Gems & Gemology

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BOOK REVIEWS

***Gem Trader*, by Louis Kornitzer. New York. Sheridan House. 1939. (May be ordered from G.I.A. Book Department, at $2.75.)**

This book, which was published in Great Britain under the title "The Bridge of Gems," is a distinct disappointment after Mr. Kornitzer's two books on pearls which were reviewed in *Gems & Gemology* for Spring, 1937. The author seems to have told the really interesting part of his story in his previous works and this book lacks much of the autobiographical interest which made "Trade Winds" and "Pearls and Men" fascinating reading. From the standpoint of the trained gemologist, the most interesting part of "Gem Trader" will undoubtedly be the fantastic errors which Mr. Kornitzer makes in his excursions into the realm of science. Among many, the following may be quoted:

"Again, the crystalline forms may be cubic, tetragonal, hexagonal, rhombic, monoclinic or triclinic, according to natural crystallization, and this crystalline form is as important to the beauty of gems as their colour, because it determines the way in which they reflect light."

"This Burmese ruby ranks next in the scale of hardness to the sapphire."

"All beryls have the approximate hardness of 8, but they vary somewhat, some being much softer than others. Both the aquamarine and the euclase, belong to this family of stones."

"The colourless variety (of tourmaline) is known as achroite and the green as andalusite, from its occurrence in Andalusian Spain."

"You will remember that the noncrystalline members of the family of silica are the opal and the chalcedony."

"Actually there is no natural substance harder than diamond, there have been produced certain alloys of tantalum which not only compete for wearing qualities with the hardest of all stones, but are even harder than diamond."

However, despite the errors, the author has had enough of his story left untold from his previous books to have moments in the present one to interest the most critical reader. Undoubtedly, since his initiation into the jewelry trade, Mr. Kornitzer has had a long and varied course of practical experience.—*R. Shipley, Jr.*

Gemming in Ceylon

by

H. V. SARDHA RATNAVIRA

Gemological Student, Colombo, Ceylon

Nestling among the peaks of the Sabragamuwa district lies Ratnapura, famous throughout the world as the city of gems. Star sapphires, blue sapphires, rubies, cat's-eyes and a large variety of other gems, of quantity unlimited, are found here. It is here that one finds the gemming industry of Ceylon at its best. Here one comes across many gem pits, all working at full speed, producing stones that will form the basis of some of the finest jewelry that Ceylon offers.

If one be interested in gem mining, he first has to obtain a license to work a gem pit. An application must be forwarded to the Government Agent of the district, who will refer the matter to the Ratemahatmaya, or Headman. The matter does not end here, for the Police Vidane (police officer) must be informed, too, that he may make inquiries as regards the intended site of the gem pit. If the site belongs to the government, permission will not be granted. These inquiries naturally cannot be rushed, the usual period extending from two to three months. The gem mining business is carried on mainly by the Singhalese.

Once the application has been passed the applicant consults an astrologer as to the time most auspicious for the opening ceremony. The method of choosing the site is not done in a scientific manner. Usually the site is chosen near a spot which has been well known to produce gems, and a trial is first made by digging a small section of the ground. An experienced man can always tell whether the site is workable, usually by the presence of gem-bearing rock known as "Thiruvana" in Singhalese. Before work is started, prayers and offerings are given to the "Powers That Be" beseeching success in the undertaking. This ceremony is performed on the site. The first spade of gravel is turned by the owner of the gem pit and then the miners start to work on it. These miners are enrolled from the ranks of the villagers of that district, who, of course, have a wide experience in this type of work.

As regards the shares, the majority belong to the owner, the remainder being divided among the miners. The value of the shares depends on the quality as well as the quantity of the stones found. The owner sometimes furnishes food, but this usually is supplied by the miners themselves. In the case when the owner pays for the meals, the miner returns half of his share. This system is called in Singhalese "karu howl," karu meaning laborer or workmen, and howl meaning a share. Sometimes the owner spends hundreds of rupees and does not get anything in return.

