Gems & Gemology

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Buying Gems in South America

by
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For a number of years I had been collecting rare gems and selling these to museums and to collectors. Though I had developed foreign contacts and had secured many unusual specimens during my years of handling gems, I still felt that by visiting the source directly I might be able to secure gems which no other dealer could appreciate.

Therefore, on May 7th, 1937, I sailed from New York for Rio de Janeiro on the first part of a journey which was, in time, to take me to practically every important source of extraordinary gems in the world.

I spent several weeks in Rio de Janeiro visiting dealers there and buying both unusual and the more often encountered colored stones, as well as a few diamonds. During my dealings in Rio, I was also getting a line on the deposits in Brazil, particularly those in the State of Minas Geraes, which adjoins the Federal District in which Rio de Janeiro is situated. Armed with information and, to my good fortune, accompanied by Dr. Moraes, a government geologist, I left Rio on May 31, 1937, by train for Bello Horizonte. At Bello Horizonte we changed trains and proceeded on to Diamantina, the center of Brazil's important diamond-producing region.

We first went to the diamond deposits at Dattas, where we met the English manager, Thomas Draper. The Dattas deposit is a friable conglomerate, badly decomposed, which overlies a quartzite. This friable conglomerate, known as itacolumite, holds the diamonds. This deposit is worked partly by hydraulic and partly by pick and shovel hand operation.

In the Diamantina district we also visited Minas Serrinha. The manager here was an American who had at one time worked in the African alluvial diamond deposits. At the same mine we met another American, named Douglas, who had worked in the carbonada mines of Brazil. The Serrinha mine was worked by hydraulic pressure, powerful jets of water being used to wash out the gravel. These diamonds also occurred in a weathered conglomerate, but of a harder nature than the above and requiring, therefore, more power to wash it loose.

After the Serrinha mine, we visited the Boa Vista. Here the diamonds occurred in a highly decomposed massas, permitting easy hydraulic operation. This deposit is managed by Senhor George Dodsworth, a Brazilian, and is said to be one of the richest diamond mines now operating in Brazil. It produces from .30 to .40 of a carat per cubic meter of earth.

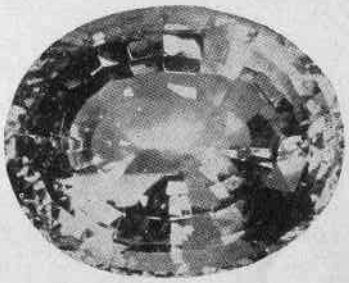
From my contacts with American diamond dealers and jewelers, I had gathered that Brazilian stones tended to be somewhat brown, but during my expedition in Brazil I found no such brownish stones and discovered, in fact, that lots of diamonds

offered for sale from the Brazilian mines generally tend very noticeably toward bluish and greenish hues.

Leaving Diamantina, we took the train to the end of the line and then proceeded some miles in a Model T Ford (the alternative is either a horse or a mule) to Sao Joáo de Sapada, some forty miles north of Diamantina. Here we visited the Barro mines, managed by another Englishman, Mr. Egbert. Here the diamonds occur in a breccia which has been claimed by several prominent authorities to be the original matrix of the stones. The Barro mines are not operating, having been refused a license because of some political ramification.

Proceeding, we visited Campos do Sampaio, a very large diamond deposit owned by Senhor Levy Leita. The diamond-bearing material here is brecciated quartzite cemented by silica, with the diamonds in silica cement. In this deposit an overburden is encountered which must be stripped off before the diamond-bearing material is reached. Fifty miles from Sampaio is the Jo Bo mine, owned also by Senhor Leita. In character, this deposit is much like the other mine owned by this gentleman except that it lies in a river bed and, being flooded, is worked by canoe and batea.

After visiting Senhor Leita's mines we set off through the forest toward Santa Rita de Arrasuahy. We traveled six days by horse and then engaged a 1926 Model T Ford. The Model T Ford is much esteemed in this country since it can cross the shallower rivers, a feat which modern, lower-built cars cannot duplicate. We paid as high as $85.00 a day for such transportation, the price depending upon the difficulty of the route and the supply of Model T Fords. As a rule, these cars carried no spare tires, and a puncture called for considerable halt (with the rent of the car continuing) while the tire was repaired. After penetrating the jungle and crossing the mountains we finally landed safely in Santa Rita de Arrasuahy. Here we visited another deposit called Barro, operated by Senhor Luiz Antonio Tannero. This diamond deposit was a series of pegmatite dikes cutting through prophyroid granite, the diamonds occurring



Blue Topaz (actual size), cut from 2500-Carat Crystal. The stone is 44 mm. wide, 35 mm. wide, and 24 mm. deep, weighs 277 carats.

in small lenses of quartz or masses of feldspar in the pegmatites. This mine also yielded especially large beryl crystals known as "Escoria," but unfortunately, only a little of them were of gem quality. I offered $500.00 for one of these large crystals, but it was refused. This beryl crystal was more than five feet long and more than fourteen inches wide. The usual procedure of the native miner is to break up the crystal little by little in order that they may find any gem material within. It so happened that this crystal contained absolutely no gem material. Therefore, my offer of five hundred dollars to them was a total loss.

