THE MIDWEST FACETER

April 1994
Volume 14 Issue 1

The Midwest Faceter

Editor
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HAROLD "ARIZONA" RICE CM
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MT CLEMENS MI 48043

Inside This Issue

BELIEF LEVELS FOR SUCCESS

100% I DID

90% I WILL

80% I CAN

70% I THINK I CAN

60% I MIGHT

50% I THINK I MIGHT

40% WHAT IS IT?

30% I WISH I COULD

20% I DON'T KNOW

10% I CAN'T

0% I WON'T

1994

April

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

May

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June

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July

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17	18	19	20	21	22	23
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31						

August

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
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September

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

October

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
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30	31					

November

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		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

MWFG MEETING
April 23

Flint Rock Show
Flint, MI
April 22-24

Mt. Clemens Show
Mt.Clemens,MI
April 15-17

MMLSD Show
Dearborn, MI
May 20-22

MWFG MEETING
JUNE 25
Mich. City, IN

MGAGS Seminar
SMU Niles, MI
June 25-26

MWFG MEETING
AUG. 6
TOLEDO, OH

MWFG SEMINAR
AUG. 19-21
HARTLAND,MI

MWF Show
South Bend, IN
September 2-4

Livingston Show
Hartland, MI
September 24-25

MWFG ANNUAL MEETING
OCTOBER 1
DEARBORN, MI

MWFG FACETERS FAIR SHOW
DEARBORN, MI
OCTOBER 28-30

The Editor's Gems...

Kathleen Myers
Bill Horton

* Spring at last!! After the bitter cold winter we welcome the warm with open arms! It is great to see the beginnings of tree buds and the appearance of the Robins.

* On a personal note - a very special thanks to all of the Guild members for your kind thoughts and expressions of sympathy at the passing of my Father in December. It has been a most difficult time for me and your kindness and understanding have been greatly appreciated.

* We are trying a new format for THE MIDWEST FACETER and hope you find it easy reading. I am sure it will take a little while to work out all the details of publication.

* Thanks this issue to Norma Painter, Bob Feir and Hoppes for contributing to the cause. We need your continued support. PLEASE help out by sending us your diagrams, notes, news, thoughts, ideas etc. We can all be better if we work together!

* Fran Bush is on the road to recovery after major surgery this winter - drop her a line or a card of encouragement when you have a few minutes. She has been a MAJOR in MWFG for a long time!

* Don Sahr is looking for some volunteers to help with the October Faceters Fair in Dearborn. If you plan on attending let Don know that he can count on your help.

* The Guild Board is looking for future sites to host a meeting - do you have an idea for an exhibit or program speaker that might be available in your area?

* Won't you consider faceting a gemstone as a raffle prize - the Guild will pay for the mounting. It will be a GREAT way of showing your support for this wonderful hobby of ours! Contact Bernie Bush with your donation.

* Congratulations to Bill Horton and Don Dunn for making the USA/Australian Cup Challenge team - we all know they are great cutters!

* Hope you are making plans to be with us at the Annual Seminar this August - it sounds like we will have a great line-up of classes and instructors again. AND always lots of time to talk faceting with people who understand it is not a disease!

* The Snow Birds are returning back to the Midwest from an excellent winter in the Southwest - we understand there was a lot of good rock tripping and many days of beautiful weather. If you are heading in that direction BE SURE to talk with Bill Horton for travel information.

* Remember to support the local Rock & Gem shows in your area - I am sure any of them would appreciate having your faceting display to add some genuine sparkle to their show!

The Ceramic Lap

continued from page 18

Then:

a. Re-work the lap with the piece of corundum.

b. Clean the lap with a tissue and solvent for small scratches, for large scratches use the lava soap.

c. Change speed (slower).

d. Use a very small portion of the lap.

e. Change the amount of pressure on the dop, (lighter first, heavier later).

f. If it is a deep scratch go back to your prepolish lap to get rid of the scratch. Trying to polish out a deep scratch just doesn't work for me, I usually end up with more scratches - perhaps best described as "going from bad to worse".

g. Reverse lap direction after reworking the lap with corundum. (Don't over look this one, you may be surprised at the results.)

If you are purchasing a new ceramic lap I would recommend starting with the 100,000 rather than 50,000 diamond.

If you are purchasing a new ceramic lap I would recommend starting with the 100,000 rather than 50,000 diamond. The 100,000 cuts slower which makes an ideal lap for cutting stars, needle facets or any other very small facets (you can cut and polish in one operation). Should you decide you do not like the 100,000 you can always change to 50,000 diamond, but you cannot go from 50,000 to 100,000.

I am sure there are a multitude of different ways to use the ceramic lap, all of which produce excellent results. Do not be afraid to try new ways of polishing with the ceramic lap. The way I look at it you will always learn from the experience!

From The North York Faceting Guild News , January 1994.
Bob is a member of both the North York Faceting Guild and The Midwest Faceters Guild.

AFMS/SCFMS Convention & Show
June 23-26 Houston, Texas

The Ceramic Lap

Bob Feir
North York Faceting Guild
Ontario, Canada

During the past few meetings a number of our members have indicated they are having problems using their ceramic laps. (From small scratches to tractor trenches!)