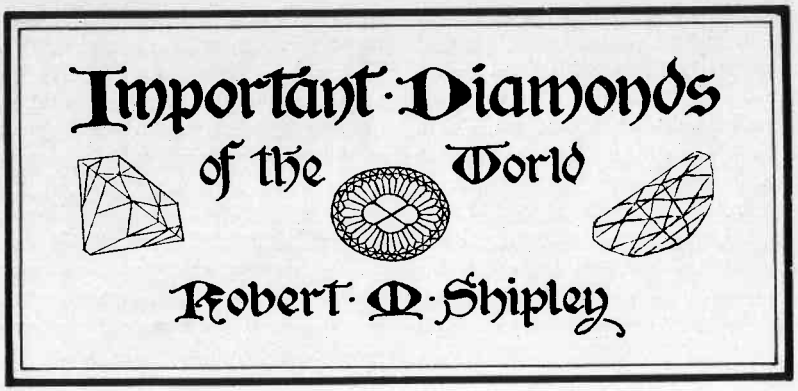
The pit is usually dug about four feet square and three to six feet deep, making room for two or three miners to work. This type is dug only if the gem-bearing gravel is

found near the surface. On the other hand, the gravel may be found deep down, and if this be the case the pits are dug about six feet square and ten to twenty feet deep, or perhaps even more. If the soil be loosely packed, especially in deep pits, a scaffolding is erected inside the pit to prevent the soil from sliding in. This precaution must be taken, as very serious accidents have occurred. If a number of pits be found close together, tunnels are constructed connecting them together. One disadvantage of a deep pit is that water gushes in due to the tapping of hidden springs. This water is bailed out by an especially constructed winch, a number of buckets being attached to the connecting rope. The miners go on digging until they encounter either a blackish rock called "ralu ratta" or a rocky gravel of whitish color called "thiruvana." This is an indication to the miner that the next layer must contain gems. This layer is called "illam." If after the illam they come to a layer of clay, called "malawa," they do not dig any further.

The illam is the most important layer and is broken up by the miners who use an iron rod called the "illam kura." The miners usually wear only a loincloth, and a handkerchief is tied tightly around the head, the handkerchief being used to prevent the debris getting amongst the hair. One feels sorry for the miners, for their work is hard; at the end of the day's labor they are covered from head to foot with mud. But they are a happy-go-lucky crowd and may often be heard singing while they work.

The gravel is brought to the surface in baskets and collected in an adjacent spot. When no more illam is obtainable the owner chooses an auspicious day for the washing and sorting. Until this time the heap of gravel is covered with leaves and well guarded. The usual custom on that day is to prepare "milk rice" (rice boiled with coconut milk) which is eaten on the spot just before the gravel is washed. If the pit be near a river, the gravel is transferred to the bank, where it is washed. When there is no river close by, a trench is cut near the dumped material and filled with water, the gravel being washed in this trench in large baskets. During the washing process the owner is always on the spot as the miners sometimes cannot resist the temptation to hide a good stone. As the gems are heavier than the gravel they remain at the bottom of the baskets and the sediment is washed away. The rough stones are then given to the owner, who decides with the miners whether the stones are to be auctioned or sold to a gem merchant. The money obtained from this transaction is then divided, the owner taking his share and the rest being divided as previously arranged.

When gems are found in streams the procedure is slightly different. A dam is constructed across the stream leaving a space in the middle of about five feet, in front of which a wooden log is fixed. The water rushes over this log and the miners standing in front with long-handled "mamoties" drag the gravel toward them. The sand is washed away and the illam is collected in the trough. As soon as the illam is noticed the miners either dive down with baskets and collect the illam or continue using their mamoties to remove it. The washing is, of course, done on the spot.



THE KOHINOOR

The Kohinoor, the most famous diamond in the world, has a long and tragic history and the longest known pedigree. Of all gems, it has been endowed with the greatest imaginary powers. For centuries it was believed that he who owned the Kohinoor ruled the world, despite the fact that its possession endangered the position and even the life of its owner, unless that owner be a woman. Perhaps it is for this reason that it is now set in the crown of the Queen of England.

There are breaks in its long pedigree, and at times its very origin is questioned. Certain authorities believe that it is a part of the Great Mogul, having been cleaved after the Great Mogul left India, probably in Persia. Koh-i-Nur, which is the Indian spelling, means "Mountain of Light," so named for the shape of the original stone. The actual history is as strange as any legend and threads its way through the romantic history of India and of the Moguls. The first historical reference to the stone appears in the "Memoirs of Sultan Baber," who founded the Mogul dynasty in India and wrote under date of May 4, 1526:

"Bikermajit, a Hindu, who was a Rajah of Gwalior (Gwalior was a part of the territory of Malwa), had governed that country for upwards of a hundred years. In the battle in which Ibrahim was defeated, Bikermajit was sent to hell. Bikermajit's family and the heads of his clans were at this moment in Agra. Haumayun did not permit them to be plundered. Of their own free will they presented to Haumayun a 'peshkesh' (tribute or present) consisting of a quantity of jewels and precious stones. Among these was a famous diamond which had been acquired by Sultan Ala-ed-din. It was so valuable that a judge of diamonds valued it at half of the daily expense of the whole world. On my arrival Haumayun presented it to me as a peshkesh, and I gave it back to him as a present."

