Gems and Gemology

WINTER 1959-60

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Gems & Gemology

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IN THIS ISSUE

On the Cover

This unique pin design, which is made up of diamond baguette trunks and a foliage of brilliant- and marquise-cut diamonds, can be worn as a pin or as a pair of clips. Designed by Marchal, Inc., New York City, it was one of the twenty-four that received awards in the Diamond-International Awards, at the Waldorf-Astoria, New York City.

Photo Courtesy
N. W. Ayer & Son, Inc.
New York City

GEMS & GEMOLOGY is the quarterly journal of the Gemological Institute of America, an educational institution originated by jewelers for jewelers. In harmony with its position of maintaining an unbiased and uninfluenced position in the jewelry trade, no advertising is accepted. Any opinions expressed in signed articles are understood to be the views of the authors and not of the publishers. Subscription price $3.50 each four issues.

Highlights at the GEM TRADE LAB in Los Angeles

by

Lester B. Benson, Jr.

The fallacy of inflated insurance appraisals was shown in a typical settlement covering a pair of dark-green, beautifully carved and polished "jade" birds, approximately ten inches high. The crests on both of the birds had been broken, and the owner was claiming a total loss for the pair. Insurance coverage was for $2000. Laboratory tests quickly proved the carvings to be serpentine, with a resultant settlement of approximately $300. This was based on a total price, including duty, of replacing these items with duplicates from Hong Kong, as quoted by a well-known jade dealer.

When advising clients on insurance coverage for unusual items (and, for that matter, any fine jewelry, unless a "valued" policy is written), a company is not responsible for other than a replacement-value settlement, regardless of the amount for which an article is insured.

* * *

A beautiful large sapphire submitted for a comparative-quality statement failed to display its maximum inherent beauty for two reasons: the pavilion was extremely rounded, causing excessive leakage of light, and the optic axis was inclined at approximately 45° to the table. As a result, the greenish-blue dichroic color predominated when the stone was viewed face up. It had obviously been cut from a distorted piece of rough to retain maximum weight. Recutting the stone to correct the discrepancies would have resulted in a weight loss of approximately 50%.

* * *

A platinum bracelet set with diamonds and what appeared to be sapphires, proved upon testing to include not only natural sapphires, but also synthetic and glass.

* * *

The surface of the green-glass background in a gold-inlaid pendant *(Figure 1)* revealed that it had been made by laying out the open gold metalwork face down on a work surface and pouring molten glass over the metal and pressing it through the open areas to surround the gold. The back of the glass was then polished flat and backed with a metal plate. To the unaided eye, it appeared to be exceptionally fine inlay work.

* * *

Is it a ruby or purple sapphire? This question arose with a corundum that displayed a pronounced color change. Under incandescent light, it was an attractive and distinctive ruby color; however, in daylight, and also under fluorescent illumination, it was decidedly reddish purple. A dealer had labeled the stone paper "ruby-sapphire." In view of the predominant daylight appearance, it was the consensus that it should be called purple sapphire.

* * *

Apparently, a discovery of corundum has been found in Finland. Mr. Rudolph Lakeside, of Helsinki, submitted a small, well-formed crystal and a very small but good-quality star sapphire cabochon that is brown in transmitted light. The following comments are from his letter:

"The stones I sent to you were the smallest ones I had. Most of them weigh from one to eight carats, being almost one-hundred percent well-shaped crystals. They are mainly a deep-brown color, and many have strong silk, giving a sharp star. In a group of one hundred stones, there were ten rubies. They are not transparent and do not display a star, but some are raspberry red.

"As far as their occurrence is concerned, they were all picked up from loose gravel in the river beds, and

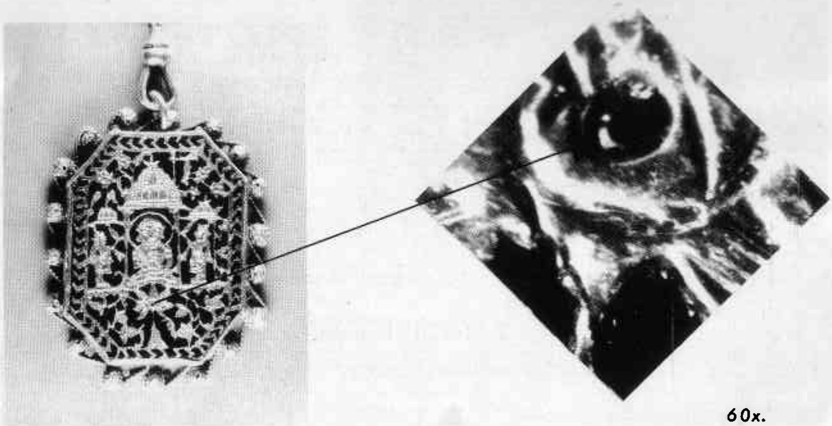


Figure 1

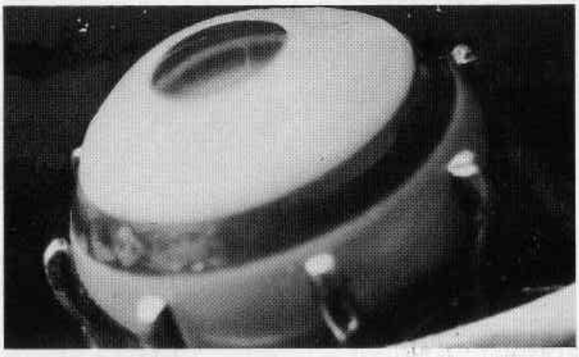


Figure 2

there they seem to occur in abundance. For instance, in one spot I kneeled down and, without moving from my position, I picked up some 40 of them. They are right at the surface and are associated mostly with hematite and garnet. Very little quartz occurs with them. I did not do any digging, but wherever there was hematite, I could be sure that there was also corundum. In this area, I also found a large deposit of nickel ore (not close to Petsamo nickel mine) but not rich enough for mining. Iron ore occurs all over.

"The corundum can be found within an area of about ten square miles. The locality is north of Inari and pretty close to the Arctic Ocean, just above the watershed. The country is very hilly and difficult to reach. One has to go by foot some 50 miles. However, the area is accessible to small aircraft."

