Gems & Gemology

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Evaluating the Make of Diamonds*

by

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Traub Manufacturing Co.

In my opinion, judging the "make" of diamonds over one-carat size requires a system. A system not only of taking the measurements, but also of comparing those measurements with the standard, and then evaluating the differences.

By standard measurements I mean the proportions as shown in Fig. 1, which were worked out by Tolkowsky. When Tolkowsky published his little book, "Diamond Design," in 1919, he established two points about diamond cutting and proportions. The first was that the brilliant cut is the mathematically correct shape to bring out the brilliancy and fire of diamonds, provided certain proportions were followed reasonably closely. The second point was that by trial and error over a period of 2000 years the diamond cutters had developed this shape and these same proportions.

It is not my contention that all diamonds should or can be cut exactly to the proportions as shown in Fig. 1. The cutter has his problems, too. He must constantly balance proportion against waste and make compromises which give the best results with the rough he has to use.

My method of evaluating make consists of three steps:

1. The stone is measured very carefully in 1/100 mm. (22 measurements in all).

2. These 22 measurements are condensed into seven by averaging some of them and compared with the standard.

3. The difference in each measurement from the standard is determined in percentage and then evaluated by definite rules.

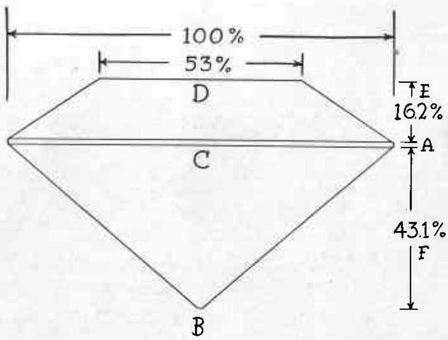


Figure 1

The instruments required are:

1. Diamondscope.
2. Mm. micrometer.
3. Mm. micrometer depth gauge.
4. A.G.S. angle gauge.

The Diamondscope, or similar binocular magnifier, leaves both hands free to hold the stone and the measuring device and provides the higher magnification necessary for accurate work. I use 20-power magnification on all except the two outside measurements. These two are the total depth and the diameter.

*G.I.A. Research Service.

The diameter is measured with the mm. micrometer writing down the maximum and minimum measurements and averaging these two extremes. This average is the diameter

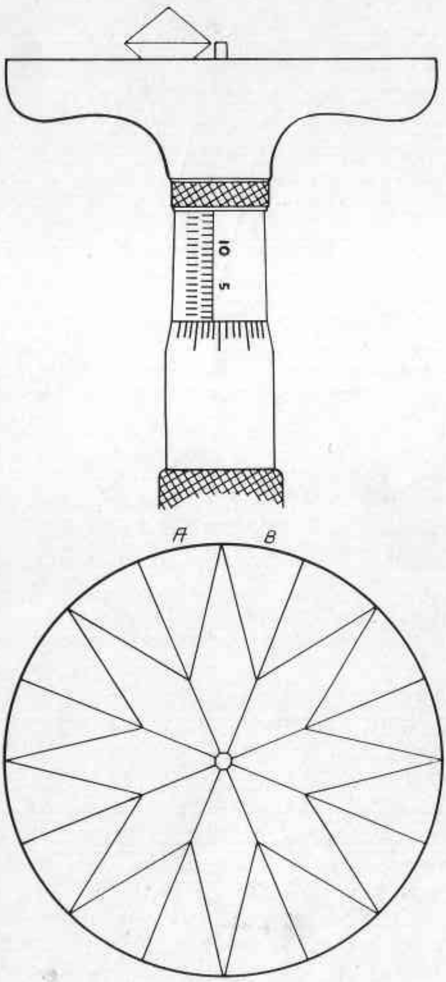


Figure 2

used as the base of all other measurements.

Next, I measure the total depth from table to culet with the mm. micrometer.

Third, I measure the table, under magnification, holding the stone in spring tweezers and still using the mm. micrometer. The table is measured from the point of one bezel facet across to the opposite point. The maximum and minimum measurements are taken and then averaged. Still holding the diamond in the spring tweezers the angle gauge is applied on several bezel facets, under magnification, and the average angle is taken very easily.

The next measurement is the thickness above the girdle. The stone is placed table down on the surface of the depth gauge. If this surface is kept slightly greasy the stone will stick very nicely.

Fig. 2 shows an outline of the diamond in position on this gauge. While taking this measurement be very careful to keep the flat surface of the post on the gauge directly in line with your vision. The thinnest point on the girdle is to the right or left of the top of each pavilion facet. These are indicated by "A" and "B" in Fig. 2. I have standardized on the one to the right and proceed around the stone clockwise while it is face down on this gauge. The post on the gauge is run up until it is exactly even with the top edge of the girdle (point A in Fig. 4) and a reading taken. Then the post is run on up until it is even with the bottom edge of the girdle (point B in Fig. 4) and a reading taken. Now the stone is turned counter-clockwise on the surface of the gauge to the thinnest point beyond the next pavilion facet and a reading taken at the bottom of the girdle first, and then the indicator is run down to the top edge of the girdle. This is repeated around the diamond until eight measurements "table to top of girdle" and eight "table to bottom of girdle" have been taken. Each group is added up and averaged. The difference between these two averages is the average thickness of the girdle itself at its thinnest points.