I have had my share, but I was determined not to let it beat me. After MANY trials and tribulations I have developed a few guidelines, which in most cases allow me to use the ceramic lap without encountering a lot of problems.

When I am finished polishing a stone I always scrub off the ceramic lap with lava soap and reasonably warm water.

I believe that your success in polishing whether or not you use a ceramic lap is only as good as your pre-polish. So, before you start polishing take a good look at your stone with your loupe to see if the facets are already to what might be called a "semi-polish", or do they still have a frosty appearance or have pits left from the courser laps. If they do not have the "semi-polish" , then I recommend you use a finer lap until you get a nice "semi-polish". If my last lap was a 1200, I would use a 3000 or 14000 (these are the only laps I have between 1200 & 50,000), but any finer lap should do.

Now for the ceramic lap and the most common questions:

a. What kind or ceramic lap should I use?
b. What micron size diamond do I use?

I have two ceramic laps a Raytech and a Falcon. I use 50,000 diamond on the Raytech and 100,000 diamond on the Falcon.

Since it is easier to stay out of trouble than get out of trouble, you should start by making sure both the lap and the stone are clean and free of contamination. When I am finished polishing a stone I always scrub off the lap with lava soap and reasonably warm water. I then store the lap in a plastic bag until I am ready to use it again.

Before I apply any diamond I start the lap a moderate speed and wipe it with a tissue dampened with rubbing alcohol or methyl hydrate. The next step is where most people get into trouble by applying too much diamond. My best advice is to apply the least possible amount you can. I then work in in with a piece of corundum.

Lap speed is personal choice, I use settings from 1 - 4 out of 16 on the Ultra Tec, the smaller the facets the slower the lap speed.

When scratches first appear **STOP**. If you don't you can expect more scratches.

continued on page 19

Precious Metal Information

continued from page16

Foreign Silverware: Contains varying percentages of silver. In some cases, the fineness is as low as 700/1000 (70%).

Danish Silver: Silverware made in Denmark is 830/1000 fine silver if made to minimum Danish standards. 925/1000 fine silver is made for export.

Silver Plated Ware: Is made by electroplating fine silver on a base metal alloy - usually nickel silver or Britannia metal, sometimes brass or copper. The inexpensive process was perfected for industrial purposes around 1840.

Sheffield Plate: (Originally) was made by bonding sheet silver to copper, rolling and manufacturing into hollow-ware. The original process was abandoned about 1840 due to the introduction of electroplating. Imitations are made by electroplating silver on copper and are sometimes erroneously advertised as Sheffield Plate.

Imitations are made by electroplating silver on copper and are sometimes erroneously advertised as Sheffield Plate.

Nickel Silver: So-called, it is a composition of nickel, copper & zinc. It contains no silver.

Britannia Metal: Is a composition of tin, copper and antimony.

Pewter: (Originally) was primarily a tin-lead alloy. It is now made in a tin, copper and antimony composition similar to Britannia metal.

Seminar Notes...

Kathleen Myers
Seminar Coordinator

Plans are under way for the Annual Seminar August 19 - 21. We have BIG IDEAS and hope to be able to pull all the commitments together and finalize schedules very soon.

At this time it looks like we will have Joe Rubin, owner and designer of the Ultra Tec machine company with us as our Keynote Speaker. We are also trying to include a session on using gemological instruments and hope to have Robert Strickland back with us for the GemCad Program. This in addition to our classes for Beginners, Intermediate, Oval & Marquise and Open Cutting.
We have some of the finest instructors you could ever hope to find - all are very experienced cutters and each brings to the Seminar their own special talents that they willingly share.
Out Special Seminar issue should be in the mail in mid-June with all the details and the registration forms.
We do have special classes in gemstone beading for the non-facetors wanting to join us.

Make your plans now to join us for **FACETING FACTS FRIENDS FUN Seminar '94.**

Precious Metal Information

From THE TRANSFER BLOCK, July '93 via THE BENTONITE, June '93

Precious Metals: Gold, silver, platinum and palladium are known as the Precious Metals in the jewelry industry. They are also called the Nobel Metals by craftsmen.

Base Metals: Copper, zinc and brass are called the base metals in the jewelry industry.

Karat is a measure of fineness.

Karat: Karat is a measure of fineness. 24 karat is fine gold. One karat equals 1/24 (.0417). Thus 14 karat is 14/24 fine gold and the balance, 10/24 is alloy. If the gold content of an object is less than 10/24, the object cannot be represented as karat gold.

Colors of Gold: Yellow, green, red and white gold are produced by variations in the alloy. Silver and zinc tend to give a green color, copper a red color and nickel a white color.

Solid Gold: The term "gold" or "solid gold" mean fine gold or gold of 24 karat and should not be applied to articles of lesser quality.

Gold Filled: Is made by joining a layer (or layers) of gold alloy to a base metal alloy and then rolling or drawing to the thickness required.

Rolled Gold Plate: Is the same as gold filled, but usually of a lower quality.

Gold Electroplate: Is usually made by electronically depositing fine gold on a base metal. The plate thickness must be at least 0.000007 inches of fine gold. Items with a gold thickness less than 0.00007 can be labeled gold washed or colored.

