

COLUMBIA-WILLAMETTE
FACETS
FACETERS' GUILD



"MORE FACETING DESIGNS EACH MONTH"

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March 2015

Portland, OR 97208-2136

P.O. Box 2136

COLUMBIA-WILLAMETTE FACETERS' GUILD

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Guild Meetings: First Tuesday of each Month, doors open by 6:45 PM, program starts at 7:30 PM
Meeting Place: Oregon Museum of Science and Industry, 1945 SE Water Avenue, Portland, Or.

March Meeting is Tuesday, March 3rd
Program: Report of the Tucson Gem Show by Linda Harvey

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President's Perspective
By Bartley "Craig" Hatch

About a year ago I became so frustrated with not being able to facet a gemstone and leave no scratches on one or more of the facets that I decided to quit faceting until I could resolve the issue. I decided this after eight hours of polishing only made the facets oversized and the scratches hidden until the stone was thoroughly cleaned. I asked several Guild members about the issue and bought some new products and tried again and again, but to no avail. So I let frustration interfere with my efforts and stopped faceting altogether for quite some time. I told myself life is so frustrating I don't need this added to my plate.

As time passed, I had a chance to review my attitude about having failed this challenge. So looking for inspiration I sought help from the words of those who faced bigger challenges. Thomas A. Edison said "I have not failed. I have just found 10,000 ways that will not work." Fine, I thought but maybe I just am not smart enough to figure out the answer to my problem. Then I discovered another quote from Mr. Edison: "Genius is one percent inspiration and ninety-nine percent perspiration." With those words I started anew and know the only limit to my success is me. The Guild sometime in November will be having an auction and hopefully by then I will have at least one stone worthy enough to donate to the guild. (Thank you, Mr. Edison)

All members of the guild are invited to cut Guild supplied facet rough for the auction. There are also cut stones that need to be re-cut or considered "preformed" and are available at guild meetings and upon request. Your help will be a valuable asset and greatly appreciated.

Thank you.

OTHER POSITIONS OF NOTE:

PROPERTY MANAGER: Haden Olson, mangriff@yahoo.com
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MEMBERSHIPS/ SUBSCRIPTIONS/ Columbia-Willamette Faceters Guild
CORRESPONDENCE/ SUBMITTALS P.O. Box 2136
Portland, OR 97208-2136

Board Meetings are held on the
3rd Thursday of each month at 6:30 pm
All Members Are Welcome.
See inside for meeting place each month.

Membership Dues:

Individual: \$25 per year, Family: \$35 per year
Overseas and Canada rates: Electronic, \$25; Hard copy, \$35 per year
Rates are in US dollars or equivalent.
All memberships include a subscription to "FACETS" (12 issues)
Checks and Money Orders should be payable to:
Columbia-Willamette Faceters Guild
Your cancelled check is your receipt

Requirements for Membership

Candidates for local membership must be approved by the Board of Directors. The Board of Directors acts on membership applications at their regular meeting. Candidates must attend at least two regular meetings of the Guild before submitting an application. At least one finished faceted stone done by the candidate must be submitted with the application (a stone from the faceting class will do nicely).

Candidates for correspondent membership who by virtue of distance, residence or other circumstances that prevent attendance at regular meetings may waive the attendance and stone submittal requirements. Correspondent members shall be entitled to all the privileges of membership except the right to vote or hold office.

www.facetersguild.com
"Like" us on Facebook!

From the Editor -

This month *FACETS* features a presentation on garnets by our own Martin Novak. Then there is a nice autobiography of one of the pioneers of modern faceting, and a long term member of CWFG to whom we all owe a debt of gratitude: Bob Long. He has been elected to a Lifetime Membership.

John Franke has gifted us with three designs-one of which is a re-work of Glorian Emerald, by W. Taylor. John said he cut it in some nice green sunstone from the Pana Mine.

We would love to hear from members with ideas fashioned into articles of interest. If you worry about your writing skills-well, that's what editors are for and I'm glad to refine a piece for you, if you feel unsure about how to make it flow. If you have a design you'd like to debut in *FACETS*, members would love to try it out.

Schedule of Monthly Programs

Each month at the guild monthly meeting, a featured speaker gives an educational presentation to the Guild members. Anyone is welcome to attend, whether member or guest.

March 3rd, 2015, OMSI—Linda Harvey: Tucson Show
April 7th, 2015, OMSI-TBD

If you have ideas for programs, feel free to pass them on to Vice President, Dotti Belk.

CWFG GENERAL MEETING

February 3, 2015

We enjoyed a presentation this evening by Martin Novak on the physical properties of garnets. What makes a garnet a garnet and the differences in the several kinds of minerals that make up the "garnet group".

Sylvia LaCroix was presented her life member badge. Congratulations Sylvia!

Gail Bumala and Craig Hatch reported that they had met with Julian and Leslie at Rice Museum to discuss putting together a faceted stone collection to display at the museum. They asked for anyone interested in working on this to let them know so that project can move forward.

After discussions by the board, Jerry Bartlemay nominated Robert Long to life membership. The motion was passed unanimously. Congratulations and thank you from the Guild for all the things you do for everyone in the faceting world!

The treasurers report showed that we had a good year in 2014, with the books balancing and the auction again alive and well.

It is encouraged that all who have access to get their information in to the *FACETS* editor to receive the newsletter by e-mail. The pictures are in color and it is a very nice presentation. (Production and mailing of the newsletter is one of the largest expenses that the Guild regularly incurs.)

Another auction coming up in November ---- more stones needed as soon as possible so that they can be evaluated; set into jewelry; cataloged and etc. All of these activities take time and the sooner we can get the stones to the committee the easier it is for them to do all of "backstage" things that make the auction run so smoothly.

Craig Hatch appointed Terry Olson, Jerry Bartlemay, and Karl Ziltener to review and make recommendations for updates to the Guild's constitution and by laws.

Another faceting class has just finished up – another to start Feb. 14. Teachers and helpers are always needed and much appreciated for your time. It is a very rewarding experience to see the delight on someone's face new to the craft when they take those first stones off the dop. When they have turned a rock into a gemstone.

No further business; meeting was adjourned at 8:50 pm.

Respectfully submitted; Karl Ziltener

CWFG Board Meetings

Each month on the **third** Thursday from 6:30 to 8:30 PM is a meeting of the CWFG Board. This meeting is where the nuts and bolts business of running the Guild happens. All guild members are welcome to attend and contribute or observe.

