GEMOLOGICAL ABSTRACTS

Dona M. Dirlam, Editor

COLORED STONES AND ORGANIC MATERIALS

Alexandrite-chrysoberyl from Zimbabwe. G. Brown and S. M. B. Kelly, *Australian Gemmologist,* Vol. 15, No. 8, 1984, pp. 275–278.

The results of the examination of one crystal cluster and one poorly faceted specimen of alexandrite chrysoberyl from the Fort Victoria district of Zimbabwe are summarized in this Australian Gemmology Study Club report. The authors speculate that the material could have come from the Novello alexandrite deposit, located 18 km northwest of the town of Fort Victoria, and provide a summary description of the deposit. Gemological properties of the faceted specimen were determined to be as follows: color—dark green (daylight), dark red (incandescent light); Mohs hardness—8 to 9; cleavage—none detected; fracture—conchoidal; S.G.—3.8; R.I.—α = 1.749, β = 1.752, γ = 1.758; birefringence—0.009; optic character—B+; luster—vitreous; diaphaneity—transparent to translucent; pleochroism—apricot, yellowish green and blue-green; Chelsea filter reaction—bright red; UV fluorescence—LW red, SW inert; absorption spectrum—Cr lines at 680, 665, 655, 650 nm; phenomenon—alexandrite effect of moderate intensity. Magnification revealed strong, straight-line color zoning (banding?) in blue, yellow, and red hues. Some of the inclusions observed are randomly oriented syngenetic two-phase inclusions in feather- or veil-like patterns, two-phase dagger-like inclusions and two-phase tubular inclusions oriented parallel to the c-axis, and irregular masses of iridescent flakes (possibly phlogopite mica).

The six illustrations that accompany this report include five photomicrographs. *RCK*

Australia's first emeralds. G. Brown, *Journal of Gemmology,* Vol. 19, No. 4, 1984, pp. 320–335.

Finally, a gemological study has been produced on the historically important Emerald Mine of Australia. In 1890, an amateur mineralogist discovered beryls of sufficient color to be called emeralds. This emerald-bearing

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lode in northern New South Wales is reportedly a quartz-topaz-feldspar-mica "pegmatite" in which the emeralds occur as "bunches" firmly embedded in flattened cavities. On the basis of spectrographic analyses performed in 1971 on an unreported number of samples, Brown attributes the color of this material to the 1,000 ppm of vanadium, and possibly also to the 450 ppm of copper, present. A chromium content of 350 ppm is, at one point in the article, denied a role in the color of these emeralds while, in the conclusion, is acknowledged as a "possible chromophore." No iron was detected. No explanation is provided for these conclusions about the causes of color in these emeralds, which is especially surprising in light of the unusually significant role attributed here to copper.

Average gemological properties are reported for these emeralds, which do not depart in any way from the usual properties for emeralds, unless the absence of chromium lines is considered significant. Nonetheless, Brown concludes that "to classify this beryl as an emerald would seem correct; in spite of its 350 ppm chromium content." This is considered low for emerald and, in fact, for proponents of the chromium-based definition of emerald, would disqualify it as an emerald altogether. Brown, however, provides no comment on his potentially controversial conclusion.

The summary of the history of this emerald locality and the descriptions of inclusions are interesting and informative. The discussion of color and chemistry, however, is somewhat confusing. While the author promises "ultimate confirmation by subsequent analytical results," it is unfortunate that more precise spectral and chemical data were not included at this time. On the other hand, the article is exceptionally well illustrated, with photomicrographs of inclusions and photos of the locality itself. *Philip G. Yurkiewicz/CMS*

Chromdravite—a new mineral from Karelia. Y. V. Rumyantseva, *International Geology Review,* Vol. 25, No. 8, 1983, pp. 989–992.

