

PHOTOATLAS OF INCLUSIONS IN GEMSTONES

By Edward J. Gübelin and John I. Koivula, 532 pp., illus., publ. by ABC Edition, Zurich, Switzerland, 1986. US\$175.00*

Surely the name most often associated with the use of inclusions for gem identification, and as a guide to the paragenesis of gems and gem materials, is that of Edward J. Gübelin. Working with him on the preparation of this monumental photo-atlas is John I. Koivula, a remarkably gifted gem inclusion specialist and award-winning photomicrographer. The combined efforts of these two authors and scientists has resulted in a book that is sure to become a classic in the gemological literature.

Both authors have impressive gemological backgrounds. Dr. Gübelin, of Meggen, Switzerland, was the first person to introduce a systematic classification of gemstone inclusions. During the course of his career, he has published more than 150 papers and five books on gemology, and has designed instruments and accessories to improve microscopy. As a specialist in gemstone microscopy, Mr. Koivula has developed several new illumination techniques, including pinpoint illumination and shadowing. His photomicrograph of a gemstone inclusion captured first place in the 1984 Nikon International Small World Competition. In addition to his editorial responsibilities with *Gems & Gemology*, he has published more than 50 articles in various gemological publications and contributed to several books.

The new *Photoatlas* has more than five times as many color plates as Dr. Gübelin's 1974 classic, *Internal World of Gemstones*. There are some other interesting departures from *Internal World* as well. The *Photoatlas* is divided into six parts. The introduction discusses the importance and beauty of inclusions, as well as the procedures of microscopy and photomicrography. Part two is a pleasant surprise since, in addition to the information on the genesis of

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mineral inclusions in gems, it also contains three essays: one by Dr. Edwin Roedder on the origin of fluid inclusions, the second by Dr. Henry Meyer on the genesis of diamond and its inclusions, and a third by Professor Dr. H. A. Stalder on the formation of quartz and its inclusions. Part three covers specific mineral, fluid, and glass (remnants of silicate melts that never crystallized) inclusions as well as multiple inclusion "scenes." Part four discusses various minerals and their inclusions, and part five presents inclusions found in man-made materials. The final section summarizes the work.

The authors are not given to verbosity, but Dr. Gübelin can be positively lyrical in English, which is not his native language. However, the 1440 magnificent photomicrographs speak for themselves. Beautifully reproduced and accompanied by interesting, concise captions, they provide the most thorough coverage of the subject ever accomplished.

Perhaps to prove a reviewer's objectivity, I am constrained to find something to criticize. It is exceedingly difficult in this instance, but on page 76 there are two photos of a three-phase inclusion in which a cube of halite is photographed in different positions in a liquid- and gas-filled cavity. The caption reads, in part: "Note how the gas bubbles stand out from its background in strong relief thanks to its much higher refractive index." This must, indeed, be a rare gas.

This book is not only beautiful (it contains roughly 13,000 square inches of color photographs), but it also provides a wealth of valuable information on a subject of vital importance to gemologists. If one can conceive of a book with a

\$175.00 price tag as a great bargain, this is it.

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PEARLS: NATURAL, CULTURED AND IMITATION

By Alexander E. Farn, 150 pp., illus., publ. by Butterworth & Co., London, 1986. US\$29.95*

This book is part of the new Butterworth Gem Books series, which is aimed at providing in-depth information on particular gems rather than surveying many or all types of gem materials under one cover. The idea has merit, but its execution in this book is lacking in several important ways.

At first glance, the book has all the ingredients for a first-class work. The author, a former director of the London Chamber of Commerce Laboratory, has had gem-testing experience that comes to only a few. The subject matter is of great interest because of the current popularity of cultured pearls, and because new books about pearls are few and far between—the last great one was *The Book of the Pearl*, by Kunz and Stevenson, published in 1908.

Even today, pearls are much misunderstood, and up-to-date information and research are sadly lacking. Much of our recent information about natural and cultured pearls has come from pearl growers, processors, and dealers, which is a clear case of the fox guarding the hens. For example, the Japanese cultured-pearl industry, until very recently, has been reluctant to admit that today, about 80% of its saltwater cultured pearls are harvested after one or at most two growing seasons (approximately eight to 20 months), rather than the three- to four-year period commonly accepted as fact. Similarly, the Japanese have been loath to explain the extent of the processing and treat-

*This book is available for purchase at the GIA Bookstore, 1660 Stewart Street, Santa Monica, CA 90404.

ments to which most cultured pearls are subjected. The need for fresh information about pearls is clear.