March 19, 2015 –Sylvan Zoo House and Saloon
551 SW Canyon Ct. Portland or 97221

April 16th, 2015-Sylvan Zoo House and Saloon
551 SW Canyon Ct. Portland or 97221

May 21, 2015-Sylvan Zoo House and Saloon
551 SW Canyon Ct. Portland or 97221

Martin Novak on Garnets

Garnets

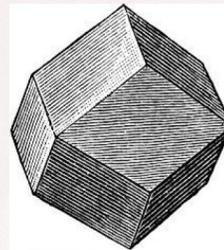
One of the Most Underrated Gems



For thousands of years garnets have been known for pretty much this color (*red*) and only in the past hundred years have we realized that there's a rainbow of garnets. So, what is a garnet? Garnet is a silicate. Chemically it is silicon and oxygen: $X_3 Y_2(SiO_4)_3$. The cool thing about garnet is that this crystal is a container for a lot of different chemical isotopes, so they go here, in x or y and that determines everything about garnet-the color, crystal structure, inclusions-absolutely everything. No matter what, the key concept here is that this container always stays the same. That's what creates garnet.

What is Garnet?...

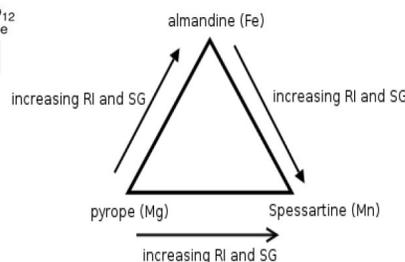
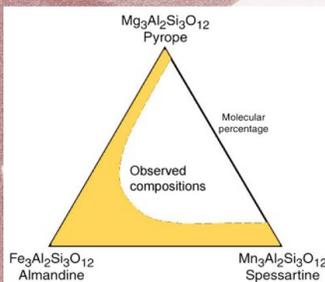
- A group of *Silicates* with variable chemical structure...
- $X_3 Y_2 (SiO_4)_3$



RHOMBIC DODECAHEDRON



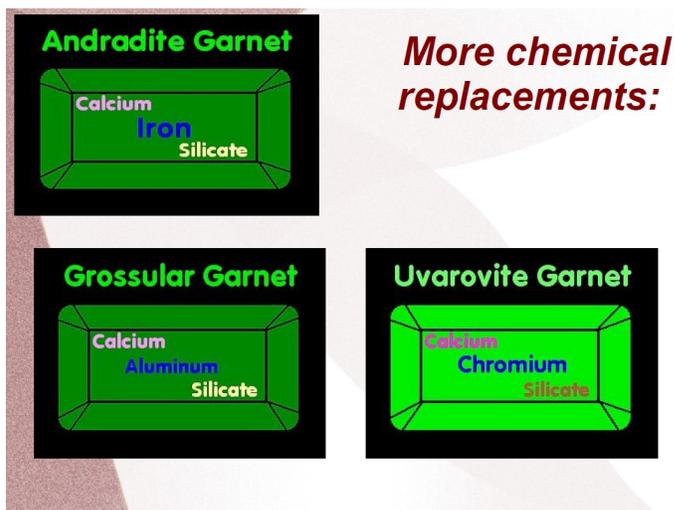
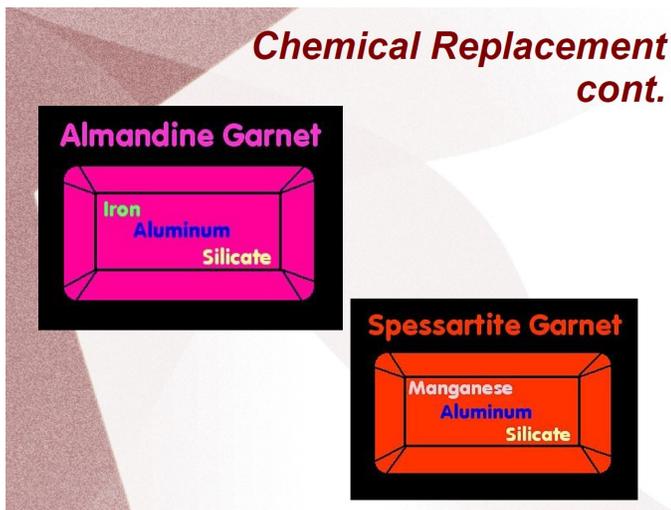
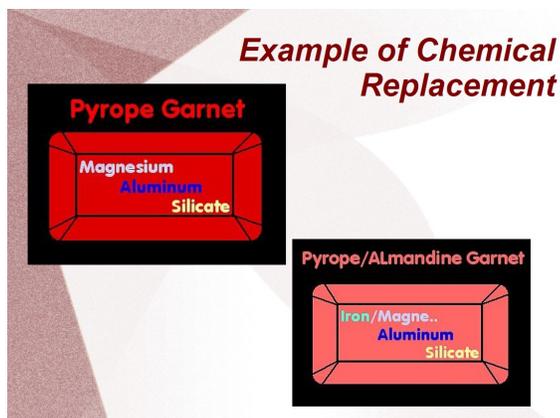
What's in a name?



Scientists had a lot of trouble coming up with this, but this is the basic classification scheme for garnet. The color, you can't really go by, because pyrope, spessartine, almandine, can all be the same color, so they came up with some sort of chemical triangle. Some of you may be familiar with feldspar-sunstone feldspar-that's something similar, where almandine has iron and aluminum, which creates that bright deep color-and spessartine has manganese and aluminum, which creates that orange color-and pyrope is manganese and aluminum. It's usually a brighter red-it has some other impurities that go into it that make it into that ultra-bright red.