By deducting from the total depth the average depth from table to bottom of the girdle, we arrive at the depth below the girdle.

Now we make a recap of our measurements as shown in Fig. 3.

Next we compare these measurements with the standard. Using a chart which gives the correct measurement for any size stone from 5.0 to 11.0 in diameter. We find that a stone which is 7.4 mm. in diameter should have a table measuring 3.92 mm. Comparing this with our stone we find the table is .52 mm. too large. This is 7½%. We find the below-girdle measurement is .16 mm. too thick, or 2%. The angle of the bezel facets are plus 4½°.

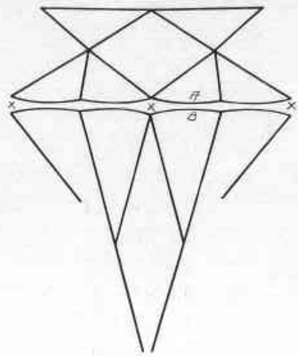
Weight 1.53 ¾ ct.

4.57	Total Depth			
7.42	Diam. & Girdle 7.38 - 7.46	(C)		
4.44	Table 4.39 - 4.49	(D)	+7½%	1½
1.19	Av. above G.	(E)		
3.35	Av. below G.	(F)	+2%	½
39°	Angle	(G)	+4½°	2
.03	Girdle Thickness	(A)		
SM.	Culet Size	(B)		

Figure 3

All other measurements are correct. This, by the way, is a very good make, being about the average for good proportions.

To evaluate these differences refer to Fig. 5, which is the back of the grading card. The table on this diamond is 7½% large. The schedule under "value reduction factors for



1	2	3	4	5	6	7	8	AV.
1.18	1.20	1.21	1.20	1.18	1.22	1.20	1.18	1.19
1.23	1.19	1.24	1.21	1.22	1.24	1.23	1.22	1.22

Figure 4

make" shows that each 5% difference in the table size equals one factor, so 7½% would equal 1½ factors as shown on the same line with the 7½% in Fig. 3. The below-girdle measurement on this diamond is 2% too large. The schedule shows that each 3% difference in this particular measurement equals one factor, so 2% would be ½ factor, by using the minimum for fractions. The angle is 4½° too much and each 2° equals one factor, so this measurement equals 2 factors. Now the factors are added and the total is 4 factors. By referring to the "grade ratings" from 1 to 12 shown in Fig. 5. This stone is automatically classified as No. 4 in make.

Girdles

I believe more can be learned about the make of a diamond by looking at the girdle than any other one part of the stone. Anyone interested in diamond grading can spend considerable time to good purpose studying girdles. When you know what to look for, a girdle tells most of the story about the skill or lack of it, used by the cutter. Your standard tweezers on your diamondscope can be used to hold the stone edge up under the binocular, but I prefer the spring tweezer. The stone is held firmer and can be rotated freely, which is very important.

The most common complaint about girdles is thickness. What is a thick girdle, or how thick is thick? I do not agree with the theory that a thick girdle reflects a grey or cloudy appearance into the stone.

I have tried repeatedly to find such a reflection in stones with very heavy girdles. A more important factor is that a thick girdle stone weighs more than it should for the show the stone makes. On the other hand, a knife-edge girdle is even worse, in my opinion, because of the danger from breakage. Chipped stones are definitely the result of thin girdles. They not only break while being set, but while loose in the paper and also while being worn. In my opinion, girdles which average more than .1 mm. in thickness at the thinnest point are too thick and ¼ of this thickness or less is too thin. This applies equally to small or large stones.

The other features to look for in girdles are:

1. Wavy girdles.
2. Uneven girdles.
3. Out-of-round girdles.
4. Girdles on which the bezel and pavilion facets do not track.

All girdles vary somewhat, but limitations must be established for these variations. A "wavy" girdle is one which is not cut on the same horizontal plane within at least .2 mm. The thick points, indicated by "X" in Fig. 4, alternate in high and low positions producing a wavy girdle plane. Uneven girdle refers to thickness. On one side of the stone the girdle is very thick, and on the opposite side very thin, resulting

DIAMOND GRADING RECORD

DIA. NO.________ RATES NO.______ VALUE IN COLOR WEIGHT________

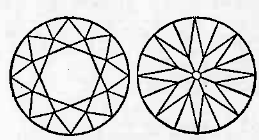
DATE________ RATES NO.______ VALUE IN MAKE ESTIMATED VALUE________

________ RATES NO.______ VALUE IN PERFECTION FROM________

MILLIMETER MEASUREMENTS (SEE BACK OF CARD FOR EXPLANATION)

