
GEMOLOGICAL ABSTRACTS

Dona M. Dirlam, Editor

REVIEW BOARD

William E. Boyajian

GIA, Santa Monica

Jeffrey M. Burbank

Santa Monica

Stephanie L. Dillon

San Clemente, California

Bob F. Effler

GIA, Santa Monica

Emmanuel Fritsch

GIA, Santa Monica

Joseph O. Gill

Gill & Shortell Ltd., San Francisco

Fred L. Gray

Richter's, Georgia

Mahinda Gunawardene

Idar-Oberstein, Germany

Gary S. Hill

GIA, Santa Monica

Steve C. Hofer

Kensington, Connecticut

Karin N. Hurwit

Gem Trade Lab, Inc., Los Angeles

Robert C. Kammerling

GIA, Santa Monica

Neil Letson

Palm Beach, Florida

Shane F. McClure

Gem Trade Lab., Inc., Los Angeles

Elise B. Misiowski

GIA, Santa Monica

Michael P. Roach

Andin International, New York

Gary A. Roskin

GIA, Santa Monica

James E. Shigley

GIA, Santa Monica

Franceye Smith

GIA, Santa Monica

Carol M. Stockton

GIA, Santa Monica

Sally A. Thomas

GIA, Santa Monica

COLORED STONES AND ORGANIC MATERIALS

Formation of tourmaline-rich gem pockets in miarolitic pegmatites. D. London, *American Mineralogist*, Vol. 71, No. 3/4, 1986, pp. 396-405.

The conditions of formation of tourmaline-rich gem pockets in miarolitic (small, irregular pockets with protruding crystals) pegmatites are evaluated on the basis of both experimental data on the stability of aluminosilicate pocket minerals (e.g., spodumene) and an analysis of fluid inclusions in crystals from gem

pockets. The development of pockets in tourmaline-rich, rare-element pegmatites occurs during the latter stage of formation at temperatures between approximately 475° and 425°C and between 2800 and 2400 bars pressure. This range of temperature and pressure conditions is comparable to that of late-stage crystallization in geochemically similar, massive (nonmiarolitic) rare-element pegmatites. Whether or not gem pockets form during crystallization seems to depend largely on the timing of tourmaline crystallization. Crystallization of tourmaline at some point during pegmatite formation removes both alkali elements (sodium, lithium) and boron from the residual pegmatite melt. It is suggested that the removal of these components within the crystallized tourmaline has a profound influence on subsequent mineral formation within the pegmatite. Tourmaline formation is rapidly followed by the deposition of other alkali aluminosilicate minerals (e.g., albite) and the release of large volumes of water from the residual pegmatite silicate melt. Exsolution of water from the melt in the form of an aqueous fluid phase then contributes to the formation of miarolitic pockets and their mineral contents during the late stages of pegmatite genesis. This model of pocket formation is discussed in relation to the famous gem pegmatites of Afghanistan and of San Diego County, California, as

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 abstractor and in no way reflect the position of Gems & Gemology or GIA.

©1987 Gemological Institute of America

well as the large, nonmiarolitic, massive, rare-element Tanco pegmatite in Manitoba, Canada. JES

Jadeite-kosmochlor solid solution and chromian sodic amphiboles in jadeites and associated rocks from Tawmaw (Burma). C. Mével and J.-R. Kiénast, *Bulletin de Minéralogie*, Vol. 109, 1986, pp. 617–632.

This article presents mineralogic data and chemical analyses on the unusual and visually striking chromian pyroxenes and amphiboles from the jade deposits of Tawmaw, Burma. These deposits are world famous for their production of high-quality jadeite.