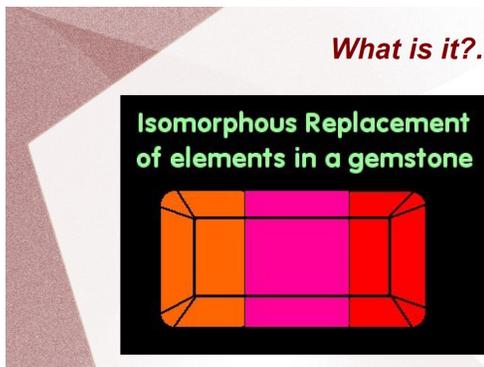
Now, pure garnet doesn't really exist. That's another key concept. So in the yellow-those would be some of the pure chemical species and they've never been found in nature. What we do have is these (observed) compositions and thepercentage determines what we call them-almandine garnet, spessartite or pyrope garnet. A lot of times, since they're so mixed, you'll see something in the middle and you'll have to make a determination by the majority of what the crystal has in it. So, if it has the most manganese and aluminum, call it spessartite and some gemologists combine the names into some kind of "Franken-names," so you'll see "pyrmandine" for pyrope and almandine and "spessartine," you know, it gets kind of crazy. Here is another little gemological clue: Pyrope and almandine in-between-you're going to get an increase in refractive index (RI) and specific gravity (SG). Also, almandine to spessartite-you're going to get the same thing-it's going to go even higher and you're going to get a higher refractive index and specific gravity, and the same thing with pyrope to spessartite: pyrope is the lowest on the scale with refractive index.

So, here's an example of the chemical placement. Pyrope is a pure magnesium with aluminum silicate with minor impurities. When you get to a certain level, you get a color change. It's like rhodolite garnet is famous for this. If it's a pure, bright color, it's most likely almandine or spessartite or pyrope, and when you mix the iron and magnesium, you get a total shift in color and that's when you find that deep, bright purple color or some nice rose color in some garnets. You'll have to keep this gradation in mind



Almandine is a heavy garnet. It's famously found in Idaho if any of you have been mining out there for them. When you replace it, it becomes kind of an orange-reddish color from manganese. Some of you might be aware of green garnets. What changes them is not this sort of first chemical constituent, but the second one. So andradite, which has iron, grossular has aluminum, uvarovite has chromium. This pretty much sums up what each garnet in each locality has in it.

What is it?....



So, this would be spessartite, almandine, and pyrope. Does anybody want to guess what you would call this guy? (Comments... "Pyrostite!") (laughter) Another gemologist would call it almandine, because it's primarily almandine, but it's not a clear official thing. "Pyrostite" would be your "technical" term.

PYROPE



Famous Localities include: Arizona & Bohemia

Pyrope are famously found in Four Corners, Arizona. That material is famous for having chromium in it and it has this bright, red color in it and I've sold it for a hundred dollars a carat. It's very hard to find anything cut or anything over a carat. They're really tiny things and they're also known as "anthill garnets," because the ants, like sunstone, will bring it up to the top of their anthills and Indians used to pick it up and sell it to the traders. The Apache Indians were even known to use it as gunshot because they believed they would inflict greater wounds on their enemies. Another classic source is Bohemia, which is where it's been mined for well over a

thousand years. All of the Victorian jewelry you see is predominantly pyrope.

Almandine is found in large deposits in Idaho and that's where Idaho star garnet is concentrated. It's the official state gemstone of New York. The really nice stuff comes from Africa, you know, those big blocky red pieces are rhodolite pieces-and down there, you'll see rhodolite and rhodolite is usually considered almandine and almandine usually has a secondary mixture.



Almandine

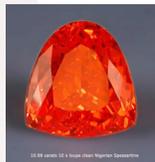
Famous Localities Include:
Africa (Tanzania, Kenya)
New York
Idaho



SPESSARTITE



Famous Localities Include:
Nigeria, California, Virginia



Spessartite is known for its beautiful, bright orange colors. The really rare stuff is from Nigeria and you really can't find the stuff rough anymore. I do see a trickle of stuff from California now and then, there's a famous mine down there. You can find crystal specimens on the market now and then, but not facet grade.

Andradite, there is a variety called demantoid, that has these little horsetail inclusions-they're asbestos fibers. There are really few inclusions that add to the value of a gem. The classic locality is Russia. You can find facet rough from Namibia nowadays, but it's not the nice, bright green color most of the time, it's more of this color where there's a secondary blue mixture. Andradite is famous for its really high refractive index. I think it looks like a nice green diamond-it really breaks up the light when you get a nice brilliant cut on it.



Andradite

Famous Localities:
Russia
Namibia



Demantoid with Horsetail Inclusion

Grossularite



Famous Localities:
Mt. St. Hilaire, Quebec
Merelani, Tanzania
Tsavo, Kenya



Grossularite-that's the last one. Tavorite is a variety of grossularite garnet. Quebec, Canada, that's a really famous locale for it-they don't mine it anymore. There's a lot of rough that you can see on the market. That's where a lot of clear garnets come from and there's a gradation color change, but it's really hard to find in any great quantity.

The first garnets were used by the ancient Greeks. There were a few peoples who made beads out of them but the Greeks absolutely loved garnets. When they first came on the market, they were worth a couple of hundred gold pieces for every garnet. Having a grape garnet was the equivalent of having a red diamond back then. They carved little seals into it. Nobody knows where they mined this garnet. There's an archaeo-gemologist in California who's trying to figure that out right now. She's looking at Ethiopia or there are trade networks that came up from Tanzania and she thinks the garnets were carved in Turkey and then brought over to Greece.

Garnet in Ancient Greece



Garnet in Ancient Europe



Garnet from the Staffordshire Hoard, England c. 800 AD

Then the second time we see garnets in history is in Europe. This buckle is from 800 A.D. and it was from a hoard that was found in England a few years ago (see.....). It's notable for considerable jewelry and lapidary work-they sort of flat lapped it in these really thin slabs and behind you see this reflective background. They actually took gold foil and created this background that's kind of like a reflector like a modern blinker light on a car. It's a kind of amazing, bright, reflective piece of jewelry when you see it in real life. They pop up in Europe when people find these big treasure hoards and they're worth a lot of money.

This is the most famous kind of garnet we see in jewelry, which is from Bohemia. It was in the beginning of the industrial age-there was this big factory in Turnov, in the Czech Republic, where they still produce these today. Their cutters have been doing this for a hundred-and- fifty years now. This sort of gave everybody a "garnet hangover." This was classic garnet, this was Grandmother's jewelry and after people bought enough of it-wore enough of it, it sort of lost favor with everybody.

