Gems & Gemology

A bi-monthly periodical, without paid advertising, supported by subscriptions from Gemologists and other gem enthusiasts, aims to increase the gem merchant's knowledge and ability in order that he may protect more thoroughly his customers' best interests.

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In This Issue:

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EDITORIAL FORUM

Gems as an Investment

In his September editorials Mr. H. C. Dake, Editor of *Mineralogist,* brought out some interesting points concerning the investment value of gem-stones. With his permission we reprint his editorial below.

The recent heavy purchases of high-quality gem stones by merchants and princes of India brings to mind a number of interesting facts concerning the past history of gem stones as an investment. Is is well known that some of the later Napoleonic wars were financed by loans made to the Emperor by Amsterdam bankers, Napoleon giving as security, a number of then famous gem stones. History records numerous similar outstanding instances. The early "bankers" and money lenders were prone to show a preference for large diamonds and sapphires for collateral in making loans. It is obvious that money values may change in a country, yet this would in no way have any material effect upon the intrinsic worth of better-quality gem stones.

Investigations of retail prices for emeralds, diamonds and sapphires reveal that there are few commodities that have shown greater stability over a period of many years. For instance, the retail prices for good-quality emerald in 1934 were approximately the same as in 1910. Diamond and sapphires are now quoted even higher than in 1910. The same is true of many of the lesser-valued gem stones.

The fact also must be taken into consideration that an enormous value can be concentrated into a relatively small gem stone, which is readily secreted and freely portable; hence it was the practice of early money lenders to concentrate the bulk of their fortune in gem stones. In times of stress or economic disruption "paper" securities and values may sink to nearly zero and yet only affect gem values to a slight degree, if any. While it is true a large diamond does not carry interest-bearing coupons, yet it would appear from the recent history of the world's security markets, the principal, at least, is safe when carried in high-quality gem stones.

Gems & Gemology is the official organ of the American Gem Society and in it will appear the *Confidential Services* of the Gemological Institute of America. In harmony with its position of maintaining an unbiased and uninfluenced position in the jewelry trade, no advertising is accepted. *Gems & Gemology* does not intend to overlap the field of any other periodical in America or England.

Contributors are advised not to submit manuscripts without first assuring themselves that the information contained in them is of scientific accuracy. Manuscripts not accompanied by return postage will be held thirty days and destroyed.

It appears likely inflation will come in our economic system and with the advancing prices of silver and gold and only slight advances in gem stones, the shrewd business man and nobility of India are changing their silver for gem stones.

A GOOD NUMBER!

We have been fortunate in securing several very interesting and valuable articles for this issue of *Gems & Gemology*. We realize that this will reach jewelers at a period when they cannot spare much time for reading. We strongly urge, however, that each subscriber carefully preserve this copy of *Gems & Gemology* if he does not have time to read it at present.

Do You Know—

What Variety of Fancy Diamond Is the Most Valuable?

—See *Fancies*, page 309

REQUIRED READING

To keep up to date on subjects already studied, articles are indicated as required reading for both *Registered Jewelers* and *Certified Gemologists*.

Continued yearly registration of *R.Js.* and *C.Gs.* will depend on the answering of a yearly questionnaire on these articles. Required reading for *Registered Jewelers* is indicated by footnotes which state "A.G.S. Research Service." Required reading for *Certified Gemologists* consists of *both* these articles and the articles which carry the footnote "G.I.A. Research Service." The questionnaires may be answered by direct reference to these articles.

T. EDGAR WILLSON

FEBRUARY 3, 1873—SEPTEMBER 1, 1935

T. Edgar Willson, editor of the *Jewelers' Circular-Keystone*, died suddenly, Sunday, September 1st at his home at Demarest, N. J. Throughout Mr. Willson's life his efforts were directed toward the betterment of the jewelry trade. His interest in the development of gemological education and his readiness to support the organization of the *Gemological Institute of America* were largely responsible for its founding. In 1933, he was chosen by the jewelry trade papers as their representative upon the Examination Standards Board. In August, 1935, shortly before his death, he was elected by that board as one of the members of the Examinations Board under whose supervision the examinations of candidates for the title *Certified Gemologist* are conducted. He was never able to accept the honor which was conferred upon him by his selection for this office.

T. Edgar Willson's activities in the gemological movement were but one of his many constructive services in the development of the jewelry trade. He was a director of the Horological Institute of America, past president of the Jewelers' Twenty-four Karat Club, and member of the Good and Welfare Committee of the Jewelers' Board of Trade. He assisted in the formation and was director of the Jewelers' Vigilance Committee. He was a former chairman of the A.N.R.J.A., member of the Jewelers' Fraternal Association and served as secretary of the National Stamping Law Committee and a member of the United States Assay Commission.

At the time of his death, he was sixty-two years of age. He was born in Greenpoint, L. I., on February 3, 1873. After a brief service with the New York *World* and the *Sun*, he joined the staff of the *Jewelers Circular*, in 1892 when but 19 years of age. He later became editor of the publication and was Vice-President at the time of his death. The development of the *Jewelers' Circular* to its present position as an outstanding journal of the American jewelry trade is largely due to Mr. Willson's efforts.

The name of T. Edgar Willson must remain in the annals of the *Gemological Institute of America* and the *American Gem Society* as one of the most powerful and constructive forces responsible for their existence. In years to come, many students and members of these organizations will benefit from the generosity and vision of this fine personality.

Fancies*
Notes on Colored Diamonds

Mr. Ball is known as one of the outstanding world authorities on Diamond. Below he gives us many interesting facts concerning the rare fancy-colored varieties of the King of Gems.

by
SYDNEY H. BALL
Consulting Geologist, New York

For over two thousand years the beginner in mineralogy has been taught that color is an important characteristic of each mineral species, and yet the principal gems, the diamond, the ruby-sapphire family and the emerald - beryl - morganite family, appear in practically all colors. Color in a marked degree is normal to the latter two species, but "fancies", the "pierres de fantaisie" of the French, that is diamonds of vivid color when cut, are among Nature's rarest products. To show that fancies are no newcomers in the gem market, we quote old John Mandeville, who accuses the diamond of taking "pleasure in assuming in turns the colors proper to other gems." When of deep color, due to their wonderful brilliance and play of prismatic colors, fancies exceed in beauty all other gems. The Abbé Haüy described gems as the flowers of the mineral kingdom; fancies are its orchids.

Blue-whiteness is associated with the diamond, and such stones are of course most sought by the public. They harmonize with every gown, nor must the feminine wearer, as with colored gems, decide whether they fit her type. That great gem merchant, Jean Baptiste Tavernier, two hundred and seventy-five years ago naively expressed this view when he stated that "all Orientals are of our opinion in the matter of whiteness and I have always remarked that they love the whitest pearls, the most limpid diamonds, the whitest bread — and the whitest women."

Of the diamonds produced each year, one-half is bort, of value for industrial purposes only, a quarter is limpid and colorless (i.e., excellent gem material) and a quarter tinted (mediocre gem material). The tint is usually feeble and often of an undesirable shade and normally detracts from the value of the stone.

Of the markedly colored diamonds, the blues, the reds, the greens and the pinks, together with exceptionally fine canary-yellow, orange and golden brown and fine black stones are "fancies". The latter gem is occasionally found particularly in Borneo, less commonly in Brazil and South Africa; when cut, while it has no prismatic play, it has a magnificent lustre, almost metallic. It is much in demand as a mourning gem in eastern countries as it is in Portugal.

Of the colors characteristic of typical fancies, yellows are most common, then browns, then rose and light green, to be followed in my opinion by blue, then decided green and lastly, rarest of all, red. Thomas Nicols, writing in 1651, was a great admirer of the red diamond and

*G.I.A. Research Service

refers to the "glorious beauty of its perfection" and emphasizes the "excellencies of super-celestial things." In the corundum family, as is well known, the sapphire is much more common and occurs in larger pieces of gem quality than the ruby; similarly, fine blue diamonds are not only more common but also occur in larger crystals than the red. Their rarity being considered, fancies other than those of deep red color probably average with limpid diamonds as to size.