This same Senhor Tannaro owns a beryl and topaz mine, known as the Ponzo Alto, four kilometers north of Santa Rita. The gems occur in a pegmatite which has largely decomposed. They are found in the koalin which has resulted from the decomposition of feldspar and which is mixed with quartz. Though this mine produces but small fragments of aquamarine, these are of the finest blue color.

Leaving the neighborhood of Santa Rita we proceeded to a deposit owned by Senhor Francisco Samuel de Costa Lage, situated between Ferros and Itabira. The beryl here occurs in lenses of fractured quartz and decomposed feldspar which are found in a series of pegmatite dikes cutting gneiss. The beryl crystals are largely broken and recemented and only the unfractured portions are suitable for cutting gems. These pieces average around 10 grams each and are seldom over 100 grams.

The home life of Senhor Francisco de Costa Lage is more or less typical of that of all the people living in this back country of Brazil. A private road winds 12 miles from the State road to his farm. The farm is a very large one and on it Senhor Samuel raises hogs for lard and cane for his private distillery. There are 18 children in the family, and all, including the parents, sleep on a tick on the floor of the house. There are no glass windows, the house being equipped with shutters which are closed in inclement weather. There is no refrigeration; the meat, which is buried in the ground when butchered, is almost always tainted.

Despite these surroundings, which to our minds would seem mere poverty, the people of the back country of Brazil are all happy and remarkably free from desire of others' goods. Though I carried several thousand dollars on my person at all times in order to buy any stones which might catch my eye, I was never molested in any way, and, in fact, never encountered a beggar.

During my stay in Brazil I visited the School of Mines at Ouro Preto (Black Gold) which is 100 miles from Bello Horizonte. At the School of Mines there is a superb mineral and gem collection, the prize of which is a six-carat cut andalusite which shows strong pleochroism even to the unaided eye. The Director told me that they had refused an offer of $6,000.00 for the gem. Near Ouro Preto I visited the Boa Vista topaz mine. This mine was a large sill with the topaz occurring in koalin between strata and associated with opaque euclase and andalusite. This koalin deposit is very similar to the diamond material near Diamantina, several hundred miles away. The Boa Vista mine has not been in operation since two workmen were killed in an accident.

I purchased a number of excellent gem specimens during this trip. One of the finest was a 2500-carat blue topaz crystal which I secured from a dealer in Bello Horizonte. This cut a very fine gem, absolutely clean, of 277 carats. I also bought a considerable quantity of fine aquamarine, topaz, some diamonds and several specimens of andalusite. A red-purple tourmaline (of the Siberite variety) weighing approximately 20 carats was also a reward of this trip. I also obtained 2 kilos of the rough of the deepest blue aquamarine I have ever seen, of which I still have a few cut stones in my stock.

A GEMOLOGICAL ENCYCLOPEDIA

(Continued from last issue)

by HENRY E. BRIGGS, Ph.D.

PEARL (Continued)

Round-shaped pearls of fine, shining luster and desirable color are the most valued and are sought after continually in good sizes. Black pearls are highly esteemed, but are not so highly valued as are the unblemished white ones. Baroque pearls are unevenly shaped and are used for pendants and other articles of adornment. Blister pearls are those which have adhered to the shell. Button pearls are, as the name indicates, flattened in form.

Pearls are found in many different molluscs, but of all the families the Aviculidae produces the greatest amount of our fine pearls. The Unionidae are important fresh-water pearl bearers.

Pearls are fished along the coasts of Ceylon, India, Japan, Red Sea, Persian Gulf, Australia, Central America, Mexico and practically all the Pacific islands. In the fresh waters of most all the continents are to be found the Unionidae which bears pearls.

The pearl is cultivated by wounding the mollusc and inserting a bead of mother-of-pearl or other foreign substance. After careful treatment the mollusc is returned to its watery home to grow and build up within itself the gem which is destined to adorn some queenly neck.

Pearls are imitated with glass spheres filled with wax, also with porcelain beads coated with a fish-scale lacquer. When properly made up these have a somewhat pleasing appearance. It should not be difficult to distinguish any of these imitations from the genuine. But the matter of telling a cultured pearl from a natural one is oftentimes a matter which is rather a complex one.