Garnet during the Victorian Era



(YAG)



Now, after the Victorian Era where people think of garnets as these dark red stones, world-wide mines have opened up many more possibilities as to what we can get out of garnet. People say there's no such thing as blue garnet, but in the past decade there've been blue garnets found in Africa, in Madagascar and Kenya and here's a picture of it. It's actually a color-change garnet but if you get it in the right light, you get that really beautiful blue color where there's usually a purple base color shifting

Are there any questions about cutting, localities, tips, hints? I'll be happy to take them.

Question: Is that blue a trick of the light, or is it half blue, half grey? (Image not available)

They actually have two light sources on it. That's probably incandescent and sunlight, coming in from different angles. With those light sources you can get both colors to reflect.

Question: If I ever get really nice cuttable rough, is there any suggestion on cutting and polishing?

Aluminum oxide works wonderfully and with a 1200 grit I go directly to aluminum oxide and I get beautiful flat facets. It's like 100,000 diamond. Sometimes it takes a little longer with larger tables but I don't even bother with Gearloose's laps or anything-I just use aluminum oxide on tin.

Question: What kind of laps do you use aluminum oxide on?

Classical tin lap-"old school."

Question: The square from the hoarde-where did those garnets come from?

It's also a mystery. It's believed they came from Bohemia. If you go to Bohemia-I've actually looked for them there, they're little tiny grains. It's tough to get those large, flat stones from them, so no one's really sure. They could have come from as far as India, or a source that's just lost to us nowadays.

Question: The green garnets from Russia and Namibia-is it possible to get rough from Russia?

It's really difficult to get rough from Russia, unless you know one of the miners and they're really hungry. There are people who just wait to buy up every bit of production there is. They sell for a thousand dollars a carat and I've never been able to get any rough.

Question: Where do you get rough?

All over-Tucson, mail order, there are some African rough dealers I work with-I'm happy to share after the presentation. You can find pretty much everything except the Russian demantoid in the rough market.

Question: What type of garnet is the biggest type?

Almandine gets huge. I've seen basketball-sized crystals.

Question: Is that cone-shaped crystal GGG or YAG? (Image unavailable)

I couldn't tell you what that is-it does look like synthetic rough. That's just a picture I found on the GIA website.

Question: Do they actually make synthetic garnet rough?

Yes, but it's sort of different from natural garnet rough. There are two types: Yttrium Aluminum Garnet (YAG) and Gadolinium Germanium Garnet (GGG)-right? Once you see the crystal structure-it's kind of a nickname they've given it, because it has some of the same properties as garnet, but it'll never compare to anything found in nature.

Question: What kind of garnet would still have a lot of color and still be translucent?

As far as most saturated color in garnet? One with the best color and is still around. What garnet will reflect back the most light and still be red? That's a tough question, because I've seen almandine mixtures that are very, very light red that reflect everything back and you still get a bright, sparkly stone or I've seen pyrope, which is slightly lighter saturation-smaller sizes, which is a brilliant red, almost ruby-like color. So the best answer is you may have to look at each stone individually and the best way to look at it is the white paper test. I don't know how many of you are familiar with it, but you take a piece of rough and put it on a white piece of paper and sort of diffused light in the area-I prefer sunlight-or semi-shaded. If you can see color through the stone into the paper, that's what it's going to do when you cut it. If it's too dark and it doesn't show any light coming through it-then no matter what you do when you facet it, it's not going to get any reflection back.

Question: They used to tell us that if you have a dark garnet and you cut it to a shallow depth, under the critical angle, then it's going to work better. Do you find that to be true?

If it fails the white paper test, then I find I've wasted hours of my time. There are those-maybe there's a little bit of light coming through and you really want to cut it and if you're a beginner, maybe you've spent a lot of money on this expensive rough, even though you know it's too dark, so then, a shallow crown will help with bringing out some of that color, but if it's too dark-no one will see it-fish tank stuff.

I've brought some books-these are the main resources on garnet if you want to read about it-just three, not much written about it. The first one is out of print-impossible to find. One I highly recommend is: *Garnet* by Lithography Publishing. It has beautiful color photography-great information. If you like the Victorian jewelry, there's a book written in Czech-it just came out-it talks about the lapidary industry in the Czech Republic and the Victorian garnet jewelry. Thank you.



Robert H. Long
Elected to Lifetime
Membership

The Members of the Columbia-Willamette Faceters Guild have elected modern faceting pioneer, Robert H. Long to a lifetime membership in honor of his long-term membership in the guild and his many significant contributions to the craft and art of faceting. The following autobiography was written up by Bob for the pages of the United States Faceters Guild website and has been updated by him for us.

Autobiography of Robert H. Long

I was born on August 6, 1924, in Norfolk, Nebraska, the "Hub of Northeast Nebraska", population then of 10,717. This is also the town that Johnny Carson called home. My father was a machinist, and my mother was a retired school teacher (retired because married women were not allowed to continue

teaching). I grew up during the Great Depression days but at the time I wasn't aware of it. We were poor and struggling, but so was everyone else. My fondest memories were of playing the bugle in the American Legion Junior Drum and Bugle Corps, marching in parades and playing at county fairs.

We moved to Davenport, Iowa, in 1940 when Dad got a job as a tool and die maker at the Rock Island Arsenal. After graduating high school, I started attending Northwestern University in 1942, studying electrical engineering. But I decided the place for me to be was in the service, so I enlisted in the Army and entered service in February, 1943. I began Basic Training in the Coast Artillery at a base near Galveston/Houston. I quickly qualified for both OCS and a new program called the Army Specialized Training Program (ASTP). I went before the base commander, a Colonel, and had to choose between them. The Colonel asked me, "Pvt. Long, how old are you?" I replied, "18 Sir". The Colonel said, "Kinda young to be an officer, don't you think". "Yes Sir, I'll take the ASTP", I replied. One of those forks in the road we all face at some time in our lives. I spent the next nine months at Baylor Univ., Waco TX. Tough duty! Four hundred GI's and 800 beautiful Texas women.