Sultan Ala-ed-din, whom Baber mentions, had reigned some two hundred years before. Ala-ed-din is credited with having taken the jewel in the year 1304, from the Rajah of

Malwa, in whose family it had been for generations without number, and now more than two hundred years afterward it was again in the possession of a Rajah of Malwa. From the time of Sultan Baber's account the diamond passed by inheritance through the long and powerful line of Mogul emperors, including Akbar Shah, Shah Jehan and Jehangir. Always the symbol of power, possession of the Kohinoor was coveted by sons and brothers of these emperors, in their continuous and bloody strife for succession to the throne. Finally the Kohinoor left India when Nadir Shah of Persia invaded India and sacked Delhi in 1739.

Various stories are told of Nadir Shah's seizure of the diamond, which he knew existed. One story is that the Kohinoor was one of the eyes of the peacock in the great Peacock Throne which Shah Jehan began and Aurengzeb completed; that Nadir Shah carried off the throne and so gained possession of the jewel. Another story, and a better one, is that "Having conquered Delhi and collected the booty which was due to the conqueror, the Kohinoor, the existence of which was well known, failed to appear amongst it. Diligent search was made, but with no result. At last one of the ladies of the harem of Mohammed Shah, the King of Delhi, gave away the secret. She said that her liege lord always wore it concealed in the folds of his turban and as an Indian rarely parts with his turban, even at night in hot weather, the stone, but for treachery, was fairly safe.

"On hearing this news, Nadir Shah invited Mohammed Shah to dinner, and instead of there and then killing him, according to the ethics of the age, he took advantage of an interchange of courtesies, which no Eastern potentate without gross breach of manners could refuse. He proposed changing turbans with his guest, which is a gesture of the greatest friendship. With such good grace as he could command, the King of Delhi thus passed the great diamond to the King of Persia. Nadir Shah in due course returned to his own country bearing the Kohinoor with him as part of the vast store of gems, among which, perhaps, was also the Orloff.

"It brought no luck to the cunning thief, conquering captain though he was, and he died assassinated by a courtier. His wretched son, Shah Rukh, a feeble ruler, was deposed. Like Shah Jehan, in the hour of misfortune he found solace in the jewel which he craftily concealed. Tortured horribly to disclose the hiding place of the diamond, he had not only boiled pitch poured over his head, but finally had his eyes put out. Nevertheless he clung to the Kohinoor and invested the stone with a new prestige, for in the end he was nominally restored to the throne so that the old saying was verified that 'Sovereignty rests with the Kohinoor.'"

The diamond passed, before Shah Rukh's death, into the hands of the founder of the short-lived Durani dynasty, Ahmed Shah, who descended from his mountain heights to the aid of the weak, blind, successor of his old master. Ahmed Shah passed the gem on to his descendants. His eldest grandson, Shah Zeman, was deposed and his eyes pierced by a lance. His brother, Shah Shuja, succeeded him and fell heir to the diamond. He wore the diamond on his breast on all occasions and Mountstuart Elphinstone, British envoy to Pesha-

war, saw it in all its splendor in 1809. Shah Shuja, too, fell and fled to the court of Runjit Singh, the "Lion of the Punjab."

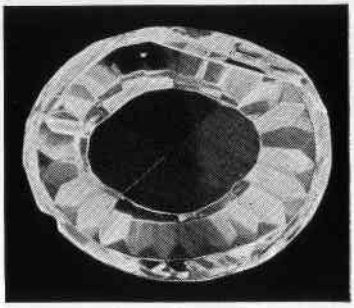
Runjit Singh was at first friendly to the exiled Shuja, but soon oppressed him. All that he had Runjit Singh took, save the great stone, and that he desired above all things. He had magnificent emeralds, but the "Mountain of Light" haunted him. At last he drove Shuja to bay. Runjit demanded the Kohinoor. Shuja tried to substitute a large topaz but Runjit was too clever for him. Runjit had the stone tested, kept the topaz, and immediately ordered the arrest of Shuja and took the Kohinoor.

When the jewel was uncovered and lay before Runjit, he asked Shuja, "At what price do you value it?" "At good luck, for it has ever been the associate of him who has vanquished his foes." By his answer he betrayed the true secret of the mysterious reference akin to worship with which choice gems have ever been regarded in the East.

Runjit wore the jewel in a bracelet for four or five years—then set it in a turban—but after a year it was set in an armlet with a diamond on each side and so worn for upwards of twenty years. Runjit carried the gem with him wherever he went. When he traveled it was placed in a camel trunk on the lead camel and heavily guarded day and night. After the death of Runjit in 1839 the Kohinoor remained in the Lahore jewel chamber. In 1849 the Punjab was annexed to the British Empire and the Kohinoor came with it.