* * *

Figure 2 shows a rather interesting pearl that had an almost black spot at the top and a black encircling band. To the unaided eye, both the spot and the band appeared as inlays. Magnification and refractive index, however, revealed that this black substance was apparently a deposit of aragonite, translucent in thin section and displaying a pronounced, vertically oriented intergrowth of hexagonal-shaped prisms. The owner of the pearl, a gentleman from India, stated that it had been in the family for more than twenty years, and that it was one of a collection of approximately thirty pearls of similar nature. The remainder, however, do not have the encircling bands, only the spots.

* * *

A large natural spinel became the center of attraction when pronounced doubling was observed within the stone. Actually, it was not the spinel but a transparent crystal, presumably biotite mica, within the spinel that displayed the strong double refraction.

* * *

A large diamond brooch contained

(Continued on page 378)

Highlights
at the
GEM TRADE LAB
in New York

by

G. Robert Crowningshield

The Laboratory has received several reports from laymen stating that diamonds had disappeared from rings that had been left overnight in an undiluted commercial bleach of the very common sodium-hypochlorite type. In two of the cases reported to the Lab, the soiled diamond rings had been placed in open glasses of the liquid. When examined the next morning, the heads of the rings holding the stones were broken and the stones were missing. A black to green residue was on the bottom of the glasses and a green substance had been deposited on the inside of the heads.

Our first attempt to solve the mystery consisted of merely leaving loose diamonds overnight in an undiluted bleach. The diamonds were unaffected. Next, a 14-Karat white-gold diamond ring was left overnight in the liquid. In the morning, when the ring was wiped off with a cleansing tissue, the head holding the diamond split through the middle and the stone fell into the paper. The diamond itself was unaffected. Diamond rings of the same and other designs were left overnight in a fresh solution with similar results, with the exception of a setting having a very heavy metal head. This setting broke along the solder joint that held the shank and head together, but the diamond remained in the setting and was unaffected. One ring showed considerable loss of metal on one prong where it rested on a diamond. Another sturdy 14-Karat-gold setting minus a stone had previously been rhodium plated; however, it was affected only where the plating had been worn off. The explanation we offered our puzzled clients for this unusual reaction was

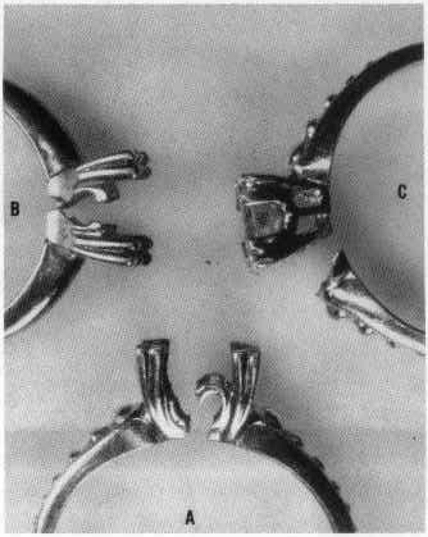


Figure 1

that the gold alloy, consisting as it does of an active metal (zinc or copper) and an inactive metal (gold), provided the requirements for an electrolytic action in the presence of the sodium hypochlorite. The result was that the base metal was attacked and the ring broke at the thinnest area as a result of tension of the shank. It is the Laboratory's opinion that the alleged disappearance of the diamonds was loss in the black or green precipitate, rather than dissolution. In *Figure 1*, the ring marked A is the GIA 14-Karat white-gold ring mentioned previously. The ring marked B is a yellow-and-white gold ring (white-metal head) belonging to a client. The ring marked C shows the break at a solder joint with the diamond still in the setting.

* * *

Figure 2 is a photo of a deep emerald-green fluorite cabochon set with diamonds and rubies in a platinum-and-gold ring. The typical octahedral cleavage of the fluorite is readily discernible.

* * *

Doublets consisting of gray-blue synthetic tops and natural corundum bases in gypsy-set men's rings are quite convincing, unless it is possible to examine the top under efficient magnification. One that was recently identified came apart when the client asked to have the stone set in a more elaborate setting. The workman who did the setting assumed the stone had split, but did not recognize the difference between the top and bottom portions.

* * *

Interesting stones that have been submitted for identification recently include the very rare zincite and cat's-eye cerussite, as well as such unusual materials as enstatite, kyanite, andalusite, amblygonite, sphene, and green

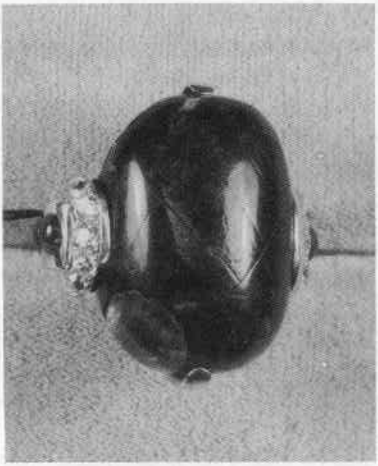


Figure 2

apatite. Unusually fine specimens of less rare stones included a fine nine-carat demantoid and a 55-carat quartz cat's-eye. Perhaps the stone most admired was a flawless 60-carat red spinel, although we have seen many handsome blue and pink diamonds lately.

* * *

It is known that many stones may become temporarily discolored if they are exposed to direct X-ray beams. For example, pale-yellow sapphires may change to a fine yellow. Even colorless synthetic sapphires become brown, but later revert to their former color when gently heated or exposed to light for a short time. Experimenters have not reported color changes in diamonds upon exposure to X-rays; therefore, we were surprised when a pink diamond turned brown after exposure to X-radiation for only a short period of time. However, when gently warmed by the heat from a Gemscope lamp, the original pink color returned. One of the routine observations made by the Laboratory on pink diamonds is their characteristic blue fluorescence under long-wave ultraviolet radiation and their bluish-green fluorescence under short-wave ultraviolet, together with marked phosphorescence; under X-rays, the fluorescence is bluish white. Therefore, it is the opinion of the staff that the unusual temporary brownish color change mentioned above was caused by the continuing phosphorescence of the diamond when it was exposed to X-rays, together with consequent electron displacement, which is not usual with exposure to X-rays alone.