A tourmaline recently found in the Onezhskiy Depression, Central Karelia, USSR, represents a new species in the tourmaline group and has been named chromdravite. It occurs in micaceous, metasomatic clay-carbonate rocks in association with quartz, dolomite, and several micas. Here it forms small needles or pyramidal crystals up to 0.1 mm that are dark green to nearly black. These crystals are uniaxial negative, pleochroic, and have measured refractive indices of ϵ=1.722 (5) (yellow green) and ω=1.778 (5) (dark green). The measured density is 3.40 (1) g/cm^3. The absorption spectrum is characterized by a band centered at 600 nm. Computer refinement of the X-ray diffraction data yielded the following unit-cell dimensions: a=16.11, c =7.27 Å. The crystals contain the highest known chromium content of any tourmaline: up to 31.6 wt % Cr_2O_3, or 78 mole % of the theoretical chromdravite end member whose ideal chemical formula is $NaMg_3Cr_6(BO_3)_3Si_6O_{18}(OH)_4$ (with 40.79 wt.% Cr_2O_3). Tourmalines with even greater chromium content would have higher refractive indices and densities. The article gives no indication that any of this material has yet been encountered in jewelry or has been found in crystals large enough for faceting. *JES*

Chromium-bearing kyanite from Mozambique. A. M. R. Neiva, *Mineralogical Magazine,* Vol. 48, 1984, pp. 563–564.

A chromium-bearing kyanite occurs as blue crystals in a pegmatite at Serra do Menucué in Mozambique. These crystals can reach 30 × 5 × 3 mm in size, and are found associated with muscovite, biotite, and andesine. The mineral has refractive indices of α=1.720, β=1.730, γ=1.753 (±0.002). Its specific gravity is 3.70. In microscope thin section, it is pleochroic from light blue to colorless and is observed to contain numerous inclusions of rutile. Unit-cell dimensions of the kyanite are also given. The physical properties and unit-cell dimensions of the crystals from Menucué differ slightly from those of other kyanites due to their unusual chemical composition. Chemical analysis shows the blue kyanite to contain Cr, Ti, and Fe as important minor constituents, and also trace amounts of V, Ba, Pb, Ge, Ga, Zr, Zn, and Sc. There is some uncertainty as to the cause of the blue color in kyanite, but in this instance the color is attributed to the presence of Ti. No indication is given of the amount of this blue kyanite available or whether it is of faceting quality. *JES*

Coesite and pure pyrope in high-grade blueschists of the Western Alps: a first record and some consequences. C. Chopin, *Contributions to Mineralogy and Petrology,* Vol. 86, No. 1, 1984, pp. 107–118.

In the Western Alps of northern Italy, an unusual geologic assemblage has yielded a mineral previously known only in synthetic form: virtually pure pyrope garnet. The colorless material occurs in crystals up to 25 mm in diameter that are largely fragmentary and are composed of 90%–98% of the pyrope end member ($Mg_3Al_2Si_3O_{12}$), the remainder being almandine and some grossular. The larger crystals contain lesser amounts of pyrope. Previous to this discovery, pyropes barely exceeded 80% of the Mg end member and invariably included significant amounts of chromium, which acted as a coloring agent. The nearly pure pyropes reported in this article contain no detectable chromium and, in the absence of any other chromogens, are colorless.

The article describes in depth the geologic occurrence of these new garnets, as well as their inclusions, which consist mainly of kyanite, rutile, and coesite that has partially altered to quartz. Chemical analyses of the garnets and the components of their matrix are reported, and phase relations are discussed in order to deduce the petrogenesis of this unusual mineral assemblage.

Other than information on inclusions and chemical composition, no data of use to the gemologist for identification of this new type of garnet are included in the article. As yet, this material has not been found in sizes that would cut as gems, and the locality is extremely difficult to reach. However, gem crystals may yet be located, so the gemologist should be aware that such material exists. Samples of this pyrope have been distributed to scientists worldwide, so more data will undoubtedly appear soon in the mineralogic and gemological literature. *CMS*

Ein neuer Edelstein aus der Feldspat-Familie (A new gemstone from the feldspar group). C. R. Bridges, G. Graziani, and E. Gübelin, *Zeitschrift der Deutschen Gemmologischen Gesellschaft,* Vol. 33, No. 3/4, 1984, pp. 104–113.

East Africa, particularly Kenya and Tanzania, is a leading source for many fine and rare gemstones today. The authors describe a new gem feldspar, of light green to light blue color, from Kioo Hill in Kenya. The chemical analysis of the new feldspar shows it to be a low temperature albite with peristerite structure. The physical data include refractive indices of α=1.535 ±0.002; γ=1.539 ± 0.004, with a birefringence of 0.008; 2V=90°. These data confirm that the new find is of the albite end of the mixed crystal series. The pegmatite also contains blue disthene (kyanite), quartz, tourmaline (schorl), and vermiculite (a dark mica) in addition to the gem feldspar. *MG*

Estudio colorimétrico de las variedades verdes del berilo—esmeralda (Colorimetric study of the green varieties of beryl—emerald). R. Möller Durán, *Gemología,* Vol. 17, No. 55–56, 1982, pp. 3–56; Vol. 18, No. 57–58, 1983, pp. 3–53; Vol. 19, No. 59–60, 1983, pp. 5–38.