	VARIATION FROM STD.	VALUE FACTORS
______ TOTAL DEPTH		
______ DIAMETER AT GIRDLE (C)		
______ ACROSS TABLE (D)		
______ AV. ABOVE GIRDLE (E)		
______ AV. BELOW GIRDLE (F)		
______ ANGLE TABLE & BEZEL (G)		
______ GIRDLE THICKNESS (A)		
______ CULET SIZE (B)		

	1	2	3	4	5	6	7	8	AVERAGE
TABLE TO TOP GIRDLE									
TABLE TO BOTTOM GIRDLE									



LOCATION OF FLAWS SHOWN ON ABOVE DIAGRAMS

- NATURAL
- NICK IN SURFACE
- CARBON PINPOINT
- BUBBLE OR CRYSTAL
- SLIVER FROM FACET
- GROUP PINPOINTS
- FEATHER
- FLAT SPOT ON GIRDLE
- FISSURE
- CLEAVAGE CRACK
- CLOUD OF PINPOINTS.
- CARBON SPOTS
- SPOT OF CLOUDY TEXTURE
- KNOT IN SURFACE

PINPOINT IS THE SMALLEST IMPERFECTION VISIBLE BY A TRAINED EYE USING 10X MAGNIFICATION AND BRIGHT DIFFUSED LIGHT.

Figure 5

MAKE

"MAKE" GRADE RATINGS

1. CORRECTLY PROPORTIONED
2. TWO FACTORS LESS THAN STANDARD
3. THREE FACTORS LESS THAN STD.
4. FOUR FACTORS LESS THAN STD.
5. FIVE FACTORS LESS THAN STD.
6. SIX FACTORS LESS THAN STD.
7. EIGHT FACTORS LESS THAN STD.
8. TEN FACTORS LESS THAN STD.
9. TWELVE FACTORS LESS THAN STD.
10. FOURTEEN FACTORS LESS THAN STD.
11. SIXTEEN FACTORS LESS THAN STD.
12. OLD MINE CUT

VALUE REDUCTION FACTORS FOR MAKE

A. THICK OR WAVY GIRDLE
B. LARGE CULET
C. GIRDLE OUT OF ROUND (EACH .1 MM.)
D. EACH 5% DIFFERENCE IN TABLE
E. EACH 2% " ABOVE GIRDLE
F. EACH 3% " BELOW GIRDLE
G. EACH 2 DEGREES IN ANGLE

DIFFERENCES REFER TO AMOUNT OF VARIATION FROM STANDARD PROPORTIONS OF CORRECTLY CUT DIAMOND ACCORDING TO TOLKOWSKY'S "DIAMOND DESIGN."

NOT OVER 4 FACTORS OF ANY ONE KIND. TWO "D" FACTORS COUNT THREE.

COLOR

1. FANCY BLUE (VIOLETISH)
2. JAGER (BLUISH BODY TINT)
3. RIVER (COLORLESS)
4. WESSELTON (BLUE-WHITE)
5. TOP CRYSTAL (FINE WHITE)
6. CRYSTAL (OFF WHITE)
7. VERY LIGHT TOP BROWN
8. TOP CAPE (SILVER CAPE)
9. CAPE (LIGHT YELLOW)
10. PREMIER (YELLOWISH BLUE TINT)
11. DARKER YELLOW
12. LIGHT BROWN

PERFECTION

1. FLAWLESS
2. FLAWLESS BUT VERY SMALL NICKS IN GIRDLE
3. NOT OVER 2 UNDER TABLE AREA
4. LARGER AND OUTSIDE TABLE AREA
5. OUTSIDE THE TABLE AREA
6. UNDER THE TABLE AREA
7. UNDER THE TABLE AREA
8. LARGER THAN NO. 7
9. LARGER OR MORE OF NO. 5 OR 6
10. LARGER FLAWS
11. MANY NO. 5 TO NO. 7
12. MANY NO. 8 TO NO. 10

Figure 5 (Back)

in a lop-sided effect in the crown of the diamond. I would like to call special attention to girdles which do not track. Such stones have become quite common in the last few months as the result of employing improperly trained apprentices in the diamond-cutting trade. Unfortunately they are being offered for sale at the same prices as fine make, and in my opinion are really worth from 20% to 30% less. It is quite obvious that the pavilion facet should be directly underneath the bezel facet to properly reflect the light within the stone and produce maximum brilliancy. These "apprentice" diamonds, as I call them, also have pavilion facets without points at their junction with the girdle, and the junction points between the pavilion facets themselves are often too close to the culet. This type of make is especially prevalent in ten-per-carat to half-carat sizes at the present time.

Tables

The most confusing and difficult measurement for me is the table. It is not only hard to measure but is always too large anyway. Out of about 400 diamonds which I have measured only three have had nearly perfect proportions. These three all have tables from 4½% to 7½% too large.