After April 3, 1849, the keys of the jewel chamber were given Dr. J. S. Login, later Lord Login. Dr. Login's letters to his wife tell the story of the Kohinoor: "The Kohinoor was placed in my hands. . . .

"I was one of the very few entrusted with the secret of its disposal. Indeed, they could not have got access to it without my knowledge, seeing that it never left my



The Kohinoor before recutting.

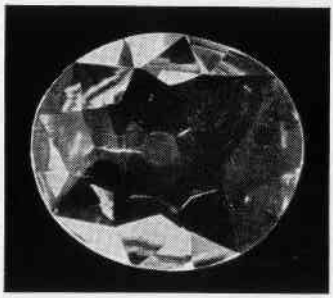
possession from the day I received it in charge. I may tell you now that it is safe—that Lord Dalhousie came to my quarters before he left Lahore, bringing with him a small bag made by Lady Dalhousie to hold it, and after I had formally made it over to him he went into my room and fastened it around his waist under his clothes, in my presence. There my responsibility ended, and I felt it a great load taken off my mind."

Unfortunately, the above letter contradicts the rather amusing story of Sir John Lawrence as having thrust the gem into his waistcoat pocket and having absentmindedly forgotten it. (The Kohinoor, set as an armlet, would make a rather large vest pocketful, to say the least.)

The Kohinoor weighed, when brought to England, $186\frac{1}{16}$ carats. The Hindu cutter evidently had handled the jewel in a clumsy way "at a time when the art was still in its infancy," and when first shown it must have been a great disappoint-

ment, looking, all experts declare, little better than a crystal. There was much consultation and it was decided to recut the gem. The final shape and style of cutting was chosen by Queen Victoria and Prince Albert, who placed the diamond upon the mill. The Duke of Wellington gave the first touch to the wheel. Owing to the flattened and oval figure of the stone, the brilliant pattern "entailed the greatest possible amount of waste." Eighty carats were removed in the cutting and the whole operation was a painful one, both to the stone and to the pride of the cutters.

The model of the original stone is fascinating. There are four incisions in the girdle, placed there for setting the stone in Runjit's bracelet; also another incision on an edge, the result of polishing out a former imperfection, an early custom in India. When the gem was recut, the artistic and historical interest was lost and there was no great amount of brilliancy gained. The stone was valued, before being recut, at 140,000 pounds ($700,000). The cutting cost $40,000 and occupied thirty-eight days of twelve hours each. The stone itself was not valued by Barbot, the French expert, at the enormous figure just quoted. He declares it an extraordinary stone, but more on account of its great surface than for its fire. After its long and tragic history the Kohinoor now rests among the crown jewels of England. It is the central stone of the Queen's State Crown, designed especially for Queen Mary in 1911. A clever method of mounting makes possible its removal so that it may be worn as a brooch.



The Kohinoor after recutting.

A GEMOLOGICAL ENCYCLOPEDIA

(Continued from last issue)

by HENRY E. BRIGGS, Ph.D.

GARNET (Continued)

Andradite. This garnet is a silicate of calcium and iron. The formula is written $Ca_3Fe_2(SiO_4)_3$. However, the composition is somewhat variable and consequently the colors are somewhat varied, too. It occurs in a fine emerald-green shade in the Ural Mountains in Russia. The color of this variety is due to chromium, and such stones are variously called Uvarovite, "Uralian emerald," etc. It also occurs in the grass-green shade which is offered as peridot in the jewelry trade oftentimes. Also in the yellow color which is known as topazolite because of its resemblance to the yellow topaz. Andradite also occurs in the opaque black called melanite. Andradite is characterized by its high index of refraction—1.895—and also by the extremely high dispersion (.057) which is much higher than that of the diamond. This is unusual for a colored stone. The gem, when cut and of good quality, is very brilliant. It occurs in Saxony and in the Ural Mountains in the varieties except in the topazolite, this variety being found in the Piedmont region in Italy. The author had a rather unusual stone at one time which was found in Montana on the Yellowstone River east of Helena. This pebble was thoroughly examined by the author and several others who were skilled in determining of gems and it was found to be unmistakably an andradite garnet. The occurrence was not the only unusual part of the incident, for the pebble was perfectly colorless, a thing which is seldom met with in garnet. The stone weighed 6¼ carats when cut and was very nearly an equal of the finest diamond in brilliancy and fire. Although no other stones have been obtained of this type from the section mentioned, it is possible there may be a deposit somewhere near the river banks in that section.