Fine Silver: Is commercially pure silver - it contains no alloy material.

Sterling Silver: Is 925/1000 (92 1/2%) fine silver and 75/1000 (71/2%) copper. This proportion is fixed by law.

Coin Silver: Is 900/1000 (90%) fine silver and the balance copper. This alloy was used for U.S. silver coins before 1966. New (from 1966) dimes and quarters contain no silver and half dollars contain 40% silver

Commerical Silver: Is a term applied to silver that is 999 fine or better.

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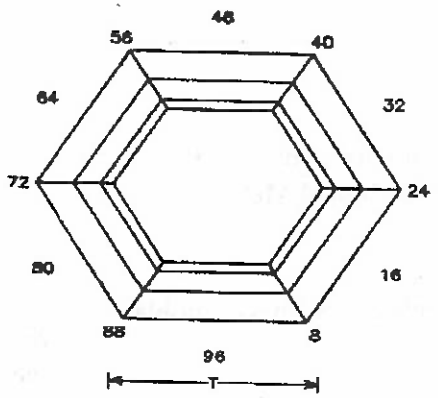
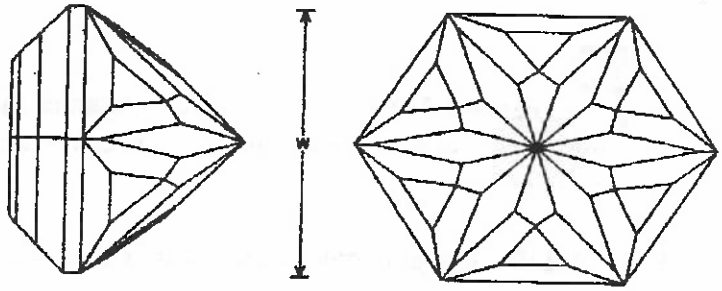
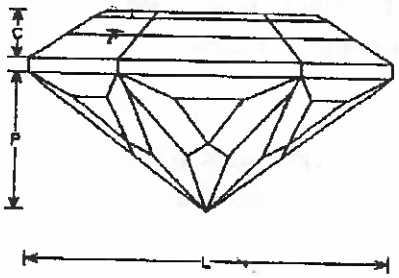
OLH6.GEM

by Orland Hoppe





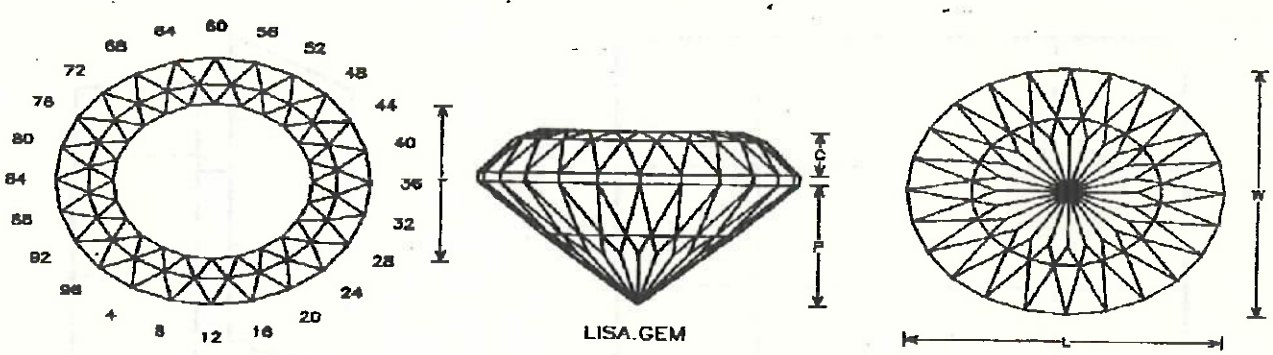


BY
ORLAND HOPPE

```
OLH6.LST
Angles for R.I. = 1.54
55 facets + 6 facets on girdle = 61
6-fold, mirror-image symmetry
96 index
L/W = 1.155   T/W = 0.662   T/L = 0.573
P/W = 0.510   C/W = 0.179
H/W = (P+C)/W+0.02 = 0.709
P/H = 0.720   C/H = 0.252
Vol./W^3 = 0.311

PAVILION

    90.00   96-16-32-48-64-80
    41.20   96-08-16-24-32-40-
            48-56-64-72-80-88
    46.20   02-14-18-30-34-46-  (cut to meet at corner on girdle)
            50-62-66-78-82-94
    48.60   96-16-32-48-64-80
    54.60   96-16-32-48-64-80

CROWN

    41.00   96-16-32-48-64-80
    39.50   96-16-32-48-64-80
    37.60   96-16-32-48-64-80
     0.00   Table
```