The color may be evenly distributed; on the other hand, it may occur as a spot of intense color, or as bands of varying intensity parallel to the crystal faces. In the first case, a skillful diamond-cutter may produce a fine fancy stone. John Mawe even mentions a parti-colored diamond, yellow and blue. Brazilian and Transvaal, and less commonly Congo rough, frequently has a distinctly green exterior, although many such stones are limpid on cutting. Indeed cutting fancies or "potential" fancies is a gamble of the first order as the results may be astonishingly satisfactory or most disappointing. What appears to be a fancy in the rough may cut into an unattractive off-color stone, while a brown "industrial" may cut into a pleasing brown fancy.

Some brown stones, subjected to radium examinations, assume a greenish tint, but upon heating the original color is restored; such stones do not come within the definition of fancies.

No adequate figures exist as to how rare fancies are. I am inclined to believe, however, that of the total world's diamond production to date, including of course much material wholly unsuitable for gems, that fancies make up but about 1/100th of a per cent of the total. Of unusually fine cut material, one stone in from 2500 to 5000 may be a fancy.

In proportion to production, India is the outstanding source of fancies in every color, next come Borneo and Brazil, while the African fields, South Africa, Angola, Congo, and the Gold Coast, produce almost none. In other words, the fields, which were relatively rich in fine colored stones, are today insignificant factors in the world's diamond production. Most of the famous fancies came from India. Borneo produces from time to time a red or a bottle-green fancy, more frequently an "ajer-laut" (one of sea-green color), and of course it is the home of the black gem variety; it also produces the "soul of the diamond", a grey or black kernel enclosed in a colorless shell. The Malay value it as a talisman and wear it around their neck to procure luck. Brazil produces an assortment of colors, particularly red and rose, less commonly fine greens and very rarely blues. Had South Africa been a less prolific diamond producer, we would rank its fine canary and orange-colored stones, which it produces much higher among "fancies" than we do. Indeed the Abbé Reynal (History of Settlement and Trade of Europeans in East and West Indies, Vol. III, p. 411), writing in 1784, ranks emerald-green as most valuable and thereafter, as a group, the rose, blue and yellow. South Africa, besides producing a surfeit of yellows, also produces fine coffee-browns and from time to time an occasional blue, green, red, or rose stone, but in proportion to its production these latter are unusually rare. Jagersfontein has produced sapphire-blue stones; Bultfontein, heliotrope; Voorspoed, rose-colored, and the Kimberley Premier deep-orange stones. The ancient alluvial stones occasionally recovered from the Reef gold mines, Transvaal, are frequently greenish, but normally the color is lost upon cutting.

It is not necessary here to more than mention the famous fancies: the Tavernier Blue (now split by a vandal's hand into the Hope and the Brunswick Blues); the Dresden Green; Paul I's Red and Le Grande Conde and the Fleur de Peche, both rose-colored gems. Among collections of colored diamonds, we may cite that in the Royal Museum of Vienna, a collection from Brazil on which a Tyrolese, Virgil von Helmreichen, spent the major part of his life, and the attractive specimens of African colored diamonds assembled by the late Gardner F. Williams.

Fancies, because of their beauty and rarity, are like fine paintings without fixed price. Each is unique and the price is determined largely by the sum the seller is willing to accept and the buyer is willing to pay. With the exception of radium, they are the most precious of commodities. A fancy of decided color is always more valuable than a fine colorless diamond of equal weight. That master of precious stones, Dr. George F. Kunz, some ten years ago (Spurr & Wormser, The Marketing of Metals and Miners, p. 340, N.Y., 1925) gave the following per carat values for exceptionally fine diamonds:

White . . .	\$3,500
Blue	6,850
Green . . .	7,000, and
Red	8,500

Before the discovery of the South African fields, a fine yellow would have been equally high-priced, but today, owing to the old law of supply and demand, it is indeed a fine yellow stone which brings a price equivalent to that of a white diamond.

DIAMOND MARKET IMPROVES

Recent reports from abroad indicate that the demand for all types of fashioned diamonds in the European centers is increasing, while the supply has become appreciably limited. The result, of course, is an increase in the price of diamonds and a healthier condition in the diamond industry as a whole. Added to this is the recent increase of 7½ per cent in the price of rough goods by the Diamond Corporation. American retailers also report an increased demand for diamonds on the part of the public.

The above up-turns in the diamond industry are particularly encouraging since they were felt even during July and August, which are normally "slow" months. It is expected that price of fashioned diamonds will continue its gradual increase for some time to come, especially if jewelers experience the volume of Christmas sales which they anticipate.

Try This One . . .

What Effect have Convex Facets on the Brilliancy of a Gem?

—See *Notes on Gem Cutting*, page 315.

Valuable Gemological Instrument Perfected*

The Shipley Hand Polariscope is expected to become one of the most valuable gem-testing instruments; its most important use will probably be the rapid, accurate detection of glass imitations.

A new gem-testing instrument—the hand polariscope—has recently been developed. It is expected that this instrument will prove of great value to jewelers, as it readily and conclusively distinguishes glass imitations from the great majority of genuine stones. The hand polariscope also finds important application in the detection of internal strain in diamonds. Several other important tests may also be made with this instrument.

In the May-June, 1935, issue of *Gems & Gemology* announcement was made of the new polarizing substance known as Sheet Polarizer. Samples of this material have been in the hands of the research staff of the Gemological Institute for several months. A great deal of experimentation has been done with a view to developing a simple gem-testing instrument which would employ the valuable new substance. This instrument, which was designed and perfected by Robert Shipley, Jr., is now ready to be placed on the market.

Sheet Polarizer is a very thin plastic film which lends itself to a great variety of uses. In the hand polariscope, a section of Sheet Polarizer is set in each of the fixed end caps. One end cap is fitted with a knurled ring which permits a rotation of the sheet polarizer mounted in it. By setting the knurled ring so that the 0° mark or the 180° mark is opposite the indicator, a position of "crossed" polarizers is obtained and almost no light is transmitted through the instrument. When the 90° or 270° mark is opposite the index, the polarizers are in a parallel position and pass light freely.

Mounted between the two fixed end caps is a cylinder which can be rotated. One portion of this cylinder consists of a removable door in which is mounted a knurled head. On the opposite end of the knurled head is a beeswax support used to hold the stone to be tested. Turning the knurled head from the outside of the polariscope with the door in position in the cylinder, turns the gem being tested inside the instrument. The door is of sufficient size to permit the entrance of even a very large ring and therefore mounted stones can be tested. In all tests, the cylinder is rotated while the end caps are held in a fixed position.

The illumination used with the hand polariscope is of considerable importance. Unhindered light coming from a broad area of the north sky is preferable, but an artificial light can be used successfully. In the latter case, it is recommended that a lamp be set behind a diffusing screen, such as a translucent sheet of white paper, and the polariscope used pointing toward the screen, and quite close to it.

The principal value of the hand polariscope is that it immediately distinguishes singly refractive transparent or translucent substances from doubly refractive. In order to

*A.G.S. Research Service

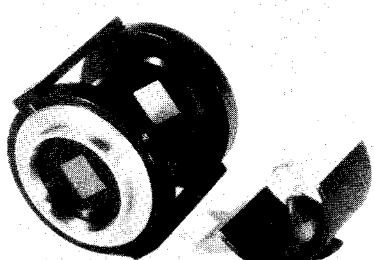
perform this determination the 0° or 180° mark on the end cap is set opposite the indicator. The gem is then mounted on the beeswax support and the door is placed in position in the cylinder. Rotation of the cylinder may produce one of two effects. The stone may remain dark or show very little light during this rotation or it may become alternately brightly lighted and quite dark. The first is the appearance of an isotropic singly refractive substance which does not alter the light so as to allow the polarizers to transmit it. The alternate lightness and darkness of the stone as it is rotated is seen only in doubly refractive materials which do alter *(polarize)* light and therefore allow it to pass through both polarizers.

Doubly refractive stones become alternately light and dark as the cylinder is rotated. During one complete rotation they show light four times and dark four times. Isotropic materials remain comparatively dark and but rarely show any pronounced change from light to dark as the cylinder is turned.

If upon first testing, a gem reacts as an isotropic material, the knurled head to which it is attached should be turned about to make sure that the observation is not being made along an optic axis, that is, along the direction of single refraction in a doubly refractive stone. Isotropic materials remain dark in all positions, while doubly refractive stones can show but two directions along which they do not polarize light.

In some cases, singly refractive stones show anomalous double refraction, which is caused by internal strain. Anomalous double refraction may easily be distinguished from ordinary double refraction after a reasonable amount of practice, since the former does not show uniform illumination or extinction (that is, uniform lightness or darkness) in any position at which the stone may be set. This effect is sometimes referred to as "patchy" extinction and the name is a good description of the appearance.