The author addresses emerald far more comprehensively than the title would suggest. He surveys the lore, etymology, geology, and lapidary of the stone, as well as its gemology. There are detailed discussions of light and color theory, color perception, and optical physiology.

To establish criteria for the color-quality grading of emeralds, Mr. Durán examined 342 available crystal specimens from sources around the world. He selected 43 to become models for master stones. These were cut—wherever possible, parallel to the c-axis—into 1-mm-thick laminae of parallel faces. Physical and optical properties were recorded, and inclusions were studied and reported in detail. The color coordinates were determined by spectral analysis, and chemical analysis was done by electron microprobe.

Conclusions are drawn with respect to color as a function of chemical composition and color as a function of thickness. For applied gemology (the certification of stones), Mr. Durán considers it important to place the hue into one of five quality levels, and to state the tone, hue, and saturation for the entire range of "greens" that beryl offers.

The article is replete with tables, diagrams, and drawings that relate the various properties under study to countries and mines of origin. *SLD*

Harts Range sunstone. G. Brown and H. Bracewell, *Australian Gemmologist,* Vol. 15, No. 8, 1984, pp. 263–274, 278.

This article reports on an investigation of "sunstone" feldspar from the Harts Range of the Northern Territory, Australia. Examination of this material yielded the following description of its macroscopic appearance: whitish to pale pink to deep reddish brown color, often modified by pearly subsurface lusters; no striations on major cleavage faces; aventurescent interference colors often observed being reflected from included metallic platelets. Examination of this feldspar with a microscope revealed inclusions of thin, reddish brown, translucent platelets, predominantly hexagonal and oriented in two planes at right angles to one another; cleavages, both incipient and healed, at approximately 90° to one another; partly healed internal fractures; two-phase negative crystals; and opaque, greenish brown crystals. Gemological properties include: hardness—6 to 6½; uneven fracture; S.G.—2.57; diaphaneity—translucent; luster—vitreous to pearly; R.I.—α=1.520, β=1.525, γ=1.527, spot reading = 1.52; birefringence—.007; optic character—B–; pleochroism—indistinct; no UV fluorescence or diagnostic absorption spectrum. Additional chemical and optical tests were performed in order to conclusively identify the type of feldspar involved. The authors conclude that this material is an untwinned aventurine microcline-microperthite feldspar.

The authors also address the often contradictory terminology used in characterizing sunstone and/or aventurine feldspars. Numerous excerpts from the gemological literature illustrate this point. Out of this discussion emerges the conclusion that the Harts Range material should be called aventurine feldspar, not sunstone. This is an important, well-illustrated article on the subject of phenomenal feldspars. *RCK*

In the land of the cultured pearl. E. Blauer, *Modern Jeweler,* Vol. 83, No. 9, 1984, pp. 43–50.

The author bases her article on her trip to Japan, the heart of the cultured pearl industry, where she visited numerous pearl farmers, processors, exporters, and jewelry designers. Blauer expands on some of her observations, most of which cover the culturing and processing of the round, or mother-of-pearl induced, cultured pearls which are all saltwater products. The correct water temperature and food supply support the cultivation of the Akoya mollusk, which is gathered for the nucleation process at the age of three years. Both before and after the mollusks are nucleated, their mortality rate is a constant concern; many die from such health hazards as parasites, seaweed entanglement, red tide, or even an abrupt change in water temperature. The pearls are rarely left in the mollusk through a third year because every year brings the risk of something killing the mollusk. Many of them are harvested within their first year of cultivation. Once the pearls are removed from the mollusk they are sorted, drilled, matched, processed, and strung. The processing generally consists of chemically treating the pearl to bleach, change, enhance, or stabilize the color.

There was an estimated 15%–20% price increase on pearl exports from Japan in 1984. Reportedly, however, not all of the exported pearls, specifically the freshwaters, were Japanese products. Many freshwater pearls are cultivated in China, pass through Japan where they are inspected, and leave bearing a tag stating that they are a "product of Japan." The Chinese product seems to be getting increasingly finer, since they are no longer easily distinguishable from the Japanese Biwas. Culturing activities in Japan, however, remain stronger than ever.