SEMI-PRECIOUS GEMS

Oftentimes we look upon the term "Semi-precious" as meaning that a gem is not valuable, durable and beautiful. Such an idea is, indeed, erroneous, for many of the semi-precious gems are not only very valuable, but are also quite durable, very beautiful, and occasionally extremely rare. The topaz is very hard and durable, it is very beautiful, especially in some of the delicate colors. But, unfortunately, it is extremely rare in some of the finest colors. Euclase is far rarer in good quality and size than any of the precious gems. The opal is not hard, but it is, indeed, one of the most beautiful of all gems, and in fine pieces will bring most remarkable prices.

From this it will be noted that it does not mean that a gem has little value, that it is lacking in beauty, durability or rarity because it is classified as a semi-precious gem. Many of the semi-precious gems are harder than some of those already treated under the heading of precious, and many are fully as beautiful. Many are as rare and some more rare than the

precious gems. Many will command a price nearly, if not just as high, as the precious gems. For these reasons it behooves us to give these gems very careful consideration.

TOPAZ

The name topaz has been so carelessly used for many years by jewelers and dealers that the average person today looks upon every yellow stone as a topaz. It seems to be the general idea that topaz is a very common mineral which may be purchased at almost any price at all. As a matter of fact, topaz is not at all common, and in some varieties is exceedingly rare.

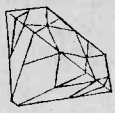
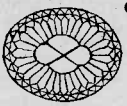
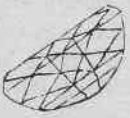
Topaz is very durable, being 8 in hardness, but it has a highly perfect cleavage. Many authors have conveyed the idea that the cleavage of topaz was so marked as to make it exceedingly fragile. This statement is not true. The cleavage is highly perfect, but the gem does not cleave any easier than do many diamond crystals. The composition of the topaz is somewhat variable. The two main classes are the fluorine topaz ($Al_2F_2SiO_4$), and the hydroxyl topaz ($Al_2(OH)_2SiO_4$). With the varying of the composition the specific gravity and also the index of refraction will vary. The more common is the fluorine variety. The gravity of topaz will vary from 3.4 to 3.6. The index of refraction will vary from 1.62 to 1.63. The dispersion is low, being .014. The gem is biaxial and optically positive in character. The crystalline form is usually the orthorhombic prism with one end terminating in a pyramid and the other end a basal pinacoid. Being differently terminated, the crystals will develop polarity. Topaz has a white streak, the fracture is conchoidal and the luster is vitreous and of glimmering to shining intensity. This gem occurs in colorless, pale blue, green, violet, pink, and red. In the yellows it ranges from a mere tint to deep yellows and yellowish browns. A variety of Brazilian topaz occurs in a wine-yellow color and is very beautiful.

The colorless variety when properly cut, especially in the brilliant pattern, is very brilliant and will show some fire. This fact, coupled with the specific gravity which is usually near that of diamond, will sometimes lead the layman astray. However, the inferior hardness, vitreous luster, and low index of refraction and anisotropic character will all make it very easy to tell these two gems apart. While the pleochroism in topaz is not strong, it will serve to identify it from many other gems which, to the ordinary eye, look similar. For instance, the light-blue topaz can easily be distinguished from the aquamarine by the aid of a good dichroscope.

The topaz is susceptible to pyro-treatment. Colored crystals change color and become white or colorless if the temperature is raised high enough. Many topazes which are offered as pink topaz and Brazilian precious topaz are artificially treated to obtain the fine color. A deep yellow stone or one which inclines to brown may be heat treated and changed to a beautiful shade of pink. While the pink does occur in nature, it is very rare and it is doubtful if even ten per cent of the topaz sold yearly as pink topaz is really of natural color. Most of the altering is done in Germany and France, although some American cutters have turned to altering the gems.

(To be continued)

Important Diamonds of the World

Robert M. Shipley

THE DRESDEN GREEN

If, in addition to size, transparency and brilliancy, a diamond possesses a marked body color, no gem can surpass it in relative value. Of green diamonds, the finest and one of the largest known, is the Dresden Green, so-called because preserved in Dresden, Germany. It was purchased in 1743 by King August the Strong of Saxony, for the royal treasury. He is said to have paid $60,000 for it. It was valued by Kluge, a German authority, in 1860, at $150,000. It is of almond or pendeloque shape and weighs 49.8 metric carats. It is 1½" long and 5/6" thick. It is clear apple-green color, being intermediate between emerald and chrysoprase in tint, and is perfectly transparent and flawless. It is probably of Indian origin, but nothing is known of its history previous to its purchase by August the Strong. This king had a passion for collecting rare gems and jewels, and a large exhibit of these, including this green diamond, is still to be seen in the Green Vaults (Grüne Gewölbe) in Dresden. Another green diamond in the collection is a brilliant weighing 40 carats which it is said the King was accustomed to wear in his hat.

