THE MIDWEST FACETER

Volume 7 Number 4

1986

AN EDUCATIONAL PUBLICATION OF THE MIDWEST FACETERS GUILD

THE MIDWEST FACETER
513 Richard Ave.
Lansing, Michigan
48917

Dated Material
Please Deliver

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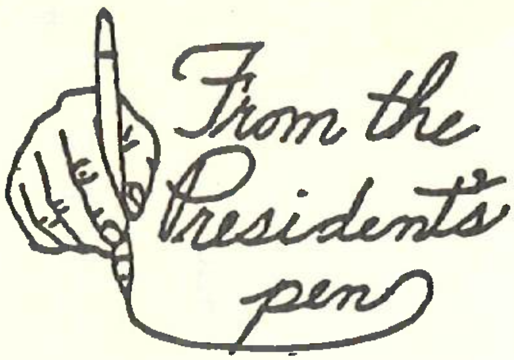


By the time you read this Bulletin, the MWF-AFMS Show will have been completed. I certainly hope that you had the chance to attend. I look forward to these shows. I have always seen something new. I have always meet someone new, and made new friendships. It's always a pure delight. We will be hosting a booth at South Bend and will be giving a program.

I would like to extend a THANK YOU Mr. and Mrs. Harold Rice and also to Mr. and Mrs. Don Sahr. They hosted a booth for the Midwest Faceters Guild in the Chicagoland Show, in Wheaton, Illinois, May 24 thru 26, 1986.

Congratulations are in order to the following faceters:
John Alden, Hayward, California (Individual High Point Winner)
Vern Johnson, Alamo, California.
Charles Hettich, Bandon, Oregon.
Glenn Klein, Santa Ana, California.
Jack McLelland, Long Beach, California.

These are the five highest point faceters for the United States, in the recent Australian-American Challange. The American top five out scored the Australian top five by 3.7 points out of a possible 2000 points. As you can see, this is a very close competition. Each country had nine entrants.

Plans are now underway for the next Australian-American contest. The California Guilds will host the competition. Our responsibility will be to handle the judging.

The Australian-American Challange Cup will be on display at South Bend.

Our next meeting will be in Toronto, Canada, August 9, 1986. It will be hosted by the Canadian North York Faceters Guild. We will meet at the Earl Bail Park. I will look forward to each one joining us. For those who will be coming thru Windsor, use Hwy 401 to Toronto. Exit on Bathurst, and proceed north to the park entrance, just north of Wilson Ave.

Plans are firming up for our Show in October, 1987. It will be presented at the Dearborn Civic Center, Dearborn, Michigan. It's not too early to plan a case display. Start now!!!

Big Mutations are always monsters, but little mutations over a long period of time lead to a semblance of perfection.

William J. Horton
President, Midwest Faceters Guild

Big Spring Prospector's Club Single Stone Competition

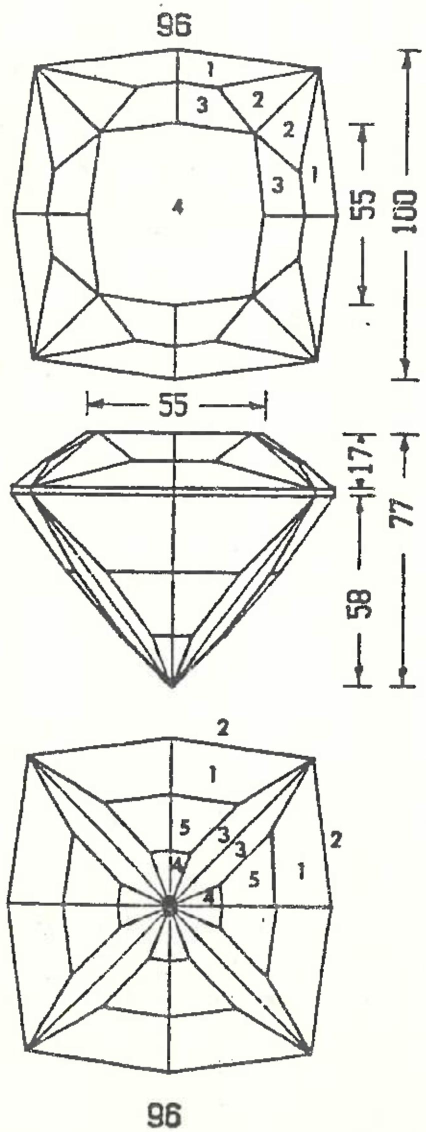
LEVEL ONE - for show March 1 & 2, 1986

SEATTLE FACETOR DESIGN APRIL 1984

Reference: WOLLERT, Ernst, DIAGRAMS FOR FACETING (Vargas & Vargas), p145

96 INDEX L/W 1.00 79 FACETS

15.056



PAVILION CUTTING INSTRUCTIONS

STEP	DESIGN ANGLE 39.0	41.0	43.0	BEARING INDEX	REMARKS
P1	50.5	52.5	54.4	94-02-50-46-74-70-26-22	Cut to temp centerpoint
P2	90.0	90.0	90.0	94-02-50-46-74-70-26-22	Fix size ; level girdle
P3	39.0	41.0	43.0	86-10-58-38-82-14-62-34	Meet P1-P2-P2-P1 (corner)
P4	39.0	41.0	43.0	94-02-50-46-74-70-26-22	Meet P3 at centerpoint
P5	45.3	47.4	49.4	94-02-50-46-74-70-26-22	As desired. P5 size is indeterminate
DEPTH	50.2	53.9	57.8		Percent of width

CROWN CUTTING INSTRUCTIONS

STEP	DESIGN ANGLE 35.0	37.0	42.0	BEARING INDEX	REMARKS
C1	40.0	42.1	47.2	94-02-50-46-74-70-26-22	Match pavilion girdle
C2	35.0	37.0	42.0	93-75-69-51-45-27-21-03	Meet C1 at girdle
C3	33.0	34.9	39.9	94-02-50-46-74-70-26-22	Cut to meet C2
C4	0.0	0.0	0.0	ANY	for 55% PP table
HEIGHT	16.9	18.2	21.8		Percent of width

The four designs in this issue represent a set of four interchangeable crowns and pavilions since they have exactly the same outline at the girdle. In the reference cited above a similar set of design drawings appears. These designs differ from Wollert's in the use of 96 INDEX instead of 64 INDEX, addition of detailed cutting instructions, and indexing adjustments to make them interchangeable whereas Wollert's equivalent to 15.055 is not. In each case angles and indexing specified is for a 55% table.