* * *

Promoters of both synthetic colorless spinel and synthetic colorless sapphire have increased activities lately, resulting in a rash of trademarked names and often insupportable claims. One claim, supposedly backed by a testing laboratory, says that the stone in the advertisement (not claimed as synthetic corundum, but identified as such by the Laboratory) is' 9½ in hardness. Perhaps it is well to repeat that Mohs' scale of hardness is only relative. Mohs arbitrarily assigned diamond the figure 10, since it would scratch all other minerals. He gave the figure 9 to corundum, since it would scratch all minerals except diamond. On numerous occasions potential promoters have requested that we make hardness tests, hoping we would issue a report stating that their own particular source of synthetic colorless sapphires was 9½ in hardness. Since synthetics have essentially the same properties as their natural counterparts, all that can be said is that both natural and synthetic corundum are 9 in hardness.

* * *

A question has been raised regarding stones that contain only a small zone of the color suggestive of a variety. For instance, a large beryl carving was virtually colorless, except for a swath of blue through one portion. The request was for a report to be issued as aquamarine, although only a very small area could conceivably be called aquamarine. The owner feared that the carving would not sell if labelled beryl rather than aquamarine. Frequently, cut sapphires are completely colorless, except for a small blue area near the culet. Emeralds, too, are often cleverly cut so that a small spot of green color is spread through the stone by internal reflection. Observed under immersion, such stones may actually be more than three-fourths colorless. No strict nomenclature can be recommended for stones of this kind. If a stone shows the desired color of any given variety when viewed from the direction it will be observed when mounted, it is the Laboratory's belief that the variety name appropriate for that color may be used.

* * *

The very large Australian cultured pearls that have been given considerable publicity in recent months are striking indeed. One that was X-rayed in the Laboratory had an overall dimension of more than 19 millimeters, yet the nucleus was only 6 millimeters. However, as the radiograph *(Figure 3)* indicates, there was, in addition to the nucleus, a considerable hollow space, which was discovered when the pearl was drilled. Moreover, it was found that the nucleus was loose, thus making it difficult to insert the peg of the ring designed for the pearl. This condition is not uncommon, as proven by the many drill holes we see in some nuclei in radiographs.

* * *

A necklace of drilled baroque beads proved to be green plastic-coated beryl. Since this kind of coating appears red under the emerald filter, the owner did not become suspicious until the plastic wore off several of the beads.

* * *

The exact process that cultured pearls undergo before shipment to foreign buyers is a secret that stays in Japan. One lovely necklace recently examined in the Laboratory showed unmistakable evidence of pink dye in the drill hole, on the silk thread used in stringing, and in a number of cracks just under the surface. It has been reported that eosin dye (a dye obtained by the action of bromine on fluorescein) is used for this purpose, but it is usually not so obvious.

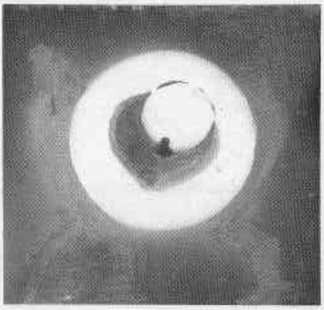


Figure 3

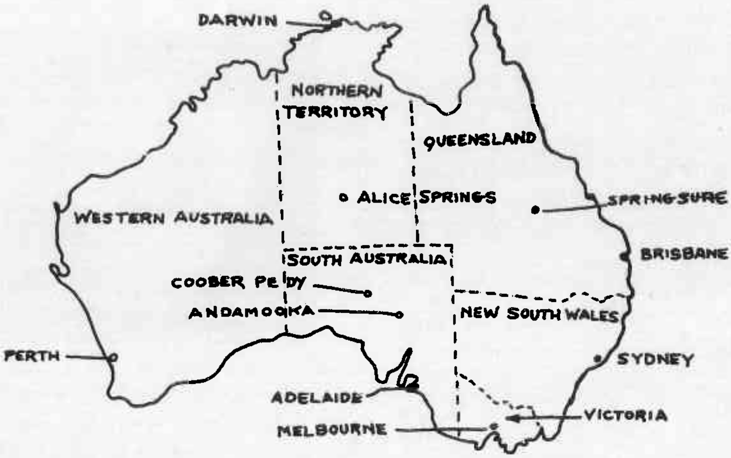
* * *

A brilliant orange-brown zircon lost all vestige of the orange color and became ordinary brown during the minute or less required to check it in the spectroscope. Knowing that light will fade X-ray-treated sapphires and other stones and that X-rays will impart a deep orange color to brown zircons, we experimented with stones from our collection and were able to produce a similar orange-brown color by exposing light-brown zircons to 40-KV and 7-MA X-ray for less than ten minutes. By keeping them out of strong light, the stones are holding their color well. Although there would seem to be no commercial advantage in turning brown zircons orange, even if the color would hold in daylight, it is possible that such treatment has been done in isolated cases.

* * *

While making a spectroscopic examination of blue diamonds that had acquired their color as the result of

(Continued on page 377)



Opal

by

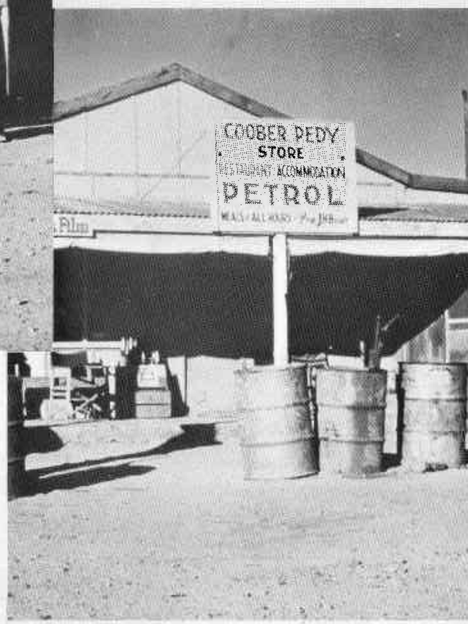
Charles H. Derby, C.G.

A visit to the main sources of precious opal today, Coober Pedy and the Andamooka deposits, in the northern areas of South Australia Province, Australia.