Lisa Gem

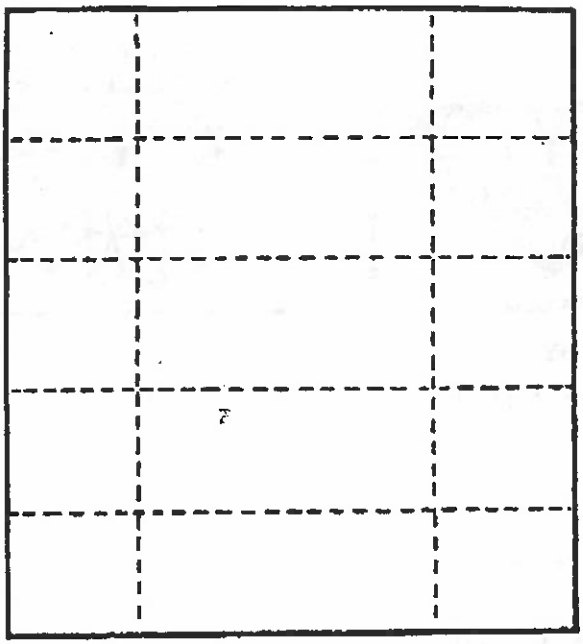
by Micheal Hoppe



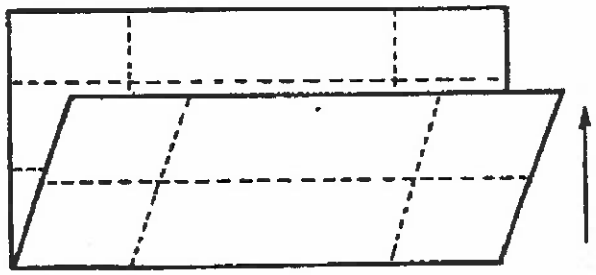

```
LISA.GEM
Angles for R.I. = 1.54
193 facets + 24 facets on girdle = 217
24-fold, mirror-image symmetry
96 index
L/W = 1.000   T/W = 0.628   T/L = 0.628
P/W = 0.489   C/W = 0.172
H/W = (P+C)/W+0.02 = 0.681
P/H = 0.718   C/H = 0.253
Vol./W^3 = 0.264

PAVILION

    90.00   02-06-10-14-18-22-26-30-
            34-38-42-46-50-54-58-62-
            66-70-74-78-82-86-90-94
    47.00   02-06-10-14-18-22-26-30-
            34-38-42-46-50-54-58-62-
            66-70-74-78-82-86-90-94
    46.00   96-04-08-12-16-20-24-28-
            32-36-40-44-48-52-56-60-
            64-68-72-76-80-84-88-92
    43.00   02-06-10-14-18-22-26-30-
            34-38-42-46-50-54-58-62-
            66-70-74-78-82-86-90-94
    44.50   96-04-08-12-16-20-24-28-
            32-36-40-44-48-52-56-60-
            64-68-72-76-80-84-88-92

CROWN

    54.00   02-06-10-14-18-22-26-30-
            34-38-42-46-50-54-58-62-
            66-70-74-78-82-86-90-94
    52.00   96-04-08-12-16-20-24-28-
            32-36-40-44-48-52-56-60-
            64-68-72-76-80-84-88-92
    24.00   96-04-08-12-16-20-24-28-
            32-36-40-44-48-52-56-60-
            64-68-72-76-80-84-88-92
    22.50   02-06-10-14-18-22-26-30-
            34-38-42-46-50-54-58-62-
            66-70-74-78-82-86-90-94
     0.00   Table
```

Procedure For Folding A Stone Paper

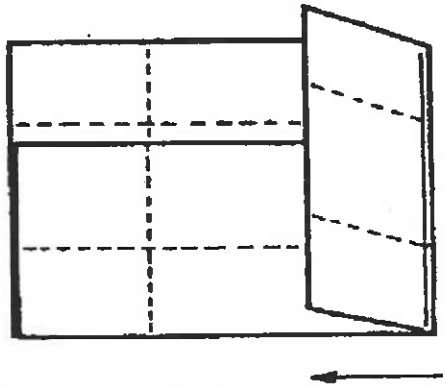
From The Tumbler July 1993



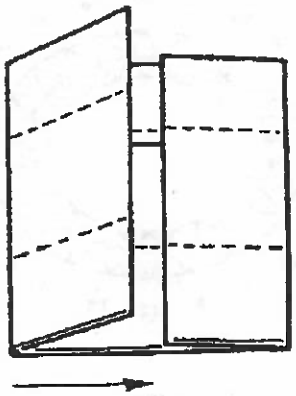
1. Lay paper flat



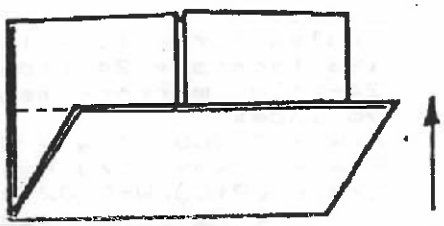
2. Fold bottom two flaps up



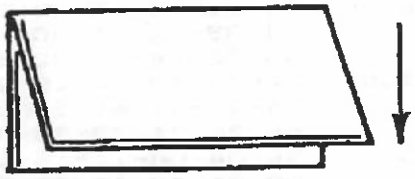
3. Fold right flap over



4. Fold left flap over



5. Fold next flap up



6. Fold top flap down to complete

Procedure for Folding a Stone Paper

"Diamond" stone papers are used to store faceted stones. In use the stone is enclosed by the folded paper and pertinent information is written on the outside. The primary advantages are that stones are protected against rubbing other stones and small stones can be stored with identification information in a handy form.