These designs are listed in category "15 OLD MINE" because that is the closest outline shape in the "Shape Classification", however strictly speaking the corner should have another pair of facets to make it the squarish equivalent of a brilliant cut to really make it like an "Old Mine" shape.

TORONTO MEETING--AUGUST 9, 1986

SPONSORED BY THE NORTH YORK FACETERS GUILD
Will meet at the Earl Bail Park

10:00 A.M.
During the Board Meeting,....
An expert presentation on diamonds by:
ABDULLAH KHANDWANE

12:00
Buffet Lunch (minimum charge)

1:00

Mr. Donald Goodger, Just back from Australia, will give a program on Sapphires and/or Opals.

There is a possibility that there will also be a presentation on Emeralds.

The Canadian Faceters have promised to roll out the red carpet and give us a time to remember. There are more to see and do in the midst of Toronto, including; museums, shows, the science center, and ect.

DIRECTIONS

Coming by way of Hwy 401, Exit Dufferin and head North to Wilson Ave. Proceed East on Wilson to Bathurst, and go north on Bathurst to Earl Bails Park.

Watch for signs. An alternate route would be to exit on Bathurst, go North on Bathurst to the Earl Bails Park. This is 5 stop lights, or 11 city blocks. There is an attached map.

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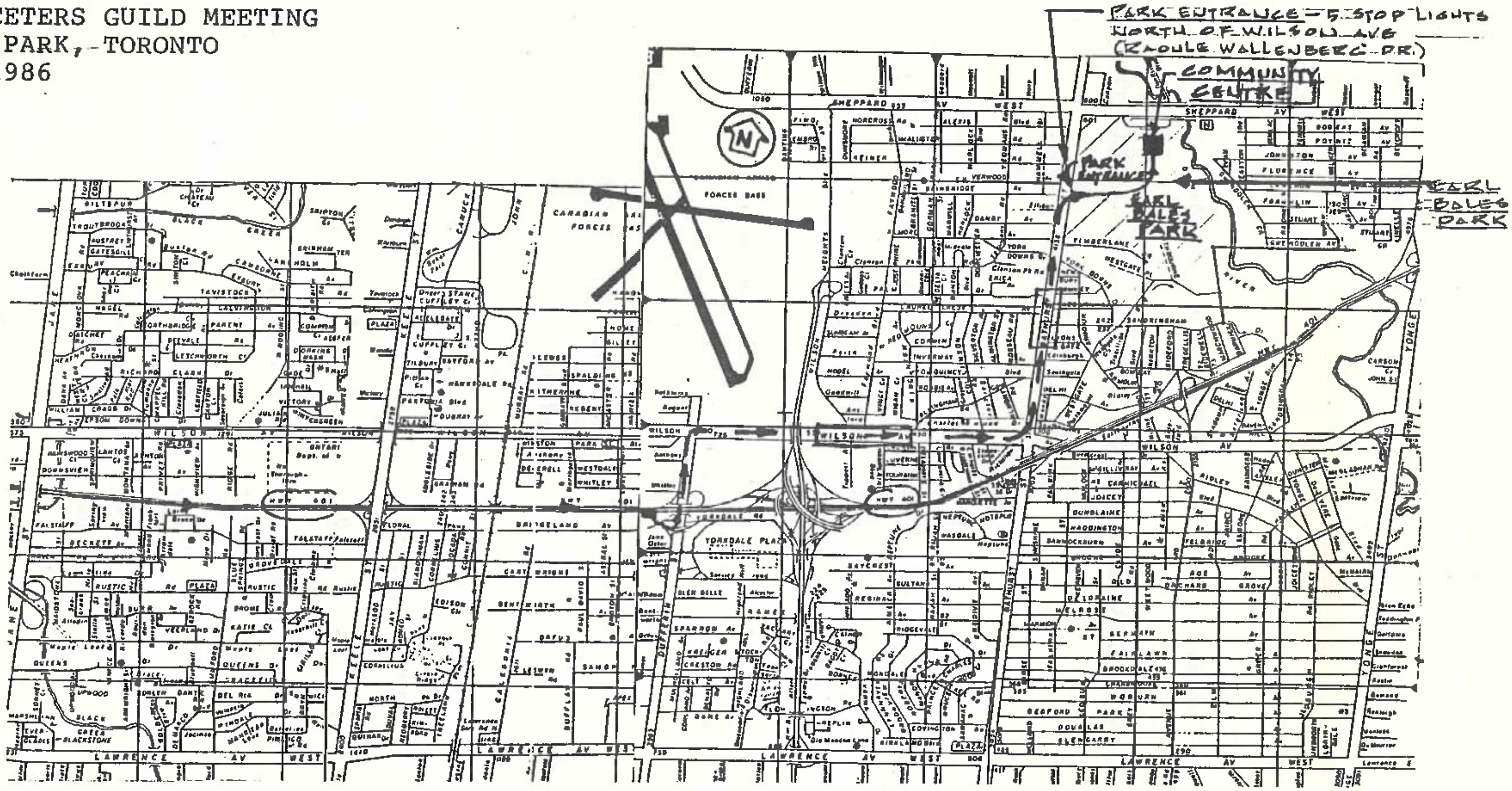
There are three types of people:

1- People who WONDER what happened
2- People who WATCH thigs happen.
3- People who MAKE thjngs happen

I hope to see all of you in Toronto. This should be a wonderful weekend. Come and join in!!!!

MIDWEST FACETERS GUILD MEETING
EARL BALES PARK, TORONTO
AUGUST 9, 1986



DIRECTIONS — FACETERS FROM MIDWEST / WESTERN ONTARIO, TRAVEL EAST ON HWY. 401 TO "DUFFERIN ST." LEAVE 401 HWY. AT DUFFERIN ST., TAKE DUFFERIN "NORTH" TO "WILSON AVE." EAST ON WILSON AVE. TO BATHURST ST. MAKE A LEFT TURN AT BATHURST & GO NORTH ON BATHURST FOR 11 CITY BLOCKS OR TO THE 5th STOPLIGHT, HERE YOU WILL SEE A SIGN FOR "EARL BALES PARK." THIS IS THE ONLY ENTRANCE TO THE PARK (WHICH IS KNOWN AS "ROULE WALLENBERG DR.) THIS ROAD LEADS RIGHT TO THE "COMMUNITY CENTRE" IN THE PARK. THERE ARE APPROX. 50 PARKING AREAS HERE. THERE IS ALSO STREET PARKING NEAR PARK ENTRANCE. THOSE OTHERS WHO ARE COMING FROM BUFFALO OR NIAGRA FALLS AREA, WILL TRAVEL EAST ON TH "QUEEN ELIZABETH" HWY. & TURN NORTH ON HW'Y. 427 TO HW'Y. 401.