CHRYSOBERYL

Chrysoberyl was at one time a very popular gem in two of its varieties, the alexandrite and the cat's-eye. It is very scarce at the present time, however, and it has lost a certain amount of its favor because of the unsteady supply. However, the fine gems are sought after by amateurs and are absorbed as soon as they are on the market.

Chrysoberyl is orthorhombic in crystallization, but the crystals often are twinned into odd-looking forms. The mineral has a distinct pinacoidal cleavage and a conchoidal fracture. It is very durable, being 8½ in hardness. The specific gravity is from 3.5 to 3.8. Pleochroism is rather marked, especially in the darker colored varieties. Chrysoberyl is biaxial and optically positive. The mean index of refraction is 1.75 and the dispersion

is .015. The mineral is a silicate of beryllium and aluminum expressed by the formula $Be(AlO_2)_2$, but may also contain iron or chromium or both.

Chrysoberyl occurs in greenish white, greenish yellow and runs through the greens to emerald-green. Sometimes it is found in the yellows and browns. The yellowish green variety is sold as merely "chrysoberyl," while the varieties which have a silky luster and chatoyancy are sold as cat's-eye. The latter variety is also known as cymophane.

Alexandrite is perhaps the most popular of all the chrysoberyl group. It was first discovered in 1833 in the Ural Mountains in Russia and was named for the Czar Alexander II. The mineral is strongly pleochroic, showing emerald-green, columbine-red, and orange-yellow under the dichroscope. An unusual property of alexandrite is that of showing one color in daylight and another in artificial light. By day the gem appears to be a fine emerald-green, while by lamplight it will appear to be a columbine-red. The coloring agent or impurity in alexandrite is probably chromium since the minerals show such an absorption band under a spectroscope. Alexandrite is now imitated in synthetic corundum; however, this substitute is easily detected with the dichroscope by its twin colors, which are not the same as those of the true mineral. The coloring matter used in making these synthetics is reported by a manufacturer of them to be vanadium.

Gem varieties of chrysoberyl are found in the Ural Mountains in Russia, in Ceylon, China, Brazil, and Tasmania.

QUARTZ

Quartz is one of the most common minerals on the face of the earth. It is found in every land, and almost every land has many of the types used as gems or for other ornamental purposes. The crystallization of quartz is hexagonal and it occurs in well-developed crystals with striated faces. Crystals are not uncommon as "rights" and "lefts," that is, with unsymetrical facets on either the right or left side. Such crystals will show two facets more on one side of the prism faces than on the other, and will rotate polarized light to either the right or left, as the case may be.

Inclusions in quartz are very common: solids, liquids and gases. The solids usually are rutile, hematite, tourmaline, actinolite, manganese dioxide, organic matter, etc. Of liquids, the most common are liquid carbon dioxide and water. Of gases, carbon dioxide is usually the inclusion, although others have been found.

The specific gravity of quartz ranges from 2.5 to 2.8; the hardness from 6.5 to 7. The cleavage, though indistinct and seldom observed, is rhombohedral. The fracture is conchoidal and the streak white, the luster vitreous to dull. Quartz is found in a wide range of colors, some transparent and some opaque. The colors are due to impurities and, therefore, we would say the mineral is "allochromatic." Radiation by radio-active minerals or waters is suggested as a possible cause of color in some of the quartz gems, although little proof has as yet been offered.

(To be continued)

The Gems of Colorado

by

RICHARD M. PEARL, C.G.

(*Zircon*)

Two sources of gem zircon have been found in Colorado, in the gold gravels of Bear River in Routt County, and in the pegmatite of St. Peter's Dome, a conical peak near Colorado Springs. The smaller crystals of the latter place are as noteworthy for their perfection as for their colors, rich transparent pinks, reddish browns, honey yellows, and emerald greens. They are large enough for cutting small brilliants or baguettes.

(*Garnet*)

At least four of the six chief kinds of garnet are known as gems in Colorado. Almandite has come from several places near Canon City and from South Park. Andradite of the topazolite variety occurs near Ouray among some of the most spectacular mountain scenery to be found anywhere. The hessonite and cinnamon-stone varieties of grossularite have been found near Turret and in the basin of the North Fork of the Arkansas River. The source of pyrope, the "Colorado ruby," is still in doubt, but there are probably specimens similar to those of Arizona and New Mexico. Gem spessartite garnet is known from three localities, at Nathrop, Silver Cliff, and Westcliffe, all in rhyolite. The stones at Nathrop occur in three dikes which form low hills along the Arkansas River, and are found with topaz in cavities as fine dark red, entirely transparent crystals, small but perfectly formed on the exposed faces. Practically every piece of rock several inches square contains one or more crystals, and some of them have been used in jewelry set pavé.

