GEMOLOGICAL ABSTRACTS

DONA M. DIRLAM, EDITOR

COLORED STONES AND ORGANIC MATERIALS

Contributions to a history of gemmology—Carl Peter Thunberg and Ceylon gemstones. J. Sinkankas, *Journal of Gemmology*, Vol. 22, No. 8, 1991, pp. 463–470.

Technology has made gemology an increasingly complex area of study, but it has also brought much greater understanding of gem materials. A glance at the history of gemology—such as Dr. Sinkankas provides in this article—reveals just how confusing it was before the advent of technology.

This article opens with a brief biography of 18th-century Swedish naturalist Carl Peter Thunberg. Primarily a botanist and physician, Thunberg dabbled briefly in gems after a few weeks' visit to the island of Ceylon (now Sri Lanka) in 1777. By that time, Ceylon was long famous as a source of gemstones, notably since Marco Polo's reports in the 14th century. In the 17th century, Jean-Baptiste Tavernier cited Ceylon as one of only two sources of colored stones in the East (the other being Burma).

From Thunberg's writings, Dr. Sinkankas provides a list of 19 gem materials with names in English, Malabarese, Sinhalese, and Swedish and with brief descriptions. The remainder of the article is a discussion in which Dr. Sinkankas attempts (convincingly) to unravel the true identities of the gems. Thunberg's descriptions of some of the "rubies," for example, clearly fit what we now know to be zircon. "Hyacinths" and "red turmalins" also appear to have been zircons, while descriptions of "blue saphire" call to mind iolite, aquamarine, or topaz rather than corundum. Europe's then-fledgling science of chemical analysis more often clouded identification than clarified it.

CMS

Turquoise in Pre-Columbian America. G. Harbottle and P. C. Weigand, *Scientific American*, Vol. 266, No. 2, February 1992, pp. 78–85.

This article presents gemology from an archaeological point of view. Pre-Columbian societies revered turquoise above even jade. Holding great social and religious value, arti-

This section is designed to provide as complete a record as practical of the recent literature on gems and gemology. Articles are selected for abstracting solely at the discretion of the section editor and her reviewers, and space limitations may require that we include only those articles that we feel will be of greatest interest to our readership.

Inquiries for reprints of articles abstracted must be addressed to the author or publisher of the original material.

The reviewer of each article is identified by his or her initials at the end of each abstract. Guest reviewers are identified by their full names. Opinions expressed in an abstract belong to the abstracter and in no way reflect the position of Gems & Gemology *or GIA.*

facts of worked turquoise have been found throughout Mesoamerica. Yet the only sources of turquoise in this area are in what is today the American Southwest. The movement of turquoise from the Southwest throughout Mexico helps identify the apparently extensive contacts between the Mesoamerican and Southwest cultures.

The earliest evidence of turquoise in Mesoamerican culture dates from approximately 600 B.C., but it was not used widely until 900–1200 A.D. We know that raw turquoise was imported from the Cerrillos area of what is now New Mexico in 700 A.D. for use in religious ceremonies. Eventually, the Chaco Canyon settlement of New Mexico developed into the major manufacturing and distribution center for turquoise. The ceremonial use of turquoise reached its zenith between 975 and 1130 A.D.

Gradually, use of turquoise expanded beyond the religious leaders and rulers to the middle and lower classes. As consumption of turquoise in Mesoamerica increased, though, Chaco Canyon appeared to lose its monopoly of the turquoise trade. The greater demand led to the opening of other sources—and trade routes—in the Southwest. By the 13th century, demand for turquoise had never been stronger, but Chaco Canyon was no longer the single major center.

The isolation of the deposits and hardships of retrieving the turquoise must have been extremely challenging to ancient miners. Simple single-shaft chamber mines were most common, although sometimes these mines were expanded to huge open pits. Tools recovered from the mine sites show little technical expertise. Most common are double-sided hammer stones of heavy throw weight. The strength required to wield them must have been considerable.

Jo Ellen Cole

GEM LOCALITIES

Wolodarsk-Wolynskii. Geologischer Aufbau und Mineralogie der Pegmatite in Wolynien, Ukraine (Volodarsk-Volynsky. Geological structure and mineralogy of the pegmatites of Volynya, Ukraine). I. M. Koshil, I. S. Vasilishin, V. I. Pavlishin, and V. I. Panchenko, *Lapis*, Vol. 16, No. 10, October 1991, pp. 24–40, 82.