Often the use of a magnifier, such as an eye loupe, is of value in detecting anomalous double refraction. The magnifier is used in the customary manner and focused on the stone inside the instrument, through one of the polarizers. The "patchy" effect shows up more strongly when observed under magnification.



The Shipley Hand Polariscope, Showing the Door Removed.

Pleochroism may be observed with the hand polariscope. The 90° or 270° mark on the knurled ring is set opposite the indicator; the cylinder is then rotated. If the stone has pleochroism and is not being observed along an optic axis it will change color during this rotation. Often turning the knurled head to which the gem is attached will serve to increase the difference between the pleochroic colors. If the gem is of the tetragonal or hexagonal systems it can show but two distinct colors, no matter what position it may have in the polariscope. If it is of the orthorhombic, monoclinic or triclinic system, it may show three distinct colors. Two colors will appear alternately as the cylinder is turned about. Turning the knurled head to shift the position of the stone may cause a second pair of colors to appear, if the gem being tested is of the orthorhombic, monoclinic or triclinic system. One of the second pair of colors will always be the same as one of the first pair.

The interference figures which have been described in previous articles on microscopy in *Gems & Gemology* may also be observed by employing the magnifier in conjunction with the hand polariscope. The magnifier is set so that it touches one of the polarizers and the back lens of the magnifier is viewed from a distance of about a foot. Turning the knurled head to shift the position of the stone and also shifting the stone on its wax mounting are usually necessary before an interference figure can be seen. Uniaxial interference figures show concentric circular color rings and crossed "brushes" which remain stationary as the cylinder is rotated. Biaxial figures usually show non-circular color rings and "brushes" which rotate opposite the direction of rotation of the cylinder.

By determining whether a stone is isotropic or anisotropic (doubly refractive) the great majority of glass imitations can be detected, since glass is isotropic; while all gem-stones, except those of the cubic system, are doubly refractive. Gems of the cubic system include diamond, all garnets and spinel. Aniostropic minerals can be further separated by observation of their pleochroic colors or by securing interference figures. Complete instructions for the use of the hand polariscope accompany each instrument.

Another use of the polariscope which will be valuable to any jeweler who does repair work is its ability to detect anomalous double refraction in the diamond. When this anomaly appears, it indicates that the diamond which exhibits it is in a state of internal strain and should be handled carefully, especially with respect to heating.

This Shipley Hand Polariscope will be distributed by the Gemological Institute of America. Patents have been applied for by the inventor.

BIOGRAPHICAL SKETCHES

DR. ALBERT J. WALCOTT

Dr. Albert J. Walcott received his education at the University of Michigan, where he earned his A.B., M.S., and Ph.D. degrees. Since his graduation from Michigan, he has held several important teaching positions, notably at the Case School of Applied Science, the University of Michigan, and at Northwestern University. At present he is associated with the Field Museum of Natural History in Chicago where he is performing research work in mineralogy and optical mineralogy.

Dr. Walcott's record of scientific achievement was begun early; during the War, while still a student at the University of Michigan, he was associated with several members of the Geophysical Laboratory in conducting research on optical glass.

Dr. Walcott holds memberships in the American Mineralogical Society, the American Chemical Society, the American Ceramic Society and the American Association for the Advancement of Science; he is a member of Sigma Xi and Gamma Alpha honorary societies. Dr. Walcott has associated himself intimately with the gemological movement in this country. One gemological project which he completed was a special study of some diamond-bearing rocks from Minas Geras, Brazil. He has also made a number of field studies on gem minerals. During the summer of 1932 he performed special work on gemological subjects at the headquarters of the G.I.A. in Los Angeles. He also acts as leader of the study group of the Chicago Chapter and of the Wisconsin Guild of the American Gem Society. Dr. Walcott holds the important position of Secretary to the Examinations Board of the G.I.A., in which capacity he passes on the final examinations taken by candidates for the *Certified Gemologist* degree.

Notes on Gem Cutting

A lapidist of long experience gives some valuable information concerning the correct fashioning of gem-stones.

by
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Deep beneath a rough and jagged exterior, concealed by flaws and impurities, Nature hides away many of her precious gems. To free such a gem and to give it a form best suited to display its own peculiar properties, requires knoweldge and skill on the part of the lapidist. In addition to this, he must see that the stone is so shaped that it can be mounted safely and gracefully into jewelry. Its own design, too, must be pleasing and beautiful. The cutter may be dealing with the beauty of color, brilliancy, dispersion, chatoyancy, or other characteristics. Each should be treated in a manner best to reveal the type of beauty that is latent within the stone.

Let us examine various modes of treatment to learn the best way to make different types of gem stones more beautiful than Nature left them. This is not an attempt to tell in detail the processes involved in gem cutting, but to explain some of the things a proficient lapidist should do and why he should do them.

Irregular Reflection

If you look carefully at a rough uncut gemstone under a single source of light, you may see on each projection a tiny point of reflected light. These lights differ in size and intensity because their reflecting surfaces differ. If you tilt the stone, or move your eye to a new position, you may still see these reflections, although they change their positions slightly. Suppose this stone is ground on a wheel to shape it. This new surface we say is "dull". It has no polish. One might think that this surface produces no reflections, but that is incorrect. Each of the smaller projections made by this grinding reflects a bit of light in all directions. These two examples illustrate what is known as irregular reflection. We will refer to it later.

The Cause of a Polish

To polish a facet, this coarser abrasive that was used to shape the gem must be followed by a polishing powder. This too is an abrasive material but of much smaller grit, which has been carefully graded to eliminate all particles above a certain size. This process wears down the larger projections that were left by the grinding abrasive and produces much smaller ones. When these minute ridges have been reduced below a certain size in relation to the wave lengths of visible light, the surface registers to the eye as "polished".

Direct Reflection

When a facet has been ground, but not yet polished, it displays irregular reflection. The polishing process first acts on the tops of all irregularities. An examination then would show that light falling upon it from a window or other source begins to be reflected uniformly in a definite direction. Irregular reflection still is present, but in a lesser degree. When continued polishing has reduced these projections to sizes corresponding with the polishing grit, the irregular reflection will have disappeared. Light rays from a given point will then be reflected uniformly. This is called direct reflection.

Theoretically, the polishing process has turned all of these irregular darts of light in one direction. No surface, however, can be polished perfectly, as some irregular reflection will always remain. If its polish were perfect, such a surface would be invisible.

It must not be thought that all light falling upon a surface is reflected. When light impinges upon any solid substance in air, a certain portion is reflected and the rest enters the solid. This is just as true of an opaque gem stone as of a transparent one. The relative proportion that enters depends essentially upon the optical density of the gem and the angle from which the light approaches it.

Absorption, Cause of Color

White light reflected from the surface of a ruby without entering remains white. The same is true of light reflected from a turquois, a hematite or an amethyst. In other words, reflected light does not take on the color of the reflecting substance unless it has passed into that substance and is reflected on the inside.

When white light enters a transparent stone, a ruby for example, such light immediately begins to suffer a loss. As it proceeds, more and more of its component parts, other than red, are quenched. The red alone goes on without much loss of vigor. If this light is reflected across the pavilion and up again through the crown, as usually occurs, this screening-out phenomenon progresses and the red color becomes more and more free from the fading effect of the other frequencies.

Asphaltum is black because all of the components of white light that enter it are absorbed. If a thick coating of asphaltum is placed on the back of a ruby, the optical density of the asphaltum is such that the reflection from the back facets is greatly lessened and the light continues through the stone and into the asphaltum. The ruby now appears black. From this experiment one can see that the ruby seems red only by light that has been transmitted through it.

When white light enters an "opaque" gemstone, a turquois, for example, it passes into the turquois for only a short distance, then it is reflected out again. This is due to the fact that such a substance is not optically homogeneous. It is, as one might say, filled with reflecting surfaces. During this short transmission, the white light loses much of its components other than blue.

A Good Polish Aids Color

When an opaque gem stone is not well polished, irregular reflection takes place along its surface. This white light dilutes the color coming from below the surface.