Most of the jadeite is whitish, grayish, or greenish, but some pieces contain small bright green spots. Detailed study of these pieces reveals that these spots contain not only minor chromite, but also pyroxenes and amphiboles with the highest chromium concentrations ever found in terrestrial rocks. Among the pyroxene minerals described is kosmochlor, which is the chromium equivalent of jadeite, containing up to 30% Cr_2O_3 . There exists a wide range of solid solution between kosmochlor and jadeite, but also a miscibility gap of 25%–50% kosmochlor component at temperatures of several hundred degrees Celsius and pressures of 10 kbars. Unusual amphiboles with up to 10% Cr_2O_3 include katophorite, glaucophane, and eckermannite. The exceptional compositions of these minerals result from their formation in a particular chemical environment caused by metasomatic reaction (during metamorphism) between an albitite dike containing chromite xenocrysts and the enclosing serpentinites. JES

Notes on fluid inclusions of vanadiferous zoisite (tanzanite) and green grossular in Merelani area, Northern Tanzania. E. Malisa, K. Kinnunen, and T. Koljonen, *Bulletin of the Geological Society of Finland*, Vol. 58, No. 2, 1986, pp. 53–58.

The authors describe the properties of tanzanite, the gem-quality vanadium-bearing variety of zoisite, from the Merelani area of Tanzania. Crystals of tanzanite occur mainly in boudinaged pegmatitic veins and hydrothermally altered graphite-bearing diopside gneiss. Associated minerals include quartz, diopside, graphite, calcite, hematite, and sphene, as well as green vanadian grossular garnet. The authors also report compositional data for tanzanite. The material has refractive indices of 1.693, 1.694, and 1.702, and a specific gravity of 3.35. Tanzanite has a striking pleochroism, with red-violet, deep blue, and yellow-green.

Two apparent generations of tanzanite are found at this locality—an older brown type and a younger type that is blue. The brown-to-blue color change brought about by heat treatment is attributed to changes in the valence state of vanadium. The inclusions in tanzanite

are described in detail. Studies of these inclusions suggest that the tanzanites crystallized from a hydrocarbon-rich fluid. Solid inclusions noted in tanzanite include calcite, gypsum, graphite, rutile, sphene, xenotime, quartz, diopside, and tremolite-actinolite. Some of these minerals occur as acicular needles which could impart a cat's-eye effect to some tanzanites. JES

Red and pink tourmaline. C. R. Marcusson, *Jewelers Quarterly*, Fourth Quarter, 1986, pp. 24–27, and 30.

The use of tourmaline in jewelry dates back as far as 1000 A.D. to a Nordic ring set with a red tourmaline cabochon. Another historic tourmaline is the 250-ct red egg-shaped cabochon, dated to the 1500s, that was bestowed as a gift to Kaiser Rudolf II. In 1925, the famous Russian mineralogist Alexander Fersman proved that this gem, originally thought to be ruby, was actually Burmese red tourmaline; it is now located in the Kremlin Treasure Room.

Tourmaline often occurs in spectacular crystals which are highly prized by collectors. Smaller crystals mounted as simple pendants are popular with crystal healers as well as the general public. It is thought by some that wearing tourmaline crystals increases one's charisma. Pink tourmaline in particular is said to be associated with joyfulness, vivacity, and the release of emotional pain.

Tourmaline is generally found in pegmatite dikes, probably the most prolific of the gem-bearing rock types. Marcusson gives an excellent, brief description of how crystals form within a pegmatite body.

Tourmaline rarely occurs in a true red. Usually it is pinkish in hue and often modified by orange or brown. The causes of color in tourmaline are very complex. Generally, pink and red tourmaline are colored by manganese and iron combined with exposure to low-level radiation emitted by other minerals associated with pegmatites. The higher the iron content, the less saturated the color tends to be.

Color enhancement has become more prevalent in recent years. Irradiation can produce dark pink and red stones from very pale material. In general, these colors are darker and less saturated than their natural counterparts. Large pink and red tourmalines rarely are free of inclusions, and the color of extremely clean large stones is often the result of laboratory irradiation. Thus far, treatment of tourmalines by this method is not detectable; consequently, with the greater amount of irradiated tourmaline on the market, the price of natural-color material has dropped.