Identification

I would like to point out that important large stones can be "fingerprinted" with the information on this grading card and identified conclusively. In addition to make, the color is classified by number as well as the perfection. The 1.53-carat diamond shown in the examples of make grading, was a No. 5 color and No. 1 perfection. Therefore, it is filed as a No. 153-541 and could be readily located in the card file by its weight which precedes the grading number, and readily identified by the detailed measurements.

The measuring is not as difficult or time-consuming as it appears. I find that the location and diagraming of imperfections accurately takes more time on a first pique stone than filling out the balance of the card.

BOOK REVIEWS

Fire in the Earth, the Story of the Diamond. **By James Remington McCarthy, Published by Harper and Brothers, New York, 1942, $2.50.**

The author has chosen an engaging title in keeping with his subject, the diamond. The book is written with a most interesting style, free from too technical phraseology above the layman's comprehension. The book is decidedly written for the layman, to whom it should prove exceptionally valuable.

"Fire in the Earth" deals briefly, but not too accurately, with the nature of the diamond, its formation and its properties. Mining, cutting, color, history and uses of the diamond are dealt with fascinatingly and more accurately. However, the author states that he writes as a reporter and not as an authority. In evidence of this is his description of diamond tweezers as "forceps."

The chapters on "The De Beers Saga," "The Art of the Cutter," "Designed for Beauty," are exceptionally well written and a timely review, entitled "Hob-Nailed Boots in the Lowlands," followed by one equally timely, "Diamonds Come to America," answer the questions that people are asking every day regarding the fate of cutters and what has become of the diamonds in Europe.

The author has not omitted chapters on "Diamonds in Legend, Superstition, and Sentiment," "Colored Diamonds," and "Industrial Diamonds," all well written and not a dull word.

The chapter "On Buying a Diamond" gives the amateur some easily understood facts as a guide to a contemplated purchase. This chapter, in the main, is authoritative and its exposé of doubtful trade practices is daring. As indicated by the author, it was largely reworded from the booklet "Diamonds," published by the American Gem Society. One anomaly occurs here in the author's reference to three different classifications of diamond grades. The scale which graduates such classifications from "collection gem perfect" through "blue perfect" to "clean" and "pique" is a most confusing and questionable guide for the diamond-buying public, because it mixes grades of flawlessness with fanciful color nomenclature.

Mr. McCarthy's book has been unduly criticized because of the quite apparent publicity given to Baumgold Brothers and certain of that firm's more important customers, but such criticism emanates from those who are not aware that McCarthy has for several years been the publicity manager of the Baumgold organization.

With the exceptions of cutting and the results on the diamond trade of the present war, the information is not original; however, the sources from which the information has been taken (and to most of whom the author has given credit in his preface on text) are, in the main, authentic, although an occasional transposition of that information by him is careless.

In transposing the story of the Sancy, he attributes the late Dr. Kunz's statement that the Sancy is now in the possession of Lady Astor to Col. Henry Yule, a gentleman who died during the last century! Also all the paragraphs on pages 219 to 222 are really direct quotations from Shipley's "Famous Diamonds." The omission of quotation marks from these paragraphs makes certain subquotations that were of doubtful authenticity appear to be statements made by Shipley himself, while in his work Shipley calls attention to the inaccuracy of these very statements.

Other inaccuracies can be attributed less to carelessness than to source. For instance, in an earlier chapter Mr. McCarthy states that the difference between graphite and diamond is that diamond is crystallized. He also believes that the specific gravity of the diamond is of importance because, "you can tell the difference between a real diamond and a phony by comparing their weight—the heavier one is the real thing." It would be interesting to see the author or one of his readers make a determination on this basis between glass of high lead content, white sapphire, zircon, and diamond.

Nevertheless, the author has an ability to bring his subject to life for a layman, which other authors on this subject have rarely possessed.

For the gemological student certain portions of the chapter on the war in "Diamonds in Fashion" will prove to be new information. In addition, the author's lucid picture of diamond cutting is unsurpassed. The greatest use of the book to the jeweler lies in stimulating its distribution to laymen. It should create diamond sales in a similar but more complete manner that less pretentious booklets on "Diamonds" and "Famous Diamonds" are already doing.—A. McC. B. and R.T.L.

Note: Obtainable from G.I.A. Book Department. $2.50.

GIFTS TO THE INSTITUTE

(From January 1-April 1, 1942)

From **James Donavan, Jr., R.J.,** of Donavan & Seamans Co., Los Angeles—2 fine, brilliant-cut diamonds; one of .37 carat graded better than 1.00 on the G.I.A. Colorimeter; the second, which weighed .44 carat, graded at 1.50. They are a valuable addition to the Institute's Master Series used with the Colorimeter.

From **C. A. Allen, C.G.,** Cranbury, N.J.—37 top-quality white and blue zircons. They will be very helpful for a study of zircon inclusions and stone examinations.