An imperfect polish on a faceted stone not only blurs the purity of color, but it impoverishes the brilliancy by refracting and reflecting some of the brilliancy away where it will not be effective. In a brilliant, the effective light enters a crown facet, reflects from one pavilion facet to another and leaves the stone through another crown facet, thus making four opportunities for damage to the brilliancy. Visible imperfections may also distract the attention and prevent the full enjoyment of the limpid beauty and the ripple of color that is possible in a beautiful gem.

Convex Facets

"Sleepy" appearing stones are often such because of a lack of flatness of the facets. If they are convex they create an effect somewhat similar to irregular reflection. They cause the reflected light, as well as the refracted light, to spread and thus lose intensity.

Convex facets produce lazy light movements, and flat facets allow quick flashing movements in the brilliancy. This fault is frequently observed on stones polished on lead laps, because the stone presses into the softer metal.

Brilliancy and Dispersion

Brilliancy of a diamond-cut stone, or a brilliant, depends not only upon the flatness and the polish of the facets, but upon a careful exactness of proportion between the depth of the pavilion, height of the crown, and breadth of the table. This insures that the angles between facets will be optically correct to produce efficient brilliancy. The principal object sought in such proportions is to gain the greatest advantage of total reflection within the gem.

Dispersion is the result of unequal refraction of the colors that compose white light. Since the blue is bent more than the yellow and the red less than the yellow, these three colors may be seen separately in certain well-cut stones under favorable conditions of light. A steeper slope for the bezel facets, up to a certain point, increases dispersion. However, if the pitch is too great, too much light is reflected back into the stone, causing a loss of brilliancy.

As before stated, a certain relative depth of the pavilion is necessary to provide the largest amount of interior reflections. If it be too shallow the center lacks brilliancy; if more shallow still, this "fish eye" becomes larger.

Greater depth is sometimes effectively retained (in order to deepen the color) by the addition of more facets than are on a brilliant. This depth only harms a colorless gem whose beauty depends primarily on its brilliancy and possibly its dispersion. Excessive depth, too, is likely to be a disadvantage in mounting. A high mounting is required to hold such a stone off the finger. This extra height is difficult to dispose of artistically. However, pale stones, like the kunzite, need to be given extra depth, and the designer must make the best of it.

(To be concluded)

Balinese Jewelry

The island of Bali has been made famous by song and story. We believe this article to be one of the few reports ever prepared concerning the jewelry of this far-off island.

by
DAVID H. HOWELL
Pasadena, California

Recently, the writer of this article was shown the jewelry in the accompanying illustration and was asked to have the Institute identify the stones in the rings. I was granted an interview with the owner, Mrs. Katharane Edson Mershon of Pasadena, California, who has spent the last three years among the natives on the Island of Bali. These rings were a part of the collection gathered by Mrs. Mershon and her husband during their stay in Bali.

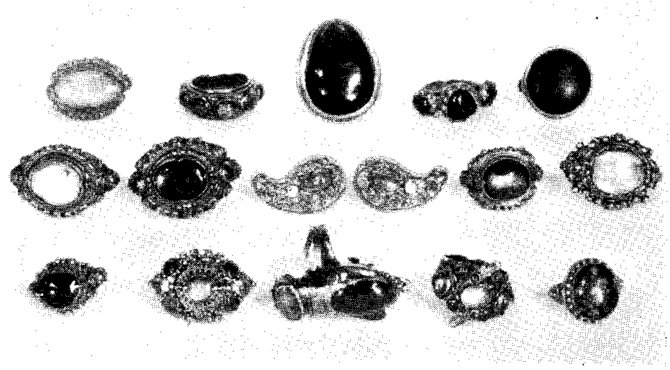
The Island of Bali is rather closely associated with the Island of Java. The people are today, a mixture of the original Balinese and Javanese. Years ago Java, a Hindu island, became Mohammedan and many of the Hindus left in order to carry on their Hindu worship elsewhere. Those who migrated to Bali were the higher-class Hindus and were for the most part artisans, goldsmiths, weavers, architects or of other artistic vocations. The people who came and intermarried with the Balinese created a new Balinese, trained in arts and trades. They use their artistic talents solely for the purpose of pleasing their Hindu Gods. Their works are outstanding and they are world famous for their sacred dances, music and architectural achievements. These rings are a sample of their goldsmithing and outstanding workmanship with crude and primitive methods.

Bali, itself, does not possess any precious metals or gem-stones. The rings in this collection are of especial interest, as the origin of the stones is unknown and each ring was made for a specific reason by an artisan who wished to please a god and thus put forth his utmost in creative ability in its production.

In general, the stones in this collection of rings were found to be corundums. The bottom row of illustrations shows Rajahs' rings. The one on the extreme left is set with a fine ruby. The center ring is called a Fighting Cricket, evidently worn by a Rajah who trained and fought crickets as a hobby. The stones in all the rings in this row are corundum, except the one on the far right which is turquoise.

The earrings, in the center of the middle row, are those worn by the young boys in religious dances. The rings to the right and left of the earrings are Priest rings, worn by the Hindu Priests in their services. These are sapphires and have a tendency to asterism, the one to the extreme left being a distinct star-sapphire. The next one to it is black, but exhibits a phenominal light effect resembling that of alexandrite. Those stones which are either blue or black are the most highly prized by the priests, for they worship the God Siva, whose colors are blue and black. The top row right, presents in the first three rings from the right, those worn by witch-doctors, called Duccoons. Tests in the G.I.A. laboratory proved the center gem of the three-stone ring of this group to be a *synthetic* ruby. The next ring or circlet was originally the type placed around a sword between the blade and the handle.

The ring on the extreme left of the top row was made for Mrs. Mershon in her presence. She gave a young native goldsmith the opal and a British sovereign from which he made the ring. This entire group, and in fact all the jewelry manufactured on the Island, is made from foreign coins.



A Number of Pieces of Balinese Jewelry. See Text For Descriptions.

Balinese goldsmiths make a kind of flowered headdress for the women, which is marvelous in workmanship. Also, they make gold-thread which is used in altar cloths and priest robes. The gem-stones are probably imported principally from either Ceylon or Burma, and traded among the natives. These traders were quite numerous in the past and were for the most part either Chinese or Arabians.

The method of manufacturing or working the precious metals employed by the Balinese is interesting. The gold is heated to a plastic state and forced by crude punches in the hands of the smiths into a die. The heating and soldering is done by the use of cocoanut oil lamps and blowpipes. This method is most primitive.

The jewelry is very unique and shows great ability on the part of the native workmen, when one thinks that they have such antiquated methods of manipulating and working their metals. The owner assured me that the Priest rings shown here, with the exception of the opal, are all over one hundred years old. This is verified by the fact that the priest rings are of an ancient pattern no longer used in their modern jewelry designs. The synthetic ruby in the witch-doctor's ring proves this piece to be of comparatively recent origin.

Make Your Own Specific Gravity Attachments

by

W. A. SWEENEY

The specific gravity test is one of the most definite which can be applied to unmounted gems. Anyone who has access to a diamond balance can easily adapt it for the determination of specific gravity. The equipment described below has been designed by the writer, incorporating certain features suggested by the Gemological Institute.

Little material is required: one 6½" by 2½" piece of sheet metal, preferably nickel steel of 20 to 24 gauge, one 12" length of 24 or 26 gauge wire (brass recommended), and a suitable container for water —a 50 ML (50 cubic centimeter) glass beaker has been found the most satisfactory vessel for this purpose.

First lay out the design of the accompanying figure on the surface of the metal. Then cut along the solid line, using a pair of metal shears, and smooth jagged edges with a file. Make right-angle bends along the dotted lines at A and B. The four prongs are then bent up at their ends to hold the water container. If a standard 50 ML glass beaker is used, the angles will be along the dotted lines at C_1, C_2, C_3 and C_4.

The twelve-inch length of wire is cut in two at a point about ⅛" from its center. The longer section is shaped to hold the stone in the water. At one end, a flat loop is bent so that it stands at right angles to the length of the wire. The small loop is preferable to a "basket" or other device to hold the stone since it requires less metal in the water and thereby makes for greater accuracy. The other end of this section is bent into a flat loop to fit over the hook which holds the scale pan to the beam of the diamond balance. This loop should be shaped so that when the wire is in position on the scale the stone holder hangs somewhat lower than halfway between the top and the bottom of the water container when the latter is in position.

The shorter length of wire is to counter-balance the wire which holds the stone. In it, too, a hook is shaped to suspend the wire from the beam of the balance.