The author also discusses major localities for red and pink tourmaline, including Brazil, Africa, Madagascar, Asia, and North America.

Marcusson has presented a well-rounded article that delivers interesting as well as useful information on

this beautiful gem. She concludes with some tips on the use of red and pink tourmaline in today's fashions.

Barton C. Curren

Sapphire aus Nigeria und von Sta. Terezinha de Goias, Brasilien (Sapphire from Nigeria and Santa Terezinha de Goias, Brazil). U. Henn, *Zeitschrift der Deutschen Gemmologischen Gesellschaft*, Vol. 35, No. 1/2, 1986, pp. 15–19.

Blue sapphire from Nigeria has appeared recently on the gem market. The locality is reportedly 50 km north of Jos in northern Nigeria. The sapphires are dark to inky, with strong color zoning. Fluid inclusions and two-phase inclusions, which are sometimes very elongated, have been observed, as well as idiomorphic apatite and rounded zircon.

Blue sapphire has also been found at Santa Terezinha de Goias, Brazil. The clarity seems poor, and the color is reported to be bluish gray, sometimes in a strong color zonation with dark blue. Muscovite and margarite inclusions oriented along the cleavage are prevalent in these stones; some fluid inclusions are also present.

EF

Stars and stripes forever. R. P. Rohrbach, *Lapidary Journal*, Vol. 40, No. 7, 1986, pp. 20–30.

When the term *phenomenal* is applied to gems, certain stones immediately come to mind: cat's-eye chrysoberyl, and star rubies and sapphires. Few lay people have ever heard of a star alexandrite or cat's-eye tsavorite.

Having collected and studied phenomenal stones for the past 20 years, Rohrbach laments the fact that standard reference books on gems pay little attention to all the other gemstones that have been found with these effects—and in an incredible diversity of colors. These include topaz, tourmaline, garnet, beryl, spinel, and obsidian, among others. He explains what causes chatoyancy and the cat's-eye effect, describes how such stones are formed, and gives tips on orientation during cutting. There is also an insert describing a jewelry designer's use of asteriated rose quartz and blue cat's-eye tourmaline in her designs. This article has valuable information for students of gemology and the jewelry arts.

Anne Riswold

DIAMONDS

Argyle—A year on. *Diamond World Review*, No. 39, Summer 1986, pp. 48–49.

The 1986 production of the AK1 pipe at the Argyle mine, in Western Australia, is expected to reach 28 million carats, three million more than the original estimate. Argyle is now the world's largest diamond mine, accounting for 8% of the annual world production of rough. The AK1 pipe yields about 6.8 ct of diamonds per ton of ore, which is five or six times higher than the

world average. This high tenor ensures the mine's continued profitability in spite of the relatively low price obtained for the bulk of its rough (about \$8 per carat).

The Argyle joint venture has agreed to sell 75% of its production to De Beers. Because of the relatively low price of Australian rough, sales to the Central Selling Organization are expected to be less than \$200 million annually. Since this represents only 10% of its total sales, the C.S.O. should have no trouble absorbing the diamond production of Argyle.

Considerable attention was generated by the establishment of Argyle Diamond Sales, an independent cutting and polished marketing operation, in Perth. Reports suggest that it was established as part of an agreement with the local state government and is not really intended to make inroads into the polished market. However, some Australians feel that their country is losing potential export revenue by selling uncut stones. Efforts are being made by various groups to expand the local jewelry industry in order to take better advantage of Australia's abundant gemstones and gold.

Barton C. Curren

GEM LOCALITIES

Kunzite from the Haapaluoma pegmatite quarry, western Finland. S. I. Lahti and R. Saikkonen, *Bulletin of the Geological Society of Finland*, Vol. 58, No. 2, 1986, pp. 47–52.

Small amounts of kunzite occur with common spodumene at the Haapaluoma pegmatite quarry near Pera-seinajoki, western Finland. This is the first reported occurrence of gem-quality spodumene in Finland. The typical zoned lithium-rich pegmatite is emplaced in granodioritic country rocks. Small transparent crystals of morganite and red tourmaline are also found at this locality.