When the ASTP folded, I was transferred to the Army Air Force and started a series of training schools leading to becoming a Radar Mechanic, GCA (Ground Controlled Approach). This was the most advanced radar system in existence at the time. The GCA team of which I was a part went to Europe, became part of the 133 AACS (Army Airway Communication Systems) Squadron, and were assigned to work with a P-47 fighter plane group. The AACS primary function was to operate the control towers. Landing P-47's was a lot different than the Cessna's we had trained on, especially when the fighter planes are returning from a long range mission and are all low on fuel. On VE day we were at the most advanced air base at the time near Munster, Germany. Later that summer we were designated "Presidential Escort" for the Potsdam Conference, and set up the radar at Gatow airport near Berlin. Fortunately the weather during the conference was perfect and our services were never required. Then we were supposed to set up at Tempelhof, but couldn't because surrounding buildings were too tall for us to establish a glide path to the field. (This problem was resolved a few years later during the Berlin Blockade by a few well-placed sticks of dynamite.) I celebrated my 21st birthday in Berlin on August 6, 1945. (Atomic bomb in Hiroshima.) We then moved to Nordholz, Germany, north of Bremerhaven on the North Sea. We were the emergency landing field for all of Northern Europe. We saved several crews from a cold swim in

the North Sea. I was discharged from the service on April 1, 1946. Home at that time was Eastland, TX. That summer Dad then to work for Beech Aircraft and we moved to Wichita, KS. I spent the summer working at the Wichita Wire Works. That was one of those jobs which convinces you that you don't want to do this for the rest of your life.

I resumed attending college at Northwestern that fall. The engineering program there required spending 18 months in industry in a Co-op program. I cooped at the Allen B. DuMont Labs. in Clifton, N.J. working in television test, factory engineering, and cathode ray tube research. I was on the team that developed the first successful 90 degree wide angle television tube. I also met and married my late wife there. I continued with DuMont after graduation with a BSEE, and eventually become Manager of Product Design. But DuMont fell on hard times after the death of the founder, Dr. Allen B. DuMont. I relocated to the Seattle area with Boeing in 1958, on the BOMARC missile program. My wife did not adjust well to the coast-to-coast move, so I quit Boeing and went with Curtiss-Wright, back in New Jersey, as a department head. Boeing contacted me about rejoining them on the Saturn 5 Space Program in Huntsville, AL. We moved to Huntsville in 1963. The next nine years, with the successful lunar landings, was a great time to be an engineer.

It was in Huntsville that I got started in the lapidary hobby. One Christmas I bought one of my sons a tumbler from Sears as a Christmas gift. When he found out it would take six weeks for any finished tumbled polished stones, he quickly lost interest. I inherited the tumbler. There is a lapidary club in Huntsville, so I joined. There is a pretty agate material found in the local Paint Rock River. Soon making cabochons occupied my spare time. When the space program virtually ended for contractors in 1972, we relocated back to the Seattle area. In February, 1973, my wife suffered a brain aneurism, which although not fatal at the time, made her an invalid for the remainder of her life, and significantly changed my life. I continued working, although at a much reduced level of responsibility, until I took early retirement in 1985. I worked mostly in software testing and validation of missile and carrier software on the SRAM (Short Range Attack Missile) and ALCM (Air Launched Cruise Missile) programs. I decided to take up faceting, since I could do that and still be there when needed to take care of my wife. After considerable research, I bought a Fac-Ette machine, although one without the electronic stop. I contacted the Boeing Mineralogical Society to see if they had any programs on faceting and was advised to contact

Norm Steele, the recognized faceting expert in the area. That was the start of a long and productive friendship and later, business partnership.

The general advice to a beginning faceter at that time was to start by cutting six standard round brilliants, then a couple of emerald cuts, then you were ready to move on to the fancier cuts. I did that and then looked for an oval design to cut. None of the references gave good, accurate cutting instructions. I asked other faceters how they cut ovals. One answered, "I tried one once and it didn't work out, so now I just cut SRB's." A Master Faceter, Del Gowdy, said that when he needed an oval he just sat down at the machine and cut an oval. Neither of these answers was acceptable to someone with an engineering background. Looking at the problem, I realized that an oval is an ellipse which can be described mathematically by an equation. That being the case, I should be able to come up with some exact cutting instructions. It quickly became apparent that an accurate oval outline was required for there to be repeatable cutting instructions. This thinking led to the Micrometer Height Adjustment (MHA) preforming technique. However, it was said that using the MHA method required a Ph.D in Math to develop the data and a Journeyman Machinist to use it. By this time I had developed a working relationship with Phil Bean of Fac-Ette. I realized the cams he sold for preforming were not correct, since they used a point cam follower but the cutting lap is a plane. I redesigned his cams for him using the MHA data. About the same time, I figured out how to simplify the MHA data by going to what is now known as the Centerpoint-Angle Method (CAM) of preforming.

This work was all essentially two dimensional, but facet designs are three dimensional. To do 3-D designs Norm was using a drafting board approach with descriptive geometry relationships. This technique is not adaptable to calculators. I needed an algebraic solution. By this time I had advanced from using a simple, though expensive at the time, manual scientific calculator, to a programmable calculator. Every year in January Norm and I would drive in his motor home down to San Jose to the annual Faceter's Fair. One year, while enroute, Norm sketched out a graphical solution to working the three dimensional problem by working in two dimensions at a time. I took the sketch home and worked out an algebraic expression for his graphical solution. This became Equations G7-G9 in the GENERAL EQUATIONS FOR CALCULATING FACET DESIGNS in Facet Design Vol. 1, OVALS, and the equations used in computing all the designs in the Facet Design series of books. These books were produced between 1978

and 1989. The early books were computed using programmable calculators, manual typewriters, and hand drawn pictures. With the coming of the IBM-PC in 1982, the books were produced using a computerized version of the design equations, Pagemaker software, and a HP plotter. Towards the end of this time period, I added a validation routine to the software which used true 3-D equations. If the design did not validate, it halted and advised the user of the error. This calculation forms one of the primary routines in GemCad, developed by Robert Strickland. In GemCad, instead of stopping and reporting the error, the program goes into an iterative loop and reaches a solution. I was not directly involved in the development of GemCad, although I vigorously encouraged its development. I knew the approach that Norm and I used was seriously in need of updating. Norm and I and Fred VanSant were the only ones that could use it. Also, any change in angles required a complete recalculation of all the data, a very laborious job. To simplify this, in 1977, I came up with the Tangent Ratio technique of scaling all the facet angles. This is documented in Volume 1, OVALS.