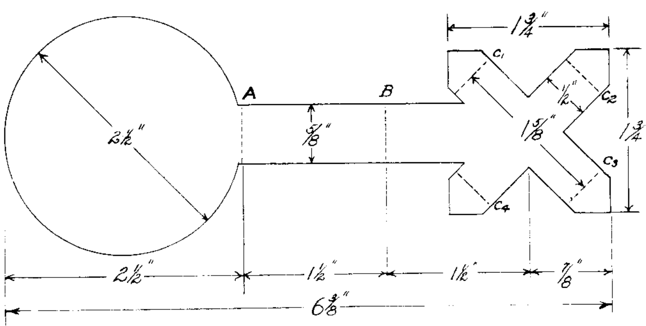
With a steel file or carborundum stone make a mark on the side of the water container. This should run parallel to the base and about ½" below the top of the vessel. This indicates the level to which the container should always be filled with water during determinations of specific gravity. Fill the beaker to this point with distilled water, set the vessel on the metal support and place all the equipment on the diamond balance.

The stand holding the water container should be placed so that the solid piece AB is behind the scale pan. This leaves the space in front of the pan free for inserting and removing the gems to be weighed. Suspend the wire with the loop at its end from one end of the beam and arrange the water container so that this wire is approximately in its center. Be careful that no bubbles of air adhere to the wire in the water, as these will prohibit correct balancing of the scale. The shorter wire is suspended from the opposite end of the beam.

The equipment is balanced by snipping off bits of the wire on the heavy side. A final delicate adjustment may be made by filing the heavier wire in order to bring the scales to a perfectly balanced position.

While this balancing is being done, and later when stones are being weighed, it is necessary to watch closely the point at which the wire enters the water. On the up-swing, the water pulls down on this wire; on the down swing, the water pushes up. This surface effect can be somewhat overcome by jarring the balance slightly. Also, a liquid whose surface attraction is less—toluol recommended—may be used in place of water, but the lower specific gravity (.88 compared to water at 1.0) must be figured in when calculations are made.

The specific gravity of an unmounted gem is easily determined upon a diamond balance fitted with the above equipment. Wipe the stone clean and weigh it first in the scale pan below the water container (W_1). Then attach the gem in the loop made for this purpose, bending the wire to grasp the stone if necessary. Then attach the wire to its place on the beam. If any air bubbles adhere to the stone or wire in the water, the accuracy of the test is impaired. These bubbles can usually be avoided by thoroughly wetting the stone and the wire before they are inserted in the water container. Now weigh the



Layout of Holder for Water Container (One-half Actual size) stone again (W_2). The second weight should always be less than the first. The specific gravity of the stone tested is found by applying the formula:

$$\text{Specific Gravity} = \frac{W_1}{W_1 - W_2}$$

If toluol is used instead of water, the result of the above computation must be divided by the specific gravity of toluol. This value, at ordinary room temperature (70° fahrenheit) is approximately .862 for fresh toluol.

The Growth of a Crystal

by

ALLEN L. BENSON

Since the great majority of gems sold are fashioned from crystals or aggregates of crystals the following excerpt should prove of value in increasing the appreciation of those persons fortunate enough to possess or handle gem-stones.

A crystal is one of the strangest objects in nature. It is not alive, yet a learned writer has said that "no definition of life has been advanced which will not apply to a crystal with as much veracity" as to any animal or plant. A crystal attracts the same kind of materials of which it is composed, arranges them with great accuracy in geometrical forms, cements the parts together and holds them. Place a crystal in a liquid or a vapor composed of the same ingredients as the crystal and the process of accumulation immediately begins. If a crystal be broken in two and the parts placed in a bath of liquid crystal, the broken surfaces will be repaired, and each part will grow into another crystal.

Even after a crystal has been worn until it is but a rounded grain of sand it will speedily become a crystal again if placed in a solution containing the ingredients of which it is composed. There is no known limit to the ability of a crystal thus to repair itself and resume its growth. Time has no effect upon it. It seems never to die, but the fact is that it has no life. It exists, but it does not assimilate food nor move its bulk.

Under a microscope a crystalline solution can be seen forming into crystals—and it is a wonderful sight. First innumerable dark spots form in the fluid, they stand still; then they begin to move. It is soon seen that the movement tends to arrange the spots in straight lines, like beads. The beads speedily coalesce into rods, and the rods arrange themselves into layers until a crystal is created. The process proceeds so rapidly that it is almost impossible closely to follow it. But it isn't growth. It is accumulation. Nor is it movement, in the sense that an animal moves from place to place. It is movement only in the sense that particles of iron fly to a magnet. But it is movement of the most orderly and precise kind. As architecture it is superb. As an example of precision, human skill can hardly equal it.

Almost any inorganic substance that is capable of becoming solid can form crystals—even the vapor that at low temperature forms such wonderful designs upon window-panes. More than 250 different crystal designs have been noted, all of which fall under six classifications. What makes them form? No one knows. To say that particles of matter attract each other is not an answer. To say that it is the nature of certain substances, in certain circumstances, to arrange themselves in beautiful geometrical designs is also to say nothing. The truth is that human beings do not know the primary cause of anything, nor can they ever be wiser. We can sometimes tell what action follows another, but not in one instance can we tell the cause of the first action. An apple falls to earth because matter is mutually attractive; the mass of the earth is greater than the mass of the apple and therefore the earth moves the apple more than the apple moves the earth, though theoretically the apple *does* move the earth some. But why does all matter attract all other matter? Nobody knows. Nobody knows the first cause back of a flower's growth, or the first cause back of the breath he draws.

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Precious Stones As Medicines

by
EDWARD PODOLSKY, M. D.
Brooklyn, N. Y.

In his eventful search for healing agents, man has had some very interesting experiences. There has hardly been a substance anywhere on earth which he has not at one time or another used as a medicine. One of the most interesting experiences in this regard is the use of precious stones as remedies.

Like other stones, the diamond was thought by the ancients to have medicinal value. The dust of the stone, however, was a deadly poison, and dire tales were told of its mixture with food or drink, in the days when poisoning was popular. Curiously enough, one old book on medicine explains that while glass was poison, diamond dust was an antidote for this and all other poisons. The Hindus say that if an inferior diamond dust be used for medicine, lameness would result. Diamonds as medicine were most costly, and given only to kings and popes. Pope Clement VII, in 1532, had a mixture of powdered stones costing 40,000 ducats, one dose alone costing 3000 ducats, and most of this mixture was of diamonds. It is recorded, however, that after the fourteenth dose, Pope Clement died.

Emeralds were also popular as medicines in former times. Hindu doctors used the emerald for cures in all troubles, calling it cold and sweet to the taste. Jewel workers of old rested their eyes while at work by gazing on an emerald. It was used in water for eye baths, causing inflammation to cease. Aristotle in his book on gems says: "An emerald hung from the neck or worn in a ring will prevent the falling sickness. We, therefore, commend noblemen that it be hanged about the necks of their children that they fall not into the complaint."

Powdered emeralds were used in the 17th Century as a drug taken internally for dysentery, epilepsy and bites of serpents, scorpions and others, also as a remedy for fevers.

Another gem which found favor in medicine was the ruby. The ancients believed, that medically, the ruby preserved the health of the owner. If rubies were applied for many diseases, cures of all kinds were expected to take place. In Annobais' receipt for a "cure all" there were 34 ingredients of powdered stones, precious and non-precious, and rubies were the most prominent in the mixture.

Naharari, a physician of Cashmere, who wrote in Sanskrit of the medicine of the 13th Century, said: "Rubies are a valuable remedy for biliousness and flatulency." A famous "ruby elixir" was compounded by a secret process at great expense, and was used only by wealthy patients. The ancient method of applying the ruby as a cure was to place it on the tongue, which was rendered at once cold and heavy, so that only incoherent sounds could be emitted. The fingers and toes also became cold, and a violent shivering followed. Thus the head symptoms disappeared and a sense of elasticity and well-being followed—the cure was complete. The stone was also used as a disinfectant in dread diseases.

Old medicine books show that the carnelian was used medicinally as "a powder or worn as a ring, and was believed to prevent bleeding at the nose." Ancient peoples used the stone with a carved intaglio for ornamental wear, believing that it would cure tumors, prevent or cure all voice and throat infections, and because of its cooling and calming effect on the blood, still the angry passions.