The author wound up her trip with visits to several jewelry showrooms where she viewed the Japanese concept of combining their pearls with metals to create some exquisite and sometimes prize-winning pieces of jewelry. *Mary Hanns*

Schleifwürdige blaue und grüne Berylle (Aquamarine und Smaragde) aus Nigeria (Gem-quality blue and green beryls (aquamarine and emerald) from Nigeria). Th. Lind, K. Schmetzer, and H. Bank, *Zeitschrift der Deutschen Gemmologischen Gesellschaft,* Vol. 33, No. 3/4, 1984, pp. 128–138.

Since early 1984, the authors have examined a number of blue and green beryls that are reported to be from a new occurrence. Inquiry into their origin led the authors to study in detail the occurrence, chemistry, physical properties, and microscopy of these beryls. The samples used ranged from intense blue or green to near colorless. The material is said to be of Nigerian origin, from the mining area near Jos. The colors are attributed to the varying concentrations of V, Cr, and Fe. The intense blue beryls contain significant Fe, while the green samples contain higher percentages of Cr and V. The refractive indices were determined as $\omega=1.570-1.574$ and $\epsilon=1.564-1.568$; specific gravity was found to be 2.66–2.68 g/cm^3. Spectroscopy revealed absorption curves typical of aquamarine (colored by Fe) and emerald (colored by Cr and V). Microscopic study of the new beryls from Nigeria revealed color zoning in many samples. Two types of two-phase inclusions were recognized: irregular "feathers" that occur mostly in the central portions of the crystals, and zig-zag cavities parallel to the prism faces of the crystal. *MG*

DIAMONDS

Genesis of diamond: a mantle saga. H. O. A. Meyer, *American Mineralogist,* Vol. 70, No. 3/4, 1985, pp. 344–355.

This article presents a model for the genesis of natural diamond based on the physical, chemical, and mineralogical properties of diamond. Optical studies suggest that individual diamond crystals have had a complex growth history in which growth may not always have been continuous. Evidence for the environment of diamond formation comes from chemical data on both trace elements and isotopes in diamonds as well as from examination of mineral inclusions. These data suggest that diamonds form at depths of approximately 180 km at temperatures from 900°–1300°C and pressures of 45–65 kbar. The data also reveal that the carbon present in diamond came from sources of differing isotopic composition. This variation in isotope content may have been produced by the inhomogeneity of carbon in the mantle, by the presence of recycled carbon brought in by subducted crystal rocks, or both. Diamond crystallization took place in any mantle material in which chemical interactions produced elemental carbon. Genetically related host rocks of diamond in the mantle can be broadly grouped into eclogitic and ultramafic (peridotitic) categories. It is likely that most diamonds formed in the Archean or Proterozoic Eras. Although diamond is commonly found in kimberlite and in lamproite at the earth's surface, these two rock types are not genetically related to diamond formation. Rather, they are the transport vehicles that brought diamond rapidly from mantle depths to the crust.

This is an article that all gemologists interested in diamond formation will want to read. *JES*

Indian kimberlites and the genesis of kimberlites. E. A. K. Middlemost and D. K. Paul, *Chemical Geology,* Vol. 47, 1984/85, pp. 249–260.

Kimberlites of Late Proterozoic age occur in both southern and central India. Those in the central region, near the town of Majhgawan, are the only ones being mined for diamonds at the present time. This article presents new chemical and mineralogic data on the constituent minerals in the kimberlites from both regions. These data and other studies indicate that there are many similarities in petrography and geochemistry between the Indian kimberlites and those of both southern Africa and Yakutia, USSR. Details of the mineralogy of the Indian kimberlites are described. The authors propose that a typical Indian kimberlite is the product of the mechanical mixing of a number of batches of kimberlitic magma.

Such magmas are thought to have originated from depths of 110 to 260 km. During their movement to the surface, they reacted and equilibrated with mineral phases in the upper mantle to produce their distinct mineralogic and geochemical features. Ideas on the petrogenesis of the kimberlite pipes in India are summarized. *JES*

The razzle-dazzle diamond market. G. Y. Dryansky. *Town & Country,* Vol. 139, No. 5059, 1985, pp. 127–128.

