com.au](http://www.gpcreations.senet.com.au)

With almost 30 years of experience as a commercial cutter of the famous black opal of Lightning Ridge, New South Wales, Greg Pardey explains "everything you need to learn about opal cutting," including tricks of the trade and step-by-step instructions. The instructions in the text are matched by the steps shown in the video—with the notable exception of a sanding step, which is described in the text only.

Background information on the occurrences of precious opal in the Great Artesian Basin is given, along with brief but useful remarks on the unique mining methods that have been developed in the Lightning Ridge area. These techniques allow much faster prospecting and development of opal deposits than was possible before. Inasmuch as the basin covers an enormous region in the eastern half of the continent, Mr. Pardey predicts that precious opal

will be produced for many years to come. These topics are treated in the first 23 minutes of the video, which is exceptionally clear and easy to follow.

Next comes the all-important art of examining black opal masses, which often occur in rough, nodular shapes that are coated with clay, and require careful delineation of the parts that may contain "precious" material. Beginning with an unprepossessing nodule, Mr. Pardey shows how touches of the grinding wheel open up the interior and give clues to the position of precious opal layers within the nodule. In this example, he eventually produces two fine cabochons, nicely shaped, with generous layers of precious opal on top of natural backings of dark gray potch. Because the layers of black opal usually are very thin, the opal typically is salvaged by cementing it to backings of black potch or to obsidian (the potch being preferred) to form doublets. Ultra-thin layers of precious material often are cemented both to a backing and to a lens-shaped cap of rock crystal quartz to form triplets. All of these steps—along with types of machinery and accessories, polishing agents, and more—are described in the book and the video.

On the whole, Mr. Pardey's combination book/video succeeds in teaching his method of cutting Lightning Ridge opal. However, his text could have been edited more closely. There are redundancies, misspellings, and other grammatical faults, and the content is sufficiently complex that it needs an index, which is lacking. Nevertheless, it is all understandable and interesting, especially the video. Lapidary and gemology clubs may find the video useful in two showings, the first on

current mining practices and machinery in the Lightning Ridge region, and the second on the lapidary processes.

JOHN SINKANKAS  
*Peri Lithon Books  
San Diego, California*

## OTHER BOOKS RECEIVED

**Diamonds and Mantle Source Rocks in the Wyoming Craton with a Discussion of Other U.S. Occurrences**, by W. Dan Hausel, *Report of Investigations No. 53, 93 pp., illus., publ. by the Wyoming State Geological Survey, Laramie, WY, 1998, US\$10.00.* This volume is concerned primarily with descriptions of the diamond-bearing kimberlites and related rocks in the Wyoming craton, which underlies Wyoming and encompasses parts of Colorado, Montana, Idaho, Nevada, and Utah. More than 100 kimberlites and a large lamproite field are known in this region, and more than 130,000 diamonds have been produced so far. Yet diamonds in both primary—kimberlite or lamproite pipes—and secondary occurrences have been reported in about two dozen other states in the U.S. Each of these occurrences is described, which makes this the most complete compilation of its kind. The location maps, photos of occurrences, and original references also make this a truly valuable acquisition (at a nominal price)—not only for those interested in the history and future potential of diamonds in the United States, but also for those who wish to visit these localities.

A. A. LEVINSON  
*University of Calgary  
Calgary, Alberta, Canada*