The authors studied one 7-cm-long purple crystal in detail. The kunzite has refractive indices of 1.660, 1.665, and 1.679; a specific gravity of 3.19; and shows a weak orange fluorescence to both long- and short-wave ultraviolet radiation. Additional mineralogic data are presented, as is a discussion of mineral paragenesis in this pegmatite.

JES

INSTRUMENTS AND TECHNIQUES

Application de la résonance magnétique nucléaire à l'étude des gemmes (Application of nuclear magnetic resonance to the study of gems). I. Mallez, J.-M. Dereppe, C. Moreaux, *Revue de Gemmologie a.f.g.*, No. 88, 1986, pp. 7–8.

Nuclear magnetic resonance (NMR) is a nondestructive and potentially quantitative method of observing light elements (e.g., hydrogen, boron, beryllium, lithium,

sodium) in gemstones. However, it cannot be applied to trace elements. The characteristics of the signals emitted by different elements vary from stone to stone, and so can be used to establish the identity of a particular gem. NMR can also help in separating natural from synthetic gemstones; the example of emeralds is discussed. EF

JEWELRY ARTS

Guilloche—engine turning. J. Wolters, *Aurum*, No. 27, 1986, pp. 40–56.

Guilloche, or engine turning, is defined as “the engraving, by means of a machine, of precise, regular patterns and ornamentation consisting of straight or curved lines.” This technique has been practiced since the 16th century, initially only on soft, easily carved materials such as ivory, wood, horn, coconut, and some soft stones. Engine turning on metal began to appear in the late 18th century, when it was applied to a variety of objects including snuff boxes, watchcases, and lockets. In the 19th century, Carl Fabergé coupled *guilloche* with transparent colored enamels, achieving a pinnacle of perfection for the art.

This extensive article, by the director of the Pforzheim Goldsmiths School, gives the history of *guilloche* with descriptions of the machinery involved and the different types of ornamentation that can be produced. Well researched and concisely written, the article is handsomely embellished with 53 photos and plates; even the figure legends are very informative.

EBM

Mokume-gane. S. D. Kretchmer, *Aurum*, No. 25, Spring 1986, pp. 24–33.

The goldsmith's art of *mokume-gane* (“wood-grain metal”) is re-emerging after centuries of neglect. The textured, patterned metals are the progeny of sword-making techniques developed in medieval Damascus, where iron and steel were folded and forged to form a strong, tensile laminate. Nonferrous *mokume-gane* originated in Japan about 300 years ago utilizing gold, silver, copper, and *shakudo*, a gold-copper alloy.

Today's gold *mokume-gane* is formed using the traditional Japanese techniques of material removal and subsequent forging, rolling, forming, or twisting of the laminated layers. The metals are further contrasted by chemical patination, which makes the piece appear “as though a trail of small black ants had trekked over it while it was still soft.”

Kretchmer has experimented with both soldering and bonding his own laminates (for details of the author's techniques, see the Spring 1983 issue of *Metal-smith*). Since soldering limits the quality and workability of the material, he bolts billets of 18K gold and *kuromido* (99% copper, 1% arsenic) together and heats them in a reducing atmosphere to 40°–50°C below the

lowest melting point of the metals in the stack. Preformed laminates of different-colored carat gold in stripes and patterns are now available commercially, primarily from Japanese manufacturers.

Pattern development with this technique seems almost limitless, including stripes, whorls, checks, and microscopic chevrons. Kretchmer has also engraved layered billets to create exotic, multicolored panoramas.

This technique is a costly one, however, since a great deal of noble metal must often be removed in order to create a pattern, and must then be refined before it can be reused. Despite the labor and the cost, *mokume-gane* is alluring to the eye and hand, a fusion of the legendary past and a fantastic future. SAT

JEWELRY RETAILING

Display—setting the stage for jewelry sales. S. S. Jensen, *Modern Jeweler*, Vol. 85, No. 11, 1986, pp. 54–57.