THE TIFFANY YELLOW

This, perhaps the largest and finest of yellow diamonds, was found at the Kimberley Mine, Kimberley, South Africa, about 1878. It was cut in Paris to a double brilliant weighing 128.5 metric carats. It has 40 facets on the crown, 44 on the pavilion or lower side, and 17 on the girdle, a total of 101 facets. Dr. Kunz stated that this unprecedented number of facets was given the stone not to make it more brilliant, but less brilliant. The stone was of yellow color, and it was thought better to give it the effect of a smothered, smoldering fire than one of flashing radiance. The stone has the unusual feature, in a yellow diamond, of retaining its color by artificial light. It was exhibited at the World's Columbian Exposition in Chicago in 1893, and again at the Century of Progress, Chicago World's Fair, 1933-34, by Tiffany and Company of New York City, and it is still a highly prized possession of that firm.

THE EMPRESS EUGENIE

E. W. Streeter described this diamond as "a perfect brilliant of 51 carats, of an oval shape, blunt at one end and very beautifully cut." It was first set as the center of a hair ornament belonging to the Empress Catherine II of Russia. This ruler presented it to her favorite, Potemkin, at the same time that she gave him a magnificent palace. From a grand niece of Potemkin, Emperor Napoleon III of France purchased the stone for a gift, on the occasion of his wedding, to his bride, the Empress Eugenie. During the whole of her reign, the Empress wore it as the center of a diamond necklace, but after the downfall of her fortunes, caused by the Franco-German war of 1870, the gem was sold to the Gaekwar of Baroda, India, for $75,000 (£15,000).

THE ENGLISH DRESDEN

The English Dresden, so called to distinguish it from the Dresden Green, is one of the few large diamonds that have been obtained from Brazilian mines. It weighed, in the rough, 119½ carats. The rough stone was found about 1857 in the Bagagem district, Brazil, the locality from which nearly all the large Brazilian stones have been obtained. It came, the same year, into the possession of Mr. E. H. Dresden of London, England, who, after cutting it, offered it for sale to various crown princes of Europe without success. He finally sold it for $200,000 (£40,000) to an English merchant in Bombay, India. This merchant was a large dealer in cotton and was able to purchase the diamond through profits made by the great increase in the price of this commodity resulting from the American Civil War. Shortly after his purchase of the stone, however, the war closed, the price of cotton fell to a low point and, lacking the capital which he had invested in the gem, the merchant failed. The shock of failure soon brought on his sickness and death. The stone was then sold by his executors to the Gaekwar of Baroda.

In an interview with the author in 1934, the Gaekwar of Baroda stated that the Dresden and the Star of the South are both mounted in a necklace in his treasury.

THE STAR OF ESTE

This is a comparatively small diamond, weighing only 26 carats. It appears larger, however, because of its fine proportions. In purity and brilliancy it is said to be of the highest quality. It has been valued at $25,000. It derives its name from having been owned for many years by the Archduke Franz Ferdinand of Austria-Este, heir to the throne of Austria-Hungary. It will be recalled that the assassination of this prince, in Sarajevo, June 28, 1914, was the immediate cause of the World War. So far as known, this diamond was still in his possession at the time of his death. What subsequent disposition has been made of it, is unknown to the writer.

Photography in Gemology

The practical value of photography to a gemologist is great. As a record either of a gem stone alone or of a finished piece of jewelry it cannot be surpassed. A sharp, clear photograph of a piece of jewelry, or of the interior of a gem which contains a few inclusions, will serve as an absolute identification of that piece in case it is lost or stolen. A print of the latter type of photograph may be given to the purchaser of an important gem, increasing his respect for the purchase he has made.

Many jewelry stores today make their own photographs of jewelry for future reference to designs or for illustrative purposes in conjunction with advertising. For the latter purpose, jewelers with a keen appreciation of gems often are able to secure photographs very superior for their purpose to those taken by a commercial photographer who, although he knows photography well, does not have the innate love of precious stones. Such "design photographs" as they may be called, are also of value for reordering of stock, either from a specialty manufacturer or from uncataloged stock of a quantity manufacturer.

One of the most fruitful fields for gemological photography is in the preparation of lantern lectures for delivery at women's clubs, service clubs, mineralogical societies, etc. Such lectures, general in nature, are available from the G.I.A. on 35 mm film. Even though a jeweler should wish to use a prepared film lecture of this sort he could enhance its value to him many times by splicing into it photographs of gems and jewelry pieces from his own stock to which he can call attention while he is showing the film.