(*Jet*)

Since its discovery near Golden 70 years ago, jet has been found in a number of places in Colorado, and the material in two deposits—near Colorado Springs and on Trinchera Mesa—has been described by Kunz as equal to the best from Whitby, England.

(*Phenakite*)

Phenakite is one of the leading Colorado gems. It is second in interest only to aquamarine among the minerals of the Mount Antero pegmatite, and Antero is the most important locality for it in this country. The first discovery of phenakite in the United States was in Crystal Park, in the Pikes Peak region south of Manitou. This area and that of Crystal Peak, north of Florissant, still yield fine crystals; most of them are colorless, but some may be pale yellow, light gray, or reddish. Five brilliants from Crystal Peak are in the gem collection of the Field Museum of Natural History, Chicago.

(*Quartz*)

Amethyst, citrine, rock crystal, rose quartz, sagenite, and smoky quartz are to be included among the gem varieties of crystalline quartz found in Colorado. Fine specimens of jewelry quality have come from several dozen places within the state. Especially notable material includes

bright amethyst from Nevadaville; rock crystal from Antero and Trinidad; sagenite from Turret, Durango, and the Tarryall Mountains; and smoky quartz from Antero and the Pikes Peak region. Gems cut from these stones are to be found in many leading museums. A rock crystal sphere from Antero, described as "one of the largest," 5½ inches in diameter, is in the Field Museum.

(*Chalcedony*)

Agate, bloodstone, chrysoprase, jasper, petrified wood, plasma, prase, and sardonyx are among the varieties of chalcedony that have been found in Colorado and used as gems. The localities are too numerous to list. The choicest material includes agate from near Canon City, petrified wood from South Park, and several kinds of chalcedony from a deposit near Fairplay.

(*Topaz*)

Gem topaz is known from eight places in Colorado, including several of the most interesting mineral deposits. The finest stones have come from cavities in the pegmatite of Devil's Head, a large, rather isolated mountain in the Pikes Peak region. They are colorless, light yellow, and bluish. The complete transparency, and often the delicate color, of many of the specimens have made possible the cutting of beautiful gems for jewelry. Perhaps the largest complete topaz crystal yet found in North America came from there in 1935 and weighed 1160 grams.

(*Tourmaline*)

Gem tourmaline has been reported for certain from only one place in Colorado, in Eightmile Park, immediately north of the famous Royal Gorge of the Arkansas River. Within a few months after their opening in 1906, the pegmatite deposits were the largest producers of tourmaline gems in the United States outside of California. None are available today, but very fine pink, lilac, green, blue, and colorless crystals, as well as vari-colored ones, were obtained.

(The End)

ILLUMINATOR-MAGNIFIERS*

Two hand illuminator-magnifiers, made by Carl Zeiss, Inc., of Germany and by Swift & Anderson, Inc., of Boston have been checked in the G.I.A. laboratory. The Zeiss instrument employs the excellent Zeiss aplanatic magnifier in a choice of 6x, 8x, or 10x. The Swift & Anderson instrument, which is being marketed as the "Se-All Firefly," has a double lens of approximately 7 power. Though this lens is of good size, it is uncorrected and its resolving power is rather low. This or a similar magnifier is being advertised by some jewelers as a "Beam-o-scope," of assistance to a customer in observing imperfections.

Neither of the instruments is particularly effective for observation of gem stones. Both illuminate objects from the top only, when used with cut stones, and produce more unwanted reflection than effective illumination. Furthermore, the "Se-All Firefly" is below the 10x limit set by the Federal Trade Commission.

*A.G.S. Research Service

GEMOLOGICAL GLOSSARY

(Continued from last issue)

(With phonetic pronunciation system.)

Terms in quotation marks are considered incorrect.

Ruttee. Same as *rati.*

Sabalite. Trade-name for a banded variscite from Utah used as a gem stone.

"Sacred Turquoise." Pale blue smithsonite.

Saffronite or Safronite (saf'run-ite). A coined word recommended by the European jewelry trade conference held in Rome in May, 1933, to refer to crystalline quartz of the color of yellow or reddish yellow topaz. The Congress recommended its use exclusively after January 1st, 1937. Before that date the term *topaz saffronite* was proposed to be used instead of "topaz" for this variety.

Sagenite (saj'e-nite). Transparent quartz with inclusions of hair-like or needle-like crystals of some other mineral, generally rutile.