TR.

ATTENTION GUILD MEMBERS

William Gardiner, your membership chairperson, keeps the mailing up-to-date. Use the form below if your name or address contains errors, or if you are renewing your membership. New members may also use this form to join.

cut on line cut on line

FACETERS GUILD APPLICATION FORM

Name ____________________

Complete Address ________________________

____

____

Telephone (_____) - ____________

NEW MEMBER ☐

MEMBERSHIP RENEWAL ☐

This fiscal year is January 1 through December 31st. Dues are $5.00 per year. Make checks payable to:

MIDWEST FACETERS GUILD

Send to:

William Gardiner
4518 Sandstone Drive
Williamston, Michigan
48895

IMPORTANT NOTICE

Dues can be paid for the following year by October 1. As of January 1, dues that are not paid will be considered to be delinquent. Dues that are unpaid by March 1, will require that member to be removed from the rolls.

It is very difficult to keep an accurate account of the membership, both for ourselves and the Midwest Federation, when dues are sent to Mr. Gardiner at all times of the year. Our Bulletin is very expensive, but is our only link to all of the membership. We have continued to extend the Bulletin in all cases, to members who have been delinquent, but rising costs force us to discontinue this courtesy. Please be prompt in the future, with dues, so we can continue to deliver the Bulletin to you.

Thank You,
MWFG Board of Directors

In the interest of our membership, we would like to have you fill out the following questionaire. The results of the questionaire will be used to organize a more complete membership listing. A special mailing of this listing will be helpful for those in each area who can help in being an instructor, or for those would need some help. It might also be useful to form new clubs. This would be beneficial to all in these clubs by sharing knowledge and experience.

NAME ______________________
ADDRESS ______________________
CITY ______________________
STATE ______________________
ZIP ______________________
TELEPHONE ______________________

TYPE OF MACHINE ______________________
YEARS OF EXPERIENCE ______________________
WILLING TO INSTRUCT ______________________
DO YOU ENTER AREA SHOWS? ______________________
COMPETITIVE ______________________
NON-COMPETITIVE ______________________
AWARDS WON ______________________

Please send this questionaire with your next renewal or with a new application.

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

No problem can withstand the assault of sustained thinking.

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

A red dot by your address means that you are deliquent with your dues. It also indicates this is the last Bulletin.

ALTERING THE COLOR OF TOPAZ

BY KURT NASSAU, PH.D.
(Lapidary Journal)
December, 1985
(Gems and Gemology)
20,26-34, 1985

Various techniques are in use today to alter colorless Topaz to produce brown, pink, and most commonly blue stones. Three sources of irradiation - gamma rays,highenergy electrons and neutrons - used to convert colorless stones to hues in the yellow to brown range and the subsequent heat treatment required in most cases to turn the irradiated stones blue are worthy of special attention. Currently, no toutine gemological tests are available that can definitively determine whether the color of a topaz is natural or the result of treatment.

COLORS AND DESIRABILITY<

Topaz is an aluminum fluosilicate, usually containing some hydroxyl. The formula can be written as $AL_2(F,OH)_2SiO_4$. Topaz occurs in a wide range of colors; most commonly it is colorless, but the yellow to brown series that includes gold to sherry colors is perhaps best known. Topaz also occurs in blue, and more rarely in green, orange,violet, and pink.

The last of these is considered the most valued of all topaz colors. Natural pink topaz, however, is extremely rare. This color is usually obtained by heating certain yellow to reddish-brown Brazilian material that contains the chromium required. Some natural yellow to brown topaz, such as is found in Utah and in some Mexican locations, fades on exposure to bright light and is therefore not used in jewelry. In blue topaz it is the depth of the color and the absence of a steely grey or a greenish tint that is considered desireable. A general account of topaz can be found in the Webster-Anderson volume[1].

While natural blue topaz is available from a variety of localities, the successful treatment of colorless topaz to produce attractive shades of blue has greatly enhanced the availability and consequently the popularity of those stones during the course of the last decade. Although irriadiation can convert most colorless topaz into the yellow to gold to sherry to brown sequence, these colors are usually unstable, and the stone will return to colorless in just a few hours of exposure to bright light. When this colorless topaz is irriadiated and (in most cases) subsequently heated, however, an attractive blue stone may be produced.

The production of blue topaz from colorless by irradiation was first reported by F. H. Pough in 1957 as one of a large number of color changes observed in a variety of materials subjected to such treatment, but little note appears to have been made of this in the years that followed. This same reaction was accidently rediscovered by the present author in a faceted topaz that had been purported to be quartz. When this was reported in 1974, many in the gemstone trade felt that it explained the large number of deeply colored blue topaz crystals that had recently appeared on the market without any new mines or significant new developments in existing mines to account for the abundance. Since that time, a number of firms have become involved in the treatment of blue topaz, with the result that literally hundreds of thousands od carats of blue topaz have entered the world market during the last 10 years. Also, the technique has been refined to the point that the blue color produced by treatment is often deeper and more intense than that seen in nature.

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Very little is known about the causes of the colors in topaz. Only the chromium-caused origan of pink, stable to both light and heat, is certain. There are at least three types of yellow to brown colors; two fade in light, the other is stable. The former two can also be bleached by heating for a short time to 200-300 degrees C, the latter by a somewhat longer heating to 200-400 degrees C. The natural blue color and the blue produced with irradiation are stable to light and are lost on heating to about 500 degrees C. The yellow to brown and blue colors are clearly all color centers produced by the interaction of radiation with electrons on defects of unknown nature. What little is known has been summarized elsewhere.

Not all colorless topaz will respond to treatment. In some cases one part of the crystal will be altered while the rest will remain unchanged. For the gemstone treater, it is very much a matter of trial and error.

