GEMOLOGICAL ABSTRACTS

DONA M. DIRLAM, EDITOR

COLORED STONES AND ORGANIC MATERIALS

Akoya pearls at the crossroads? A. Muller, *Swiss Watch & Jewelry Journal Export*, No. 5, May 1991, p. 802.

The members of the Japanese cultured pearl industry voiced alarm about the growing importance of Chinese Akoya pearl production. Their primary concerns include:

- The Chinese Akoya cultured pearl industry will continue to expand rapidly.
- The mediocre quality of Chinese pearls will further depress already threatened global sales of Akoya pearls.
- China's production costs are a fraction of Japan's.
- In the last two years, China's output has risen from some 800,000 mommes (1 momme = 3.75 grams or 18.75 ct) to approximately 1,200,000 mommes, while Japan's own Akoya pearl production has leveled off at around 17,000,000 to 20,000,000.
- China has a healthy mollusk population and more space for breeding grounds than Japan.

All these factors indicate that, if the present trends continue, the Japanese will have to reconsider their current practices and face the prospect of radical changes in their way of doing business.

Jo Ellen Cole

Almandine garnet in Montana sapphire. J. I. Koivula, C. W. Fryer, and R. C. Kammerling, *Zeitschrift der Deutschen Gemmologischen Gesellschaft*, Vol. 40, No. 2, 1991, pp. 89-92.

This article details an almandine garnet inclusion found in a 3.55-ct rough sapphire crystal from the Dry Cottonwood Creek area in Montana.

The Dry Cottonwood Creek alluvial deposit was

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.*

discovered in 1889, several years before the Yogo Gulch deposit. Its sapphires apparently crystallized in an igneous environment. Crystals commonly display etched surfaces on tabular forms or a water-worn appearance.

The inclusion described is slightly brownish orange and isotropic in nature, measuring approximately 0.8 mm in diameter. It was first thought to be a spessartite garnet due to its color and transparency. However, microspectroscopy and X-ray powder diffraction proved that it was an almandine, although some spessartine component may be present. The major component determines the species, so this garnet was identified as almandine. *Jo Ellen Cole*

Australia's magnificent pearls. D. Doubilet, *National Geographic*, Vol. 180, No. 6, 1991, pp. 108-123.

Doubilet's text on pearl farming in Australia ricochets from farm to farm across the northern coast of Australia, jumping back and forth from factual descriptions of pearls and pearling to a sort of lyrical adventurama that tells the once and present problems that face the hopeful farmer. Accompanied by a superb photographic essay, this article details the hazards of the deep, the tedium of tending the "seeded" mollusks, and the fulfillment of the dream. Diving is a major part of the drama, since *Pinctada maxima*, the mollusks used to culture the pearls, are gathered full grown from the ocean floor. These mollusks are then nucleated and tended through at least one, but possibly several, harvests.

In Australia, pearling is a closed society in which the pearlers keep a tight control on production in order to prevent the overfishing that could wipe out the mollusk beds essential to the industry. Although most cultured pearls still come from Japan, Australian farms produce 60% to 70% of the world's supply of South Sea pearls. *Archie Curtis*

Gemmology Study Club lab reports. G. Brown, S. M. B. Kelly, and R. Beattie, *Australian Gemmologist*, Vol. 17, No. 9, 1991, pp. 363-367.

The first material covered is an apparently new imitation of jadeite being sold in the Orient. The carved pieces are both dyed and wax-coated, and consist of a grayish green, feldspar- and mica-rich rock that is mined on the Philippine island of Mindanao and known locally as "Philippino [sic] jade." Next, the authors report the presence of elongated gas bubbles in the diffusion layer of so-called "deep" diffusion-treated sapphires.

An entry on an 18.9-ct faceted cerussite includes useful tips on how to fashion this fragile collector's gem. This is followed by reports on two organic gem materials: the claws (dactyls) of the Philippine mantis prawn (pictured here set in earrings) and cultured blister pearls of the small *Pinctada maculata* oyster from the Cook Islands. A helpful note on the identification of bone follows. A final entry on red Kauri gum includes information on material recovered from coal seams as much as 40 million years old. This fossil Kauri gum reportedly has properties identical to those of amber and, furthermore, cannot be distinguished from amber on the basis of solubility to volatile solvents such as ether or chloroform. *RCK*

The mystery of the missing mollusks. D. Haldane, *Los Angeles Times Magazine*, January 5, 1992, pp. 23-26.