As a segment of a larger article entitled "Europe's Colorful Crossroads: the Special Delights and Discoveries of Belgium and Holland," this serves as a general overview of the diamond industry in Antwerp and Amsterdam. It reads like the script for a tour guide, with a bit of history, a bit of business, and a few insiders' insights into the diamond trade to pique the interest of the general public. The author may be excused the few inaccuracies that exist in this segment (example: GIA hasn't had a Diamond Grading Laboratory in Santa Monica since 1982) as, overall, the piece is meant simply to titillate the reader by giving him basic insight into the workings of a complex and highly specialized industry. *EBM*

Solid grounds for higher output. J. Roux, *Jewellery News Asia,* No. 9, 1985, pp. 30–31, 34–35.

As the retired manager of technical information for De Beers Central Selling Organization, author Johnny Roux uses his expertise and insight to interpret annual diamond production figures. Roux discusses, outlines, and then summarizes the world production of diamonds, bringing to light particular aspects that help give more meaning to the mass of figures put out by the U.S. Bureau of Mines and the *British Mining Annual Review.* He points out that while overall figures show an increase of 10 million ct in 1983 over 1982 figures, many prominent mines had a decrease in production. The four Kimberley mines alone (De Beers, Dutoitspan, Bultfontein, and Wesselton) decreased by approximately 118,000 ct in 1983. On the other hand, changes in the crushing circuits at the Premier mine have increased its production by some 184,400 ct. Roux points out that De Beers's careful production regulation is "part of a plan to maintain the smooth flow of rough diamonds from which the clients of the CSO can produce saleable polished."

Roux also examines diamond production in other African republics, and then moves on to Australia, with the "expected" increase from 557,000 ct in 1982 to 6.2 million ct in 1983 mainly due to Argyle production. He also reviews the production in South America and Asia, as well as in the Communist Bloc (as with the USSR estimated by the U.S. Bureau of Mines to be producing approximately 11 million ct a year).

Danusia Niklewicz

Working of diamond with metal. A. P. Grigoriev and V. V. Kovalsky, *Indiaqua,* Vol. 39, No. 3, 1984, pp. 47–54.

Ten years ago the authors discovered a method by which diamond can be worked using metal foil heated in a hydrogen atmosphere at atmospheric pressures. They describe the process as rather simple: a piece of iron or nickel foil dissolves the diamond carbon at the point of contact. The carbon atoms diffuse through the foil, react with the adjacent hydrogen, and are removed as methane. Thus, the foil sinks uniformly into the diamond to form a smooth-walled hollow that corresponds to the shape of the foil. The temperatures required are 600° to 1200°C (well below the temperature at which graphitization begins).

Using this "thermo-chemical" technique, diamonds can be worked without regard to hardness directions at speeds that closely approximate those of mechanical methods in the softer directions. Many interesting applications, both gemological and industrial, are suggested. Macles (twin crystals) that previously would have been left for industrial uses can easily be shaped thermo-chemically into gems. For industry, unusual products such as diamond gears and diamonds with precise figure-shaped holes, previously unobtainable, are now possible. The renowned "Russian operation" for eye surgery is now performed using a thermo-chemically sharpened diamond knife.

Although the article contains ample illustrations of the technique's capabilities, too little is said of the thermo-chemical technique's current impact on the diamond industry. *Dave Thomas*

GEM LOCALITIES

The mystique of place: the battle over gemstone origin. D. Federman, *Modern Jeweler,* Vol. 84, No. 3,1985, pp. 22–28.

Taking a comprehensive approach, David Federman reviews today's attitudes toward the ongoing controversy about gemstone origin. In the past, naming the origin of a gemstone was relatively simple because there were so few major gemstone localities and their color differences were very distinct. Today, treatment to change or enhance color has made this task much more difficult. Concentrating on emerald, ruby, and sapphire, noted members of the trade discuss both sides of the issue by examining the real value of a locality designation, and whether or not it is too specialized a service for most dealers to perform. Most of the panel believed that these questions are very important to the trade. In fact, so few people have the experience necessary to accurately pinpoint a gemstone's origin that it might be recommended that jewelers "abandon selling on the basis of origin and sell geared to color pure and simple." But this has its drawbacks as well. To deny a ruby its justified "Burma" designation could ruin its romance and mystery, thus reducing sales appeal. Then again, to call a Sri Lanka sapphire "Kashmir" because heat treatment has produced the "Kashmir" appearance would also be wrong.