Commercial "diamond" stone papers have an inner lining (plastic or wax paper), but if a good grade of paper is used this added protection is not really necessary.

Rules Ramblings...

Dick Fairless
MWFG Rules Chairman

It's Time !!! Time to start thinking seriously about your entry for the next Midwest Faceters Fair Gem & Jewelry Show. Dust off the faceting machine and get out that notebook full of diagrams and begin today with your goal to enter AT LEAST, one category!
Watch your mail soon for the updated guidelines and rules for competition and the required cuts for both the natural and man-made or synthetic single stone contests.
Don't wait... Start cutting today!

A micron is exactly one thousandth of a millimeter.
A millimeter is equal to .0394 inches.

From The Rolls...

Tom Gibbs

MIDWEST FACETERS GUILD MEMBERSHIP

Dues $5.00 - includes subscription to The Midwest Faceter
Dues are due and payable in December

Name _____

Address _____

City _____ State _____ Zip _____

Phone (____) _____

Make all checks payable to **Midwest Faceters Guild** and send to:

THOMAS GIBBS, MEMBERSHIP CHAIRMAN
622 EIGHTH STREET, WYNDOTTE, MI 48192-2637
Phone (313) 282-3745

If the year on your address label is not current with the first issue of the Midwest Faceter for the new year, it will be your last issue, and you will be dropped from the active membership rolls.

The Cutting Edge...

Ed Myers
Special Competition Chairman

Great News !! We have just received information from Walter Carss, the Australian-USA Challenge Coordinator that the judging for the 1994 contest has been completed. Individual and team scores, together with the overall results, will not be available until the GEMBOREE at Ballarat at Easter time, but we have the make-up of the two teams.

For the United States, the top five facetors in alphabetical order are:

Don Dunn	**Dayton, Ohio**
Bill Horton	**Howell, Michigan**
Vern Johnson	**Sonora, California**
Glenn Klien	**El Toro, California**
Ralph Mathewson	**Lewiston, Idaho**

The Australian team in alphabetical order are:

Norm Coates	**Griffith, New South Wales**
Don Hardman	**Moree, New South Wales**
Don Henson	**Glenrowan, Victoria**
Ray Maunder	**Tamworth, New South Wales**
Ralph Weston	**Australian Capital Territory**

Walt also reports there were thirteen sets of stones from form both the US and Australia; two each from the United Kingdom, Canada and New Zealand and one set from Norway.

We will have a complete list of all entrants for you when it becomes available.

Congratulations to each of the team members ! We are especially proud to have two of our MWFG members named to the USA team!!

Special thanks go out to Walt for an EXCELLENT job coordinating the contest from this end!

NOTHING GREAT WAS EVER ACHIEVED WITHOUT ENTHUSIAM.

Standard American Gemstone Sizes

Norma Painter

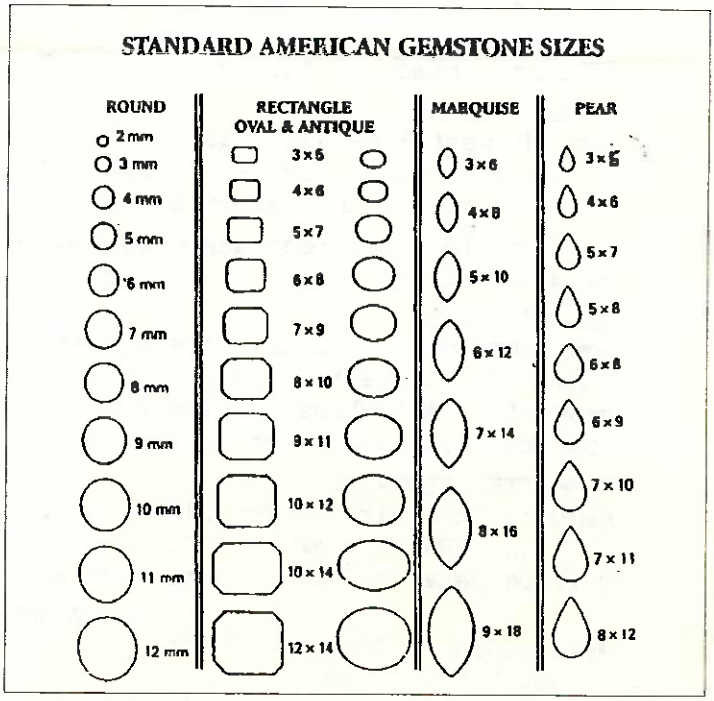
Will the stone one wishes to cut from a specific design fit in a standard mounting? Many facet designs give the length to width ratio. A quick look ath the length to width ratios in the table below will tell one if the proposed design will come close to a standard size mounting.