The many gemological students and enthusiasts who have attempted to photograph gem stones, either directly or through the microscope, have found themselves in a practically unknown field concerning which no instructions or suggestions are available. Consequently, each man wishing to employ photography in this manner has had to work out processes and methods entirely for himself, with no help except what he might get from some more expert photographer whom he could interest in the work he was doing. This difficulty was encountered in the G.I.A. laboratory when, in 1936, complete camera equipment was presented by H. D. Feuer, C.G., and the first attempts at photography of gem stones were made. During the many months that the photographic equipment has been used in the G.I.A. laboratory, many processes have been developed and many standard processes have been altered to suit the subject matter. At the present time satisfactory photographs of almost any manner of gemological subject can be obtained with almost mathematical certainty of results. In order to help those many camera-user students of gemology who wish to attempt the photography of gem stones, this article has been prepared. General photography of gems or jewelry pieces, and photomicrography of the interior of gems (as for identification purposes)

both will be covered. Obviously, the cameras used by various gemologists vary widely in their design and in the uses to which they can be put. In the G.I.A. laboratory, a complete set of Zeiss Contax equipment is used. This excellent miniature camera has the great advantage of adaptability to almost any photographic problem, though it has the one great disadvantage of small film size and consequent necessity for great enlargement in most cases. However, expensive equipment is by no means a necessity for making good photographs. A good box camera can undoubtedly be used to advantage, especially if equipped with an exaggerated "close-up" attachment which can be secured at nominal cost from any reliable lens maker. For satisfactory results, however, a somewhat better camera will prove much less expensive in the long run, and more satisfactory to use.

The camera should first of all be equipped with a lens which gives a good clear focus. If a small negative size is used, the lens should focus clearly enough to permit considerable enlargements to be made. Furthermore, either the lens should be one with which close-working attachments can be used, making possible photography within six inches of the lens; or the camera should be one equipped with bellows extendable sufficiently to produce this same effect. An iris diaphragm for varying the lens aperture (f. value) is very valuable. For most gem photography, a ground glass for focusing is essential. With an inexpensive box camera, focusing may be done by means of heavy tissue paper stretched across the film guides when the back is removed from the camera.

The camera support is an important accessory. Unless the camera is too heavy to permit its use, a laboratory support of the type obtainable from any school or laboratory supply house, is satisfactory. A regular camera tripod is not as easily used as is the laboratory support. Almost all photographs of gems are taken vertically, i.e., with the camera pointing down at the gem, and a suitable connecting arm may be obtained, or adapted from a stock apparatus-carrying arm, to attach the camera to the laboratory support. The center of the lens of the camera should extend no less than six inches beyond the foot of the support, though greater distance is not necessary since all the photographs to be made with this apparatus are of small pieces which rarely will exceed a few inches in width. Some jewelry stores have previously purchased a camera, usually attached to the wall, which can be used.

To sum up, the camera should be so arranged that it can be focused sharply on an object six inches or less from the lens and should be mounted on a support which both allows ready adjustment and holds the camera rigidly for both focusing and photographing.

Illumination is, of course, a very important consideration in photographing fashioned gem stones. Most illuminating devices used for general photography are not satisfactory in gem work, since they are not sufficiently adjustable to eliminate bright direct reflections from facets. These direct reflections are one of the most difficult problems in gem photography.

(To be continued)

Abalones and Their Pearls

by

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Along the rocky shores of the California coast is found one of the most remarkable classes of shells in the world—the abalone. They occur in other places, but attain their greatest size and perfection among the surf-swept rocks of "The Golden State." At False Bay, near San Diego, fossilized abalones are taken from stone of the Pleistocene period. Nature appears to have been satisfied that perfection was reached at that time, as the abalones of today are almost identical with those of that by-gone age.

The overseeing Providence which continually works to make things perfect was good to the state of California—in different favored districts along its shores are various types of this marvelous shell, known under the common names of "red," "black," "green," "pink," etc. The varieties differ slightly in form and greatly in color, but each shows such exquisite loveliness that it seems to be the best. The colors range through the brilliant greens and blues; there are green-blacks and blue-blacks; there are pinks and fawn-yellows, and mixed with and through these colors are flashes of flame-like reds.