Meetpoint faceting evolved from the CAM preforming technique. My article in THE FACETER'S GEM, July 1976 titled "Preforming by the Angle Method," caught the eye of Tom Ricks of the North Carolina Lapidary Society. This began a long series of exchanges between Tom and myself. In one letter in 1977, Tom wrote, "I would like to develop or see someone develop non-preforming techniques for faceting oval and marquises..." In the same letter he sent a copy of an oval procedure and stated: "What I had hoped to do was to establish a specific "meet" point or points for each facet. It seems to me that faceting procedures (designs) can be constructed so that each facet can be placed at a predetermined index and angle and cut to a point where it meets its adjacent facet at a predetermined point." The first design published using "meetpoint" was in the June 1977 issue of FACETS titled "10 MAIN MARQUISE WITHOUT PREFORMING", By Tom Ricks. It used data provided by me to Tom. Fully implementing the meetpoint concept awaited the advent of the ability to calculate the exact facet angles, made possible by the equations mentioned earlier. My first published meetpoint designs were the SUPERNOVA OVAL series begun in the January 1978 issue of the Seattle Facetor Design Notes. So if you dislike meetpoint faceting, blame Tom Ricks. If you love it, I will be happy to take the credit.

In writing the Facet Design books, we had to decide what accuracy to specify the facet angles. Our software computed the angles to six decimal places,

but obviously the facet machines could not be set to that accuracy. To test the waters, we published the first designs in the Seattle Facet Design Notes with one decimal place accuracy. We received some flak, but not too bad. Then one month we switched to two decimal places. We were told loud and clear that the faceters didn't like it. We went back to one decimal place. That same year, at the San Jose Faceters Fair, I overheard Joe Rubin of Ultra-Tec saying, "Here we were fat dumb and happy turning out faceting machines that could be set to one degree, then along come these guys Long and Steele". On the other hand, the Jarvi's had just brought out their Facetron machine which was settable to one decimal place, so they were very happy with our books. In the long run, most manufacturers added vernier scales, and in some cases, used better bearings, in order to achieve the 0.1 degree accuracy. GemCad uses two decimal places, but this is mainly to satisfy the program. It can usually work OK with one decimal place data entry, but is much happier with two place accuracy.

During this time period, working with Dr. Piet VanZanten of the Netherlands, I developed a ray tracing program, RayWin. The connection with Dr. VanZanten was through Alex Wolkosky of France. Piet had a program, written in PASCAL, which produced numerical data, with no graphics. I converted his program to Visual Basic, and added a graphical presentation of the results, i.e., a brightness plot. Later revisions to RayWin extensively modified the algorithms for finding the facet intersections, which greatly increased its speed. Also, a second light model, SPOT plus ISO, was added to overcome a problem with the ISO light model. Optimizing a design using the ISO light model resulted in designs with low crown angles, and very poor performance in the real world. We know this problem as the "Head Shadow" effect, originally described by Bruce Harding in the article "Faceting Limits", in the FALL 1975 issue of Gems and Gemology. The use of RayWin is very limited these days, because, unlike Robert Strickland's GemRay program, you cannot pass variables to it and run in batch mode to optimize a design.

Norm Steele had always maintained a database of all published facet designs. To make this database available to other faceters, I wrote the controversial database "front end" program called DataVue. The first version was very unwieldy, with thousands of small files, and used the Bitmap image format for the pictures. The second version, DataVue2, put all the small files into a few (STO) library files, and replaced the bitmapped pictures with low resolution line drawings (THB). I have to thank Robert Strick-

land for the STO and THB file formats and the utilities to generate them. The functionality of DataVue2 has now been incorporated into GemCad. At the death of Norm in 1997, maintenance of the database was taken over by John Franke of the Facet Shoppe. DataVue has now been made obsolete by the on-line database Facetdiagrams.org.

The book business, all the copyrights, was sold to The Graves Company in 1994. My wife passed away in 1997, after spending the last 14 months in a nursing home. Norm Steele also passed away in 1997. I, in essence, retired from the faceting hobby. Later, my excuse for not faceting was cataracts in both eyes. I could no longer see the meets. The cataracts have been fixed, and I now have 20/20 vision in both eyes. But the time spent faceting has been replaced by other activities, like traveling, flower gardening, doing 10K walks with the Volkssport organization, exercise classes, and doing some entertaining, mostly at retirement and nursing homes, playing the Autoharp and some singing with my companion at the time, who is a professional folksinger and Irish harp player. Recently the creative faceting juices started flowing again with the Easy series of designs, which I cut in Marbleite. The logic there is that if the design will work in Marbleite, it will work in any faceting material. The Easy designs all start with a CAM preform, all of which is incorporated unchanged into the final Pavilion. You can find them on the Facetdiagrams.org website.

CWFG Policy on Membership Renewal

Starting two months before your membership month, you will receive a blue notice in FACETS that your membership is about to expire. Another clue is the blue highlighting of your membership date on your mailing label.

You have a two month grace period, during which time you receive a red notice (and red highlighting on the label) telling you your membership has indeed expired and you need to send in your dues. If we haven't received a check by the third month after your due date, we're sorry to say you are taken off the active rolls.

You can reestablish your membership at any time just by sending us your dues. We really hate to see people go, so please make sure to get those dues in on time!

A note for those of you who do renew: if you send in a renewal, say, early in September, I may not get the information until after the October issue has gone to press. So, if you get a renewal notice again, no worries! Your renewal information probably hasn't been sent to me yet. If you get the notice in November, though, let me know.

Gail Bumala, Editor

CWFG BOARD MEETING

February 19, 2019

We discussed the idea of putting together the Guild case at the Rice Museum. Sylvia LaCroix has a couple of cases that she would be willing to donate to the Guild/Museum to use for this display. Finding suitable location for the display still has to be worked out.

Looking forward to this year's auction we will need to get a committee organized soon to get started on all of the details that have to be worked out for this project.

We talked about organizing an "ask the expert" program a little differently than we have in the past with several "round table" discussions at the same time.

We talked about the CWFG web site and some of the things that are going on to get it updated.

We discussed some of the issues involved around the security of our auction inventory. The question was asked; Do we need to think about a safety deposit box to store the stones? And if so the logistics of inventory lists and etc --- and still allow the auction committee the access they need to be able to complete their tasks?

CMAG and the Gathering of the Guilds group is offering three days access to us for a table at their event rather than just the two days they offered last year. Because the table produced a decent profit last year the board is recommending that we do it again this year and that the membership should discuss the logistics of this before making a commitment.