Jensen offers advice on jewelry display compiled from interviews with 13 presentation and packaging companies located around the U.S. The article's premise, as voiced by Margaret Furman of Visual Dynamics in San Francisco, is that the store should be viewed as a theater stage, artfully designed to set the mood for the audience (the customers) and enhance the jewels at center front.

With this premise in mind, the jeweler should lavish special attention on store windows, which can entice a new generation of shoppers who are already attuned to visually stimulating displays. Today's windows are uncluttered, skillfully lighted, and changed as often as every two weeks. Clever seasonal or story themes are very effective in window displays, and should be carried through to the inside of the store. Props need not be expensive, and can substantially add to the romance of the jewels. Neutral colors, such as soft grays and pastels, make versatile display backdrops, especially given the present popularity of colored stones.

Accompanied by many photos of professional jewelry displays, this article provides practical, proven advice on jewelry display. SAT

A jeweler's guide to female complexion. J. S. Philby, *Modern Jeweler*, Vol. 85, No. 9, 1986, pp. 48–57.

The third in a series of articles on female hands, face, and complexion, this article suggests that jewelers take advantage of the art of color consulting to match jewelry to a woman's face and hands. Color consulting involves categorizing a woman into one of the four seasons on the basis of her complexion, hair, and eye color. The author explains how to determine a woman's season and how to use the color palette within that season to coordinate her jewelry. Outlines are given to help jewelers identify stone preferences for each appropriate season.

Judi Fiotti

Men's jewelry—tradition and quality sells. S. Mitchell, *American Jewelry Manufacturer*, Vol. 34, No. 12, 1986, pp. 32–36.

AJM investigates the market for men's jewelry through queries of fashion editors, menswear designers, and shirt and jewelry manufacturers.

Now that American men are spending more on vanity items such as skin care products, fragrances and face lifts, can we assume the same will hold true for jewelry?

The consensus is guarded but hopeful. The emphasis in men's jewelry must be on function, quality, and classic styling. Watches are the number one jewelry item bought for and by men. Tie pins, tie bars, cuff links, stud sets, key rings, money clips, signet rings, luggage tags—all these can appeal to even the most conservative men. Gold chains are *passé* and forget about earrings, as those men so inclined can always buy from the far greater selection of women's earrings. Given that women buy 50% to 70% of men's jewelry and that sterling is hot in women's jewelry, it stands to reason that sterling must be seriously considered.

Anne Riswold

New: JVC's action of the month. *Jewelers' Circular-Keystone*, Vol. 157, No. 9, 1986, pp. 40–51.

The Jewelers Vigilance Committee is taking a strong stance by publishing each month the details of a legal action taken against a member of the trade who has failed to follow honest business practices. Executive vice-president of the JVC, Joel Windman, hopes that publicizing an "action of the month" will help keep the jewelry industry "more alert and more informed" about malpractices in the trade and the function the JVC performs in curbing these malpractices. Windman also stresses the responsibility of retail jewelers to stay informed gemologically so that they can check gems and hallmarks on incoming goods, and not have a "blind reliance" on what they are given or told.

This month's publicized action, prompted by written complaints from dissatisfied parties, exposes a misleading advertising campaign to promote diamond sales. It is hoped that publication of this and future actions will focus the trade's attention on how well the JVC has been performing the task of jewelry industry watchdog for the last 75 years.

EBM

SYNTHETICS AND SIMULANTS

Is diamond the new wonder material? A. L. Robinson, *Science*, Vol. 234, No. 4780, 1986, pp. 1074–1076.

The laboratory synthesis of polycrystalline diamond films on semiconductor metal or polymer substrates has been successfully achieved by Russian, Japanese, and American researchers during the last few years. Because of the exceptional physical properties of diamond, should this process become economical for industrial

applications, it would open the door to tremendous advances in cutting tools, optics, and electronics.