The creature is a mollusk, a species of large snail, and its shell is curiously formed. It has the peculiar twist or whorl that is a characteristic of the snail, but the shell is flattened and has a certain resemblance to the human ear. Along the left side, a short distance from and paralleling the distal margin, is a regular series of holes for the admission of water to the respiratory organs and other purposes. As the shell increases in size and length the holes at the posterior end close one by one and simultaneously others appear at the anterior extremity. Nature has curious ways of protecting its creatures; the abalone when in danger can clamp down tightly on the rock to which it clings. Protected by its shelly covering, it can continue to function properly by using the row of small holes. Abalones prefer to inhabit wave-swept rocks where food may be obtained easily—kelp, sea-moss, diatoms, minute sea-worms, etc. A large muscular organ called the "foot" is so constructed that it can be spread over considerable surface and act with great suction—on the order of an exhaust-cup. No difficulty is encountered in removing an abalone from its rock if it is taken in the proper manner, while in motion, but if it becomes startled and clamps down tightly for protection, considerable ingenuity and great force are required. It is much better to secure it while moving, as in this way the shell will not be broken or the abalone injured. While the exterior of the shell is usually encrusted with barnacles, sea-moss, and other marine growths, the interior is as exquisitely lovely as a fairy's home —and in this wondrous environment grows an occasional pearl.

While the commoner kind of pearls are produced by different varieties

of Margaritifera ("pearl-oysters") which are bivalves, both abalone pearls and conch pearls occur in univalves (two species of large snail). Oriental pearls from "pearl-oysters" do not usually occur in colors, but are generally creamy white, while abalone pearls and conch pearls are of bright and vivid coloring.

Abalone pearls are found in statues of Buddha, made in Japan in 300 A.D. It is possible that they were taken from the smaller and inferior "ear-shells" of the Japan Sea, but it is also possible that they were acquired by trade or exploration in the distant past when Asiatic hordes poured into western North America and traveled south. The size and perfection of the pearls seem to indicate that they came either from the coast of California or from Baja California.

It is probable that as "The Great Pink Conch" *(Strombus gigas)* occurs only in the Bermudas, the West Indies, and along the extreme southern coast of Florida, its pearls were probably unknown to Europe until Columbus discovered America. However, they may have been seen by Quetzal, "The White God" who came to the Mayas "in a ship with white wings" "from across the seas" —and they may have been seen by Vikings during their trip down the eastern coast of North America. It is a known fact that as soon as fine abalone pearls and conch pearls were obtainable they became highly prized by the princes and rajahs of India and were added to their marvelous collections of gems. The finest specimens have been used as crown jewels throughout Europe and the Orient.

In years gone by it was not uncommon for fine, well-formed abalone pearls to be found, but as the abalones in which they grew were recklessly taken by shiploads, they became ever scarcer. Baroques and rough pearly concretions are still occasionally found, but large, perfect abalone pearls are rare. Dr. George Kunz, who was for over forty years gem expert with Tiffany and Company, once told the writer that "a perfect abalone pearl is among the most rare, the most beautiful, and most valuable of gems." Dr. Kunz also stated that "the time may come when a large and profitable business in the growing of abalone pearls will be carried on along the Pacific Coast of North America."

It has been natural for the values of gems to be, to some extent, controlled by their scarcity and as fine, perfect abalone pearls are now the rarest of all pearls, they should head the list and command the highest prices. No other class of pearls can hope to compare with the brilliant beauty of coloring found in abalone pearls. Their bright blues and greens, their blue-blacks and green-blacks and fawn-yellows, all shot through with flame-like flashes of crimson and red, cause a breath-taking effect that cannot be duplicated by any other class of pearls.

While the scarcity of large, fine abalone pearls is such that many jewelers of the United States have never seen a perfect specimen, and they are highly prized in some of the great collections of the world, they are not at present popular in the jewelry store.

It is doubtful if any other stone or gem can equal a fine abalone pearl when used as the centerpiece of a group setting, and a designer with talent can, with spray and leaf, the different colors of gold, and chasing, chip-cutting, and bright-cutting, create art jewelry unsurpassed.

GEMOLOGICAL GLOSSARY

(Continued from last issue)

(With phonetic pronunciation system.)

Terms in quotation marks are considered incorrect.

Oriental (oe"ri-ent'al). (1) Pertaining to the Orient (Asia), hence referring to gem-minerals which have actually originated in an Oriental country. (2) A trade name often used for the finest variety of a gem-mineral or other gem material such as pearls. See also Noble. (3) Prefix used with certain incorrect gem names: "Oriental Emerald" (for green corundum), etc.

Oriental Agate. Finely marked and very translucent agate.

"Oriental Amethyst." Purple corundum.

Oriental Cat's-Eye. Chrysoberyl cat's-eye; also, incorrectly, smoky corundum.

Oriental Chalcedony. Finest translucent variety of chalcedony, known also as "Beach Moonstone," "Chalcedony Moonstone," etc.

"Oriental Chrysoberyl." Yellowish-green corundum.