The Classification and Sales Possibilities of Genuine Pearls*

by
PAUL C. RIETZ
Juergens & Anderson, Chicago

When I was asked, several years ago, to assist in writing the revision of the pearl assignments, I had a thought which I felt might be incorporated in the course which would be of some help to the students. I spent a great deal of thought and time in attempting to explain my theory in a simple, understandable manner.

Sometime later I asked some pearl dealers why my thought was not given more consideration. The answer was, "Why, you are crazy. Why tell them all about pearls, make them buy pearls and find out for themselves, as you and I have." That, in my mind, was an inadequate reason for not considering the merits of my thought, which had been to help students to the better understanding of pearl values and how they are applied in a commercial way.

Such an attitude does far more harm than good to the industry as a whole.

The Theory

My thought is that pearls could be classified somewhat along the lines diamonds are. It would make it easier for you and future students to understand pearls.

The application of my theory is rather simple. You all handle diamonds; most of you have an excellent knowledge of diamonds and their value, and through experience in handling them, many of you are real authorities. You classify diamonds as being Jagers, Rivers, Wesseltons, etc., also as being perfect or flawless, VVS, VS, etc. I believe that if you could apply the same methods with respect to pearls you would more readily understand the method of classifying and evaluating them.

Terms of Classification

While, on the whole, the principle would be the same, I believe that we should adopt the terms of the various classifications from what the Food Products Industry teaches us. I think they are much smarter than we in the Jewelry Industry, in that we start at the top with flawless and suggest that each succeeding step is much less desirable. Please understand that I do not advocate that our terms of classifying diamonds should be changed, however, we must admit our method is a negative suggestion.

The Food Products Industry grades its products as super-fine, extra-fine, fine, select, special and standard grades as A, B, and C. These terms of classification all indicate that they are presenting and you are buying something choice. The power of suggestion in their classification is positive, it creates sales appeal so that if and when the Gem Society should create a classification for pearls, let us try to follow along the ideas presented by the canners.

*A.G.S. Research Service.

Classification

For example, let us use the term "gem quality" for the finest quality of pearls, which would be comparable to the flawless Jager or Golconda diamonds, followed by the terms extra-fine, fine, good, fair, imperfect and poor quality.

Before we proceed further, I want you to remember that the qualifications combined in a pearl of the very finest quality that nature can produce is iridescence, maximum luster of even intensity, even color, perfection of shape and surface skin. With this formula in mind, let us now attempt to classify the various qualities to the terms previously suggested.

Gem Quality

[An iridescent pearl, absolutely round, with maximum luster of even intensity, free of all visible or undersurface blemishes.] The color must be even or unusual like a decided pink rosea (the body color of such a pearl is white with an over-tone of light red producing a pink tone) such pearls indeed are very rare and I believe that pearl dealers as a whole will agree a pearl or necklace of such pearls is the finest. Unusual, fine cream rosea and extreme fancy rosea pearls would also come into the gem classification. If and when it is possible over a period of time to acquire a complete necklace of such pearls, the owner would have a very rare article which could and would command a very high price. It would be comparable to assembling a necklace of all perfectly matched Jager's or Golconda diamonds, flawless, with the tables and make alike.

Extra-Fine Quality

[The same basic qualifications as a pearl of gem quality, but the color need not be unusual or extreme.] This pearl being more plentiful, more easily blended and assembled into necklaces and consequently more commercial, I would make comparable to the flawless, top Wesselton diamonds.

Fine Quality

[Pearls with the same qualifications of extra-fine quality, but the pearls may be very, very slightly oval or flat, but when strung they will appear round.] Such pearls are comparable to VVS top Wesselton.

Good Quality

[Pearls of extra-fine classification with small, minute surface blemishes or pit near the drill holes so that when such pearls are strung into a necklace, the imperfections would not ordinarily be visible, or pearls without blemishes, round in shape, only very slightly less lustrous.] Pearls of this description would be comparable to the VS top Wesselton, or VVS Wesselton.

Fair Quality

[Pearls of good luster with small visible surface blemishes or pearls slightly more off shape.] Pearls of this description are comparable to PK diamonds, the size or amount of imperfections would designate whether they were comparable to first or second PK.

Imperfect Pearls

[Pearls with many noticeable surface blemishes and noticeably off shape.] They would be comparable to imperfect diamonds.

Poor Quality

[Dull, very imperfect, decidedly off shape pearls or pearls undesirable in color that would not be readily salable for additions.] Europe and India absorb most of this quality.

Color, Iridescence and Luster

Color in itself is not a dominating factor in the value of pearls as long as the color is even and desirable. Whether it is dark or light or a variation of cream or fancy tints makes no difference as long as it is desirable, usable and saleable.

Now, what I am about to say next may not be scientifically or gemologically correct, but to me iridescence is that property in a genuine pearl which is lacking in the majority of cultured pearls and that only a suggestion is found in the finer cultured pearls.