The two published manufacturing procedures have the same basis: An organic molecule is dissociated, via a high-energy or catalytic process, and the carbon is deposited as diamond on the substrate. However, the growth process itself is not yet understood. Growth rates range from 1 to 10 μm per hour, and continuous films of more than 1 mm thick have been reported. Although millions of dollars have been invested in this research, some key steps in certain applications are still missing. The author emphasizes that while all the possibilities still appear to be viable, there are "numerous tasks yet to be mastered before potential applications can be actualized."

EF

Différenciation entre les gemmes naturelles et les matériaux synthétiques par microspectrométrie Raman à laser (Separation of natural gems from synthetic materials by laser Raman microspectrometry). M.-L. Dele-dubois, J.-P. Poirot, H.-J. Schubnel, *Revue de Gemmologie a.f.g.*, No. 88, 1986, pp. 13–14.

Raman spectroscopy is a nondestructive method that identifies molecules and polyatomic structures on the basis of their vibration spectra. The Raman microprobe makes the identification of inclusions in gemstones possible with some restrictions: Neither the inclusion nor the host crystal should be too opaque or fluorescent, and the inclusion should be large enough (at least 1 μm) and close enough to the surface of the gem to give a signal that can be differentiated from that of the matrix. Examples are given of inclusions in natural stones that have been identified by this means.

This article (which was originally published in English in the *Journal of Molecular Structure*), is followed by a separate piece that discusses how to identify inclusions in synthetic rubies and emeralds by means of Raman spectroscopy.

EF

TREATMENTS

Farbung und Bestrahlungsschaden in elektronenbestrahlten blauen Topasen (Coloration and irradiation damage in electron irradiated blue topaz). K. Schmetzer, *Zeitschrift der Deutschen Gemmologischen Gesellschaft*, Vol. 35, No. 1/2, 1986, pp. 27–38.

Nigerian topaz that is electron irradiated and then heated to produce a blue color is investigated and compared with blue topaz colored by other treatment methods (gamma ray and neutron irradiation) as well as with natural blue stones from Brazil, Nigeria, and Zimbabwe. The polarized optical absorption spectra of the Nigerian material reveal three strongly polarized absorptions bands, caused by two "X-centers" and one "Y-center." The relative intensity of the bands may vary

according to the type of treatment used; however, no distinctive feature between natural and treated blue topaz can be ascertained. Unfortunately, Dr. Schmetzer discusses spectroscopic results without showing any related spectra.

The electron-irradiated samples exhibit cracks and parting planes parallel to the cleavage plane, as well as a zoned structure: a light blue outer shell, an intermediate zone with a high concentration of macroscopic defects, and a colorless core. This shell-like structure is attributed to the temperature gradient caused by the water used to cool the crystals during irradiation. A patchy dark blue-violet color is sometimes superimposed on the light blue outer shell, and is thought to be related to trace elements because of its patchy pattern. EF

Glass fillings in sapphire. K. Scarratt, R. R. Harding, and V. K. Din, *Journal of Gemmology*, Vol. 20, No. 4, 1986, pp. 203–207.

The recent occurrence of glass-filled surface cavities in natural rubies has been well documented in the gemological literature. In this article, the authors analyze the glass filling of a surface cavity in a faceted sapphire, and attempt to establish the origin of such glass fillings. They postulate that they may be (1) a volcanic glass, (2) a man-made glass, or (3) the result of the melting of natural inclusions.

The authors conclude that the glass fillings in rubies and sapphires represent a range of compositions, some of which could be natural. It is unlikely, however, that any of the glass inclusions reported thus far are natural volcanic glass. In the sapphire studied, the glass filling was man-made.

The article is well written, and contains a nice list of references on related topics. David C. LeRose

MISCELLANEOUS

Evaluation/decision process for small-scale placer gold mining. M. J. Richardson, *Mining Magazine*, Vol. 154, No. 4, 1986, pp. 312–317, 319, and 321.