This brief, detailed article concerns the endangerment of the abalone that can (rarely, now) be found along the California coastline, especially around Anacapa Island. The abalone are prized for their meat as well as for their colorful shell (also referred to as Paua shell), which is incorporated in jewelry and other decorative items. As a result of overfishing, pollution, the growing numbers of sea otters (a predator), and a mysterious disease that is killing the abalone, the mollusk population in this area has dropped more than 90% in the last 30 years. Conservation programs are being instituted to save the abalone and preserve their habitat. Three color photographs illustrate the article. *RT*

Rhino horn and elephant ivory. N. F. Singer, *Arts of Asia*, Vol. 21, No. 5, 1991, pp. 98-105.

Elephant ivory and rhinoceros horn have been associated with the arts of China and Myanmar (Burma) for 3,500 years; in this well-researched but disorganized article, the author discusses the use of these materials by artisans, magicians, and the military.

To the lay reader, the article is interesting primarily for its environmental focus. By the year 1,000 AD, overhunting had led to the near-disappearance of both animals from China. Contemporary writers predicted the elephant's extinction and bemoaned the frivolous use of ivory by "courtesans and the nouveau riche." Military demand for the skins of both animals added pressure to the shrinking populations.

The Chinese belief in rhinoceros horn's aphrodisiac qualities is well known. The Myanmar valued the beast for its ability to neutralize poison.

By the end of the 16th century, Chinese elephants were seen only in the Imperial stables, and ivory carvers were supplied with African tusks by Spanish and Portuguese traders. This continued trade has led, of course, to the near-extinction of both animals in this century. *Lisa E. Schoening*

DIAMONDS

India's diamond crisis worsens. J. Shor, *Jewelers' Circular-Keystone*, Vol. 162, No. 8, August 1991, pp. 160-162.

India's diamond business may not be as strong as it appeared several years ago. This article discusses and explains the financial problems of diamond dealers in India, many of whom have had difficulties paying for their sights.

Sight allocations have been suspended to those Indians who have not paid for previous sights, in large part because the Reserve Bank of India has put restrictions on the conversions of rupees to the currency needed for international transactions.

India's currency problem began during the Persian Gulf crisis, when the government ran low on foreign exchange. The country's chief source of foreign currency had been the thousands of Indian expatriate workers in the Persian Gulf, who accounted for more than one billion U.S. dollars a year. However, these workers were forced home after Iraq invaded Kuwait. As a result, the diamond-polishing force has already dropped from 800,000 to about 500,000. While many dealers predict improvements in the future, in the short term diamond exports will continue to decline.

KBS

When diamonds met buckyballs. A. S. Moffat, *Science*, Vol. 254, No. 5033, November 8, 1991, p. 800.

Science magazine voted synthetic diamond films "Molecule of the Year" for 1990 because their potential practical applications are so great. However, a major problem has continued to be finding a suitable base on which to grow the material. A pretreated coating of synthetic diamond grit is impractical in many cases, and alternatives such as pump oil or various compounds of hydrocarbons fail because they lack both stability at high temperatures and the three-dimensional cage structure required for the growth of diamond's molecular structure.

Now, researchers R. P. H. Chang and Manfred Kappes of Northwestern University have found that synthetic diamond films easily grow on coatings of C_{70} clusters. These are relatives of the original C_{60} "buckyball," named after physics genius Buckminster Fuller, best known as father of the geodesic dome. Chemically inert resilient compounds, these hybrids of the C_{60} buckyballs were deposited on a surface and bombarded with carbon and hydrogen ions, breaking open the cage structure and exposing the free ends of the buckyballs' carbon network. This provides an ideal template for nucleating diamond growth. The researchers found that a base layer of C_{70} molecules was about 10 orders of magnitude better at seeding diamond-film growth than an untreated surface. *Jo Ellen Cole*

GEM LOCALITIES

Some Australian turquoise deposits. G. Brown, *Australian Gemmologist*, Vol. 17, No. 9, 1991, pp. 369-373.

Turquoise has been found in all Australian states with the exception of Western Australia. This report begins with a general description of the chemistry, formation, and gemology of turquoise and then focuses on three significant Australian sources.

The Bodalla-Narooma turquoise deposits are found on the southern coast of New South Wales. The Bodalla field, discovered in 1894, was the first turquoise deposit in Australia to be commercially mined. The Tosca mine, near Ammaroo Station in the Northern Territory, currently supplies large quantities of porous material to cutters in both Southeast Asia and Germany. The third locality discussed, at the Iron Monarch sedimentary iron ore deposit in South Australia, is significant for its rare, near-microscopic turquoise crystals.