The lack of this property in most cultured pearls is what usually gives one who is accustomed to handling pearls an almost instantaneous hunch that the pearl is not real.

To me genuine pearls seem to have an indescribable warmth or life, due to their iridescence, that is lacking in the cultured pearl.

Cost Basis for Figuring Pearls

I will not attempt to give you a base price from which you can definitely figure the cost of pearls. The market fluctuation as in diamonds does not make this feasible. I would rather attempt to give you an idea of the approximate percentages from an arbitrary base price cost of the extra-fine quality pearl. The various other qualities will fluctuate therefrom.

Let us arbitrarily take the figure $8.00 base for the extra-fine quality pearl. The gem quality, which is the same as the extra-fine quality except that it is more unusual, would cost 15% to 20% more, or about $9.50 to $10.00 base. Before I go further, let me say that all the way through this discussion I refer to the average sizes of pearls, which are the more commercial sizes and which you, as dealers, are most likely to handle in your possible pearl transactions. The largest sizes would run seven to eight or even ten grains.

Now we have defined and priced the gem and extra-fine quality pearls from the $8.00 base figure for the extra-fine quality. The fine quality would be somewhat similar to the difference between flawless and VVS diamonds, or 15% to 20%, making fine quality pearls around $6.50 base, the good quality pearls $4.00 base, fair quality pearls $2.50 base, the imperfect pearls $1.50 base and poor qualities from ten to fifteen to fifty cents base. So that you may more clearly understand and actually see the pearls described in the various classifications of gem, extra-fine quality, etc., I have assembled a group of pearls figured on the arbitrarily selected base price cost $8.00 base for the extra-fine quality pearl. I believe that studying and examining these pearls will make it much easier for you to understand these factors which determine in what classification the pearls are as I have described them to you.

Now if you were buying an original bunch of pearls using the same basis of figuring the values, they would in all probability cost you $6.50 base. In assorting them you might find a very few pearls of the gem quality worth $9.00 to $10.00 base, a fair proportion of the extra-fine quality costing $8.00 base, but the biggest proportion would be of the fine quality costing the approximate price of the lot, or $6.50 base. You would also find a fair proportion of the good quality costing around $4.00 base, also in all probability a small proportion of fair quality pearls costing around $2.50 base. A lot of pearls in the original bunch, if well balanced and of good value, costing $5.00 to $6.50 base for the lot, should not contain any imperfect or poor quality pearls. These pearls are found in lots or bunches of effective pearls costing $2.00 to $3.00 base.

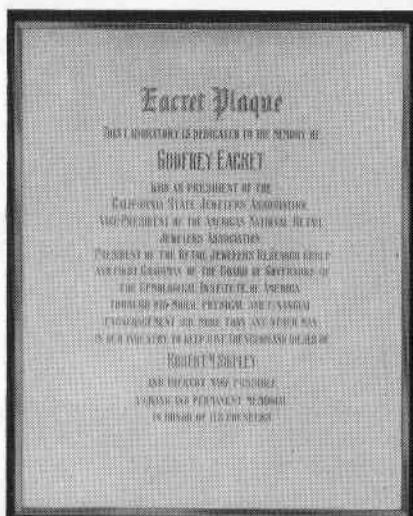
Assembling a Pearl Necklace

The majority of pearl necklaces are assembled more or less in the same manner in that we naturally strive to make the center one-third, or visible portion of the necklace, of the best pearls. The remaining two-thirds or the pearls running along the sides and the back of the necklace are made up of lesser quality, effective pearls, but of the same fine luster. These pearls you will recall in assorting the original bunch are the most plentiful in number. Another reason for assembling necklaces in this manner is to save some of the larger and finer pearls for additions to already completed necklaces. It is the addition of pearls to existing necklaces that is by far the greatest portion of the pearl business. The sale of a pearl necklace is only the start of a good pearl prospect. They are vulnerable for many further additions for many years to come, if the jeweler keeps up the interest of his prospect in the necklace and is careful in selection of pearls so that when additions are made it will not only enhance the appearance of the necklace, but also the value, doing so will maintain the customer's interest and their pride of ownership, as well as profits for the jeweler.

(To be continued)

R.J.R.G. HONORS FIRST G.I.A. CHAIRMAN

The Retail Jewelers Research Group recently presented this handsome sterling silver plaque to the Gemological Institute of America in honor of the late Godfrey Eacret, their former president and the first chairman of the Institute's Board of Governors.



DIAMOND GLOSSARY

(Continued from last issue)

Bultfontein Mine (South Africa). Third pipe mine discovered (i. e. early in 1871). Bultfontein produces the best color goods of the pipe diamond mines. The comparative perfection of the white Bultfontein stone is below the average.

Burning of Diamond. See heat.

Bye or Off-Color. Having a tint of undesirable color-tone. Used sometimes by the Diamond Syndicate.