This book endeavors to cover most aspects of pearls, cultured pearls, and imitation pearls, and includes a brief gemological description, a chapter on the origin of pearls, a very brief historical perspective, an anatomy of the pearl oyster, a discussion of the sources of natural pearls, a chapter on cultured pearls, the techniques of pearl identification, a discussion of imitation pearls, natural-pearl pricing methods, and a final chapter entitled "A Pearl Pot-pourri," which includes small tidbits of "pearlobilia" that wouldn't fit anywhere else. Included also are a short glossary, a reading list, references, and an index.

The author effectively works to clarify and distinguish the differences between the various types of pearls and cultured pearls. Although the point has been made many times before, he emphasizes the fact that the term *pearl* should only be applied to natural pearls, of either saltwater or freshwater origin, and that cultured pearls should always be designated as such. This is an important distinction not always made in commerce.

The second chapter, on the origin of pearls, takes the reader back to the earliest ideas about pearl formation (e.g., myth of dew-formed pearls), and then carefully traces the evolution of modern thought on pearls which arrives at the conclusion, scientifically derived, that

most pearls are induced by parasitic infestation of the mollusk and rarely, if ever, by a grain of sand. While this idea is probably correct when applied to the saltwater pearl, certainly as opposed to the grain-of-sand myth, it should be noted that pearls, especially freshwater pearls, are often nucleated by *calcareous* objects, in the form of shell bits or shell-bearing parasitic mollusks.

The author also does a good job of presenting the techniques used in pearl identification, and proceeds from the simplest to the more advanced. His information is good, although a general reader might have difficulty following his explanation of the fine points and nuances of modern methods of pearl testing. A table showing the strengths and weaknesses of each method, vis-à-vis the various types of pearls and cultured pearls, would have been helpful. The table showing the number of pearls and cultured pearls tested at the London Laboratory from 1926 to 1984 is new information and very interesting. Notably, the author points out the difficulty in using available techniques to test some of the newer cultured pearls, especially mantle-tissue nucleated cultured pearls produced in saltwater, and calls for ongoing research in this field.

The book could have been much better in its overall execution; I came away with the impression that it was rather hurriedly put together. It suffers from a so-so editing job: the author's writing style, erudite in

tone, is often rambling and hard to follow. The editor should have helped to organize and present the information more effectively, so that the book would lend itself to reference.

Although the book has a good number of photographs, maps, line drawings, and tables, many of these are not especially well done, and do not add much. The photos of radiographs, intended to show the features which identify pearls and cultured pearls, are in most instances not sharp enough to reveal these characteristics.

Finally, while the author does achieve his stated objectives of distinguishing between the various types of pearls and cultured pearls and of explaining the history and technique of the pearl-identification practices used at the London Laboratory, he falls short of the broader goal of providing a useful source of information for both the public and the jewelry trade. His obvious forte is pearl identification, especially of oriental pearls, but the information he provides about cultured pearls in general and freshwater pearls in particular, both natural and cultured, is often out of date or incorrect. Although the book is truly a noble effort by a respected author, at a time when our knowledge about pearls and cultured pearls is still plagued by myths, half-truths, and noninformation, the work does little to break new ground.

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MORE ON "SYNTHETIC"

I would like to comment on the letter from W. W. Hanneman in your Summer 1986 issue.

Synthetic is acceptable on two grounds: (1) often in the usage of the English language, the noun is inferred, and the adjective only expressed; (2) I know of no dictionary that covers the specialized usage in every field of science, arts, sports, etc. *A synthetic* is a term perfectly understood by all gemologists, and widely defined in all gemological literature.

And, if Dr. Hanneman is going to be pedantic, the terms *borate* and *silicate* indicate a chemical formula, not a "defined crystal structure." The possible crystal structure may be inferred from the formula, but equally, many substances with a chemical formula can also exist in an amorphous form. Australia's best-known precious stone—opal—has the formula $\text{SiO}_2 \cdot n\text{H}_2\text{O}$ and is amorphous; chalcedony, with the same formula, is not.

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