The various heating and irradiation processes used on topaz aresummarized in figure 3. Surprisingly, none of the many other enhancement processes used on other gemstones appear to have been applied to topaz except for the dyeing of waterworn pebbles in indigo dye pots reported in Webster. The following account of the major processes used to alter the color of topaz is based on a critical comparison of the authors own experiences, published data, and information provided by many experts in the field.

IRRADIATION OF TOPAZ

Several types of irradiation can be used to alter the color in topaz; the electromagnetic rays, X-rays and gamma rays, neutrons and high-energy charged particals such as electrons, protons and the like. Some of these are not in common use: X-rays of the usual low energies have only a very shallow penetration, and high energy charged particals other than electrons are more costly to generate and provide no advantage over electrons. Neutrons tend to induce radioactivity but have been used at times in a special manner. The most commonly employed gamma rays and high energy electrons produce somewhat different results.

Further details on irradiation techniques and their application to gemstones are given in the author's recent book, GEMSTONE ENHANCEMENT. The comparative advantages and disadvantages of using gamma rays, high-energy electron and neutrons to convert colorless topaz to brown or blue are examined below.

GAMMA RAYS

Gamma rays are produced within a gamma cell, a device containing a quantity of radioactive material, such as cobalt-60 (CO-60), which emits these rays. Such devices are commercially available in large sizes, require little upkeep, and continuously produce the rays with only a slow decay over many years. The rays are very penetrating and will produce uniform coloration if the material is uniform. Relatively little heat is generated during this process and this heat is produced uniformly through the specimen, so that cracking is not a problem. To avoid excessive temperatures, the rate of irradiation is kept at a reasonable level, usually less than five megarads per hour, depending on the size of the specimen.

When colorless or pale-colored topaz is exposed to gamma rays, a color in the sequence yellow to brown to reddish brown to very dark brown is produced with significant color already appearing at quite low irradiation doses(i.e. less than one megarad of CO-60). Because of variations in the nature of the topaz (impurities and other defects), these colors are frequently not uniform and will vary even among zones within a single crystal. The larger the dose of radiation used, the darker the color of any region up to a point controlled by the nature of that region. Different parts of a crystal may show different rates of coloration as well as different color limits. These yellow to brown colors usually fade on

(CONTINUED)

exposure to light, and can also be removed by heating to 200-300°C for as little as a few hours.

If gamma radiation is extended to relatively high doses(say a few tens to many thousands of megarads of Co-60), then an olive-greenish component may be visible in the yellow to brown range of colors. The greenish component is derived from the presence of a light absorption that by itself leads to a blue color. On heating to 200-300°C to remove the yellow to brown component, there may then be revealed a blue color, which is produced much more slowly by the gamma rays than the brown color. This blue color is stable to light and is destroyed by heat only if a relatively high temperature of about 500°C for a few hours is used. At this temperature the natural blue topaz will also turn colorless.

The blue color produced in colorless or pale topaz by practical doses of gamma rays(i.e. a few hundred to a few thousand megarads at most) and subsequent heating is usually not very intense; some topaz may show hardly any blue color even on extended gamma radiation. There is no relationship between the rate of coloration and the maximum depth of the blue color. When the color is very intense, however, a steely blue may result.

HIGH ENERGY ELECTRONS

Electrons are accelerated to high energies in a variety of machines, including linear accelerators(linacs), Van de Graaff generators and betatrons, among others. After reaching the selected energy, the beam of electrons is electrically deflected in a zigzag pattern to cover an area, typically a few to many centimeters across, or a sample container is moved in such a way as to expose the whole specimen holder to the electrons. Such high-energy electron facilities are large, complex, expensive to build, expensive to operate and must be well shielded, hence the higher cost of electron irradiation versus the cost of gamma irradiation. For the coloration of blue topaz, irradiation energies in the 10-20 mega-electron volt range are most commonly used.

High-energy electrons act quite differently from gamma rays. They produce much heat, with much of the heat generated at the surface of the specimen. The samples are usually cooled with cold running water during the irradiation. Even so, cracking is common if certain inclusions or defects are present, and melting can occur if the water supply is interrupted or the beam of electrons remains in one spot. A large amount of negative electricity is also carried by the beam into the specimen, and an internal electrical discharge or "internal lightning" (also referred to as "treeing effect" or "Lichtenburg figures" in other contexts) can occur as shown in Figure 4, and may cause severe damage. If the energy used is high enough, most of the beam can be made to pass through the specimen to avoid damage from this effect.

Because the energetic electrons have limited penetration, the coloration effect, like the heat, is most intense at the surface. The penetration depth can be increased by raising the energy of the electrons, but then induced radioactivity may occur. This last factor depends on the specific impurities present in a specimen, and for topaz it usually sets in above an energy of about 15 mega-electron volts. A "cooling off" period of a few days to a few weeks may be necessary, during which the induced radioactivity decays to an acceptable level.

A significant advantage to the use of electrons is that the dose rates available are much higher than those in gamma cells. It is practical, therefore, in reasonable time periods of a few hours to reach doses of many tens of thousands of megarads of energetic electrons, while it may take many days to achieve just a few thousand megarads of gamma rays. A high dose may be required since the coloration does not vary in a linear fashion with the dose.

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Like gamma rays, high-energy electrons can produce both the brown and the blue colors in topaz, and heating is used to remove the brown if blue is desired. Since high doses are practical, electrons can produce a more intense blue than gamma rays; the inky or steely blue color often seen in stones treated with gamma ray or neutron irradiation does not seem to occur. In view of the potential electrical discharge problem and the tendency for greater interaction at the surface, the production by electrons of a deep blue color in specimens much larger than about 150 carats or much thicker than about 15mm is usually not practical.

NEUTRONS

Neutrons, produced in nuclear reactors, can also induce radioactivity in all but the purest of topaz crystals. However, they have excellent penetration, so that there are no surface heating or coloration problems and the colors produced are usually uniform and deep. Because there is no risk of cracking, size is not the problem it is with high-energy electron irradiation.

The neutrons in a nuclear reactor can be of varying energy and are also accompanied by gamma rays and other rays and particles. By placing the material to be irradiated into a cadmium-lined iron container, the thermal neutrons that do essentially all of the activating are absorbed by the metals, which then also generate additional gamma rays. To use neutron irradiation, however, the treater must have access to a reactor facility that is able to handle the very high radioactivities involved with the special cadmium-lined iron container. Doses of us to 1000 megarads are said to be adequate to produce, after heating, a deep blue. The color may be darker than that produced by electrons, often inky or steely. Zoning of color can be expected to be similar to that observed with other irradiation techniques used for the blue product.