Length divided by width = ratio
Width times ratio = length
Length divided by ratio = width

Rectangle - Oval	Length to Width Ratio
5 x 3	1.67
6 x 4	1.50
7 x 5	1.40
8 x 6	1.33
9 x 7	1.29
10 x 8	1.25
11 x 9	1.22
12 x 10	1.20
14 x 10	1.40
14 x 12	1.17

Marquise	Length to Width Ratio
6 x 3	2.00
8 x 4	2.00
10 x 5	2.00
12 x 6	2.00
14 x 7	2.00
16 x 8	2.00
18 x 9	2.00

Pear Sizes	Length to Width Ratio
3 x 1	3.00
6 x 4	1.50
7 x 5	1.40
8 x 5	1.60
8 x 6	1.33
9 x 6	1.50
10 x 7	1.43
11 x 7	1.57
12 x 8	1.50



Free Knowledge... Bring Your Own Container

Secretary's Minutes

Fran Bush

JANUARY 15, 1994 ----

10:00 AM - Only three Board Members Present -- No Board of Directors Meeting.

MEMBERSIP MEETING

The Membership Meeting of the Midwest Faceters Guild was called to order at 1:05 PM by President William Gardiner in the Royal Fork Restaurant, Okemos, Michigan.

Leonard Domorsky moved to accept the minutes as printed in "The Midwest Faceter". Seconded by Frank Beaven, passed.

The Treasurer's report was sent in by William Horton and read by Bill Gardiner. Leonard Domorsky moved to accept the Treasurer's report as read by Bill Gardiner. Frank Beaven seconded the motion and it carried. Tom Gibbs and Bill Horton had the Accounts transferred from the Sylvania Society National Bank to the Bank in Howell, Michigan.

Things Bill Gardiner would like to see accomplished in 1994: (1) A Memorial Case with stones cut by deceased Members to be exhibited at various shows. (2) A Committee to set rules and ways for accepting and awarding the Scholarship money. Some discussion for a possible GIA Scholarship, encouraging participation in faceting by a Youth or a scholarship to a non-facetor to the Annual Seminar for a Rock & Gem Club members, some advertising to encourage new facetors in the 35 to 40 year age group. Bill said how wonderful it would be if there could be a semi-trailer equiped to teach faceting, etc., that could go to a club area and teach a week at a time and then move to another club area.

CORRESPONDENCE:
The Midwest Mineralogical and Lapidary Society of Dearborn would like to invite two members of te Midwest Faceters Guild to be guests at their 32nd Annual Banquet. Diane Tourville and Carmen Eiche will attend.

Dick Fairless has been asked to look over the rules and make a report and possible recommendations.

OLD BUSINESS:
Tom Gibbs mentioned how nice it was that so many people came in the door at the Show and volunteered their help. It was appreciated and really made the Show run smoothly. All those willing hands should be sure to sign up to help in 1994, so your talents can be put to use and we can have a fun time at the show again.

COMMITTEE REPORTS:
Membership Chairman, Tom Gibbs reported 120 un-apid members, 160 paid members for 1993 and 204 Paid members for 1994. Beginning with the next newsletter, the label will be dated as to the year your Membership has been paid.

TENTATIVE DATES FOR 1994

April 23rd - Flint, Michigan
August 6th - Toledo, Ohio
June 25th - Michigan City, Indiana
Seminar, August 19, 20 and 21st.
Annual Meeting October 1, 1994 at the Dearborn City Tavern, Dearborn, Michigan.

If there is a 10:00 AM Program planned for the meeting day the information should be in the newsletter and try to spark the attendance of more members and Guests.

A motion to adjourn was made by Frank Beaven, seconded by Joe Badilla and carried.

See you all at the next meeting, April 23rd in Flint, Michigan.

Respectfully submitted,
Carmen Eiche, Secretary Pro-Tem.

9. **Growth From Solution.** This is a more general adaption of the process described in (1.) above. In growth from solution, the solvent is not limited to water and much more complicated apparatus may be used. This process is widely used in industry to grow single crystals of easily disolved substances.

10. **Gel Growth.** This is an interesting varition of Growth in Solution. In gel growth, a gelatinous substance is used and is allowed to "set up" in a solution of the compound to be crystallized. Thus, the gel "sets" to include the dissolved compound. In some cases, a second chemical may be introduced on top of the gel. The second chemical slowly reacts with that already in the gel to produce a third compound which will be grown. There are many possible variations.

Fine gem crystals, such as quartz, are grown this way.

11. **Hydrothermal Growth.** Almost anything can be dissolved in water if the temperature is high enough. In an open container, water cannot be raised above the boiling temperature (212 degrees F. at sea level). Energy lost in the conversion to steam maintains the liquid at no higher than that temperature. But the boiling temperature can be increased with increased pressure - the principle of the pressure cooker. The commerical vessel for applying enormous pressures is called an autoclave or, aptly, a bomb. A feed material at the bottom of the autoclave goes into solution and rises to the top where the temperature is slightly lower. It re-deposits on seed crystals at the lower temperature position. Fine gem crystals, such as quartz, are grown this way.

12. **Flux Growth.** This is similar to growth from solution, the difference being the solvent. In flux growth, the solvent for the desired growth material. The concept is simple: its application may not be. Finding a suitable solvent (flux) is often a problem. Then, there are problems having to do with high temperatures involved. Despite the problems, yttrium aluminum garnet (YAG) barium titanate, corundum, beryl and cubic zirconia (CZ) are routinely grown this way.

*This article is from the June, 1992 issue of MEET POINTS, via THE NEW MEXICO FACETOR, February, 1992 issue.