Richardson analyzes the process of evaluating small-scale placer gold mining operations. Sampling, feasibility, and equipment selection are among the topics discussed.

Most small-scale placer gold mines fail because of the lack of competent evaluation prior to the purchase of equipment and the commitment to mine the property. First the presence of gold in quantities that will allow profitable mining must be established. Next the overall size and type of deposit must be evaluated. Only then should the miner determine which process he will use to recover the gold and the equipment he will need. Equipment selection is discussed in detail.

The author also discusses specific operations such as excavation and personnel. A backhoe augmented with a bulldozer and/or front-end loader is the most efficient

piece of equipment for excavation. In the search for personnel, Richardson stresses the importance of finding people who have experience in successful small-scale placer gold mining.

Finally, the author presents four questions for prospective miners. If he answers them accurately and honestly, the miner can significantly reduce the risk of his gold mining venture. Barton C. Curren

A former-king's ransom. B. Hillier, *Los Angeles Times Magazine*, February 22, 1987, pp. 30–31.

This article, which appeared in a magazine with a circulation of well over a million, proves that the April 1987 auction of the Duchess of Windsor's jewelry—by the renowned London auction house Sotheby's—captured the interest of not only the gemological community but also the popular press. Although brief, the article does serve up a few details about the actual pieces being auctioned, even if it dwells primarily on romantic anecdotes surrounding the famous courtship between King Edward VIII and Wallis Warfield Simpson, the American divorcee he married in 1936 at the expense of his throne. On April 2 and 3, 1987, almost a year after the death of the Duchess, Sotheby's auctioned a jewelry collection that included some 87 pieces by Cartier, the Windsors' "court jeweler," and 23 pieces by Van Cleef & Arpels. The author singles out the Duchess's engagement ring—"a large emerald mounted in gold with small diamonds on the shoulders"—as an item of particular interest. Also described and illustrated are a charm bracelet hung with nine jewel-studded gold crosses and a group of Cartier "great cat" jewels—bracelets in the form of panthers and tigers. The author also cites the royals' penchant for engraving personal messages on the jewelry, including some in facsimile of Edward's handwriting and others that are actually clever puns. The author notes that one of the "most touching mementos of the royal couple" is a diamond-studded gold medallion memorializing their cairn terrier, nicknamed "Mr. Loo." This is certain to be one of many popular articles dealing with the well-publicized Windsor auction. JMB

40 years in the hot seat—Dick Frankovich retires. *American Jewelry Manufacturer*, Vol. 34, No. 105, 1986, pp. 28–34, 36, 38–40, 42, 44, 46–47, 50.

This extensive interview with George R. (Dick) Frankovich, recently retired vice-president and executive director of the Manufacturing Jewelers and Silversmiths Association, reveals the development of the association from a small regional group of 200 members to a major national organization.

Frankovich originally joined the group in 1946 as an industrial engineer. He used his expertise in this area to help the jewelry industry convert from war-time production of items such as buttons, buckles, and bullets to the peace-time manufacture of jewelry.

In just two years, Frankovich became head of the

association. He was responsible for the creation of *American Jewelry Manufacturer*, a technical publication designed to reach thousands of nonmembers with the MJ&SA message. In time, it became a strong tool for promoting growth for the organization. During the 1950s, MJ&SA gained a stronghold in Washington, resulting in the passage of legislation beneficial to the industry. One major victory in Washington was the lifting of an excise tax that had been placed on luxuries during the war. Although they only managed to reduce the tax by half (from 20% to 10%), it was an important step for the entire jewelry industry.

MJ&SA has also addressed such issues as free trade, the dropping of tariffs and how it would affect the U.S. industry, the purchasing and pricing of gold after the Treasury closed the door on gold in 1968, as well as the issue of correct gold refinement. The organization has also been extremely influential in the marking and stamping of gold, and headed the action for "plumb gold" in the 1970s.