St. Stephen's Stone. Translucent chalcedony with round blood-red spots.

Sandstone. A rock consisting of old beds of sands or gravel or both, bound together by a natural cement which may be of various light hues.

Sandstone Opal. One of the miner's varieties of opal found in the rough. (Queensland.)

Sandy Sard. Sard dotted with darker spots.

"Saphir d'eau" (sa"fere'doe'). (French, "Water Sapphire.") Blue cordierite.

Sapphire (saf'ire). As generally used, refers to any gem corundum other than red (ruby). By some, considered only the fine blue corundum, other varieties being classed as *fancy sapphires.* Gem variety of sapphire should be transparent unless asteriated or chatoyant, or with girasol effect. The word *sapphire* is also used as an adjective to describe blue varieties of other species, as *sapphire spinel.*

Sapphire Glass. A sapphire blue glass of apparently unknown composition with exceptional hardness up to 6¾.

Sapphire Quartz. Blue quartz.

"Sapphirine" (saf'er-in or -ine). Term used incorrectly for blue chalcedony, blue quartz, or blue spinel. Also a separate, non-gem mineral.

Sapphire Spinel. Transparent blue spinel.

Sard (sard). Translucent brown to reddish brown chalcedony. See also *carnelian.*

Sardonyx (sard-oniks'). Strictly, chalcedony of alternate parallel layers of brown and other color or colors. Frequently incorrectly applied to sard, or carnelian. See also *Carnelian Onyx.*

Sardoin (sar'doin). Same as sard.

Satin Spar (sat'in spar). Translucent, silky variety of gypsum. Also occasionally applied to calcite. See *Gypsum, Calcite.*

"Saxon Chrysolite" (sak'sun or sak's'n). Pale greenish yellow topaz.

"Saxon Topaz." Incorrect term for citrine.

Scaly (skale'i). Consisting of scales.

Scapolite (skap'oe-lite). A transparent to translucent, colorless to reddish brown, or greenish or bluish gray, mineral sometimes used as a gem. Hardness, 5½-6, refractive index, 1.56, specific gravity, 2.7. A very light red, slightly adularescent variety is incorrectly called "Pink Moonstone."

Scarab (skar'ab). A form of cutting gem minerals and other substances, developed by the early Egyptians. The top of the stone is cut to represent a conventionalized beetle, the lower side bears symbols and may be used as a seal.

Schiller (shil'er). A general term applied to the peculiar luster, sometimes nearly metallic, observed in certain minerals, as in hypersthene, sunstone, and others.

Schiller Quartz. Quartz Cat's-eye.

Schiller Spar. Bastite. An altered bronzite or enstatie having approximately the composition of serpentine, and exhibiting pronounced schiller.

Schist (shist). A metamorphic rock with a highly developed parallel or foliated structure, along which it splits easily.

"Scientific Emerald" (sei"en-tif'ic). Green glass.

"Scientific Gems." Usually imitations, although formerly applied to synthetics and reconstructed stones.

"Scientific Ruby." Red glass.

"Scientific Sapphire." Blue glass.

Scientific Stones. Same as *Scientific Gems.*

Scoop Stone (skoop). A name for amber, applied especially to that amber scooped from the sea along the coast of Prussia.

Schorl (shorl). Black tourmaline.

"Scotch Topaz." Smoky quartz. See *Citrine, Saffronite.*

Sea Amber. Amber which has been scooped from the ocean or found on the beaches. See also *Scoop stone.*

Seal Sapphire. A brown (seal-colored) silky or girasol variety of corundum.

Seam. A thin vein; also a bed in stratified (layered) rocks, as a seam of coal.

Seastone. Amber.

Second Cape. Same as "Cape." "First" cape is same as silver cape.

Sectile (sek'til). Capable of being cut as into slices or shavings.

Sedimentary (sed"i-men'ta-ri). Produced by, or pertaining to, sedimentation. See *Sedimentation.*

Sedimentation (sed"i-men-tae'shun). Process of rock or mineral formation by consolidation of material transported from its place of origin.

Seed Pearl. A pearl under ¼ grain in weight (usually not perfectly spherical).

Selenite (sel'e-nite). Colorless gypsum, used as an ornamental stone.

Semicarnelian. Yellow agate.