THE RESTORATION OF COLOR

Irradiation can also be used to restore the natural yellow to brown or blue color in a topaz when this has been accidentally destroyed by overheating, Although irradiation will usually produce an additional yellow to brown component as well, this can be removed by a gentle heating or exposure to bright light, thus producing a restoration of the original color. The final stable yellow to brown or blue color will be just as stable as the original natural one. It is also possible in this same way to return the heated pink topaz back to its original color if, for example, the pink is too pale.

THE HEAT TREATMENT OF TOPAZ

A heating step is usually required to remove the yellow to brown color and reveal any blue that may be present. Just as not all colorless topaz will alter to the yellow to brown range with irradiation, not all irradiated yellow to brown stones will alter to blue, and variations in color from stone to stone, or even within a single stone, are possible. While gamma and neutron irradiations in themselves can be conducted on quite large topaz specimens, this is not true of high energy electron irradiation because of the three factors discussed above, i.e., limited penetration depth, heat generation, and build-up of electrical charge. Heating, too, cannot be performed on large topaz specimens without loss.

It is well known that most topaz is very heat sensitive and often breaks, cleaves or shatters on heating, even if temperatures as los as 200°C are applied very slowly and carefully. The presence of strains, flaws, inclusions (particularly liquid-filled ones) and cracks makes a specimen especially prone to damage.

The solution is obvious: Perform these processes on faceted stones, or at least preforms (gemstones that have been roughed out but not finished) that are fashioned so that they do not contain stresses, flaws or inclusions. An added

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advantage to using preforms is that irradiation fees are based on weight, and there is a large reduction in weight in going from the rough to the preformed or faceted stone. The yield of faceted product intended to become blue topaz is less than that for most other gemstone materials because all but the smallest of strains, flaws and inclusions must be eliminated.

For the heating step used to remove the brown color from irradiated topaz (and possible to improve the steely blue of the gamma- and neutron-irradiated products), temperatures in the 200-300°C range are used, usually for one to two hours. At high temperatures, about 500°C, the blue color itself begins to fade. The fading occurs as the electrons return to their original location from which they were displaced by the Irradiation that formed the color center. A wide variety of different color centers can form in topaz, including slowly and rapidly fading yellow to browns, stable yellow to browns, a stable blue and the steely blue-causing component, Although formation rates of these color centers can be quite different even in different parts of the same crystal, the temperature-induced fading behavior is usually quite consistent: The unstable yellow to brown colors require only a short time (an hour or less) at temperatures as low as 200!C, the stable yellow to brown colors require a longer time (a few hours) at 200-400°C, and the stable blue requires about 500°C to make it fade.

Any type of furnace can be used, and heating in air is perfectly adequate. Heating may be performed with the topaz wrapped or buried in some inert substance such as clean dry sand. This is placed into a cold furnace and heated to the treatment temperature very gradually; the larger the stones, the slower the heating rate that needs to be used. After the required time at temperature, the furnace is often cooled at an equally slow rate and the stones are not removed until they have returned to room temperature.

In an original modification(C< Key, unpublished observation) of the electron irradiation and heating process described above, the rough topaz is first heated without any of the usual precautions so that all the potiential fracturing occurs before the cutting, irradiation and subsequent heating steps. In this way there is essentially no cracking in these later steps, leading to a considerable economy in the process.

Heating of yellow to reddish brown topaz from Ouro Preto, Brazil, has been practiced to develop a salmon pink to purple red color that appears only if chromium is present in the topaz. By heating in the 400-500°C range, the yellow to brown component is bleached. There is little doubt that a simular heating can be used on green topaz, for example, from the Urals, to produce blue. It can also be used to convert purplish or bluish pinks to a pure pink by removing the blue component, the latter at perhaps a somewhat higher temperature.

COMMERCIAL FACTORS

The supply of blue stones has remaine strong since the early 1970's, when they were first identified in the marketplace, until the present. It might have been expected that the existance of the irradiation process would cause a significant increase in the value of colorless topaz, but this has not happened, possibly for the following two reasons.

First, the costs of cutting and irradiation are sufficiently greater than the cost of the colorless topaz itself so that these steps appear to account for 90% or more of the world cost of the blue topaz supplied.

Second, the supply of mined colorless topaz, even though not large, is apparently still larger than the past and current demand for the blue topaz. In addition , there are believed to be sufficient amounts of unmined(because of the lack of previous demand) colorless topaz suitable for treatment should any additional demand arise.
As discussed above, there is much variability in the behavior of topaz on irradiation; colorless material that could be gauranteed to turn a deep blue would obviously command a premium.

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The irradiation of gemstones is such a small fraction of the total irradiation business that there are no dedicated facilities. Industrial irradiation facilities are commonly used for such purposes as medical supply sterilization, food preservation, the modification of pf plastic products, semiconductor treatment and so on. Gemstone irradiation is carried out in between such activities. Commercial gemstone irradiation firms frequently act only as intermediaries. The accumulate material and then have the irradiation performed at an industrial facility.

It is probably true that for most topaz the impurities or defects that provide the potential to form blue are the same for the different forms of irradiation. The impurities or defects giving the potential to form brown are different from these. By a preliminary low-cost, medium-dose gamma ray irradiation and subsequent heating to the blue stage, the fraction of material least likely to yield a more intense blue color could be eliminated from the more costly electron irradiation without, however, any significant change in the overall yield of the deep and medium blue products.

IDENTIFICATION OF NATURAL AND TREATED TOPAZ

The properties used to distinguish topaz from other gemstone materials are well known. The necessity for distinction from a synthetic does not arise, since so far only tiny topaz crystals have ever been grown by the hydrothermal method, which is slow and costly.

The identification of the origin - natural or treated - of the various shades of pink, brown and blue presents many difficulties. The "burned" pink is reported to have a much larger dichroism (dark cherry red and honey yellow) than the very rare natural pink topaz, but the origin of the color cannot be established concretely by routine gemological methods.

Both the irradiated brown and the blue colors show the same absorption spectra as the equivalent natural stones. With the blue material there is a difference in the thermoluminescence as reported by Petrov et al. As the temperature is raised, there is an emission of light in the irradiated blue topaz that is not present in the natural blue topaz. Similar thermoluminescence results have been reported by Rossman.