Calf's head cut. A tapering baguette with the wide corners truncated.

Calibre cut. Small stones which are cut to exactly fit a space in a mounting; such spaces are usually in lines in which are set many stones side by side.

Caliper; Calliper. An instrument used for determining the thickness or diameter of objects, distances between surfaces, etc.

Calliper. See Caliper.

Canary. An intense slightly greenish yellow fancy diamond. See Florentine. See Tiffany. See Yellow (Distinctly).

Canavieiras (Brazil). A source of fine Brazilian diamonds.

Cape. South Africa has long been known in Great Britain simply as the Cape, so at first all African diamonds were called "capes". Later the term came to mean any diamond noticeably tinged with yellow.

Cappe. Dutch term for octahedral cleavage.

"Cape May Diamond." Colorless and clear rock crystal from Cape May, New Jersey.

Carat. A standardized unit of weight for diamonds, other gems and pearls. The carat formerly varied somewhat in different countries, but the metric carat of 0.200 grams or 200 milligrams was adopted in the United States in 1913, and is now standardized in the principle countries of the world.

Carat-goods. Parcels of diamonds which have an average weight of about one carat each.

Carbon. An elementary substance occurring native as the diamond and also as graphite and forming the major constituent of coal, petroleum, asphalt; also important in limestone and other carbonates, and all organic compounds. Symbol, C. Atomic weight 12.0.

2. A jewelry trade term applied to any black appearing inclusion or imperfection in diamonds. Includes also diamond crystals which appear black in transmitted light.

3. Carbonado is sometimes called carbon or "carbonate."

Carbonado. Black diamond. A massive, impure, slightly cellular aggregate of small diamond crystals, forming a rock of granular to compact texture. Opaque, black, brown or dark grey. An industrial diamond.

"Carbonate." An industrial term for Carbonado.

Carbon inclusions. Inclusions which by transmitted light appear black. Although some occasionally may be graphite, or small inclusions of some other black mineral, the majority of these by careful examination by scientific grading instruments or microscopes are revealed as included crystals of smaller diamonds or other transparent minerals. Patches or clouds of such "carbon" are apparently groups of crystals.

Carbono (Sp.). The element carbon.

Carbon pin-points. A jewelry trade term referring to small black inclusions in diamonds and other gems, which were thought to be extremely small crystals of other minerals. They are probably tiny included diamond crystals and sometimes graphite.

Carbon spots. Opaque black specks or spots in diamond.

Carborundum. An artificial crystalline product. Silicon Carbide (SiC). Also found in meteorites associated with diamond and graphite. The artificial product is 9¼ in hardness and its many commercial uses include that of furnishing material for polishing wheels for gem stones other than diamond.

Cascalho. Diamond-bearing gravel in Brazil. Cascalho is probably gorgulho, which, being washed from the plateaus and mountain sides, has become somewhat worn. Floods or changes of stream courses have left the material in the valley deposits. See Gorgulho.

Cathode. The negative terminal of an electric source, or more strictly, the electrode by which the current leaves the electrolyte on its way back to the source. See also Electrode. See also Electron.

Cathode rays. Rays projected from the cathode of a vacuum tube in which an electric discharge takes place. By impinging on solids the cathode rays generate Röntgen rays or X-rays.

Cavities. Fosses or fissures in a surface.

Cyclical twins. Diamond may form this type of twinning, somewhat similar to that of chrysoberyl. See Cyclical.

Charcoal. The amorphous form of carbon.

Ceylon cut. A mixed cut.

"Ceylon diamond." A misnomer for colorless zircon.

Chemical composition (diamond). Almost pure carbon, the composition of the graphite of the lead pencil. The impurities, such as iron compounds may be a cause of color in the diamond.

Chevee. A flat gem with a polished concave depression in the table.

Chimney. A natural vent or opening in the earth as a volcano or the solidified rock filling such an opening.

Chip. A small piece of a crystal or cleavage. A small, irregularly shaped diamond. In diamond nomenclature any such piece weighing less than three-fourths of a carat.

Chonolith. See "Blow."

Chromatic Aberration. See Aberration.

Cincora (Brazil). See Bahia.

Clastic. Rock formed from the fragments of other rocks. Fragmental.

Clatersal. Small fragments of diamond from which diamond powder is produced by crunching.

"Clean." Term formerly used by some jewelers to mean absence of internal imperfections only. Term used later by many jewelers to describe diamonds with slight imperfections. Use of term prohibited by American Gem Society.

(To be continued)

A GEMOLOGICAL ENCYCLOPEDIA

(Continued from Fall, 1941, Issue)

By HENRY E. BRIGGS, Ph.D.

HEMATITE

Hematite is an important ore of iron, its composition is merely oxygen and iron after the formula Fe_2O_3. The gem variety occurs in hexagonal crystals, with a hardness of 5½ to 6½ and a specific gravity of 4.9 to 5.3. The luster is metallic and the streak red. Since the mineral is always opaque it is cut usually en cabochon and is often seen now as intaglios. It is widely distributed, important localities are England, Minnesota, Norway, Sweden, and Brazil.