Another stone which was used as a medicine was the turquoise, which the ancients used as a paste to treat diseases of the hip. Precious stones have had a most profound influence on human destinies, and among the most interesting of these were their uses as medicines.

LABORATORY ASSISTANT MAKES EASTERN TRIP

Wilbur A. Sweeney, Research Assistant in the G.I.A. laboratory, left Los Angeles in September for a year's stay in the East. His principal purpose is the refinement of the design of the several instruments whose construction he has been supervising. He also will call upon various optical companies in order to interest them in the manufacture of various gemological instruments.

Upon his departure, Mr. Sweeney presented Institute laboratory with much valuable equipment which formerly formed a part of his private laboratory.

Mr. Sweeney's work at the Institute laboratory is at present being performed by David Howell of Pasadena. Mr. Howell is now engaged in supervising the development of a simple illuminator for judging the color and perfection of diamonds, which will probably be brought on the market by the American Gem Society in the near future.

BOOK REVIEWS

Getting Acquainted With Minerals, by George Letchworth English. Mineralogical Publishing Company, Rochester, 1934.

This text is written in an extremely interesting manner and should appeal to all types of persons, since no scientific background is required for its complete understanding. Each mineral is described in simple fashion and the "mathematical relationships" which appear in the usual mineralogical text are avoided.

The illustrations are interesting and easily understood and are pertinent to the text. Twenty-eight pages of fine mineral identification tables are included, but their value to the gemologist is limited, since they are based primarily upon hardness tests. The pronouncing vocabulary at the end of the book should prove of considerable value to every gemologist. From the gemological standpoint, some of the discussions of gems—particularly of the various phenomenal light effects—are rather haphazard.

The author has a long record as an authority on minerals and is at present a consulting mineralogist for Ward's Natural Science Establishment. Therefore, his work is sound fundamentally as well as interesting to the average reader. Combined with clarity and simplicity, its authenticity renders "Getting Acquainted with Minerals" an excellent book on the subject.

Working In Precious Metals, by E. A. Smith. Published by N. A. G. Press, London, 1933.

"Metallurgy," states this author, "is the most ancient of the mechanical arts . . ." He goes on to show that under the name of metallography it is one of the most modern of sciences as well.

Mr. Smith tries to combine both the scientific and artistic aspects of the metal workers' craft, but his material deals far more with the science of working metals than with their artistic application. He makes a strong point of the necessity of correct procedure in jewelry manufacture, both while working metals and while annealing them. His discussions of the effects of working and annealing upon the structure and consequently upon the physical properties of metals and alloys is clearly presented and should be of great value to any manufacturer of jewelry.

Unfortunately, the gold alloy discussed are those which are standard in Great Britain and are not exactly the same as those used in the United States; but the discussion of these alloys may easily be applied to similar alloys used in America. The platinum metals are fully discussed and many helpful suggestions concerning their manufacture are given. Various jewelry alloys are compared and suggestions are made for the use of the correct alloy in each particular type of jewelry.

Methods of coloring, cleaning and polishing precious metals are explained in detail. The difficulties encountered in each process are pointed out and advice is given as to how to avoid or remedy them.

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(To be continued)

GEMOLOGICAL GLOSSARY

(Continued from last issue)

Epidote (ep'i-dote). Known also as Pistacite. Gem quality resembles tourmaline or peridot. Chemical composition $Ca_2(Al,Fe)_2(AlOH)(SiO_4)_3$ Monoclinic system. Hardness 6-7; Refractive index 1.75; Specific gravity 3.37. Transparent (pistachio-green) light yellow green. See also Piedmontite.

Epithelial Sac (ep"i-thee'li-al). A sac composed of epithelium, for example, the pearl sac.

Epithelium (ep"i-thee'li-um). A layer of cells bounding a surface in the body of an animal, whether external or internal.

Erinide. Trade-marked name for a yellowish green synthetic spinel.

Erinoid. A casein resin used as a mould material for many common objects. See also Imitations.

Eruptive (ee-rup'tiv). Minerals of volcanic origin in geological formations. Sometimes synonym of igneous rock.

Essence d'orient (e"sans' doe"rian'). A substance imitating the luster or orient of a pearl; made from silvery scales of underside of a fish.

Essonite (es'oe-nite). See Hessonite.

Estrellada (es-tre'ya-da). A diamond bearing deposit of Brazil.

Etched. Having the surface roughened by solution or corrosion.

Euclase (ue'klase). Very rare and desirable gem mineral. Chemical composition $Be(AlOH)SiO_4$; Hardness, 7½; Refraction 1.66; Specific gravity 3.07. Transparent, very light green and light blue. Classified by Schlossmacher (leading German authority) as precious.

European Cut. A specific style of brilliant cut. The angles of its bezel facets (41°) and pavilion facets (38½°) with the plane of the girdle make it rather too thick a stone for maximum efficiency.

"Evening Emerald." Peridot which loses some of its yellow tint by artificial light, appearing more greenish.

Exfoliation (ex-foe-li-ae'shun). Splitting apart and expansion of flakes or scales on being heated.

Exotic Fragments. Foreign rock reef, found in diamond pipes which is unlike floating reef.

Eye Agate. Concentric rings of agate with a dark center.

Eyestone. Thomsonite.

Facet (fas'et). One of the small planes which form the sides of a natural crystal, or of a cut gem.

Fahrenheit (fa'ren-hite). Pertaining to the scale used by Fahrenheit in the graduation of his thermometer; as 40° Fahrenheit (or 40°F).

Faience (fae"yans'). A term now applied generally to all kinds of glazed pottery. Formerly a variety of majolica, usually highly decorated with colors and glazed, originally made in Faenza, Italy. See also Glazed Faience.

Fairy Stone. Twinned crystal of staurolite, forming a cross.

Fales. Stones with two, or more, differently colored strata.

"False Amethyst." Purple fluorite.

"False Chrysolite." Moldavite.

False Cleavage. Same as parting.

"False Diamond." Quartz crystal.

"False Emerald." Green fluorite.

"False Hyacinth." Garnet.

"False Lapis." Agate or jasper artificially colored blue.

"False Ruby." Red fluorite.

"False Sapphire." Blue fluorite.

"False Topaz." An incorrect name applied both to yellow fluorite and to citrine quartz.

Fancy Agates. Agates showing delicate markings and intricate patterns.

Fancy Stone. An unusually fine stone, or trade term applied to those varieties of a gem less often encountered commercially, as for instance, the term "fancy sapphires" which refers to sapphires other than blue or white.

Fashioning (of gems) includes slitting, cleaving, cutting, polishing, and other operations employed in preparing rough gem material for use in jewelry.

Fashoda Garnet. Dark brownish-red pyrope garnet.

Fault. Anything within, or on the surface of a stone which affects its beauty or value.

Feathers. A term commonly applied to almost any irregular semi-transparent fault within any stone.

Feldspar (felspar) (feld'spar"). The minerals known as feldspars are important as major constituents of igneous rocks. Certain varieties are of gem value. Gem varieties are colorless, white, pale yellow, green or reddish. Vitreous to pearly luster. Hardness 6 to 6½. See also Adularia, Amazonitem Labradorite, Microlene, Oligoclase, Sunstone, Yellow orthoclase.

Felted. Composed of matted fibers.

Female Ruby or Sapphire. Light-colored ruby or sapphire.

Feminine (fem'i-nin). Term applied to stones of a pale color.

Ferrous (fer'us). Any mineral substance having a considerable portion of iron in its composition.

Fibroc (fei'brok). Bakelite product. A paper composite combined with asbestos.

Fibrolite (fei'broe-lite). A gem mineral. Same as Sillimanite.

Fibrolithoid. Substitute for Celluoid.

Fibrous (fei'brus). Having a thread-like or hair-like form.

Filiform (fil'i-form, or fei'li-form). See Capillary.

Finger Printing (of Diamonds). Special process of Frank Heitzler of Boston which photographs microscopically and in perspective the imperfections in diamonds and other gems.

Fire. Term applied to the appearance of dispersion in gems, more especially in the diamond. Also, somewhat incorrectly applied to play of color in the opal.

Fired Stones. Those which have been heated to change their color. Treated stones.

Fire Opal. Red or yellowish-red opal.

First Bye. First quality of by-waters.

First Water. Diamonds so pure and colorless that they can scarcely be distinguished from water when immersed in it, and (in England), also without imperfections of any kind.