Such a test could be performed on a microscopic specimen scraped from the girdle of a stone, but extensive research would be required to ensure that his is a consistent and reproducible test that could not be negated by a selective preliminary heating of the stone. Also the equipment required makes this test impractical for the average jeweler/gemologist. Although the origin of color (treated) appears to be obvious in the deepest of blue topaz (darker than any naturally occurring blue topaz), it is not possible to establish the origin of the blue color definitively using routine gemological tests.

Finally, for the yellow to brown shades of topaz, there is the problem of distinguishing the stable from the fading colors, either natural or irradiated. At present no gemological test is known for this identification other than a direct fade test. This should always be performed if there is any question as to the permanence of the color.

As mentioned above, radioactivity can be induced into topaz during irradiation. Such radioactive material was indeed found in the trade in 1981, its origin traced to irradiation operations in Brazil, but no additional occurrences have been reported since that time.

MOST COMMON TECHNIQUES

Although topaz has been subjected to heating alone (to turn yellow to reddish brown stones pink to red) and some dyeing, by far the most common technique used on topaz today is irradiation and subsequest heat treatment to alter colorless stones to blue. Literally hundreds of thousands of carats of attractive blue topaz have been produced in this fashion during the last 10 years.

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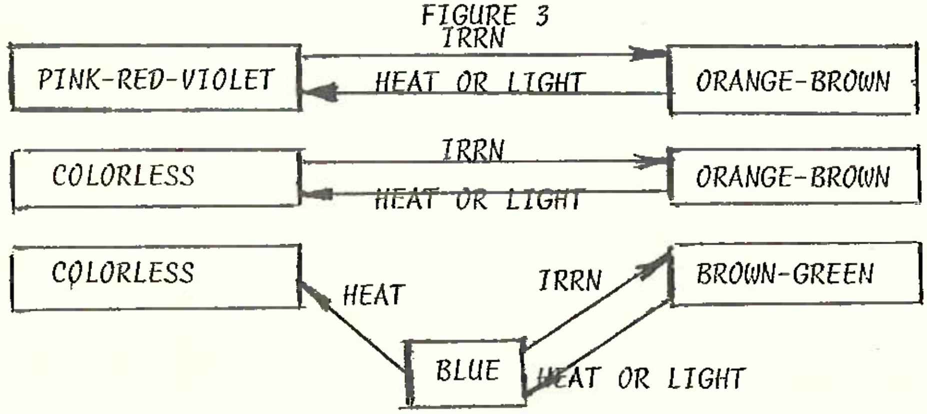
Irradiation has also been used on other gemstones to effect a variety of color changes. In some instances, such as Maxixe beryl and irradiated yellow sapphire, these colors are unstable and will fade on exposure to light, as does the irradiated yellow to brown topaz color. In other instances, such as irradiated smoky quartz and irradiated diamond, the color is stable to light, as is the irradiated blue topaz (Nassau, 1984).

Blue topaz, however, is currently the most common gemstone being irradiated. The blue color that results after heating is stable and has shown wide consumer acceptance. The treated material cannot be distinguished from its natural blue counterpart by gemological testing at this time.

FIGURE 3



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OCCUPATIONAL STONES:

Architects	- Cornerstone	Doctors	- Gallstones
Politicians	- Blarney Stone	Vintners	- Rhinestone
Burglers	- Keystone	Hatters	- Brimstone
Tourists	- Yellowstone	Laundress	- Soapstone
Motorists	- Milestone	Bartenders	- Whetstone
Pedestrians	- Tombstone	Shoemakers	- Cobblestone
Astronauts	- Moonstone	Truckers	- Lodestone
Editors	- Grindstone		

POINTED POINTS TO PONDER:

Wise men think without talking, fools reverse the order.

Before you give somebody a piece of your mind, be sure you can get by with what you have left.

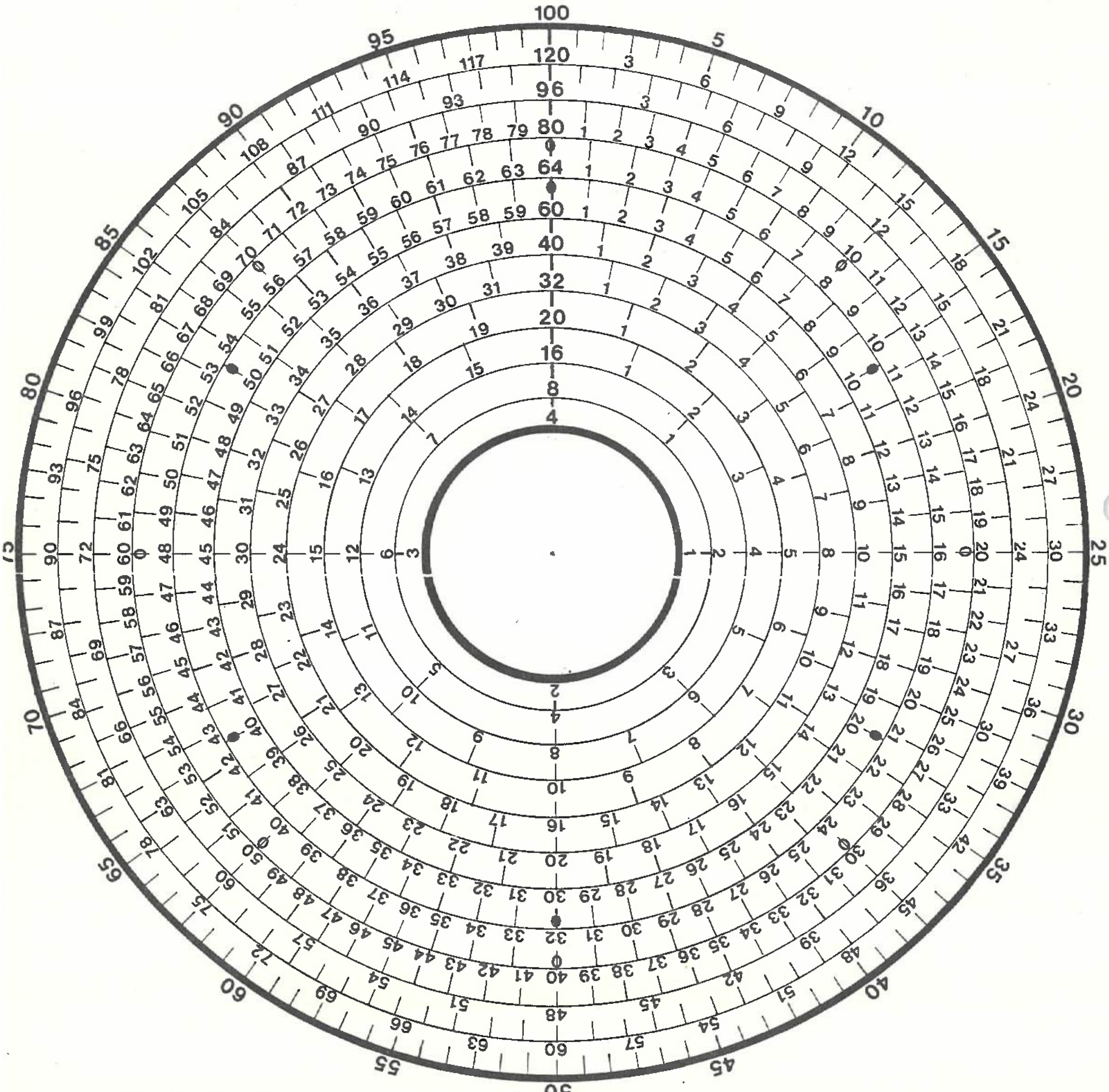
Middle Age is when your memory is shorter, your experience longer, your stamina lower and your forehead higher.