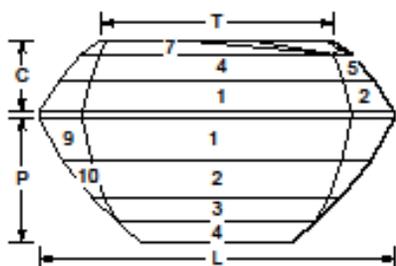
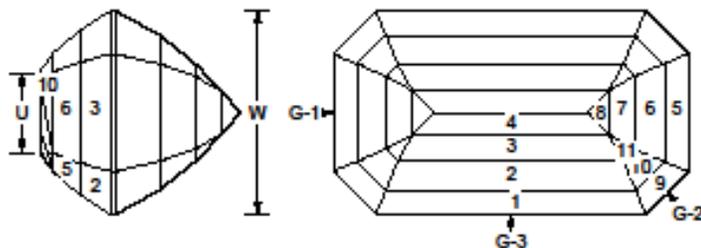
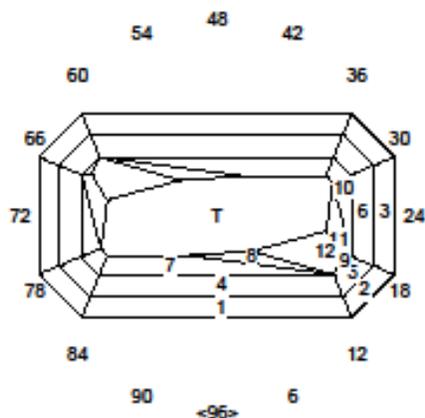
We discussed participation in the Rose Festival jewelry project again this year. This is another item that will need to be decided soon so that an early May deadline could be met.

The meeting was adjourned at 9:10 pm.
Respectfully submitted; Karl Ziltener

Save a Tree-and Save us Some Money!

If you would like to receive *FACETS* electronically, you may receive it via email, saving us printing costs and treating yourself to the publication in FULL COLOR.

The day is coming when electronic will be the only way to enjoy *FACETS*, so why not start now? Send an email to update your address: editor@facetersguild.com



Glorion Emerald - revision by John Franke

These angles should work well for most materials.
The depth should help deepen the color of light materials.

Angles for R.I. = 1.540

59 + 8 girdles = 67 facets

2-fold radial symmetry

96 index

$L/W = 1.750$ $T/W = 1.142$ $U/W = 0.392$

$P/W = 0.610$ $C/W = 0.351$

$Vol./W^3 = 0.929$

PAVILION

G-1	90.00°	24-72	Establish Length
G-2	90.00°	12-36-80-84	Establish Corners
G-3	90.00°	96-48	Establish Width
1	61.00°	96-48	Level Girdle
2	51.00°	96-48	Step Cut
3	44.00°	96-48	Step Cut
4	41.00°	96-48	Step Cut
5	61.00°	24-72	Level Girdle
6	51.00°	24-72	Step Cut
7	44.00°	24-72	Step Cut
8	41.00°	24-72	Step Cut
9	61.00°	12-36-80-84	Level Girdle
10	51.00°	12-36-80-84	Meet at 1-2-9
11	41.22°	12-36-80-84	Adjust angle to fit

CROWN

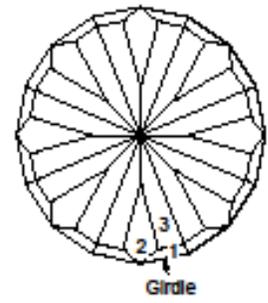
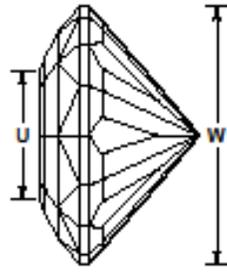
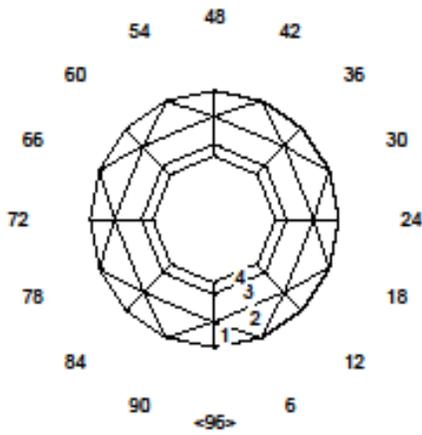
1	57.00°	96-48	Level Girdle
2	57.00°	12-36-80-84	Level Girdle
3	57.00°	24-72	Level Girdle
4	50.00°	96-48	Step Cut
5	50.00°	12-36-80-84	Meet at 1-2-4
6	50.00°	24-72	Meet at 2-3-5
7	35.00°	96-48	Meet at 4-5
8	25.00°	01-48	Meet at 4-5-7
9	35.00°	12-36-80-84	Meet at 4-5-7-8
10	35.00°	24-72	Meet at 5-8-9
11	25.00°	22-70	Meet at 5-8-9
12	17.00°	04-52	Meet at 4-5-7-8
T	0.00°	Table	

The above is a revision of PC06.034 Glorion Rectangle by:

Taylor, W; Diag for Faceting, v2p04

Taylor, W; Gems & Min, Nov 77

C:\Users\Logos\AppData\Local\Microsoft\Windows\iNetCache\Content.Outlook\FJ77OXPC\GLorionEmerald.gem



4Becky 8

Design by John Franke

Angles for R.I. = 1.540

81 + 16 girdles = 97 facets

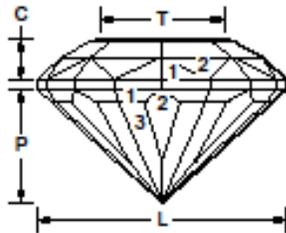
8-fold, mirror-image symmetry

96 index

L/W = 1.000 T/W = 0.493 U/W = 0.493

P/W = 0.441 C/W = 0.162

Vol./W³ = 0.224



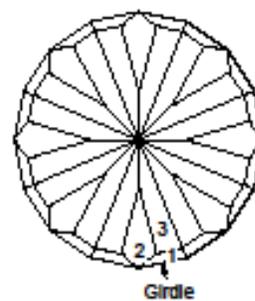
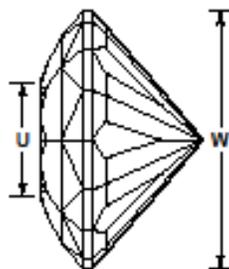
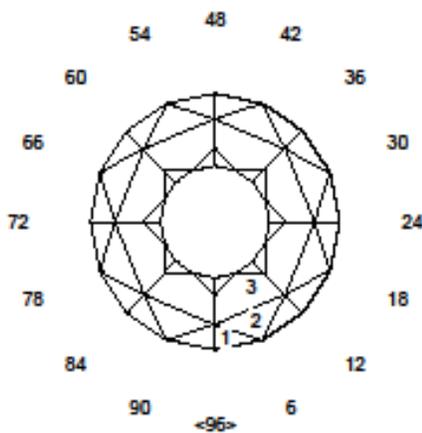
PAVILION