(Continued from Fall 1959)

These buildings, sitting on the very edge of a high bluff, give the impression of two crouching cats facing each other. The store and general trading post of the Brewsters is on the north side of the road. Opposite, and in direct competition, stands the Marks store, no relation to the opal Marks. Marks is postmaster, overseer for the aborigine, etc. His sign says, "Opal and Specimens for Collectors." Both he and the Brewsters have gas pumps and competition is keen. The Brewsters are old-timers and former opal gougers, now retired to store tending, getting meals for tourists, and opal buying. There are about forty persons living at Coober Pedy.

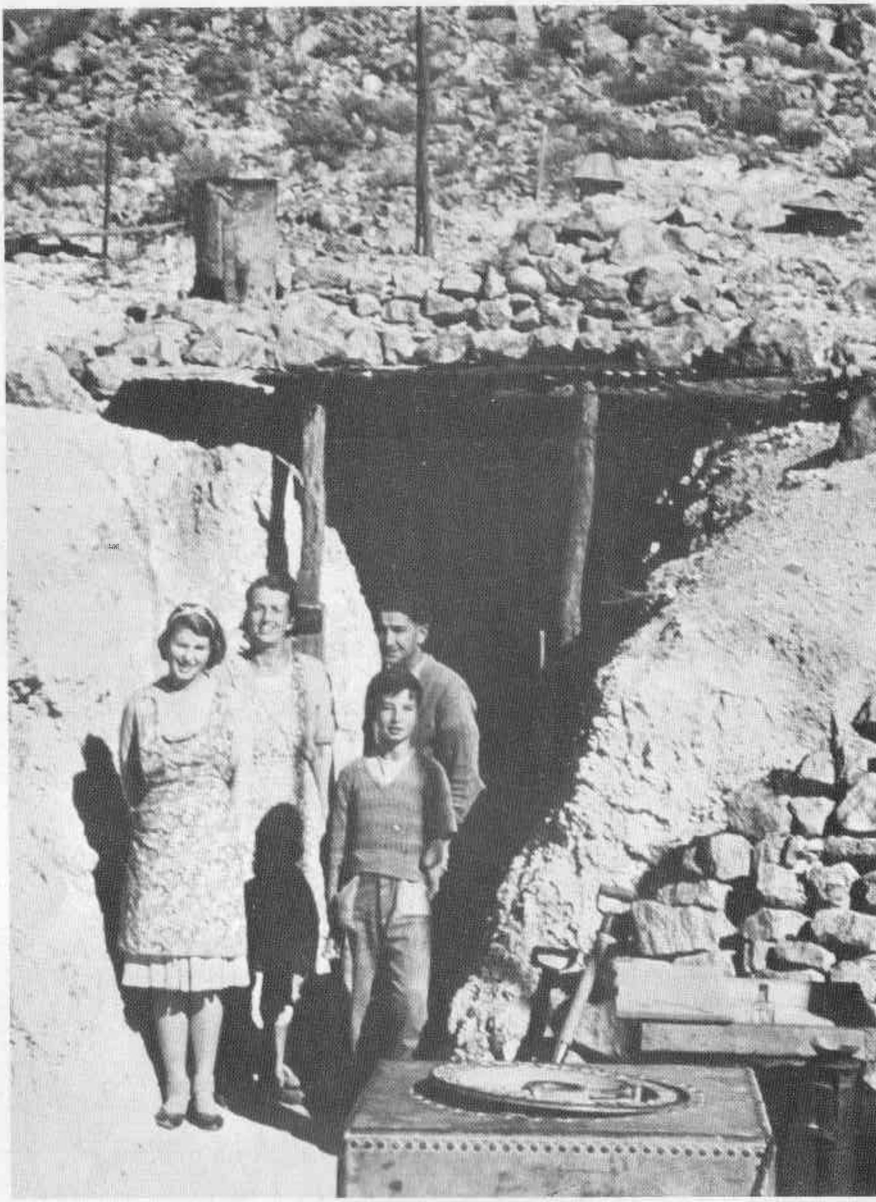
Coober Pedy is famous not only for its fine opal, but also for its queer houses. In the olden days, all of the houses were under the ground. This was done for two reasons: there was no timber in the area, and there were great seasonal changes in the weather. In summer it is hot, and in winter it is cold, with the winds swirling up from the South Pole. When it is hot these underground houses are cool, and when



Coober Pedy

The author stands with the Brewsters at their store, the hub of universe out there. The kindness, hospitality and never-ending stories of these two old-timers will never be forgotten. Mrs. Brewster is a cook *par excellence*.

the cold winds blow they are warm. Then, too, in a land plagued by flies, these carved rock houses offer a retreat, because the flies shun them. Rooms are gouged out of the soft sandstone, and the house can become as spacious as you have the patience to dig. Shelves and cupboards are cut out of the solid rock wall and the bed base is often of the same material. The old-timers still have lanterns and candles, but some of the more progressive folks have wind generators that keep storage batteries charged, for they enjoy electric lights. There were a few kerosene refrigerators — luxury indeed. Coober Pedy's school is by radio and at home, the Government supplying the sets. On one



Coober Pedy

Mr. and Mrs. Blatchford and family wait to welcome me to their home. The ventilators and chimney indicate the underground size of this house. It was very cozy.

Coober Pedy

The interior of the dugout house. Bryan greets his teacher several hundred miles away via radio. All of his lessons have been carefully prepared in advance and supervised by his very able mother. Note the refrigerator in the background; it runs on kerosene.

of my morning visits to the Blachford home, young Bryon was addressing a good morning to his teacher several hundred miles away. The scholastic standing of these children is high. Coober Pedy has one blessing: that of being on the main road of the north-south highway. It was surprising to learn of the numbers of vacationists who find their way down through the area in the dry season. Water is caught off a basin watershed and stored in a manmade covered reservoir; unless the season is very dry, there is adequate water for all.

It was here that I saw two old camels, remnents of the once fabulous Ghans traders. My home here was twenty-five feet under the ground in the old post office. Shared with Vin Wake, it was most comfortable, but I have to confess to a feeling of heavy claustrophobia that first night. The hospitality was wonderful, and I will never forget that kangaroo-tail goulash that was cooked for three days by Mrs. Keith Hamilton and the party that the Hamiltons gave to serve the goulash.