Talent is developed in retirement; Character is formed in the rush of the world.

Memories are treasures made from pleasures we have known.

via many bulletins.

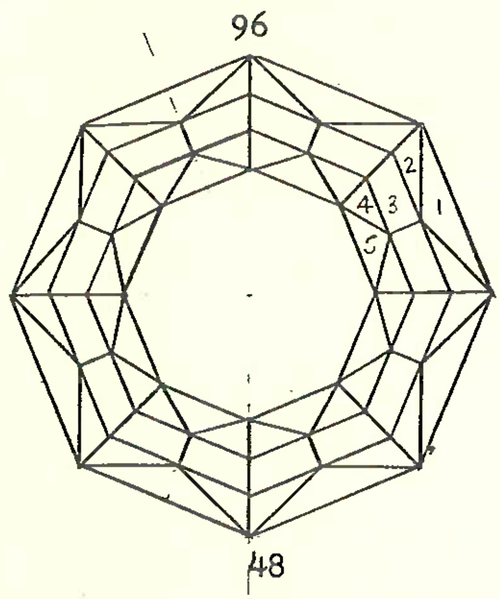
POLAR PERIODIC CONVERSION TABLE



T. F. Engel
Midwest Faceters Guild

CHAPCO'S RIM FIRE

By Charles W. Covill

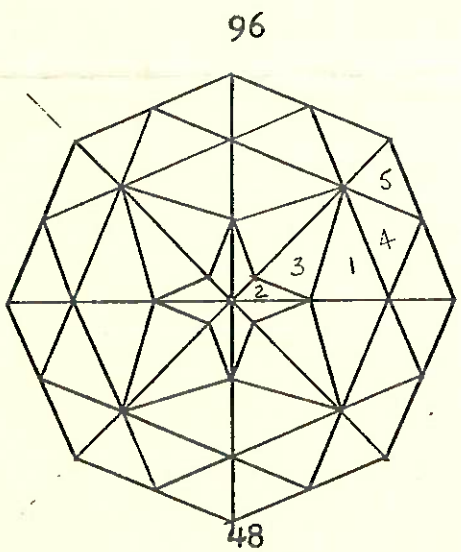


96 Index
Angles are for Quartz

Preform at 90° -- 6, 18, 30, 42, 54, 66, 78, 90

CROWN (64 Facets)

Step	Angle	Index
1	45°	6, 18, 30, 42, 54, 66, 78, 90
2	38°	5-7, 17-19, 29-31, 41-43, 53-55, 65-67, 77-79, 89-91
3	33°	5-7, 17-19, 29-31, 41-43, 53-55, 65-67, 77-79, 89-91
4	28°	5-7, 17-19, 29-31, 41-43, 53-55, 65-67, 77-79, 89-91
5	24°	6, 18, 30, 42, 54, 66, 78, 90



PAVILLION (48 Facets)

Step	Angle	Index
1	51°	6, 18, 30, 42, 54, 66, 78, 90
2	43°	93-3, 21-27, 45-51, 69-75
3	48°	89-7, 17-31, 41-55, 65-79
4	55°	6, 18, 30, 42, 54, 66, 78, 90
5	60°	5-7, 17-19, 29-31, 41-43, 53-55, 65-67, 77-79 89-91

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Secretary's Comments

Those present at Flint, Michigan in Williams School as President, Bill Horton called the Board of Directors of the Midwest Faceters Guild to order at 10:36 A.M. were President Horton, Ted Engle, Bernard Bush, Elery Holt, Tom Gibbs, Dorothy Loyd, Joe Manina and Kathleen Myers.

The minutes were approved as published in "The Midwest Faceter" through a motion made by Tom Gibbs and seconded by Ted Engle. The Treasurer's report was accepted as read by Elery Holt through a motion made by Tom Gibbs and seconded by Joe Manina.

Proceedure and reports are the same as those of the regular meeting. Please refer to them for details.

The plans for the August meeting will be finalized on Friday and will be mailed to Dorothy Loyd for publication. The Gem section of the Royal Museum is closed for renovation so it is possible members will be divided into small groups for that particular part of the program. A map and a list of lodging places will be included. A buffet lunch is being planned.

Application for new members to order their Guild badges will be in the next bulletin.

Tom Gibbs will provide maps and hotel/motel guide for the 1987Show.

The Trophy and displays that won at the Australian Challenge will be on display in the U.S.A. for the first time at the AFMS - MWF Convention in South Bend.

Contact Margaret Heinek for non-competitive displays and Kathleen Myers for Competitive Displays at the Convention.

A new Membership application will be in the bulletin. Please complete and use when renewing your membership.

John Gansen has agreed to making new cases for the special Birthday Display at our 1987 Show. No estimate has been obtained for rebuilding the old cases.

Bill Gardiner had our new computer and showed anyone interested in its functions.

A motion to adjourn was made by Tom Gibbs, seconded by Joe Manina and carried. Meeting adjourned at 11:56 A.M.

Submitted by Bernard Bush, Secretary.

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MINUTES OF THE REGULAR MEETING

The Regular meeting of the Midwest Faceters Guild was called to order at 1:16 PM on May 31, 1986 in Williams School in lint, Michigan by President, Bill Horton, as he welcomed all those present.