Life is one exciting discovery after another !

Discover something exciting today !

Crystals & Crystal Production

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complex equipment. It is a very good method of growing crystals of substances that go from the solid phase to the vapor phase without an intermediate liquid phase. The element iodine, a compound called greenockite (cadmium sulfide) and metals used in this film coatings are good examples.

3. **Melt growth.** This is the method our earth uses to grow a great many crystals in a plastic, semi-molten magna. Its use in synthetic growth is limited by the lack of suitable nonreactive containers.

4. **Bridgeman-Stockbarger Method.** This is a good technique for growing very large crystals of substances that melt below the melting point of Pyrex glass. It involves the cooling of a molten mass inside a glass cylinder that tapers to a closed point at the lower end. The upper part of the cylinder is held at the just molten temperature, the lower end allowed to cool at a tad below melting. A single crystal grown at the slightly cooler end. Flourite, halides and many other crystalline substances grow readily this way.

The growth table is slowly rotated and retracted to keep the puddle level constant. The result is the growth of a boule.

5. **Verneuil of Flame Fusion Growth.** This is the method used to grow great quantities of corundum, spinel and other gems with a very high melting point. An inverted hydrogen-oxygen blowtorch is used to melt powered material falling through the flame. A molten puddle forms on a special table and builds as melted material accumulates. The growth table is slowly rotated and retracted to keep the puddle level constant. The result is the growth of a boule.

6. **Czochralski or Pulling Technique.** Molten crystal material is kept liquid in a non-reactive crucible. A seed crystal mounted on a rod is lowered to just touch the melt. Then the rod is very slowly rotated and withdrawn. Crystallization occurs at the point of impact and enlarges the seed. Growth keeps the growth point constantly in contact with the nutrient as the rod is withdrawn. Many high melting point substances can be grown this way.

7. **Kyropoulos Technique.** The Kyropolos Technique is a variation of the Czochralski procedure in which the seed crystal remains in the same position relative to the melt. Instead of slowly withdrawing the seed crystal, a temperature gradient is introduced in the molten nutrient, that is the melt temperature decreases from the seed crystal downward toward the bottom of the crucible. This procedure tends to produce wider, stubby crystals than grown by the Czochralski technique.

8. **Zone Growth.** Zone growth is similar to the Kyropoulos Technique except that the temperature gradient of the melt is caused to move very slowly downward. There are several modifications to this technique such as Zone Refining and Float Zoning.

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of tiny crystalline bodies & fibers, bound together by viscous liquids such as resins, and waxes. What about water or synthetic corundum? Water, when sufficiently heated, is a simple gaseous substance. Cool the vapor and the tiny droplets begin to grow - we have steam, a dispersion of very small liquid droplets suspended in air. Cool the stem to 32 degrees F. and frost crystals begin to grow around tiny dust mote nuclei. Eventually, the water freezes into a solid taking the form of the surrounding container. It is a single crystal solid taking the external form forced upon it by its container.

And then there is corundum. The earlier view was that corundum grown by the Verneuil ("Ver-not") of flame-fusion process was a glass, an extremely viscous liquid. It now appears it is a single-crystal solid with the growth lines rounded by rotation of the growth platform. Internal bubbles are always rounded or elongated into tadpole-like shapes, both the rounded growth lines and the distinctive bubble shapes assist in easy microscopic identification of corundum so grown. The hardness, index of refraction and specific gravity closely match that of real corundum. The colors, clarity and freedom from flaws exceeds that of all but the very finest natural crystals.

How Crystals Grow - We can define a crystal as a substance with an ordered arrangement of it's atoms. For instance, the sulfide of lead - we know it as galena - usually forms six-sided cubes like the dice used in games. Once crystallization starts, lead sulfide atoms form regular layers on all sides, thus increasing the size of the crystal. However, it is not necessary or usual that the growth cease with smooth flat planes on all sides. There may be visible stair-steps or other irregular features on any or all faces. Atoms within a growth 'netrient' find it easiest to attach themselves to edges or corners of a growing crystal. Almost all crystals have numerous regions where atoms attach themselves in misfit layers called dislocations. These regions are easiest areas of attachment for new layers the repeat the original misfit.

There are only a dozen or so basic methods for growing crystals and several of those are just variations on others.

The continuing growth of crystals is fairly well understood by investigators. A more puzzling thought is: What starts the tiny seed crystal upon which all this growth takes place? We have some answers but certainly not all of them.

Methods For Synthetic Growth - There are only a dozen or so basic methods for growing crystals and several of these are just variations on others. Let's list them as follows:

1. **Growth From Moderate Temperature Aqueous Solution.** This is the usual method of growing crystals at home.

2. **Vapor Growth.** This method usually requires high temperatures and complex

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Crystals & Crystal Production

Merrill Murphy

Synthetic vs. Imitation - To the general public, synthetic and imitation are synonymous terms. They are not. By definition, all synthetic substances are man-made, but they are true to name. That is, synthetic ruby is real ruby chemically and physically. Red glass, used to simulate ruby is imitation.