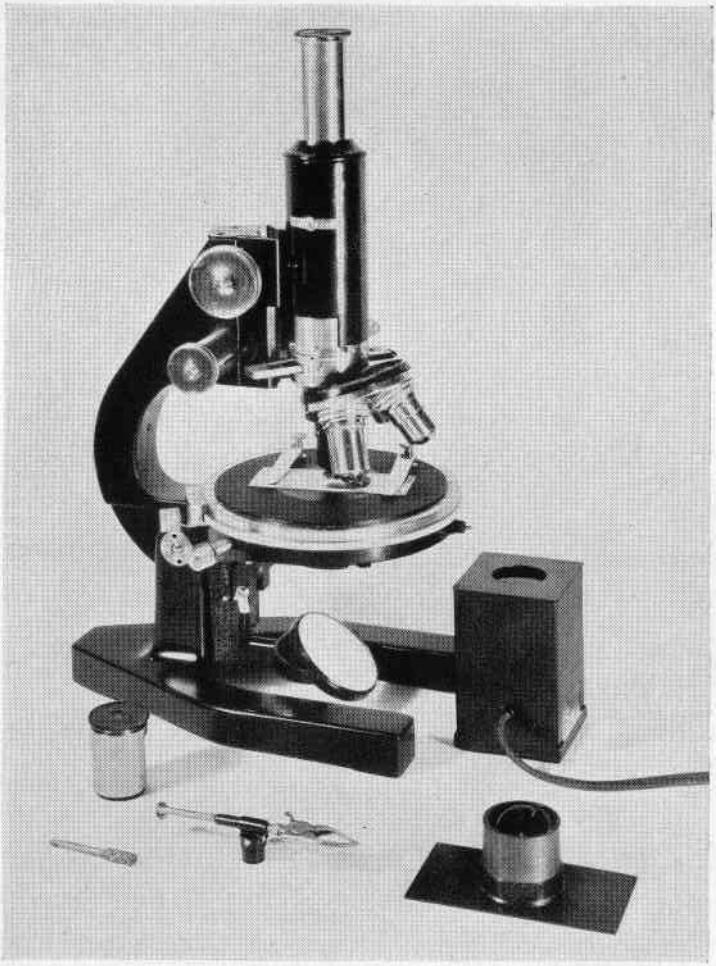
Semiopal. Common opal as distinguished from precious and fire opal.

Semiprecious. A classification of those gem materials ranking below precious stones. The classification is an artificial one and is perhaps best avoided. See *Precious Stones.*

(To be continued)

GEM-TESTING MICROSCOPE*

by
ROBERT SHIPLEY, JR.
Director of Research, Gemological Institute of America



Gem-Testing Microscope with complete accessories.

Advanced students of gemology have largely been using a Zeiss monocular microscope, with several special attachments developed by the Gemological Institute laboratory, for research and gem-stone identification. The uncertainty of supply from Germany and present increased costs have made it advisable to develop an American-made instrument for this

*G.I.A. Research Service

purpose. Development of this has been in progress in the G.I.A. laboratory for the better part of the past year, and the Institute now takes pleasure in announcing the new G.I.A.-Bausch and Lomb gem-testing microscope illustrated on this page.

In order not to duplicate development work already done on the Zeiss instrument, a petrographic or optic mineralogical stand by Bausch and Lomb was studied instead of the medical-style instrument. Though the resulting instrument is somewhat more expensive than the Zeiss instrument, which is based on a medical 'scope, its delivery within a reasonable time is assured. Furthermore, if a less expensive instrument be desired, the Bausch and Lomb stand, which is the equivalent of the Zeiss instrument, can be adapted by the same methods which were formerly used, at a resultant cost considerably below even the former price of the Zeiss microscope. However, it is believed that the average advanced gemology student or C.G. will prefer the petrographic form of instrument with its built-in features. The Bausch and Lomb instrument illustrated on this page has all the same features as the G.I.A.-Zeiss gemological stand, and has the further advantage of having the analyzer built into the body tube of the instrument. The Bertrand lens is also built-in, in the accepted petrographical style. The Zeiss instrument employs a cap analyzer which considerably limits the effective field in polarized light and which must be removed and replaced each time ordinary light is desired. The analyzer on the Bausch and Lomb instrument is thrown into the optical system by a thrust of the fingers and removed as readily. The Bausch and Lomb instrument has such additional features as focusing cross-hair eyepieces, more working space on the stage, and a dustproof slot for quartz wedge in the body tube. The Bausch and Lomb instrument, as it is primarily designed for work with polarized light, is a handsome (and more impressive) instrument than is the Zeiss.

The total cost of the G.I.A.-Bausch and Lomb gem-testing microscope is $441.00, and the same instrument with the additional feature of rotating analyzer in the body tube is $466.00. The equivalent Zeiss instrument with cap analyzer is at present approximately $400.00. At these prices either instrument is equipped with stone-holder, with special universal motion immersion stage, and with quartz wedge for analysis of interference figures.