In recent years, larger quantities of beryls and topazes from Volodarsk, Ukraine, have become available than ever before. However, what little has been written about this locality is mostly in Russian. In this article, Koshil et al. describe (in German) the geology at Volynya and the minerals found there.

The gem crystals are found in granites and pegmatites related to the Korosten pluton. On the basis of structure and mineral content, several types of pegmatites can be distinguished. The type called "chamber pegmatite" (*Kammerpegmatit*) generally contains the widest range of minerals (over 90 species are listed in the article). This type is also the main source of gem specimens (primarily beryl and topaz, along with smoky quartz and some amethyst, citrine, and phenakite).

Beryl occurs in opaque to transparent, often large, columnar crystals up to about 30 cm (12 in.). They are predominantly green to yellowish green, but golden yellow and blue stones are also found. Most crystals show etched faces, and specimens corroded to absolutely irregular forms are not rare. Topaz occurs in etched crystals, too, but for the most part they are well formed and resemble the topazes from Ilmen and Adun-Chilon. Crystals can reach considerable sizes (the largest on record weighed 117 kg). The topazes occur in various pale to intense hues (colorless, blue, pink, red, yellow), some of which will be affected by heat treatment or irradiation.

The article contains a geologic map, several cross-section sketches of typical pegmatites, and 29 beautiful color photographs of gem and mineral specimens.

Rolf Tatje

INSTRUMENTS AND TECHNIQUES

The microscopic determination of structural properties for the characterization of optical uniaxial natural and synthetic gemstones. Part 3: Examples for the applicability of structural features for the distinction of natural and synthetic sapphire, ruby, amethyst and citrine. L. Kiefert and K. Schmetzer, *Journal of Gemmology*, Vol. 22, No. 8, 1991, pp. 471–482.

Using the techniques outlined in part 1 of this series, the authors examined a variety of natural and synthetic corundums, as well as natural and synthetic amethyst and citrine, to determine characteristic structural features useful for identification. They found that the internal growth features of alkali-basalt sapphires parallel the characteristic crystal habit for corundum from this type of source—i.e., with basal pinacoid *c* {0001} and hexagonal dipyramid *z* $\{22\bar{4}1\}$ dominant, often accompanied by the positive rhombohedron *r* $\{10\bar{1}1\}$. Also observed, though less commonly, were growth features parallel to the second-order hexagonal prism *a* $\{22\bar{4}3\}$ and to hexagonal dipyramids *n* $\{22\bar{4}3\}$, *w* $\{11\bar{2}1\}$, *v* $\{44\bar{8}3\}$, and *v* $\{44\bar{8}1\}$. As yet, the authors have not encountered *a* $\{11\bar{2}0\}$ and hexagonal dipyramids other than *n* $\{22\bar{4}3\}$ in flux-grown synthetic sapphire. Chatham flux-grown synthetic blue sapphires are discussed in some depth.

The techniques used here are particularly effective with natural and synthetic rubies that lack any other internal features—a problem that has plagued gemology for some time. Examples provided include recent production of natural rubies from Malawi and Knischka synthetic rubies marketed since 1987. Both exhibit features that reflect their respective origins.

Structural characteristics that distinguish natural from synthetic amethyst and citrine have been established previously; here, the authors illustrate how their recently developed techniques can be used to reveal these features.

One addition that would have been extremely useful, given the complex and diverse nature of the material covered in this trilogy of articles, is a table of the characteristic features discussed. Without it, the reader must juggle an

almost unmanageable quantity of technical information. Moreover, much of the discussion in the text assumes a working knowledge of crystallography. However, even the gemologist whose crystallography is rusty—or essentially nonexistent—will appreciate the information provided by the numerous photomicrographs. *CMS*

JEWELRY MANUFACTURING ARTS

Golden hoard from a lost tribe. P. Dragadze, *Connoisseur*, Vol. 221, No. 950, March 1991, pp. 94–97, p. 120.

In the late summer of 1987, Soviet archaeologist Vladimir Guguev excavated the burial mound of a high-ranking Sarmatian woman. The Sarmatians were a nomadic tribe of Indo-Iranian descent who made their home in southern Russian between 400 B.C. and 400 A.D.

Among the treasures found in the grave were gold bracelets, a ring, a diadem decorated with stags, and a turquoise-encrusted torque showing a seated Oriental warrior flanked by dragons. This necklace of stamped and chiseled gold weighs over 2 kg. The male figure, sitting with his legs crossed, dates the piece to the first century A.D.; the style of his sword places its manufacture somewhere in Central Asia.