"Oriental Chrysolite." Greenish-yellow corundum or chrysoberyl.

"Oriental Emerald." Green corundum.

Oriental Garnet. Almandine.

"Oriental Hyacinth." Rose-colored corundum.

Oriental Jasper. Bloodstone (quartz).

Oriental Lapis. Lapis Lazuli.

Oriental Moonstone. Genuine moonstone. (Orthoclase Feldspar.)

"Oriental Moonstone." Pearly corundum.

"Oriental Onyx." Banded, mottled, or clouded travertine.

Oriental Pearls. A term broadly applied to all naturally occurring pearls from true pearl-bearing mollusks, and hence not to cultured pearls. Occasionally, natural pearls found in Oriental countries only.

"Oriental Peridot." Green corundum.

Oriental Sapphire. Blue corundum.

"Oriental Smaragd." Same as "Oriental Emerald." See also Smaragd.

"Oriental Sunstone." Girasol corundum.

"Oriental Topaz." Yellow corundum.

Oriental Turquoise. Genuine turquoise.

Original Lots. Unbroken parcels of diamonds as graded at the mines.

Ormer (or'mer). See Abalone.

Orthoclase (ore'thoe-klase). A mineral of the feldspar group; precious moonstone (adularia) is a variety of orthoclase. A transparent yellow variety of orthoclase is sometimes cut as a gem-stone. R.I. 1.52, S.G. 2.56, Hardness 6-6½, Monoclinic crystal system.

Orthose (ore'those). Moonstone (feldspar).

Orthorhombic (ore"thoe-rom'bik). A crystallographic system; has three axes of unequal length, each perpendicular to the plane of the other two axes.

Osseous Amber (os'ee-us). See Bone Amber.

Ostrea or Ostrea edulus (os'tree-a). The common edible oyster.

Ounce pearls. Lower grade pearls sold by the ounce.

Ouvarovite (oo-va'roe-vite). Same as Uvarovite.

Ox-eye. Dark stones of labradorite (feldspar).

Oxide (ok'side or sid). The combination of oxygen with another element.

Oxidation (ok"sid-ae'shun). Combining chemically with oxygen.

Oyster Pearl. Signifies those concretions found in common edible oyster (ostrea edulus). They are generally black, purple, or with a mixture of black and white, or purple and white. They are almost invariably devoid of nacreous luster, possessing neither beauty nor value.

Paar. Ceylon name for rock or hard-bottom oyster bed. The banks near Ceylon on which the pearl oysters live.

Padparadscha (pad"par-ad'sha). An orange-colored variety of sapphire.

Painted Diamond. A diamond painted around the girdle or pavilion, or both, in order to improve its color temporarily.

Panning. Primitive method of washing gravel by use of a pan.

Paper Worn Diamonds. Diamonds which have been dulled on the surface from being carried loose with other diamonds.

"Paphos Diamond" (pae'fos). Quartz.

Parent Rock. See Matrix.

Parting. Separation of a mineral along planes of twinning, as opposed to true cleavage, which occurs along crystallographic planes.

Parure (pa"rur'). A set of jewelry, such as a parure of emeralds, consisting of rings, bracelets, earrings, brooch, etc.

Paste. Name for glass when used as imitation of gems.

Paved or Pavé (pa"vae'). A number of small diamonds or other gems set one against another as closely as possible.

Pearl. A calcerous concretion resulting from one of several species of molluscs coating an irritant with shell-forming substance. In the strictest sense, the term pearl applies to such concretions only when they are of more or less symmetrical form and exhibit fine luster (orient).

Pearl Essence. See Essence d'Orient.

Pearlite (pur'lite). See perlite.

Pearlometer. Same as pearloscope.

Pearloscope. An attachment, or set of attachments, for a microscope for distinguishing genuine from cultured pearls, or a complete instrument designed for this purpose.

Pearl Sac. The little bag which secretes the layers that build up a pearl.

Pearl-Shooting. Artificial coloring and dyeing of pearls.

Pearly. Resembling the surface appearance of the pearl.

Pear-Shape. Same as Pendeloque.

Peat. Dark brown to black substance, formed by the partial decomposition of vegetable matter in marshes.

"Pecos Diamond" (pae'kose). Quartz from Pecos River, Texas.

Peeler. A pearl with an imperfect skin, the removal of which might improve the pearl. See also Peeling.

Peeling. Removing outer layer of a pearl in the hope that under layer will be of better quality. See also Peeler.

(To be continued)

BOOK REVIEWS

***The Curious Lore of Precious Stones,* by George Frederick Kunz, Copyright in 1913. 7th printing in 1938 by Halcyon House (Blue Ribbon Books), New York. Special Edition, $1.69. Regular Price, $8.00.**

First printed in 1913, this reprint of the *Curious Lore of Precious Stones* at a special price will make it available for every gemologist's library.