This useful locality report includes a table of generalized gemological properties of turquoise, plus some specifics relating to the deposits discussed. A second table succinctly lists (with references) the several Australian turquoise deposits. *RCK*

INSTRUMENTS AND TECHNIQUES

Application of mineralogical techniques to gemmology. C. M. Gramaccioli, *European Journal of Mineralogy*, Vol. 3, No. 4, 1991, pp. 703-706.

Mr. Gramaccioli feels that the jewelry trade is coming out of the age of inbred apprenticeships to absorb scientific concepts at a surprising rate. A concurrent tendency to improve scientific equipment in gemological laboratories is motivated by four factors:

1. The increasing demand for "written guarantees" for gemstones
2. The wide variety of gem and, especially, synthetic gem materials available
3. The need to cut stones along the appropriate crystallographic orientation
4. The effort to improve identification methods for synthetic and treated gemstones

The author points out the need not only for sophisticated scientific instrumentation, but also for proper scientific education of the operator and of the members of the gem trade at large. This should be done in collaboration with scientific institutions, which will also derive benefits from working on gemological materials.

The role of X-ray crystallography is explained at length, together with recent experiments done in the author's laboratory. Chemical analyses still present some challenges (proper mounting, analysis of light

elements such as boron), which will probably be overcome in time. Raman, infrared, and optical absorption spectroscopy are also very useful to the gemologist.

One feels throughout the article that the author, although full of laudable intentions, has little knowledge of, or concern for, the very practical needs of the jewelry industry. This article lacks examples that show the practical value of gemological research. Also, the absence of any mention of X-ray fluorescence as a useful technique, and the inference that some gemological laboratories have an electron microprobe on their premises (which to this abstracter's knowledge is not the case), certainly promotes a skewed picture of the reality of gemological research. *EF*

The Gold-Meter®. T. Linton and G. Brown, *Australian Gemmologist*, Vol. 17, No. 9, 1991, pp. 360-362.

The Gold-Meter® is an electronic instrument that uses an electrochemical process to test the precious metal content of jewelry. Its two major components are a micro-computer and a handheld testing pen, the latter holding a reservoir of an acid testing solution.

According to this Instrument Evaluation Committee report, the Gold-Meter® is easy to use and accurate for calculating gold content to the nearest karat for alloys in the 6-18 K range. For alloys between 18 and 24 K, the instrument simply identifies the metal as being within this rather broad range. Other limitations relate to the different types of gold alloys—e.g., pink, white, and green golds—where a conversion table (provided) and some interpretation of results is required. It is important to note that, as with other portable gold-testing units, the pen's acid produces a brownish stain on the metal at the point of testing. This must be removed with gentle abrasion and repolishing. *RCK*

Lasers in the jewelry trade. W. M. Steen, *Goldsmith's Technical Digest*, 1990/91, pp. 10-15.

This article covers the current uses and the future of the laser in the creation, decoration, and repair of jewelry. With the assistance of a computer-aided design (CAD) package, lasers can be involved in making molds for lost-wax casting. The laser (Light Amplification by the Stimulated Emission of Radiation) has the ability to focus a beam of light to a very fine point, which allows the operator to work on a small area without affecting the surrounding area. This is particularly useful for enameling, electroplating, fusion welding, and soldering. Possible future applications include engraving and carving. One table included in this article provides a breakdown of the different types of lasers used for metal work.

RT

Radioactivity of some minerals in the Mogok area. U.T. Hlaing, Z. Aung, and W. Htein, *Australian Gemmologist*, Vol. 17, No. 9, 1991, pp. 356-359.

This article reports on radioactivity measurements carried out on zircon, apatite, and sphenes from Myanmar (Burma). Uranium and thorium contents were measured using high-resolution gamma spectrometry with a high-purity germanium (HPGe) detector and by the radioisotope-excited X-ray fluorescence method (XRF).

The authors obtained the following results: (1) the zircon contained more uranium—150 to 2,200 ppm, with an average value of 681 ppm—than either the sphene or apatite, with apatite showing the lowest uranium content; (2) the sphene contained 110 ppm thorium, but the thorium contents of the zircon and apatite were below the minimum detection limit for the XRF method; and (3) in all cases, the uranium content was higher than the thorium content. Unfortunately, the correlation between the gamma-ray spectroscopy and XRF was extremely poor, with the difference in readings varying from less than 1% to more than 300%.