Mining here is about the same as at Andamooka. The fields are more vast

The first view over the hill from the Brewsters at the old diggings of the main find at Coober Pedy. Notice that both the hills, as well as the flats, have been explored. The finds were fabulous.

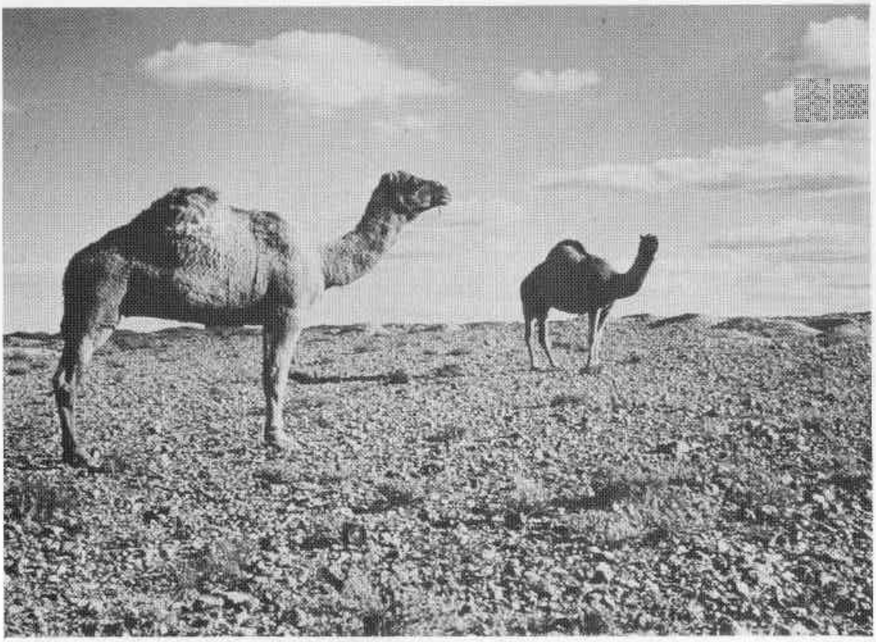
and the distances are greater and more widely separated. The bottoms are much deeper and the horizons don't have the massive bands of gypsum that indicate the nearness of opal. The opal found here is of a lighter color and slightly softer. Usually, it is thought that these can be easily told apart; however, I discovered that occasionally stones are sent between fields and sold as Andamooka or Pedy stones, as the occasion demands. I doubt that any genuine opal buyer can be fooled consistently. It was further interesting to note that the gougers each believed that the stones from his area were the best. The buyers bought anything and everything they could get their hands on.

Because of the floods and washouts on the roads to the south, I was forced to go north on my return journey, coming out through Alice Springs. Then by air to Darwin and via the Philippines on to Japan, where I visited the massive pearl farms and the rock-crystal works.

GEOLOGICAL FEATURES

Andamooka

Precious opal occurs here in a fault outlier of lower Cretaceous beds resting unconformably on quartzites, sandstones and shales of the Upper Pre-



Coober Pedy

Sentinels of the past. Two ancient camels left from the once mighty herds that made up the Khans trading routes.

In the early days it was with these beasts that the Mohammedans from the Middle East came to ply trade throughout central Australia.

Cambrian Age. The geological section is approximately as follows:

Superficial mantle of ferruginous and siliceous *gibbers*, or rocks.

Fifteen feet, approximately, of dense quartzite and sandstone, now mostly eroded away but capping a few hills.

A zone of cream-colored siliceous shale with limonitic veins; thickness not known.

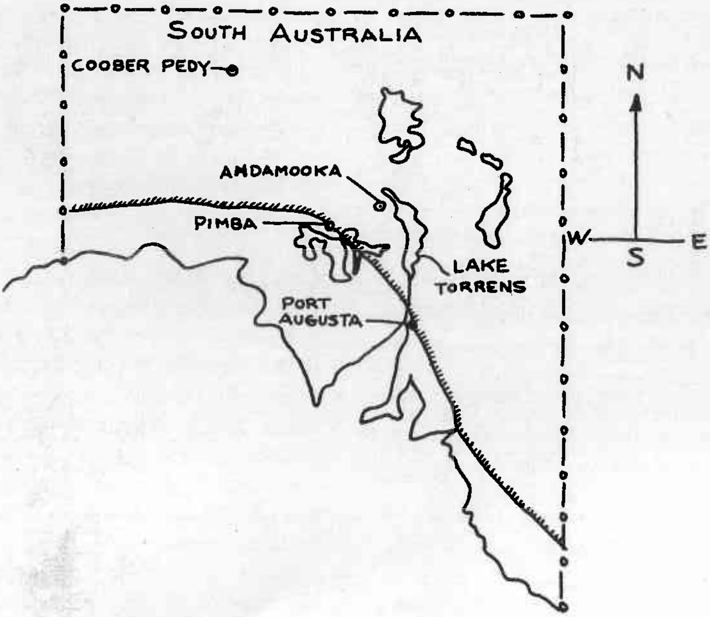
Cream of pale-pink siliceous clay and porous sandstone, approximately 55 feet thick.

Hard band of brown sandstone and a seam of massive gypsum. A band of coarse conglomerate and boulders up to nine inches in diameter. White micaceous clay.

Opal occurs in the interstices of the conglomerate and as a surface film, or layer, on the boulders, and it also occurs as seams within the clay that underlies the conglomerate band. The conglomerate and clay constitute the opal *horizon*, and the hard band and gypsum, when present, serve to indicate the proximity of the *horizon*. The sequence described above may be regarded as typical, but is not necessarily continuous throughout the field. The total

Coober Pedy

A buying partner comes to inspect his mine. This was a deep shaft, almost seventy feet down. Note the steps on the sides and the winch at the top.



thickness of this zone is about five feet.

Veins of opal may traverse the clay at any angle, but usually are flat. In one example, they followed a vein for 55 feet.

Coober Pedy

The geological section is approximately as follows:

A superficial layer of smooth, rounded *gibbers,* or rocks. These form an almost continuous thin mantle over the tableland surface.