The organizations with which the MJ&SA has been closely associated, such as the Jewelers of America, and the accomplishments in which they have jointly succeeded are also brought into the interview. The article ends on a note about the future of the organization: Matthew Runci is Dick Frankovich's successor at MJ&SA. The idea of new leadership seems exciting, but Dick Frankovich is definitely a tough act to follow.

Mary Hanns

The Homestake—America's greatest gold mine. J. C. Zeitner, *Lapidary Journal*, Vol. 40, No. 8, 1986, pp. 48–52.

Rumors of gold in the Black Hills of South Dakota started as early as 1833, and in 1863 the G. T. Lee party actually did mine some gold. But because the area was so isolated and the Sioux Indians were at war much of the time, development did not start until 1874, when a party led by General George C. Custer discovered gold on French Creek. After this discovery, little could stop ambitious prospectors.

In February 1876, a party of prospectors led by Moses and Fred Manuel filed lode claims in Bobtail Gulch. That spring, they began work at the open-cut mine they called the Homestake. The mine grew quickly and more claims were filed. Gold camps began to spring up, including the present-day towns of Lead (pronounced *lead*) and Deadwood. The camps grew quickly and attracted many soldiers of fortune, resulting in a rash of gunfights, train and stage robberies, and hangings.

Meanwhile, the Manuels and their partners eventually sold the expanded Homestake mine (then 4½ acres) to Senator George Hearst of California for \$70,000. Hearst and his partners continued to develop the mine and expand to adjacent properties, until their best claims formed a strip 1½ miles long and ½ mile wide. By the late 1800s, 1,500 people were employed by Homestake.

The growing mine suffered many problems. Water was either scarce or overly abundant, cave-ins were frequent, and fires wreaked havoc. Still the mine continued to produce.

The ore body of the Lead-Deadwood area is Precambrian and consists of six major formations. The bottom of the ore body has still not been reached, although the mine is now 8,000 ft. deep. During its 100 years of existence, the Homestake mine milled 115,491,582 tons of ore to produce 31,510,612 oz. of gold and 7,285,784 oz. of silver. Currently, exploration continues more than 1½ miles beneath the surface.

Homestake Mining Company now has mining interests in several states as well as in Canada, Australia, Peru, and the Philippines. It has also diversified outside of the mining industry.

Zeitner has presented a fascinating article on the colorful history of America's greatest gold mine, which has been in continuous operation longer than any other gold mine in the world.

Barton C. Curren

Treasure houses of the world. P. Bancroft, *Lapidary Journal*, Vol. 40, No. 5, 1986, pp. 21–26.

Subtitled "A traveler's guide to outstanding mineralogical museums abroad," Dr. Bancroft considers the merits of seven museums, four in Western Europe, two in Australia, and one in New Zealand. For each, he gives a brief historical overview and describes the main emphasis of the collection.

Nine color pictures depict specimens in the collections as well as interior shots of the exhibits.

Patricia Gray

Utilisation gemmologique des minéraux des timbres Français (Gemological use of the minerals from the French stamps). J.-P. Poirot, *Monde et Minéraux*, No. 75, 1986, pp. 28–36.

The French government recently issued four postage stamps featuring quartz, calcite, fluorite, and marcasite, and Poirot took the opportunity to describe the gemological use of these four minerals. Poirot, a specialist in gem history, describes in detail the origins of quartz lore, and relates the history of quartz carving. The use of quartz to substitute for other gemstones or in doublets dates from antiquity, and now treatment (especially irradiation) is quite common. Poirot emphasizes that quartz is presently making a come-back in fine jewelry. Calcite is briefly discussed, mainly for its polarizing properties. Fluorite is primarily used for decorative purposes, although cut green fluorites are very much sought after. Poirot insists that what is commonly called marcasite in jewelry is, in fact, pyrite, and that the mineral marcasite has never been cut as a gem. The misnomer arose from the French name *marcassin*, which has been applied by miners to describe both sulfides.

EF