But the difference may be more complex. For example, take a gem material alexandrite. Alexandrite is a variety of chrysoberyl that exhibits a distinct color change depending on the type of light striking it. In sunlight (rich in blue to violet rays), fine alexandrite is green with plum-colored overtones. In incandescent light (which has more red rays), the same stone is raspberry red.

Very rarely, a corundum gem is found that also exhibits color change similar to alexandrite though less distinctly.

So far, so good. Now let's drag in the complication. Very rarely, a corundum gem is found that also exhibits color change similar to alexandrite though less distinctly. Synthetic gem growers discovered that they could grow synthetic corundum with the same but better color change characteristics by adding very small amounts of certain oxides. The man-made material is a synthetic corundum. BUT it is often used to imitate alexandrite and called synthetic alexandrite. When so used and so called , the substance is an imitation. So, the proper terminology, synthetic or imitation, may be determined by how the material is used and specified.

Crystalline or non-crystalline - Most matter can exist in any of the three phases: solid, liquid, or vapor, depending on the temperature. A few substances go from solid to vapor without passing through the liquid phase. As temperature is increased, the electrons orbiting the nucleus of each atom whirl at an increasing speed and the atoms increase in occupied volume, i.e., the material expands. A further increase of temperature leads to a fourth phase of matter called the plasma phase where the orbiting electrons move so fast and so far from the nucleus that they break free of the nuclear bond. Plasma then, is made up of electrically charged, super-heated ions. Plasma phase no direct association of crystal growth.

In general, all solids are crystalline. But, here too, there is no simple truth. You mention glass, a material everyone treats as a hard brittle solid. Science tells us glass is an extremely viscous liquid. For centuries, scientists pointed to the very old window panes in middle ages cathedrals. The window panes were always thicker at the bottom that at the top, proof, they said, that the glass very slowly flowed under the pull of gravity. Now, that view is being challenged. Experts are now saying that panes were made thicker at the bottom to better support the weight of the large panels. They insist there is no measurable flow. Who is right? The verdict is not yet in.

Under certain conditions, some obviously liquid substances seem to exhibit crystalline characteristics. It appears that these substances are, truly, crystalline. Ask: what is the form of a piece of wood? I can only tell you that it is an apparent solid made up

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From the President's Quill...

Bill Gardiner

Spring may not have sprung quite yet, but it is in the air. And after a nasty winter— too much ice, snow, cold and just plain crap— we do have better things to look forward to with warm weather just around the corner.

Of course, from all bad things comes a little good. Say what! Well, with all the bad weather, there was plenty of time to do some cutting. Well, at least in my case, there was plenty of time to do a little thinking about it!!!

Bill Horton took several days out in January and dedicated it to cutting. Bill took his motorhome west, stopped off at Demming, NM, and finished the stones for the Australian/American Challenge. As of this writing Bill has been informed he and Don Dunn made the American team. Congratulations William and Don !!!

We want to offer our prayers and "get well quick" wishes to Fran Bush. Fran had surgery recently and is reported on the mend. Fran is an outstanding worker we cannot afford to lose! Go For It Fran!!!!

Up coming meetings are to be in Flint (the Saturday of the Flint show), Michigan City (June 25) and Toledo (Aug. 6). Then comes out Annual Seminar, scheduled for August 20-21, again in Hartland. While this seems to be a long way off, it'll be sooner than you think. Mark it on your calendar now, especially if you've never attended. I can assure that those who have made this annual teaching/learning activity already have the date set aside.

Make Every Day Count...

Do more than exist,
live
Do more than touch,
feel
Do more than look,
observe
Do more than read,
absorb
Do more than hear,
listen
Do more than listen,
understand
Do more than think,
ponder
Do more than talk,
say something

GUILD MEETING APRIL 23, 1994

Flint Rock & Gem Club Show
Williams School
3501 Minnesota
Flint, Michigan

Board Meeting..... 10:00 A.M.

See You In Flint !

Regular Membership Meeting... 1:00 P.M.

Program:
Enjoy the GREAT Flint Rock & Gem Club Show!

Bring A Friend !!

To Williams School Community Education Center: 3501 Minnesota Flint, MI

From the South: Take I-75 to I-69. Go East on I-69 to I-475. Go north on I-475 to Stewart Ave. Turn right on Stewart; turn right on Dort Hwy.; turn right on Franklin Ave.; turn right on Wyoming.
From the North: Take I-75 to I-475. Go south on I-475 to Stewart Ave. Turn Turn left on Stewart; turn right on Dort Hwy.; turn right on Franklin Ave.; turn right on Wyoming.
From the East & West: Take I-69 to I-475. Go north on I-475. Exit on Stewart Ave.; turn right on Stewart; turn right on Dort Hwy.; turn right on Franklin Ave.; turn right on Wyoming.

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* *Membership Information*
* *Newsletter Deadlines*

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THE MIDWEST FACETERS GUILD

* ORGANIZED JULY 14, 1979

PURPOSES

* TO PROMOTE EDUCATION AND RECREATION
* TO DEVELOP THE ART OF FACETING
* TO EXCHANGE INFORMATION RELATED TO FACETING
* TO PROVIDE MEETING FOR THOSE OF LIKE INTERESTS
* TO PROMOTE THE ACHIEVEMENT OF INDIVIDUALS

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