Gray or brown quartzite, with some conglomerate and porcellanite. Approximately fifteen feet thick.

Zones of pink and cream-mottled clay, with scattered flakes of selenite. Approximately eight feet thick. It is not present in all parts of the field.

White, cream or pale-pink siliceous claystone, with one or more horizontal seams of fibrous gypsum up to 18 inches thick.

Pink or brown ferruginous sandstone, with veinlets of precious opal or pelecypod shells replaced by opal. The opal-bearing sandstone is the lowest formation exposed in the mines. Its thickness cannot be determined, but the total thickness below the quartzites (including the mottled clay) exceeds 60 feet.

The seams of opal range in thickness from about two inches to a fraction of an inch, and are irregular in their occurrence. Some are vertical, but the majority are horizontal or nearly so. Many of the veins are not continuous and are in the nature of lenticles, occur-ring in a series of fissures or joints.

The main level of opal is about 70 feet below the top of the plateau; as the result, most of the wide development has been on the flats.

There are few, if any, surface indications here to guide the miners in the selection of sites for prospecting.

Andamooka opal varies in body color and is generally darker than that obtained in Coober Pedy or White Cliffs. Some specimens, notably those of the German Gully area, are dark enough to compare favorably with the Lightning Ridge opal.

Australian opal fluoresces under rays of the long-wave ultraviolet light.

A Short History of Opal

In gem history, opal is one of the oldest of known gemstones; however, it had no place of honor with the ancient Hebrews. It was not included in the placement of jewels on the High Priest's Breastplate. However, by Roman times it had become known, appreciated, and highly sought after. In ancient Greece, the stones were used as talismans of foresight and prophecy. In Rome, they were symbols of hope and purity and were thought to preserve people from disease. Pliny, the learned Roman scholar, wrote, *It has the fire of carbuncle, the brilliance of purple amethyst, the sea green of emerald, all shining together in incredible union.* The ancient Arabs believed that these fiery stones fell from heaven in flashes of lightning. An interesting story of Rome tells of a Senator, Nonius, going into exile rather than forfeit his jewel to the Emperor. This jewel, a great slab of opal was olive green with a magnificent play of color; when viewed by transmitted light, it was ruby red. Later, at Alexandria, Egypt, during excavations, a magnificent opal was recovered. It was debated by historians if this were the Nonius opal. This gem eventually found its way to the French Court. Could this opal have been the fabulous *The Burning of Troy* possession of the Empress Josephine? When the Nadir Shah overran and conquered India and the Mogul court, part of the treasure he sought was opal. Queen Elizabeth I, of England, had a mania for gems. She owned a wardrobe of some 2000 gem-encrusted gowns. She was so infatuated with these and the gem designs that she had an artist commissioned to paint them. Her favorite stone was opal. Charles the Bold and General Potemkin each paid thousands of ducats for fine fiery cabochons. After centuries of supremacy, in the nineteenth century, all of the love, fame and glory were eclipsed by the publishing of a novel, Sir Walter Scott's *Anne of Geirstien.* At once a superstition spread through the Victorian world that opal was unlucky. Even though Queen Victoria and other greats such as Bernhardt gave opal great publicity, the stigma is still well planted in the Western world.

Book Reviews

GEMCRAFT, How to Cut and Polish Gemstones, by Lelande Quick and Hugh Leiper, FGA. Published by Chilton Company, Philadelphia, Pennsylvania. 179 pages, 177 black-and-white illustrations and photographs, tables, and bibliography. Price $7.50.

This book, based on the combined experience of two leading lapidaries, describes the latest techniques for fashioning gem materials. In addition to the usual instructions for cutting cabochons and faceted stones the authors go a step further and explain the intricacies of carving and sculpturing gemstones, how to make mosaics and intarsia and the tools necessary for this unique byway of the lapidary art. One interesting section furnishes step-by-step instructions for carving a continuous-chain link necklace.

The care and cleaning of equipment is thoroughly discussed, as well as its construction and correct usage. The section pertaining to faceting, the selection of cutting material and its preparation for cutting (sawing, dopping, preforming, etc.), and the various types of laps used in this operation is most complete. The chapter called "How to Carve and Engrave Gems" contains complete information on hollowing out, internal grinding, shell carving, landscape making, and carving cameos from amber, jet and coral. The chapter entitled "The Making of Gemstone Novelties" gives explicit directions for making bookends and spheres. Gemstone mosaic and intarsia are treated in a separate chapter. Useful tables and a bibliography complete this comprehensive book on the lapidary arts.

MINERALS OF NEW MEXICO, by Stuart A. Northrop, 665 pages. Published by the University of New Mexico Press, Albuquerque. Price $10.

This revision of a book first published in 1944 offers fascinating possibilities, both to the jeweler and the hobbyist interested in spending a vacation collecting gemstones or other minerals in the Southwest. Northrop has not limited the scope of his book to a basic recital of the minerals found in his state (he is Chairman of the Geology Department at the University of New Mexico in Albuquerque), but gives the highlights of the history of mineralogy and mining in New Mexico and other facts of interest. Sources are located by mine names in the various mining districts and other localities, over 170 of which are shown on a large foldout map in a pocket attached to the back cover.

Minerals of particular interest are given thorough treatment. The section on turquois consumes sixteen pages, including a very short summary of its nature, a short discussion of the spelling and derivation of the name, a bibliography of references to New Mexico occurrences, records of occurrences, value of production, history, folklore, technology, and other aspects.

The book seems thoroughly researched and well prepared.

* * *

PRECIOUS STONES AND PEARLS, by Dr. Karl Schlossmacher. Second edition, 1959. Schweizerbart'sche Verlagsbuchhandlung, Stuttgart. 340 pages, two color plates, two microphotographs and 115 text figures.