While the article gives no answers to the controversy, it does bring to light the dilemma faced by dealers and appraisers. Awareness of the various approaches taken by prominent people in the trade may make future decisions on this matter easier. *Danusia Niklewicz*

The rare-earth element abundance in the sedimentary gem deposits of Sri Lanka. M. S. Rupasinghe and C. B. Dissanayake, *Lithos,* Vol. 17, 1984, pp. 329–342.

The gem deposits of Sri Lanka are a well-known source for a wide variety of gemstones, including corundum and spinel. These gemstones are found with various heavy minerals in placer deposits in sedimentary gravels derived from the erosion of underlying crystalline metamorphic and igneous rocks. Until recently, however, there has been limited geologic study of the origin of the gem-bearing sediments in this part of the world.

The study described in this article represents one of the first geochemical investigations of the rare-earth elements in the gem-bearing sediments in Sri Lanka. The rare-earth elements—those lying between lanthanum (La) and lutetium (Lu) in the periodic table—are found as widespread minor or trace constituents in the rocks of the earth's crust and can occur in greater amounts in such minerals as monazite and zircon. Because of their distinct geochemical behavior, careful investigation of the relative distribution of these elements has led to a better understanding of many igneous and metamorphic geologic processes. The present study was undertaken to learn more about the origins of the gem minerals in the placer deposits of Sri Lanka.

Analysis of sediment samples from the Ratnapura and Elahera gem fields showed that the sediments are highly enriched in rare-earth elements relative to known rock standards. There is also a marked similarity in the distribution patterns of the rare-earth elements for the sediments and for charnockites (pyroxene-bearing granitic rocks) that are found in the same area. From these results and a knowledge of the general geology of the gem fields, it appears that the rare-earth elements in the sediments were derived from a magmatic charnockite-granite source that is prevalent in the areas of Sri Lanka where gemstones are found. This result lends support to the hypothesis that formation of the charnockites may have been related to the formation of some of the gem minerals in this region. *JES*

INSTRUMENTS AND TECHNIQUES

The Alpha-test gemstone identifier—a test report. P. Read, *Journal of Gemmology,* Vol. 19, No. 3, 1984, pp. 261–265.

The Alpha-test uses thermal conductivity not only to separate diamond from its simulants, but also to distinguish between other gemstones. When a heated probe tip is applied to the surface of a stone, a reading is seen on the instrument's digital display. The reading represents the amount of time taken for the probe tip to fall from one predetermined temperature to another. The faster the temperature falls, the smaller the reading, and the more rapidly the stone conducts heat away from the probe tip.

Numerous comparisons are made between the Alpha-test unit and the Gemtek Gemmologist (reviewed by Read in a previous article, "The Gemtek Gemmologist—a test report," *Journal of Gemmology,* Vol. 18, No. 7, 1983, pp. 643–650). A number of environmental restrictions and conditions are given for both units.

The test results indicated that, with care, positive separations could be made between diamond and its simulants; between ruby and garnet; among aquamarine, spinel, and topaz; between sapphire and tourmaline; and between natural and some flux-grown synthetic emeralds.

A photograph of the unit and a table showing the test results accompany the article.

Douglas E. Kennedy

Color grading systems revisited. C. Kremkow, *Goldsmith,* Vol. 165, No. 8, 1984, pp. 28, 30, 66–67.

In September 1983, the Accredited Gemologists Association (AGA) sponsored a Color Grading Test among four color-grading systems on the market: GIA's Colored Stone Grading System, Cap Beesley's Color/Scan, California Gemological Laboratories' Gem Color Guide, and Howard Rubin's Gem Dialogue. The purpose of the test was to compare the four systems and rate their effectiveness in accurately and consistently describing color.

As reported in other publications, AGA ultimately chose GIA's Color Grading System and Cap Beesley's Color/Scan as the two most "practical" systems because they presented what the judging team called "total visual communication." The outcome of the test has been highly criticized, mostly because of the way the gathered data were analyzed and interpreted. The test information was ultimately passed on to a color scientist from the Appearances Committee of the American Society for Testing and Materials who will translate the data into a three-dimensional international visual color communication language (CIELAB).

General trade feelings on choosing a single system and language are variable. Some feel that all of the systems have their merits; others disregard the concept of grading colored stones altogether. Apparently the AGA test made many gemologists wary of choosing any system, and some think that many people will wait until one system gains industry acceptance before using any of them. *Mary Hanns*

LED there be light. P. Read, *Canadian Jeweller,* Vol. 105, No. 7, 1984, p. 16.