A correction of the Australian Challenge for fourth place was Glen Klien of San Anna, California instead of the previous listing.

Gail and Don Shar and Harold Rice were representatives of the Guild and maintained the booth at the Chicagoland Show over Memorial Day weekend. Gail reported the need for teachers in that area is in great demand and to her knowledge there aren't any. Many of our Guild members that facet should be willing to share their knowledge with others that want to learn to facet but have no one available to help. If you can facet, you can teach, or at least show them what you know and enrich both your talents. Sharing ideas, hints on basic ideas is called Education in our hobby.

The minutes were approved as corrected through a motion made by Gail Sahr and seconded by Al Gear. The Treasurer's report was accepted as read by Elery Holtwith a motion made by Bill Gardiner and seconded by Bill Grant.

COMMITTEE REPORTS:

Editor Helen Taylor needs articles as her supply is almost exhausted. President Horton said everyone should be able to

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SECRETARY'S COMMENTS (cont'd)

to contribute to the bulletin.

Membership Secretary, Bill Gardiner has about 470 names in the new computer. Dues are due January First and a are payable from October First. Those not paid by January Second are considered delinquent and will be dropped f from the mailing list after the first issue. A Red mark or star on your mailing label will indicate it is your last bulletin until your dues are paid.

Bill Horton reported for Special Competition Chairman, Ed Myers. The Americans won the Australian Challenge by 3.7 points. The next challenge w will be in the United States. The Midwest Faceters Guild offered to be the host, but it is undecided as California also wants the honor as the winners were from there. Each Gu Guild will select a cut and take one part for judging. Glenn Vargas will make a Committee from The Midwest, Northwest, California and Texas Guilds. It is possible California will be running the show and the Midwest Faceters Guild would act as a clearing house for the Judging. Judging will be done through a 10X, hand held loop. Three show choices are being considered. Bob Kleepe, Show Chairperson for September 1987 at Anaheim, California; the National Show in Oklahoma City, 1988 and the Midwest Faceters Fair in Dearborn in 1987. Mr. Myers has the correspondence form Glenn Vargas and the matter will be acted upon in the near future.

AFMS Rules Committee Chairwoman, Kathleen Myers is accepting applications for displays at South Bend. The Michiana Gem & Mineral Society granted permission for us to hold a special Faceting Competition at South Bend. The AFMS Rules will be followed and for the MWF, as well. The Faceters Guild is responsible for the table favors for the "All Exhibitors Breakfast". Kathleen will make them. The 1987 Bulletin Rules are almost complete and will be mailed soon to all members.

Frances Bush suggested we are in need of a Sunshine Person to keep the Guild Members informed of any awards, illnesses or deaths of members.

Larry Kelly is making the CZ to be used by the 16 volunteers to cut replicas of the World famous Diamonds for the Field Museum. The stones will be displayed at the Museum indicating the cutter's name with their particular stone. The Museum would like the stones all at once so they can plan a "Grand Opening" with the Guild present to share the honors. The cutters should strive for accuracy and a date will be set for completition of the stones.

An inviatation has been extended to a all members to host a Guild Membership meeting. Please discuss the matter with your Club and come prepared to sign up for a meeting next year.

More people are needed for demonstrating in the booth at Sourh Bend. If you can bring your faceting machine and have a few hours to donate please contact Frances Bush.

Prizes are needed for the three highest salesmen and for the raffle its itself. The First Prize is a Star Sapphire set in a man's 14 K Gold ring, seconded prize is a lady's 14 K Gold ring set with an aquamarine. Third prize is a Silver inlaid bola tie and fourth prize a 14 K Gold pendant with topaz. Leonard Demorsky has offered a silver ring with a star ruby as fifth prize. Money from the raffle will be used to pay for the VCR and Computer that has been recently purchased.

The Dearborn Civic Center has been secured with a downpayment for our 1987 Show.

Al Gear made a suggestion that he minutes of the Board of Directors and the Regualr Meetings be combined to save repetition of reading. The By-Laws state the Secretary shall prepare minutes ofall meetings for publication in the bulletin so the minutes will be summarized to save printing space.

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SECRETARY'S COMMENTS (cont'd)

Vivian Randall inquired as to why our dues are so cheap and have not been raised. After a very lengthy discussion it was the general con - senus thata raise at this particular time is not necessary and until the time arrives when our expenses exceed our income they shall remain as is. Ed Myers made a motion, "That we establish a definite cut off date for our dues." The motion was seconded by Bill Gardiner and carried. Dues are now payable from October First of this year until January First. After January Second members are considered delinquent and will be dropped from the mailing list as of March First. A RED MARK OR STAR ON THE MAILING LABEL WILL INFORM YOU THAT IT IS YOUR LAST BULLETIN UNTIL YOUR DUES ARE PAID.

Congratulations were extended to Bill Horton on his retirement as of July First. Best of Health and Good Wishes to enjoy your leisure years, Bill.

The details for the August meeting will be in the next bulletin with suggestions for lodging, directions for all round information for our visit to the Royal Museum in Toronto, Canada.

The meeting adjourned at 2:13 PM through a motion made by Gail Sahr and seconded by Al Gear.

David Miller presented a detailed slide program on how to design an eight main oval using a MM Ruler, angles, protractor and a circle graph. Copies were given to all present. A job well done, Dave, "THANK YOU". A Big "Thank YOU" to Dorothy Loyd, our Educational Chairwoman fo spending your many hours arranging for our programs.

Submitted by Bernard Bush, Secretary.

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M O V I N G ?

If you are moving or have moved since you filled out your application to become a member, please notify the Membership Secretary of your change of address.

William H. Gardiner
4518 Sandstone Drive.
Williamston, MI 48895

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M E M B E R S H I P N E W S !

If you are a member of the Guild and have news of yourself or another member, such as awards you receive, special anniversaries such as 25th or 50th, Hospital confinement or illnesses or deaths) please notify the secretary:

Bernard B, Bush
931 Bricker Avenue
Toledo, OH 43608

Arrangements will be made to send them to our Sunshine Chairperson as soon as possible. You know what we do as a Guild, let us know you personally so you are more than just a name on our mailing list. We value our Members and would like to know you.

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T U R N IN Y O U R R A F F L E T I C K E T S AS S O O N AS P O S S I B L E ! !

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