The Sarmatians left no written record; the objects buried with this noblewoman offer some of the first insights into their spiritual life. Much more archaeological work remains to be done in Rostov. Excavations have been limited by the lack of modern equipment and funding, but local experts feel that the area contains a wealth of other artifacts. *LS*

Menuki: The magnificent miniatures of Japan. R. B. Caldwell, *Arts of Asia*, Vol. 22, No. 1, 1992, pp. 70–77.

Menuki are the paired ornaments that fill the grips of Japanese samurai swords. Their importance is two-fold: They are exceptional works by recognized artists, and their ties to the sword give them a place at the center of traditional Japanese culture. In this article, the author discusses the collecting of menuki from both of these perspectives.

The sword was a symbol of absolute authority in Japan from the 13th century onward; during the 14th century, some of the country's most skilled artisans began to devote themselves exclusively to its ornamentation. The Goto clan, in particular, became known for their menuki. Menuki are unique as works of art in that they reflect the wearer, rather than the artist. In his advice to collectors, the author states that one should get a clear sense of the man for whom the menuki were made, and only then search for the tiny details that identify the maker.

The earliest of these tiny sculptures were made of *shakudo*—a mixture of copper, gold, and other metals that developed a black patina. Advances in metalsmithing over the centuries have changed the composition of the metal and thus its color, providing the collector with a means of dating unsigned pieces. Very often, menuki are decorated with gold or silver, and occasionally one sees pieces made entirely of gold.

The most popular images were dragons and lions, or the lion-like Chinese Foo dogs. The author provides a wide range of examples—from the traditional cranes, monkeys, and bats to an extraordinary pair showing all 12 creatures of the zodiac.

In describing menuki as "functional works of art created to fill a need in the most artistic fashion . . . they can convey a concept of beauty or of purpose and tradition," the author makes a strong case for collecting these extraordinary works. *LS*

Mr. Stuart and his laser: The industry's best-kept secret. R. Weldon, *Jewelers' Circular-Keystone*, Vol. 163, No. 3, March 1992, pp. 84–86.

Martin Stuart of Martin Stuart and Co., Lakeview Terrace, California, has developed a way to repair jewelry by using a laser instead of the more conventional jeweler's torch. The process has been compared to a microwave. "When using a typical jeweler's torch, you heat from the outside inward," he says. "When using a laser, you heat from the inside outwards. It works by selective absorption of light, leaving a 3/4 to 1 mm focal spot for the weld." The weld occurs within 1/1000 to 1/20,000 of a second, so the heat to which the piece of jewelry is subjected is thousands of times less than that from a jeweler's torch. Mr. Stuart has successfully worked on antiques, enameled pieces, and costume jewelry. This technique also has proved effective on jewelry containing heat-sensitive stones. Because the laser works so fast, most stones need not be removed before the jewelry is repaired. *KBS*

The watering hole: A detailed look at water pollution sources and permit requirements for the jewelry manufacturing industry. Mabbett, Capaccio & Associates, *American Jewelry Manufacturer*, Vol. 40, No. 3, March 1992, pp. 148–152.

This article, written by an environmental consulting and engineering firm, outlines pollutants generated by various manufacturing processes, regulations for pollutant discharge into the water systems, and pollution prevention. Pollutants include heavy metals from base metals, plating chemicals, toxic organics from cleaning solvents, oil, grease, and petroleum hydrocarbons. Jewelry manufacturers are required to obtain pollution-control permits before they discharge any of these chemicals into the wastewater. Applicable regulations can be obtained from state and local regulatory authorities. They typically cover discharges to sewage systems, discharges to surface water and groundwater, review and approval of wastewater treatment plans, cross-connection permits, backflow prevention devices, and the oil-spill prevention control and countermeasures (SPCC) plan. The article also provides a detailed breakdown of each regulation. Discussed briefly are methods for pollution prevention. A future article will provide more

detailed information on pollution-prevention and waste-minimization techniques. *RT*

Spirits and souls: Denise and Samuel Wallace. C. L. E. Benesh, *Ornament*, Vol. 15, No. 2, 1991, pp. 45–49.