The zirconium/hafnium ratio was also calculated for the zircon and was found to be different from that reported for zircon from other localities. This and other data suggest that Myanmar zircon is of granitic origin. *RCK*

Des techniques qui déconcertent les meilleurs experts: Au royaume des pierres le faux vrai et le vrai faux (Disconcerting techniques even for the experts: In the stone kingdom, the false true and the true fake). J.-L. Mothias, *Le Figaro*, October 12-13, 1991, p. 8.

This newspaper article describes how French experts feel that even sophisticated techniques are sometimes not enough to help with difficult gem identification problems. One such example is the separation of natural-color from treated-color green diamonds. Large amounts of colorless topaz and diamonds are irradiated in Delft, The Netherlands, and in San Diego, California, to produce a more salable color. This color is very difficult to identify as resulting from laboratory treatment. One expert from the laboratory of the Paris Chamber of Commerce is cited as saying that, in difficult cases, the expert gemologist can only rely on experience. The article is illustrated with a picture of the Charlemagne talisman. A lengthy caption explains that the central cabochon was called a blue glass fake by Fred Ward in a recent *National Geographic* article, although the museum's description of the jewel actually states that one of the original cabochons was replaced with a larger piece of blue glass.

It is unusual to see articles that explain the difficult challenges of gem identification to the widest pos-

sible audience, i.e., that of a nationwide newspaper. It means also that, in France at least, there is a general feeling that synthetics and treatments are so sophisticated that in some cases they cannot be identified, although they were fairly easy to detect in the past.

EF

JEWELRY MANUFACTURING ARTS

Ancient jewellery: A conservator's eye view. M. Hockey, *Goldsmith's Technical Digest*, 1990/91, pp. 16-21.

The aim of conservation for ancient jewelry is to restore and preserve the object so that it can be displayed and handled for academic study. The author, senior conservator in the Department of Conservation at the British Museum, provides a brief history of jewelry, with the earliest examples of bone, shell, and teeth used for beads dating back 30,000 years. She succinctly discusses chemical deterioration and the restoration of gold, silver, copper, enamels, glass, and gemstones. Specific examples are discussed in the article, accompanied by 10 color photographs.

RT

Der wille zum experiment (The will to experiment). S. Lambert, *Art Aurea*, No. 1, 1991, pp. 59-61.

Gold takes on many forms in the work of the designers represented at the recent "Triennale Europeene du Bijoux Contemporain" in Luxembourg. Treasured since prehistoric times, gold's versatility and sensual appeal is displacing aluminum and space-age metals (which not long ago dominated Europe's industry-inspired creations) in these thoroughly contemporary works.

The show's purpose was to convey the actual state of the art of creating jewelry; 300 artists representing the Japan Jewelry Designer Association and the World Gold Council participated. Although the jewelry displayed owes more to art than to commercial instinct, some of the design concepts will certainly be seen at trade shows within the next few years.

This well-illustrated article is printed in both German and English. *Lisa E. Schoening*

JEWELRY RETAILING

The bracelet's charm. B. L. Scherer, *Town & Country*, Vol. 145, No. 5139, December 1991, pp. 174-177, 217-218.

Mr. Scherer presents a concise history of the bracelet in this compact but meaty article, accompanied by 17 beautiful photographs by Matthew Klein.

The oldest evidence of bracelets has been found in excavations and cave paintings of the Paleolithic period. The earliest reference in English dates to the 1438 inventory of King James III of Scotland. The author also discusses several historical paintings and sculptures in which bracelets are featured, as well as the importance of bracelets in imperial regalia. He then reviews a number of collections of recent well-known personalities, from Gloria Swanson to Andy Warhol.

Neo-Etruscan Victorian bangles, 1920s and 1930s platinum pieces, and second-hand contemporary bracelets by design houses such as David Webb, Cartier, and Tiffany continue to be very popular among collectors of estate jewelry. Trends in modern bracelet wear are discussed, with emphasis on wider metal bangles for daywear and narrower, stone-set, flexible bracelets for formal evening attire.

Scherer concludes this fascinating article by stressing how important it is to pay attention to detail, such as the quality of construction and finishing of prongs, when purchasing bracelets. This attention to detail is equally important in caring for your bracelet once it has been purchased. *Jo Ellen Cole*

Crime against jewelers. G. Holmes, *Jewelers' Circular-Keystone*, Vol. 162, No. 9, September 1991, pp. 40-65.