In it Dr. Kunz concerned himself not at all with the science of gemology, but entirely with the symbolism and superstitions regarding gems. Included in the volume are "Folk Lore, the Use of Precious Stones as Talismans and Amulets; Crystal Balls and Crystal-Gazing, Mysticism, Religious Uses, Divination, Birth-Stones, Lucky Stones, Astral Influences of Precious Stones, and the Medicinal Use of Gems." However, it must not be thought that this well-known work of the late Dr. Kunz is without value to the average gemologist. The development of the birthstone question is excellent—one of the few sources to which the average jeweler has reference which gives the traditional birthstone list. Dr. Kunz has strong criticism of the list arbitrarily adopted by the A.N.R.J.A. in 1912. The book is full of fascinating details concerning gems, and a reading of it by the jeweler will surely disclose to him many points which he can use later in selling gems.

***Minerals of California,* by Adolf Pabst, Bulletin No. 113, Issued by the California State Division of Mines, San Francisco, 1938.**

This is a continuation of a listing of California minerals, the first issue of which was published in 1866. The first list contained about 75 mineral species, while the present bulletin contains over 400 different minerals. Of these, 54 were first discovered in California, and 41 have been found only in California. Of these minerals found only in California, the only one of importance to the gemologist is benitoite, which has had limited use as a gem stone.

The listing in *Minerals of California* is of no particular value to the gemologist, unless he is particularly interested in sources. The properties of each gem are covered very briefly and the California sources of the gem are then described, usually in a very condensed form. Among the important gem minerals found in California and covered in *Minerals of California* are tourmaline, spodumene, topaz, beryl, various garnets, and diamond. Of the diamonds, several hundred specimens have been found, principally in the gold-mining regions, but few were over two carats and of gem quality.

SELECTED BIBLIOGRAPHY
GEM DIAMOND

GENERAL

This month, the editors of *Gems & Gemology* are beginning an extensive bibliography of the gem diamond. The first section will include only general works on the diamonds. The bibliography is to cover the following subjects: Genesis of the Diamond, Crystallography, Physical and Optical Characteristics, Sources of Diamond, Cutting, Polishing, Famous Diamonds and allied subjects. The student is referred also to the bibliography of general works on gems, many of which contain chapters and sections on the diamond. (See *Gems & Gemology*, January, 1934, to Summer, 1938.)

Abraham, F.

Die diamant-gesellschaften Sudafrikas, Berlin, H. Steinitz, [1867].

Austin, A. C. and Marion Mercer

The story of diamonds. Prepared for the Century of Progress committee of Chicago jewelers' association. Chicago, R. R. Donnelly & Sons, 1935.

Babinet, Jacques.

The diamond and other precious stones. [Smithsonian Institution, annual report, 1872].

Ball, S. H.

Early gem mining, real and otherwise. 3 figs. Min. & Met. 9:488-492 N'28. General and historical review on mining gems and semi-precious stones interspersed with extracts from romantic tales and scientific literature.

Geologic and geographical occurrence of precious stones. Econ. Geol. 17:575-601 N'22. Tables. Bibl. Contains valuable general information on diamond.

Geological notes on the various diamond fields of the world. Eng. & Min. 190:1202-1209 My 29 '20.

Historical study of precious stones, valuation and prices. Econ. Geol. 30:630-642 S-O'35.

Batchelor, S.

The cabinet of gems; or vocabulary of precious stones, arranged according to their comparative value, together with a description of the largest known diamonds and colored gems in the world; the commercial history of rough diamonds; an account of the pearl fishery; and the regalias of England and Scotland [London] 1846.

Baumhauer, E. H. von.

Diamonds. In Ann. Phys. Chem. 2 ser:, I, 1877, p. 462.

Bournon, J. L. Comte de.

Catalogue de la collection mineralogique du Comte de Bournon—Fait par luimême, et dans lequel sont placés plúsieurs observations et faits intéressants qui jusqu'ici n'avoient pas été décrits, etc., ainsiqu'une réponse, au memoire de m l'abbé Haüy, concernant la simplicite des lois auxquelles estosoumise la structure des cristaux, etc. A. Londres, R. Juigné, 1813.

A descriptive catalogue of diamonds in the cabinet of Sir Abraham Hume. London, 1815.

Boutan, Edmond.

Le diamant. Paris, Donod, 1886.

Diamant. [In Frémy's Encyclopédie Chimique.]

Cattelle, Wallis Richard.

The diamond . . . N.Y., John Lane co., 1911.

(To be continued)