Fish-eyes. Brilliant cut diamonds with dullness in their centers.

Fissure (fish'ure). Separation along cleavage plane which slightly penetrates the surface of a diamond. Geologically, a narrow opening formed by a parting of the earth's crust.

(To be continued)

A GEMOLOGICAL ENCYCLOPEDIA

(Continued from last issue)

HENRY E. BRIGGS, Ph.D.

It is interesting to note that certain names have been applied to first one gem by one people, and then to another totally different gem by a people of another age. Thus the name "Sapphirus" was applied in ancient times to the opaque blue gem lapis-lazuli. In a later age it was modified to "sapphire" and applied to the blue variety of corundum. How entirely different are these two gems, and yet the same name has been used to designate both. The name really means "azure", a tint of blue, and consequently might in one sense be applied to any blue stone. However, in the nomenclature of gems, we should be more specific than that.

The name corundum is indeed of great antiquity. It is derived from an ancient name "Korund", which was applied to the same mineral to which we apply the name corundum.

We also see reflected in the names of gems some of the ancient lore connected with the minerals. The Greek name "Amethyst" will call to our memory the myth of Bacchus. Who according to the myth bestowed upon this stone the power to prevent intoxication of its wearer. The Greek word literally means "without drunkenness".

Mineralogists have adopted a new system of nomenclature of gems, but it seems to have never gained much popularity with the average public. Perhaps it is well it is so. For we should hardly care to discard the common name "Garnet" for the cumbersome "Carbunculus dodecahedrus" given by Dana. Or our ancient and loved name "Jade" for Dana's "Nephrus amorphous", etc.

However, the new names which are coined and which are objectionable are such names as "Starlite" and "Sparklite". And, as well, all such misleading qualifying names as: "Cape Ruby", "Brazillian emerald", "Spanish topaz", "Scotch topaz" and "Montana ruby". Such qualifying names are absolutely misleading, and the fact that they are designed to mislead cannot be gainsaid. It is a well-known fact that Montana has produced some of the finest corundum ever produced, and any such name as "Montana Ruby", when applied to garnet, as is usually the case, is directly misleading. Such names are coined in the hope to lead the buyer to believe that he is getting a rare and valuable stone, when in reality he is getting only a very common and comparatively cheap one. In many cases the qualifying name is eventually dropped altogether, as in the case of topaz. Over 90% of the topaz sold today by jewelers is nothing but the very common mineral quartz. Either of the variety "Citrine", which is naturally yellow, or of the smoky variety which, when treated properly with heat will turn a bright yellow to golden brown color. This was at first sold as "Scotch topaz", "Spanish topaz", etc., but eventually the qualifying and misleading part of the name was dropped, and the selling of quartz as topaz became a wholesale swindle.

The trade names such as "Sparklite" and "Starlite" whch are applied usually to altered stones are more or less misleading. It is very plain that the vendors of these stones do not want the customers to know exactly what the stones are. For if they did why would they not use the names of the stones which are commonly understood instead of these patent names? The two names mentioned apply to zircons which have been heat-treated to alter their color. The zircon as it comes from the mine is often of a color which would render its sale as a gem almost impossible. These stones are heated and after a skillful treatment some will be found to have turned blue, while others have become entirely colorless. The blue ones are often sold as "Starlite" and the colorless ones as "Sparklite". Many times they are sold as natural-mined stones and with absolutely no mention being made of the treating process through which the stones have passed.

We will turn to the synthetic or scientific gem line and even there we find that vice has entered in and misleading names are used in an effort to "hoodwink" the unsuspecting customer. It is possible to produce synthetically, corundum which more or less is the same as the natural. (See synthetics.) This artificially prepared corundum is often made in various colors in imitation of the other gems and sold as: "Synthetic Garnet," "Synthetic Alexandrite," "Synthetic Tourmaline," and "Synthetic Beryl." Such naming is directly misleading as they are not scientific reproductions of the genuine gems whose names they bear. They are rather a mere synthetic corundum colored to imitate the other gems, and the use of such qualifying names is just as questionable in this case as it is in the case of the misrepresentation of natural stones.

Today the markets are cluttered with countless thousands of skillful imitations. In many cases the names of costly gems are applied either to mere "fakes" or to other minerals of little value. These conditions make it necessary for the buyer to arm himself with a fairly comprehensive knowledge of gemology.

ARTIFICIAL GEMS

Since time immemorial man has used gem stones for personal adornment. Unfortunately some of the most beautiful are also the most rare. For this reason man soon learned to place a great price upon fine gems and this in turn made it impossible for some of the less financially fortunate to possess these things of beauty.

In ancient times the mines or localities which yielded gems were comparatively few. The mining methods were extremely crude and we can readily see why gems of real beauty often commanded a stupendous price even in ancient times.

These facts caused man to seek to produce artificially gems to satisfy his longing. This was accomplished with more or less success many, many years before Christ. At first only glass imitations were made. Later methods of treating common minerals, to render them like more expensive kinds, were devised.

(To be continued)

GUILDS

Devoted to News and Activities of Educational Organizations and of Vocational Study Groups and Their Members.

FIRST CERTIFIED GEMOLOGISTS ANNOUNCED

The Gemological Institute of America has announced the first group of students to be awarded the coveted title, *Certified Gemologist.* These title-holders have been working over periods varying from three to five years and have completed an extensive training course in the theory and practice of gemology. The examinations which must be passed before this title is awarded were explained in *Guilds* for February, 1935.

The first group of students to receive the title, *Certified Gemologist,* consists of:

HANS J. BAGGE, Chicago, of J. Milhening, Inc., manufacturing jewelers; Secretary of Metropolitan Chicago Chapter, A.G.S.

LESLIE E. DEWEY, Minneapolis, Minnesota, of J. B. Hudson Co., retail jewelers; Mr. Dewey has been one of the most consistent students of the G.I.A.

MILTON GRAVENDER, Minneapolis, of the Diamond Department of J. B. Hudson Co.; author of "Fascinating Facts about Gem Stones".

H. PAUL JUERGENS; Mr. Juergens is one of a long line of jewelers. In his possession is a letter of apprenticeship which was issued to his great-great-grandfather in 1793. Mr. Juergens is Vice-President of Juergens & Andersen Company, a firm founded by his father and grandfather; and President of the Metropolitan Chicago Chapter of the A.G.S.

RICHARD M. PEARL, son of a Detroit retail jeweler, finished high school and temporarily gave up education as a bad job. After completing the *Certified Gemologist* course, he has now decided to obtain a degree in mineralogy and is studying at the University of Colorado.

E. PAUL SHAW; Mr. Shaw, of the J. B. Hudson Co., Minneapolis, with Messrs. Gravender and Dewey of the same firm, another of the Institute's early students.

HOWARD S. SMITH, retail jeweler of Redlands, California, is Vice-President of the Southern California Inland Guild. In special work at the Institute headquarters, Mr. Smith has distinguished himself as an outstanding laboratory man.

CAPT. TED SYMAN, Denver, President of Syman Bros. Jewelry Company; prior to taking the Institute's courses, Capt. Syman searched for gems in Africa and has distinguished himself as one of the outstanding "showmen" of the American jewelry trade. He is also an instructor of night classes in a Denver art school.

FRED B. THURBER, Providence, of Tilden-Thurber Corporation; member of the Board of Governors of the G.I.A. and the A.N.R.J.A. appointed representative to Examination Standards Board. Mr. Thurber, who is a third-generation jeweler, was the first to complete all three portions of the *Certified Gemologist* examination and is *Certified Gemologist* No. 1.

JOHN F. VONDEY, San Bernardino, President of the Southern California Inland Guild, A.G.S., was one of the first men to complete verbal courses during the organization period of the G.I.A., thereby earning the title of Theoretical Gemologist. He has continued his studies to become one of the first *Certified Gemologists.* For two years he acted as leader of his regional study group. Mr. Vondey has distinguished himself by building a large business in colored stones in his region.

In addition to the above, George C. Barclay, Newport News, Va.; Frank Blackstone, San Bernardino, California; Colin L. Christie, Butte, Montana; Basil Felts, Banning, California; Alvin M. Knudtson, Roseburg, Oregon; Harold M. Lewis, Cleveland; Paul Noack, San Bernardino; Edwin E. Olson, Milwaukee; E. Howard Phillips, Conneaut, Ohio; Newton Rosenzweig, Tucson, Arizona; Harold Seburn, Greensboro, N.C.; and F. W. Twogood, Riverside; are at present engaged in completing their *Certified Gemologist* examinations.