Denise and Samuel Wallace have created a series of bejeweled belts designed with the ethnic peoples of the Pacific Northwest as their central theme. This article focuses on the Crossroads of Continents belt. Adorned with 10 figures representing ethnic peoples throughout Siberia, Alaska, the Yukon Territory, and British Columbia, the belt is crafted from sterling silver, 14K gold, fossilized walrus tusk, scrimshaw, fossil coral, Bruneau jasper, variscite, chrysoprase, sugilite, lace agate, and chrysocholla. It is a work of art, with painstaking detail evident in the design of the costume that adorns each piece. The individual figures can be removed from the belt and worn as pendants; in addition, each one opens to reveal drawings and other detachable pieces such as earrings. This article describes each figure in detail, including its significance within the particular culture. Seven color photographs accompany the article. *RT*

JEWELRY RETAILING

Antique jewelry: Buying and selling in a recession. E. Weber, *Jewelers' Circular-Keystone*, Heritage Insert, Vol. 163, No. 2, February 1992, pp. 130-134.

The current economic recession in the United States has adversely affected the antique jewelry market. Retail clients are more hesitant about buying and more practical about what they buy. Wholesale dealers have increasingly limited themselves to more discriminate, domestic purchasing and rely more on international buyers. Collectors, because of their unique, less-monetary motivation, are the least discouraged from making acquisitions during this time and are the most likely to be persuaded to make important purchases.

One positive aspect of the antique jewelry market during this recession is the auction market. This is due to its relative stability and the recent recommendations of economists to purchase antique jewelry as an investment. In addition, wholesale dealers are working to generate more activity in the market by re-evaluating their pricing structures and finding creative methods to attract new clients.

Alicia G. Powers

Good appraisals can boost a jeweler's reputation, provide a competitive edge against discounters and generate profits. R. Shor, M. Thompson, and R. Weldon, *Jewelers' Circular-Keystone*, Vol. 163, No. 4, April 1992, pp. 57–73.

This article gives a candid view of what an appraisal is, what it isn't, and what it should be. It walks the reader through the appraisal process by providing much-needed information: take-in procedures, types of appraisals, appraisal tools, product analysis, sources and resources, and legal liability. A particularly useful section details appraisal organizations, purpose.

This is an important article for anyone thinking about becoming an appraiser. Although thorough in its attempt to educate, however, it should not be used (and is not intended) as a substitute for a formal appraisal education.

KBS

Retail jewelers are top target of telephone credit-card scams. W. G. Shuster, *Jewelers' Circular-Keystone*, Vol. 162, No. 12, December 1991, pp. 108-109.

This article discusses the ever-increasing problem of telephone credit-card scams and its effect on several U.S. retail jewelry businesses. According to the U.S. Secret Service, "phone frauds as a whole, including those against retailers, cost $1.2 billion a year." Even though there are no specific figures for the jewelry industry, the Jewelers' Security Alliance estimates that individual losses average $2,000 to $10,000. Some culprits are criminals currently incarcerated for other crimes. One such ring in Pittsburgh, Pennsylvania, had access to telephones in prison and used confederates working for them on the outside. They fraudulently ordered millions of dollars in merchandise from retailers in 30 states.

The article gives important information on recognizing telephone scams and several case histories of scams against jewelry retailers. Clues to watch for include lack of concern about price and insistence on overnight shipping. Any jeweler who suspects fraud is advised to contact the local Secret Service office or the Jewelers' Security Alliance. Precautions for preventing such problems are also listed. The article is highly recommended for anyone in the jewelry industry. *KBS*

R_X for insurance appraisal headaches. P. J. Geolat, C. Van Northrup, and D. Federman, *Modern Jeweler*, Vol. 91, No. 3, March 1992, pp. 38–49.

This excellent article describes the near-war between appraisers and insurance companies and details what can be done to bring about a truce.

Included are some of the possible liabilities involved in writing an insurance appraisal report. To underscore the severity of the risk, the authors cite an example whereby an appraisal written as a "freebie" by a West Coast "appraiser" earned him a conviction for fraud and a very large fine.

Partisan viewpoints are given: Jewelers see insurers as replacing jewelry at a fraction of the actual cost, and insurers see jewelers as overgrading and overvaluing the product. Both arguments carry weight.

Outlined are the basics of replacement-cost appraisals and what will cover appraisers' "fiduciary responsibilities." Proper take-in procedures are also demonstrated. A quick overview of insurance coverage helps clarify for the customer the purpose of the appraisal. Examples show how easy it is to get into trouble if the appraiser does not know what he or she is doing.

Jeweler/appraisers must realize that valuations have to reflect market reality, not dictate it. Value generally should be determined on the basis of research on actual and realized prices, not on what it would cost to manufacture the particular piece.

This article, one of the most thoroughly written on the subject, is easy to comprehend and a pleasure to read.