This special report is devoted to the increasing problem of crime in the jewelry industry. Mr. Holmes goes into great depth on how to help prevent burglaries in a business, with 20 tips to deter robberies. He emphasizes using common sense when it comes to security—before, during, and after a holdup. He discusses insurance policies and how to handle adjusters when purchasing insurance for your store, as well as after you have been robbed. Equipment that should be used to help discourage burglars includes surveillance cameras, buzz-in locks, and mirrors. Perhaps most important is the description of trade associations such as the Jewelers Security Alliance and Jewelers Mutual Insurance, which are a greatly under-used security tool. Holmes includes in his discussion accounts of 29 actual crimes. *KBS*

The personal computer: A jeweler's tool. M. Golding, *Jewelers' Circular-Keystone*, Vol. 162, No. 12, December 1991, pp. 52-56.

Michael Golding gives a detailed account of the advantages of computerizing one's business. He divides these advantages into four basic functions: accounting, inventory, receivables, and payables. Then he presents specific examples, such as how to save on accounting costs and how a computer can help with mailing lists, appraisals, jewelry design, bench-ticket scheduling, etc. He also discusses what the com-

puter cannot do—such as substitute for people or transform a business overnight. This article is a useful incentive for those who would like to computerize their business. *KBS*

Preserving history at top jewelry houses. V. Swift, *Jewelers' Circular-Keystone*, Vol. 162, No. 8, August 1991, pp. 174-182.

Our present "information age" has underscored the importance of preserving and documenting records that have potential historic significance. Many of the large jewelry houses have archivists who collect, catalogue, and preserve the artistic traditions of their companies. Items that are archived range from design renderings to the jewels themselves, the latter frequently repurchased by the company at international auctions.

Three of the legendary jewelry houses—Tiffany, Cartier, and Van Cleef & Arpels—are the focus of this interesting article. Interviews with the archivists for Cartier, and with Nina Wohl at VC&A, give us an understanding of the fascinating variety of information that can be found in these archives, as well as the amount of work that goes into amassing them. Although much of the work is tedious and difficult, the results are rewarding and of value to all within the jewelry community. This article proves, once again, that there is much to learn from our past. *EBM*

Editor's Note: GIA's Liddicoat Gemological Library and Information Center is prepared to be the archival repository for records from other companies in the jewelry industry. Contact Dona Dirlam at GIA Santa Monica for further information.

What every jeweler should know about appraisals. S. W. Ipsen, *Jewelers' Circular-Keystone*, Vol. 162, No. 8, August 1991, pp. 192-198.

Writing appraisals for jewelry in today's sophisticated world is no easy task, although many jewelers are not yet aware of this fact. Gone are the days when "one gold and diamond ring, value $2,000" would be considered an appraisal. This article emphasizes the seriousness of performing appraisals, which are legal documents used by insurance companies, police departments, and banks, as well as in the settlement of property following divorce or death.

The author, Sylvia Ipsen, indicates the many details that should be included in a jewelry appraisal, and covers some basic points that all appraisals have in common. She also instructs the potential appraiser to seek further assistance from one of the nation's appraisal organizations, which will "provide help to qualified individuals in preparing acceptable appraisals." Lastly, Ms. Ipsen underscores the fact that appraisals are not easy to prepare and can have unpleasant legal repercussions if not prepared correctly. *EBM*

SYNTHETICS AND SIMULANTS

Synthetic found mixed with rough ruby. *Jewellery News Asia*, No. 85, September 1991, p. 172.

Rough synthetic ruby has recently been found mixed in parcels with good-quality natural rough that was being sold in China, Thailand, and Vietnam. The Hong Kong Gems Laboratory has found that approximately 30% of the rubies tested from these parcels were flame-fusion synthetics. The synthetics are being tumbled to give them the appearance of rough mined from a secondary source. In addition, some have been found to have cracks caused by heating and rapid cooling. The cracks are similar to those seen in some natural rubies. *Jana E. Miyahira*

Editor's Note: A photo of "rough" synthetic ruby purchased in Vietnam as natural ruby appears in the Gem News section of this issue of Gems & Gemology.

Verneuil synthetic red spinel. G. Brown, R. Beattie, and J. Snow, *Australian Gemmologist*, Vol. 17, No. 9, 1991, pp. 344-347.

Following a well-referenced review of the development of Verneuil synthetic spinel, focused on red material, the authors describe their investigation of some red synthetic spinel boule fragments and faceted stones. The material, purchased at the 1987 Tucson Gem Show, had the following gemological properties: color—bright, slightly purplish red; diaphaneity—transparent; luster—vitreous; polariscope reaction—minimal anomalous double refraction; S.G.—3.59; U.V. fluorescence—bright red (long-wave) and inert (short-wave); absorption spectrum—broad, strong absorption from 500 to 580 nm and strong general absorption below 465 nm. In addition, an emission band centered at 685 nm was noted in the spectroscope when the stone was stimulated with long-wave U.V. radiation.