SMITHSONITE

This mineral is little used as a gem; however, we see it occasionally in the form of a cabochon. It is hexagonal in crystallization and has a hardness of 5 and a gravity of 4.1 to 4.5. It is colorless when pure, but is usually greyish, yellowish, bluish, greenish, brownish, or white, but also occurs occasionally in a delicate pink. The mean index of refraction is 1.75. It is uniaxial and optically negative in character. The luster is vitreous and it is translucent to opaque. Pleochroism is very weak. In composition it is a carbonate of zinc, $ZnCO_3$. Important American localities are Marion County, Arkansas, and Kelly, New Mexico.

COBALTITE

Cobaltite is an opaque ore of cobalt and is sometimes cut as a gem stone. Its crystallization is cubic. Its hardness 5½ and specific gravity 6.0 to 6.4. The luster is metallic and the color is a metallic white inclining to a pink. The streak is greyish black. Composition, sulphide of arsenic and cobalt, CoAsS. Important localities are Sweden, Norway, England, and Ontario, Canada.

SODALITE

Sodalite is used to some extent as a gem, and really deserves more attention than it gets. In crystallization it is cubic and, therefore, isotropic. The hardness is 5½ to 6, and the specific gravity 2.14 to 2.30. It is a dark blue in color and transparent to translucent. Occasionally, however, it is found in other colors, including grey, greenish, yellow, and lavender-blue. The index of refraction is 1.48. In composition the mineral is rather complex, being a sodium aluminum chloro-silicate, $Na_4Al_2(AlCl)(SiO_4)_3$. It is seldom that it is found transparent in crystals large enough to cut, but when such gems are found, they are very beautiful. They resemble the blue spinel in appearance. Important localities are Norway, Maine, Ontario, Canada, and the Ural Mountains.

WILLEMITE

Willemite is rather an uncommon gem, but is occasionally fashioned in the brilliant or trap cut. It is hexagonal and occurs in rather small crystals. It has a hardness of 5 to 6, and a specific gravity of 3.9 to 4.3. It is transparent to opaque and the color is usually yellow, although greenish browns and reddish crystals are found. Willemite is uniaxial and optically positive. The mean index of refraction is 1.70. The composition of willemite is zinc silicate Zn_2SiO_4. The only occurrence of gem-grade material is at Franklin Furnace, New Jersey.

MALACHITE, AZURE-MALACHITE, AND AZURITE

Malachite is a green carbonate of copper and azurite a blue carbonate of copper. Azure-malachite is merely a mottled combination of the two minerals. They are soft, being only 3½ in hardness, and specific gravity ranges from 3.7 to 4.0. The luster of malachite is usually vitreous to waxy, while the azurite is vitreous to dull. The index of refraction (mean) for malachite is 1.81 and for azurite 1.77. The crystallization is monoclinic for both minerals, they are biaxial, and malachite is optically negative while azurite is positive. The composition for malachite is $CuCO_3.Cu(OH)_2$; for azurite, $2CuCO_3.Cu(OH)_2$.

They are usually cut en cabochon and are usually very attractive, but not very durable. However, as beads, brooches, stones for pins, etc., both minerals are usually quite satisfactory. Malachite is extensively used as a material for ornamental objects such as table tops, paperweights, trays, etc.

Important localities for malachite and azurite are: Belgian Congo, Rhodesia, South Africa, Alaska, Ural Mountains, and Arizona.

PYRITE

Pyrite is the sulphide of iron with a formula of FeS_2. It is well known to prospectors as "Fools' Gold." The color is a brass-yellow. The crystallization is cubic and the luster metallic. The hardness is 6 to 6½, and the specific gravity 4.9 to 5.2. It is used to some extent in jewelry, but only in very cheap goods. Pyrite is a very widely distributed mineral.

MARCASITE

Marcasite has the same composition as pyrite, but its crystallization is orthorhombic and the color is usually more inclined to greyish. The physical properties are similar to those of pyrite.

SCAPOLITE (WERNERITE)

One variety of scapolite, wernerite, is used as a gem, and indeed is very attractive when cut on the brilliant pattern. An adularescent variety, cut cabochon, is sometimes sold as "Pink Moonstone." It occurs in colorless and shades of yellow to brownish and reddish. The hardness is 5 to 6 and the specific gravity is 2.66 to 2.73. The luster is vitreous, the mean index of refraction is 1.56. The crystallization is tetragonal and, therefore, it is uniaxial. Optically it is negative. In composition, scapolite is somewhat variable; however, all are silicates of calcium, sodium and aluminum with chlorine present in some samples. Important localities are Madagascar, Norway, Siberia, and Canada. Wernerite is strongly dichroic, colorless, and the color of the specimen being the twin colors.

(To be continued)