Jo Ellen Cole

SYNTHETICS AND SIMULANTS

An unusual assembled inclusion specimen. R. C. Kammerling and J. I. Koivula, *Journal of Gemmology*, Vol. 22, No. 8, 1991, pp. 459–462.

Gemological pitfalls can sometimes occur in very unexpected places. Messrs. Kammerling and Koivula report on an assembled specimen of dendritic agate and glass. Although the manufactured nature of the specimen is evident from a side view, it would be less obvious if the sample were mounted in a bezel. However, magnification revealed numerous bubbles in the cement layer between the agate back and glass cap. Refractive index readings on the agate layer were ineffective because of an epoxy or resin coating on the back surface of the specimen. *CMS*

TREATMENTS

Dyed quartzite sold as jadeite. *Jewellery News Asia*, No. 89, January 1992, p. 60.

Dyed quartzite is being sold as natural green jadeite in Hong Kong, Thailand, and the People's Republic of China. The Hong Kong Gems Laboratory identified both mounted and loose quartzite that had been sold as jadeite in 1991. Ou-Yang Chiu Mei, former director of the Asian Institute of Gemological Sciences, said that while dyed quartzite turned up occasionally in previous years, more pieces have been seen recently. Dyed quartzite is sometimes called Malaya jade. Quartzite is actually the recrystallization of quartz sandstone. Appreciable differences in specific gravity and refractive index, as well as dye concentrations visible with magnification, should aid in identification.

Jana Emi Miyahira

Emeralds from Colombia (Part 3). G. Bosshart, *Journal of Gemmology*, Vol. 22, No. 8, 1991, pp. 500–503.

The third (and final) part of this series on Colombian emeralds includes brief, general discussions of treatment methods and identifying characteristics. In addition, the author describes how emerald's sensitivity to heat and ultrasonic cleaning varies with the quality of the individual gem. A combination of microscopic features (spectra, refractive indices, and specific gravity) can be used to determine if an emerald is of Colombian origin, but the author finds it impossible to distinguish emeralds of one Colombian mine from those of another. Although most Colombian emeralds are treated, usually by oiling of some kind, a major unresolved problem is the determination of the precise treatment present—a requirement under CIBJO guidelines. The article closes with the author emphasizing his position that the only non-emerald group of green beryl is the one colored solely by vanadium and/or iron with no chromium present.

CMS

MISCELLANEOUS

Hot art, cold cash. M. van Rijn and A. Page, *Art & Auction*, Vol. 14, No. 8, March 1992, pp. 92–99, 135–136.

This article contains an excerpt from an upcoming new book, *Hot Art, Cold Cash*, by international art dealer Michel van Rijn, on the intrigues and intricacies of the world art and auction markets. It also provides an interview with the author, and a response from Sotheby's.

The portion of the book published here tells the story of the Avar Treasure, a collection of gold and silver belt fittings, allegedly from Turkey, that was to be auctioned by Sotheby's in late 1981. The treasure, initially highly admired in the art world, mysteriously failed to sell and was subsequently "bought in" by Sotheby's for failing to meet the collection's reserves. After the auction, van Rijn revealed that the pieces were actually fakes he had commissioned to get revenge on the auction house, which he blamed for the loss of an important sale involving Japanese clients.

Van Rijn describes how he commissioned a now-deceased collector/antique dealer, Patrikiades, to forge pieces based on his own collection and pass them off as genuine. Patrikiades was not only a superb artist and craftsman, but he also knew how to duplicate the composition of ancient metals.

Van Rijn acknowledges that Sotheby's did follow proper procedures, checking with known experts for authenticity of the pieces and inquiring of various countries whether similar treasures had been documented before they were stolen. Van Rijn says he also concocted this scheme to prove how easy it is to get something of debatable origin accepted as genuine by the "experts."

Sotheby's states in its reply that the Japanese venture that Mr. van Rijn claimed was the source of his animosity toward the auction house did not take place until months after the failed Avar auction. Sotheby's goes on to point out that it did not buy back the Avar Treasure, but rather cancelled the sale of two of the items so that the collection could remain intact. *Jo Ellen Cole*

Paper gems. J. Eadie, *Journal of Gemmology*, Vol. 22, No. 8, 1991, pp. 498–499.

This brief note alerts gemologists to a different form of gem collecting: stamps that depict gem materials or related topics. Twenty-nine color photos illustrate the range of stamps available. Of even greater value is the author's offer to provide a list of topics and stamps that can be found; his address accompanies the article. *CMS*