Girdle	90.00°	03-09-15-21-27-33-39-45-51-57-63-69-75-81-87-93	Establish Width
1	51.00°	03-09-15-21-27-33-39-45-51-57-63-69-75-81-87-93	Establish Pavilion Girdle
2	42.00°	96-12-24-36-48-60-72-84	Meet G-2-G
3	41.00°	03-09-15-21-27-33-39-45-51-57-63-69-75-81-87-93	Cut to centerpoint, almost to girdle

CROWN

1	42.00°	03-09-15-21-27-33-39-45-51-57-63-69-75-81-87-93	Establish Crown Girdle
2	34.00°	06-18-30-42-54-66-78-90	Meet G-2-G
3	30.00°	06-18-30-42-54-66-78-90	Meet 1-2-1
4	22.00°	06-18-30-42-54-66-78-90	Cut step row @ #3 settings
	0.00°	Table	

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4Becky 16

Design by John Franke

Angles for R.I. = 1.540

89 + 16 girdles = 105 facets

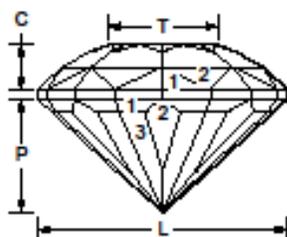
8-fold, mirror-image symmetry

96 index

$L/W = 1.000$ $T/W = 0.437$ $U/W = 0.437$

$P/W = 0.441$ $C/W = 0.175$

$Vol./W^3 = 0.226$



PAVILION

Girdle	90.00°	03-09-15-21-27-33-39-45-51-57-63-69-75-81-87-93	Establish Width
1	51.00°	03-09-15-21-27-33-39-45-51-57-63-69-75-81-87-93	Establish Pavilion Girdle
2	42.00°	96-12-24-36-48-60-72-84	Meet G-2-G
3	41.00°	03-09-15-21-27-33-39-45-51-57-63-69-75-81-87-93	Cut to centerpoint, almost to girdle

CROWN

1	42.00°	03-09-15-21-27-33-39-45-51-57-63-69-75-81-87-93	Establish Crown Girdle
2	34.00°	06-18-30-42-54-66-78-90	Meet G-2-G
3	30.00°	06-18-30-42-54-66-78-90	Meet 1-2-1
	22.00°	03-09-15-21-27-33-39-45-51-57-63-69-75-81-87-93	
	0.00°	Table	

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Faceting Class Schedule

The next series of faceting classes at the Rice NW Museum have been scheduled. All classes consist of five days and are held from 1:00 to 5:00 PM. The cost is now \$150. We have room for seven students per class.

- 1 - Sept. 20, 27, Oct. 4, 11, 18, 2014 - Done
- 2 - Oct. 25, 26, Nov. 1, 2, 8, 2014 - Done
- 3 - Dec. 6, 7, 13, 14, 20, 2014-Done
- 4 - Jan. 3, 10, 17, 24, 31, 2015-Done
- 5 - Feb. 14, 21, 28, Mar. 7, 14, 2015-In progress
- 6 - Mar. 28, 29, Apr. 11, 12, 18, 2015
- 7 - May 2, 9, 16, 30, Jun. 6, 2015

If you know of anyone who is interested in taking this class, call the Rice Northwest Museum at (503) 647-2418 or go to www.ricenorthwestmuseum.org.

It's important to step up and help with these classes. We need both primary instructors and assistants. If you want to assist, talk to Jerry Bartlemay at the Guild meetings. If you want to contact him directly, see page 2 for contact info.

For Our Online Members

There are so many websites available it staggers the imagination. Here are some we have found useful. If you have others that should be added to the list, please let me know. Gail Bumala, Editor

Gem Design Archive (Search by shape, RI, designer, etc.)

www.facetdiagrams.org

Designs at GemologyOnline (Many forums by subject)

http://gemologyproject.com/wiki/index.php?title=Faceting_Designs

CWFG Web Site

www.facetersguild.com

Rice NW Museum of Rocks and Minerals

www.ricenorthwestmuseum.org

GemCad and GemRay

www.gemcad.com

The Facet Shoppe (John Franke's site)

Find Datavue 2 here.

www.gemcutter.com

The Gemstone Artist (John Bailey's site for Voodoo Magic Polish and others)

www.gemstoneartist.com

www.facetingacademy.com

Beta Diamond Products

www.betadiamond.com

Ameritool Inc. Lapidary and Glass Equipment

www.ameritool-inc.com

Charles Covill Design Books

www.ladyfeathers.net

Jeff Graham's books can be purchased at

www.silversupplies.com/catalog/books/faceting.shtml

An archive of the late Jeff Graham's site can be found at

<http://web.archive.org/web/20090413055349/http://www.faceters.com/>

Facetron Faceting Machines, Jarvi Tool Co.

www.facetron.com

Ultra Tec Faceting Machines

www.ultratec-facet.com

Poly-Metric Faceting Machines

www.polymetricinc.com

Mine Direct (Farooq Hashmi's site)

www.minedirect.com

The Image - Gems, Gemology, Faceting, Photography

www.theimage.com

Bob's Rock Shop and Rock and Gem Magazine

www.rockhounds.com

Custom Cut Gems (Lisa Elser's site)

www.custom-cutgems.com

Fine Cut Gemstones (Michael Field's company)

www.finecutgemstones.com

Olga Ulianova Designs

<http://www.pierre-a-facettes.ch/Diagrams.html>

United States Faceters Guild (And forum)

<http://www.usfacetersguild.org/>

Take a deep breath and keep faceting.