In the first edition of this book, which appeared in 1954, the major portion of the characteristics and methods of differentiation of precious stones was kept comparatively short. The text was mostly concerned with the individual precious stones. (At this time, the *Textbook for the Precise Identification of Precious Stones* was still in the process of arrangement at the publishers.) When the first edition of the book sold out, texts from both books were combined to make one volume entitled *Precious Stones and Pearls.* The first part is more comprehensive (40 pages), in order to give demanding gemologists a summary of the characteristics of precious stones and the methods and instruments necessary for their identification. Nevertheless, this book is, as stated in the foreword, ". . . a book of the middle"; i.e., between a strictly scientific presentation and a more generally understandable preparation for laymen. The emphasis is toward an intensive and extensive view of the knowledge of gemstones.

The second portion, of about 20 pages, enlarges especially on the manufacturing aspect. In the chapters dealing with diamonds, detailed information concerning grading and evaluation is given; i.e., the judging of color, clarity and make (polishing, cutting and grinding). The detailed chapter on the synthesis of diamonds by the General Electric Company is new.

Innovations that were discovered by researchers in the last few years have been added to the colored-stone section. There is added information concerning recent imitations and synthetics and their characteristics. Adulteration by artificial dyes has been especially emphasized. The chapters on finish and cutting of precious stones have been enlarged by the addition of historical data.

The conclusion of the book consists of tables, two color plates of the most important precious stones, and three microphotographs of inclusions and growth lines.

This second edition of *Precious Stones and Pearls* offers the gemologist and the precious-stone trade a generally understandable and up-to-date summary of our present knowledge and potentialities.

Gemological Digests

Diamond Sales

An all-time record for the first nine months of any year in the history of the diamond industry has been announced by De Beers Consolidated Mines. Sales of gem and industrial diamonds during the first nine months of this year totaled $191,539,171. Total sales for the entire year of 1958 amounted to $183,521,483.

Diamond Displays

A replica of the famed Liberty Bell, built and owned by the Mikimoto Pearl Company, of Japan, consists of 11,759 pearls and 366 diamonds. The bell, one-third the size of the original, has started a ten-month tour of the U.S. The company has listed its value at several hundred thousand dollars.

Russia

It has been reported that De Beers has recently become exclusive diamond-sales agent for the Soviet Union. Russian diamond production has been rising in recent months, with the exploitation of new deposits of industrial diamonds in Siberia. It has also been reported that gem diamonds have been found in the Northern Urals.

De Beers Synthetic Diamonds

The South African discovery of a method of manufacturing synthetic industrial diamonds is the climax to a program that was initiated in 1955. In 1956, De Beers Consolidated Mines completed a special research center, **Adamant Research Laboratory,** adjacent to the Diamond Research Laboratory, which has carried on various experiments with diamonds since 1947. A team of scientists consisting of Dr. H. B. Dyer, Dr. P. T. Wedepohl, Dr. B. W. Senior, assisted by a staff of ten technicians, and with Dr. J. F. H. Custers as director of research, began intensive research on the subject of diamond synthesis. In September, 1958, the first synthetic diamond was produced; X-ray tests furnished conclusive proof of its character. The first particle produced measured 0.4 millimeter by 0.25 millimeter, and it was made up of six equal-sized particles joined together. In September, 1959, a continuous production of synthetic diamonds was established. Mr. Harry Oppenheimer, chairman of De Beers Consolidated Mines, has stated that the method has been sufficiently advanced for commercial production, if it becomes desirable to produce this material on any scale.

San Francisco Diamond Class

Members of the San Francisco Diamond Evaluation Class, which met September 14th, through September 18th. Seated left to right: **Verl G. White,** Berkeley, California; **Verl W. Owen,** Tracy, California; **Sol Perper,** San Francisco; **William Frazier,** San Francisco; and **George Whitely,** San Francisco. Second row left to right; **Philip A. Lawton,** Gilroy, California; **B. Q. Haines,** Omaha, Nebraska; **Herbert Umeda,** Sacramento, California; **Pat A. Amanse,** San Francisco; **S. Streeper,** Salt Lake City, Utah; and **Edward Injayan,** Palo Alto, California. Third row left to right: **Robert T. Lindemann,** San Francisco; **Ray Mickel,** Lodi, California; **Richard A. Coleman,** Corvallis, Oregon; **William H. Whitman,** Napa, California; **Emerson Baughman,** Hayward, California; **William A. Allen,** GIA instructor; and **Robert Waldow,** Oakland, California.

Portland Oregon Diamond Evaluation Class

Members of the Portland, Oregon Diamond Evaluation Class, which met September 21st, through September 25th. Seated left to right: **Mrs. Pauline E. Timm,** Portland; **Mrs. N. E. Bordon,** Portland; **William P. Bordon,** Portland; **Robert C. Moore,** Tigard, Oregon; **Harley A. Piper,** Woodburn, Oregon; and **Shelley M. Gowans,** Portland. Standing left to right: **William A. Allen,** GIA instructor; **Loren Hughes,** LaGrande, Oregon; **Paul N. Morris,** Portland; **Charles W. Lesch,** Albany, Oregon; **Wesley B. Shaner,** Astoria, Oregon; **Donald M. Brown,** Walla Walla, Washington; **William R. Johnson,** Portland; **William M. Keating,** Pendleton, Oregon; **Vernon D. Henry,** Silverton, Oregon; **Raymond W. Ordway,** Portland; **Graham C. Griffith,** Portland; and **Lawrence A. Smith,** Beaverton, Oregon.

Seattle Diamond Evaluation Class

Members of the Seattle, Washington Diamond Evaluation Class, which met September 28th, through October 2nd. Seated first row left to right: **C. M. Huber,** Seattle; **Port C. Martin,** Walla Walla, Washington; and **Harold P. Hopkins,** Spokane, Washington. Seated second row left to right: **Walter Siebert,** Seattle; **Clarence O. Villaume,** Yakima, Washington; and **Frank Wheeler,** Kalispell, Montana. Standing (as they appear) left to right: **John B. Rowe,** Seattle; **James F. Geoghegan,** Ellensburgh, Washington; **Gerald S. Walker,** Grangeville, Idaho; **Douglas Erspamer,** Mount Vernon, Washington; **Guy T. Beckwith,** Shelton, Washington; **Gail W. Bevan,** Belleview, Washington; **H. Vincent Jones,** Vancouver, B.C., Canada; **Leon J. Ethier,** Kent, Washington; **William A. Allen,** GIA instructor; **John A. Martin,** Seattle; **Virgil M. Groth,** Tacoma; **Melvin L. Kincaid,** Moscow Idaho; **Hans Hagen,** Everett, Washington; and **Richard Tallcott,** Olympia, Wash.