The G.I.A. Examination Standards Board has recently made the ruling that the second and third portions of the C.G. examination are to require one whole day each. This additional time has become necessary chiefly because of the increase from 10 to 20 of the number of unknown stones whose identification is required.

OTHER TITLES AWARDED

During the months of September and October the following retail jewelers passed required examinations and were awarded titles.

REGISTERED JEWELERS AMERICAN GEM SOCIETY

California:
George C. Brock, Los Angeles
Thomas B. Buchan, Los Angeles
S. L. Cook, Los Angeles
Chas. H. Terstegan, Los Angeles

Illinois:
John C. Conlin, Oak Park

Maine:
George B. Bryant, Bangor

Massachusetts:
F. Forest Davidson, Boston

Pennsylvania:
Orrin A. Siegfried, Allentown
Carl W. Appel, Allentown

Wisconsin:
Fred A. Schmitter, Milwaukee

GRADUATE MEMBER AMERICAN GEM SOCIETY

Illinois:
Milton H. Herzog, Chicago

QUALIFYING CERTIFIED GEMOLOGISTS

Florida:
Julius M. Kadish, Tampa

Indiana:
Guy Swartzlander, Kendallville

A.G.S. GUILD AND STUDY GROUP MEETINGS

Held in October

October 8th—Boston Study Group—Held at Boston Society of Natural History under leadership of Dr. Edward Wigglesworth.

October 11th—New Jersey Guild meeting held at Douglas Hotel, Newark. Synthetic exhibit shown and talk read by Donald J. Cooper, Registered Jeweler, of Bayonne.

October 17th—Eastern Pennsylvania Guild meeting at Academy of Natural Sciences of Philadelphia. Synthetic exhibit shown and talk read by Dr. Samuel G. Gordon.

October 17th—Wisconsin Guild—Hotel Pfister, Milwaukee. Hans J. Bagge, Certified Gemologist, of J. Milhening, Chicago, gave talk on *Diamonds*, showing crystal models and rough diamonds.

October 25th—Northern Ohio Guild—Held at Case School of Applied Science, Cleveland. Synthetic exhibit was shown.

October 29th—Tri-State Guild—Held at University of Pittsburgh. Synthetic exhibit shown.

October 30th—Washington, D.C., second Study Group meeting held at Raleigh Hotel under leadership of Dr. W. F. Foshag.

October 30th—Second meeting of Cincinnati Study Group held at University of Cincinnati under leadership of Prof. Otto Von Schlichten.

To Be Held in November

November 5th—Metropolitan Chicago Chapter of A.G.S. to meet in Illinois Room of Palmer House. Synthetic exhibit to be shown and talk delivered by F. Otto Zeitz, Q.C.G.

November 5th—Boston Study Group—Boston Society of Natural History under leadership of Dr. Edward Wigglesworth.

November 8th—New Jersey Study Group under leadership of Dr. A. C. Hawkins.

November 21st—Wisconsin Study Group under leadership of Dr. A. J. Walcott, to be held at Pfister Hotel.

November 21st—Eastern Pennsylvania Study Group under leadership of Dr. Samuel G. Gordon, to be held at Academy of Natural Sciences of Philadelphia.

November 22nd—Northern Ohio Study Group—Case School of Applied Science under leadership of Professor Richard Barrett.

New York Chapter A.G.S.

The New York Chapter will meeet on the afternoon of November 2nd in the American Museum of Natural History, New York City. Herbert P. Whitlock will be the lecturer, and his talk on "colored stones" will be supplemented by lantern slides.

A.G.S. CHAPTER FORMED IN CHICAGO

Students of the American Gem Society and the Gemological Institute and other persons prominent in the retail jewelry trade met in Room A of Marshall Field's grill Thursday, September 12, 1935, and formally organized the Metropolitan Chicago Chapter of the American Gem Society. Mr. Hans J. Bagge, of Milhening, Inc., acted as temporary chairman, and after approval of constitution and by-laws, the following officers were elected to serve for the ensuing year:

H. Paul Juergens, Juergens & Andersen........................President
Geo. A. Arbogast, Arbogast & Holdorf................Vice-President
Hans J. Bagge, Milhening, Inc...Secretary
Earl C. Luscomb, C. D. Peacock.....................................Treasurer

The new chapter of the A.G.S. will meet quarterly upon the evening of the first Tuesday of each month beginning in November.

It was decided that the chapter would supervise the meetings of a study group of the A.G.S. which is to be organized. The first meeting of the study group was held Tuesday, October 1st.

ADDRESSES L. A. MINERAL SOCIETY

On Thursday, October 17, Robert Shipley, Jr., Laboratory Director of the Gemological Institute, addressed the Los Angeles Mineralogical Society. His subject was "The Commercial Production of Synthetic Gems." This talk was the same as the one which is now being given at various A.G.S. Study Groups, except that the special display exhibits could not be shown to the Los Angeles Mineralogical Society as they had previously been scheduled to be used at the meeting of the Eastern Pennsylvania Guild in Philadelphia.

DIAMOND REPLICAS USED WITH JONKER EXHIBITIONS

In conjunction with their display of the Jonker Diamond in Los Angeles, Brock & Company, who are Institute Members, used the Institute's Famous Diamond show in their front window. This exhibition of glass models of the important diamonds of the world, which had been exhibited by the Institute at the recent World's Fair in Chicago, attracted a great deal of attention.

When the Jonker was forwarded to Shreve & Company of San Francisco for display in that city, the latter firm made special arrangements with the Institute to use the display of diamond replicas, having heard of the great interest it created in connection with the showing of the Jonker Diamond in Los Angeles.

DIAMOND INSURANCE AND HOLD-UPS

I fail to see how any system of registration or identification could be established that would reduce the number of hold-ups. It has been my observation that the customer who brings up the subject of hold-ups is usually not much interested in diamonds and does not offer this objection as a real reason for not buying and wearing them. In fact, I believe that hold-ups for diamonds alone are few and far between and about 99% of hold-up artists are far more interested in money than anything else, and in case a customer gives this as a real reason for hesitating to purchase, that, the jeweler can go a long ways to overcome it by calling attention to the new insurance policy mentioned in the May-June issue of *Gems & Gemology* which only costs one-half the premium as the all-risk policy. I think the trade certainly owes Paul Juergens a vote of thanks for his work.

—*Note by Leslie E. Dewey, Certified Gemologist, Minneapolis.*

New Instructor for American Gem Society Study Group in Cleveland

On September 27th occurred the first monthly meeting of the students of the A.G.S. and the G.I.A. in the Cleveland region to be conducted under the auspices of the Cleveland Guild of the A.G.S.

The Study Group was fortunate to secure the services of a new leader, Prof. Richard L. Barret, the head of the Mineralogical Department of the Case School of Applied Science. The future meetings of the study group will be held in the laboratory of this institution. They will occur upon the fourth Friday of each month.

BOOTH AT A.N.R.J.A. CONVENTION SUCCESSFUL

The joint G.I.A. and A.G.S. booth at the A.N.R.J.A. Convention in New York was managed by members of the New York Chapter, A.G.S., and of the New Jersey Guild.

Members who spent time in the booth included Kenneth I. Van Cott of Marcus & Co., New York; Jack Gordon of Avvocato & Tuch, New York; H. V. Paul of Wiss & Sons, Newark; Frank L. Spies of Handy & Harman, New York; Richard H. Van Esselstyn of New York; and J. Arnold Wood of Poughkeepsie.

The booth was a pronounced success and the members in charge of it answered many questions and distributed literature explaining the work of the G.I.A. and of the A.G.S.

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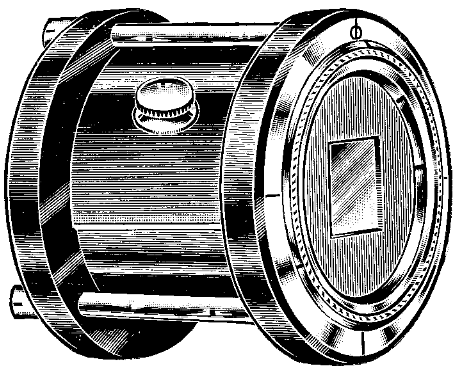

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