After reporting on the history and use of yellow light-emitting diodes (LEDs) as a refractometer light source, Read briefly describes two units presently available.

The author found that in comparison to a sodium light source, an LED unit is less expensive and produces a cooler light that does not require as much warm-up time to reach full intensity. Unfortunately, the non-monochromatic LED source does not produce as sharp and clearly defined a refractometer reading as the monochromatic sodium light does.

In comparison to an interference-type filter with a high-intensity white light source, the LED unit produces a cooler light. Although neither source is truly monochromatic, the LED's refractometer reading is still not as sharply defined. Because very sharp refractometer readings are frequently needed, it is surprising that the author did not explore the limitations of the less-sharp LED readings.

The article ends with brief descriptions of the Eickhorst GemLED Refractometer and the Rayner LED Refractometer, accompanied by a photograph of the latter and a circuit diagram of its light source.

Douglas E. Kennedy

JEWELRY ARTS

Jade carving in two cities. S. Markbreiter, *Arts of Asia,* Vol. 15, No. 1, 1985, pp. 63–73.

During the past 10 years, modernization of carving techniques and new sources of jade have altered the jade carving industry in China. In 1984, the author visited two jade carving factories in Taipei and Canton; he reports here on his observations.

The Con Da Enterprise factory in Lu Chou, Taipei, is very small and employs only eight people. These carvers primarily use white Korean nephrite and some Canadian green nephrite to produce their solid carvings. Their highly mechanized cutting and carving processes are revealed in detail, along with some interesting information on how they obtain rough jade for carvings.

In contrast, Southern Jade Craft factory in Canton employs 700 workers, 500 of whom are carvers. Although a portion of the factory (that was not open to the author) does produce "largely unoriginal and highly commercial" cut jade for jewelry, the craftsmen demonstrate their skill and originality through carvings made from serpentine. The factory produces intricate openwork; several concentric pierced balls that rotate within one another can be carved from a single block of stone. Such work demonstrates a precision of craft that is somewhat unexpected from such mass production.

The article is accompanied by many photographs of jade carvings in an attempt to help the reader distinguish new commercial copies from old, traditionally crafted pieces. The author does warn, however, that these photos and descriptions are to serve as guides only, and that prolonged personal exposure to Oriental carvings is necessary in order "to arrive at sensible conclusions." *SAT*

Up to snuff. I. McNicholl, *Arts & Antiques,* November, 1984, pp. 70–73.

Along with the extensive art collection he inherited from his father in 1947, Baron Hans Heinrich Thyssen-Bornemisza also inherited a passion for collecting that has spurred him to amass one of the greatest private art collections in the world. Among his many treasures are a variety of 18th-century jeweled snuffboxes, seven of which are described and illustrated in this article. Beautifully fashioned of gold with inlaid gems and enameling, the boxes are, in the baron's words, "masterpieces of the craftsman's art." *EBM*

RETAILING

Smash, grab and runs: the 3-minute burglaries. L. Martin, *Modern Jeweler,* Vol. 84, No. 2, 1985, pp. 60–63.

Thousands of dollars of jewelry can be stolen in just 60 seconds. Smash-grab-and-run burglars beat even sophisticated alarms and vibration detection devices, and flee the scene before police can arrive. Jewelers Mutual Insurance Company reports a drastic reduction in such claims since 1980, when they first required their jewelers to install devices to prevent break-ins. "Those committing smash-grab-and-runs are not skilled burglars. They are often young punks. If you put up a barrier against them, you can stop them," explains Jed Block, communications director for Jewelers Mutual.

Iron gratings installed *inside* the windows and doors are highly recommended because the barrier allows the police more time to respond to the window alarm while the thieves try to break in. The gratings can be decorative and are relatively inexpensive compared to the cost of stolen merchandise. Also recommended are burglar-resistant glazing, bullet-proof glass, sliding security grills, and simply locking *all* valuable merchandise in a vault every night. Names and addresses of some companies that manufacture and install these protection devices are included in the article.