San Francisco Diamond Evaluation Class

Members of the San Francisco Diamond Evaluation Class, which met October 5th, through October 9th. Seated left to right: **Miles Olwine**, San Francisco; **Burton Clark**, Gilroy, California; and **Mrs. Sallie Morton**, Cambrian Park, California. Standing left to right: **Michael Reddish**, Salt Lake City, Utah; **Cy Lambird**, Lodi, California; **Richard Holtzen**, Healdsburg, California; **Alva D. Andrus**, Salinas, California; **William A. Allen**, **GIA** instructor; and **F. Joseph Hannon**, Corona, California.

The GIA's popular one-week Diamond Evaluation Classes that were held recently in San Francisco, Portland and Seattle drew attendance from California, Oregon, Washington, Utah, Idaho, Montana, Nebraska and Canada. These classes, which are open to any jeweler, cover the GIA's diamond-appraisal system and important diamond-merchandising features. Since they teach diamond evaluation and appraisal, the major portion of the classwork is devoted to supervised practice in color, imperfection, proportion and finish grading and final pricing.

Early in 1959, the GIA classes were scheduled for major cities throughout the nation. Classes were held during the first half of the year in cities that were centrally located in the East, South and Middlewest, whereas the West Coast classes were scheduled for September and October. A second, but smaller, class for San Francisco was necessary because of the overflow of registrations. William A. Allen, instructor on the staff of the Gemological Institute of America (Los Angeles), conducted the West Coast sessions. G. Robert Crowningshield and Bertram Krashes, of the Institute's Eastern Headquarters, directed the classes that were held in the East, South and Middlewest.

Twenty-one classes have been scheduled for 1960.

N. Y. LAB NOTES

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atomic bombardment, we were surprised to note that absorption lines ordinarily expected only in yellow- to brown-treated diamonds were present in exactly half of the lot. The rest of the stones showed no absorption lines whatever, although their color was such that no colored-diamond dealer would mistake them for naturally colored stones. It is the tentative opinion of the Laboratory that stones entirely devoid of absorption lines may have been light brown before treatment, and that those showing lines may have been ordinary off-color, or cape, stones.

* * *

On several occasions the Laboratory has been called upon to identify rough diamonds for persons who have been inveigled into importing them. More than once the parcels were found to have been salted with quartz pebbles or consisted entirely of quartz. This type of fraud has extended even to the industrial diamond buyer, as evidenced by the sale of two very large almandite crystals sold as industrial diamond rough.

* * *

We are indebted to Mr. William T. Lusk, president of Tiffany and Company, for a 1.74-carat, brown, emerald-cut diamond of the green fluorescent type that shows the 5040 Å absorption line in the spectroscope.

We wish to thank Mr. Raphæl Esmerian, New York dealer, for two handsome greenish-yellow fluorescent diamonds and a selection of natural black pearls to be added to our study collection.

Similarly, we wish to thank Mr. Theodore Moed for two treated yellow diamonds that illustrate the characteristics of treated diamonds.

We thank Mr. Hans Sinzheimer, New York dealer in black cultured pearls, for a selection of his pearls for study purposes.

We wish to thank the firm of Lazare Kaplan and Sons for the beautiful split-leaf philodendron for our new quarters at 580 Fifth Avenue.

Following are students who have recently been awarded diplomas in in the Theory of Gemology:

Murray Rosenblatt, Rose Jewelers, Bellport, New York; **Patricio Amanse y Abelle,** Philcogen, World Trade Center, San Francisco; **Bertrand L. Fontaine,** Owen-Cotter Jewelry Company, St. Petersburg, Florida; **John T. Carpenter, Jr.,** Carpenter Jewelers, Camp Hill, Pennsylvania; **Oscar T. Kennedy,** J. F. Bard Company, Inc., Chicago, Illinois; **Vernon Gregory,** Ottawa, Illinois; and **Donatien Dugre,** Shawinigan, P. Q. Canada.

The following student was awarded a diploma in the Theory and Practice of Gemology:

Rosser Chesebrough, Sherman Oaks, California.

L. A. LAB NOTES

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two unusual pieces of rock crystal that served as borders for the diamond-set ornamentation. Both pieces of quartz were approximately one and one-half inches in length and had elongated pentagon outlines and open centers. They provided the equivalent of step-cut, transparent frames, approximately one-fourth inch in width, for the diamonds on each side of the brooch. Obviously, such stones could not have been faceted on a conventional faceting unit.

* * *

In the last issue, it was stated that a complete summary of current work on turquois would be presented in this column. In the meantime, one of our students who deals in turquois is collecting a large number of specimens that will represent all current methods of treatment; also included will be untreated specimens of various grades from the better-known deposits in the Southwest. Having access to such a collection will give us an opportunity not only to conclude the present research, but to provide better illustrations for publication than are presently available. This summary will, therefore, be postponed until a later issue.

We were delighted to receive two very rare volumes, *Die Diamonten Wuste Sudwest Africas,* by E. Kaiser, through the courtesy of Dr. J. Daniel Willems, Chicago, Illinois. This rare two-volume edition makes an interesting addition to the GIA library.

Another very much appreciated gift was a copy of the first edition of *Edelsteinkunde,* by Max Bauer, generously donated to the GIA library by H. Paul Juergens, GIA governor and former Board Chairman, Juergens & Andersen Company, Chicago.

We thank Bill Ilfeld for the garnet-and-amethyst specimen that he sent to the GIA from Mexico, where he is presently traveling.

A box of rock-crystal beads donated by John Fuhrbach, Amarillo, Texas, will be used to good advantage in our practice-stone sets.

A green grossularite garnet cabochon donated by George Marcher, San Francisco gem dealer, will make a welcome addition to our garnet collection.

Leo Steinem, Los Angeles gemstone dealer, presented the GIA with a light-blue jadeite cabochon. This stone will add another color to our jadeite display.

Our thanks go to Rudolph Lakeside, Helsinki, Finland, for the cut and rough star sapphires discussed previously in this column.

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