Magnification revealed broad curved color banding, as well as single-phase (gas bubble) and two-phase (gas bubble plus a solid or liquid phase) inclusions oriented in lines perpendicular to the curved growth. The gas bubbles were quite variable in shape, including rounded, tadpole-shaped, and elongated, highly convoluted types.

The authors conclude that, because all gemological properties of this material overlap with those of natural spinel, standard testing procedures—with the exception of microscopic features—cannot be used to distinguish this synthetic spinel from its natural counterpart. *RCK*

TREATMENTS

Examination of a plastic coated "sugar-treated" opal. R. C. Kammerling and J. Koivula, *Australian Gemmologist*, Vol. 17, No. 9, 1991, pp. 352-355.

The authors received an unusual opal that was purchased for a considerable sum in Australia as a "black opal." Without magnification, the opal appeared to have an even, black body color, against which it displayed a fairly strong, uniform "pinfire" play-of-color. Examination through a binocular microscope revealed the "peppery," speckled appearance associated with sugar-treated opal from Australia. A colorless coating covered the entire cabochon; it was significantly thicker at the base than on the dome, and contained gas bubbles. The coating appeared orange when examined in transmitted light.

After various gemological tests, the authors concluded that the specimen was a natural opal that had been "sugar treated" and subsequently plastic coated, possibly to "set" the initial treatment as well as protect the surface and improve the apparent polish.

Maha Smith

MISCELLANEOUS

The mineral collection of Moritz and Adolf Lechner, Vienna. B. Smith, *Mineralogical Record*, Vol. 22, No. 6, 1991, pp. 433-438.

This essay recounts the dispersal of the Lechner mineral collection, once one of Europe's largest and finest private mineral collections. The collection was formed by Moritz Lechner in Vienna during the late 1800s. It was left to his son, Dr. Adolf Lechner, who continued to add specimens. The Lechner collection grew primarily by the purchase of all or part of existing respectable European collections; a list of some of these early collectors accompanies the article.

The collection ultimately consisted of 8,314 specimens; the majority ranged from 4 × 6 cm to 8 × 10 cm. Most of the mineral species considered valid in the early 20th century were represented, along with specimens from Central European localities and silver ore minerals. In 1911, the entire collection was offered for sale. It remained intact and available for more than 40 years, before it was ultimately dispersed to American museums and private collectors. In 1952, approximately half of the specimens were sold to Raymond and Alvin Schortmann, from whom both Harvard University and the Smithsonian Institution purchased some in 1955. The Smithsonian's original 355 Lechner specimens were incorporated into the Roebling collection. In 1959, they purchased 249 additional Lechner specimens from the Schortmanns.

By the early 1960s, the remaining Lechner specimens were released for sale to the general public. In 1971, Ron Bentley purchased the Schortmanns' business, including those Schortmann/ Lechner specimens that had not yet sold. The author suggests that 3,000 Lechner specimens have been sold directly to U.S. collectors.

The 10 color photographs that accompany this article include specimens of gem materials such as garnet, cassiterite, prehnite, and lazulite. *LBL*

More "PERFECT" Challengers

Following are the names of "Perfect Challengers" who were inadvertently left out of the list printed in the Fall 1991 issue. All received a perfect score on the 1990 *Gems & Gemology* "Challenge."

Michael J.P. Cavanagh, Vancouver, B.C., Canada; Raffi M. Eurdekian, Southfield, MI; Jim Ferguson, North Charleston, SC; Agop Ghazalian, Santa Ana, CA; Edward D. Gold, Hemet, CA; Martin D. Haske, Woburn, MA; Werner R. Hoehne, San Francisco, CA; Rhonda R. Jones, Vancouver, B.C., Canada; Gary Ephraim Kampel, San Mateo, CA; Dorothy Lewis, Richboro, PA; Lianne Lui, San Jose, CA; Cheryl Ann Lundstrom, Concord, CA; Kathryn J. March, Winston Salem, NC; Kathleen J. Molter, Milwaukee, WI; Richard Petrovic, Newport, OR; Pinchas Schechter, Miami Beach, FL; Nancy Marie Spencer, Corona, CA; Larry C. Winn, Arvada, CA.