Daytime grab-and-runs can be prevented by installing a door chime, dispersing valuable pieces throughout the store, using a closed-circuit television with a back-room monitor, and designing the store to slow a thief's exit. Most importantly, never turn your back on a customer, and refuse to be diverted by other people. *SAT*

SYNTHETICS AND SIMULANTS

Einige Erkennungsmöglichkeiten für Kashan-Rubinsynthesen (Some of the identification characteristics of Kashan synthetic rubies). U. Henn and H. W. Schrader, *Goldschmiede Zeitung,* Vol. 82, No. 12, 1984, pp. 40–42.

The inclusions in synthetic Kashan rubies can be classified into four types: (a) feathers, (b) "fingerprints," (c) "string of pearls," and (d) "comets" or hair-fine needles. The authors also analyzed Kashan rubies by electron microprobe and neutron activation (NAA), which revealed the presence of more Na than is typical of natural rubies. The authors propose that this is due to the use of cryolite (Na_3AlF_6) in the manufacturing process. The article is accompanied by seven inclusion photographs and tables giving the NAA and microprobe data. *MG*

Zwei neue Kunstprodukte auf dem Edelsteinmarkt. Synthetischer "Ramaura"-Rubin und Yttrium-aluminimgalliat (Two new artificial products in the gem market. Synthetic Ramaura ruby and yttrium aluminum gallate). E. Gübelin, *Goldschmiede Zeitung,* Vol. 82, No. 11, 1984, pp. 55–61.

Dr. Gübelin presents a lengthy article covering the Ramaura synthetic ruby and an artificial product known as yttrium aluminum gallium garnet, both of which are now available in the trade.

The author describes his visit to the U.S. manufacturer of the new synthetic ruby and the method of synthesis. The main component, aluminum oxide, is mixed with chromium oxide (which acts as a coloring agent) and fluxes such as lead fluoride, bismuth oxide, or lanthanum oxide. A platinum crucible is used to melt the solution in a melt-diffusion atmosphere at a temperature of about 1250°C. The addition of lanthanum oxide results in the formation of rhombohedra rather than the platy crystals that would otherwise grow. Crystallization is spontaneous, but the growth directions can be controlled by using seed crystals.

Since the physical data for both natural and the Ramaura synthetic rubies are nearly the same, the author presents 24 color photographs of distinctive inclusions. He also reports that ultraviolet spectrophotometric analysis fails to distinguish Ramaura from natural or other synthetic rubies with any certainty.

A new imitation for tsavorite garnet is yttrium aluminum gallium garnet. It can be easily separated from tsavorite garnet because the physical data of the two materials differ greatly. The reported refractive index is about 1.90, and the specific gravity is 5.06 to 5.08. It is known in the trade as "YAGG" (the second G stands for garnet). While it is not a silicate, like the natural gem, its structure is similar to that of garnet. Apart from the main chemical components of yttrium, aluminum, and gallium, the new product contains traces of PbO, PbF_2, and Bi_2O_3. The characteristic inclusions noted are remains of flux in various forms, and are mostly yellow in color. Forty-two photographs and illustrations accompany the article. *MG*

MISCELLANEOUS

Why does George Holmes keep winning awards? D. Reese, *Folio,* March, 1985, pp. 61–63, 66, 71.

Under Editor George Holmes's careful guidance, *Jewelers' Circular-Keystone* has captured 12 Neal Awards (trade publishing's "Pulitzers"). Last year, Holmes won the Crain Award for an outstanding career in business journalism. His success stems from a basic commitment to sharp business reporting, tempered by the queries: "Is it accurate, is it relevant, is it fair?" JC-K has been called the "bible" of the jewelry industry, and Holmes sees its role as that of a community watchdog that services its 40,000 retail jeweler subscribers. " 'Each year, we try to isolate what we see as the most crucial issues for our readers,' Holmes says. Once a story is isolated, 'whatever we find, we report. There's no suggestion that you have to put on the brakes for any reason.' "

Holmes believes in first-hand reporting from across the nation or, if need be, around the world, and he backs that policy with an ample budget. In the same vein, he regularly mails out questionnaires and uses the resulting feedback to keep JC-K attuned to its readers' concerns. In addition, Holmes does not shrink from covering controversial issues, but delves into them with intensive primary research to reveal every possible angle. Taking his editorial responsibility an extra step, once a problem is revealed, Holmes presents possible ways for jewelers and the industry to deal with it.

George Holmes has managed not only to tap the life-line of the industry, but has also kept a healthy distance from its entanglements, an accomplishment that has maintained JC-K's reputation for both incisive business reporting and credibility within the industry. *SAT*