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Glass on Metal® Magazine, a magazine pertaining to vitreous enamel and related arts, published five times a year by The W.W. Carpenter Enamel Foundation, whose mission is to help perpetuate, preserve, and expand the use and art of vitreous enamel. Glass on Metal®'s goal is to open communication among users of enamel, and to educate the public about the concept of glass on metal. Glass on Metal® is a registered trademark of The W.W. Carpenter Enamel Foundation.

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Publisher’s Column

We apologize for being so late. Unfortunately Tom Ellis fell and broke his ankle August 8th, the morning he started to work on this issue. Two more sessions of therapy and he should have a clean bill of health.

Page 88 is H. De Koningh’s presentation to the Royal Society of Arts in London, England on January 25, 1928. This was a high water mark for the art of enameling. De Koningh joined a prestigious group of presenters at the Royal Society of Arts starting with William Crookes in 1890, Alexander Graham Bell in 1902, Sir Andrew Nobel in 1909, Madame Curie in 1910, Orville Wright in 1910, etc.

De Koningh was instrumental in the development of enameling, as an art and craft, in the early 1900’s, especially in England. In 1917 he translated from the French, Louis-Elie Millenet’s book “Enamelling On Metal.” In 1927 he wrote “The Preparation of Precious and Other Metal Work For Enamelling.” He was an excellent enameler and innovative.

We thank Erika Speel for sending us a copy of De Koningh’s presentation to the Royal Society of Arts.

Keep in touch,

Woodrow Carpenter

New Donation to WW Carpenter Enamel Foundation Museum

Jackie Spencer and her husband Clay from Arab, Alabama, stopped by the foundation in late September. Jackie was a former resident enamelist and studio head at the the John C. Campbell Folk School. Her husband Clay, is a master blacksmith. The newly expanded and renovated blacksmith shop at the Folk School has been named in his honor, the Clay Spencer Blacksmith Shop. They were on their way to a Blacksmith Conference in Troy, Ohio. While here, Jackie surprised us with a large donation to the museum. Nine painting on enamel panels by John Killmaster (John has contributed many articles in past issues of Glass on Metal) and a bowl with foot by Ed Winter.

Sprayed enamel on steel, crayon, sgraffito, 4 x 6 inches, by John Killmaster.

Red and gray bowl with metallic gold decoration by Ed Winter. 6 ¾ dia. x 4 inches high, transparent and opaque enamel on copper.

Sgraffito and stenciled enamel on steel, 5 x 8 inches, overglaze and crayon, by John Killmaster.
Harold Bill Helwig
1938-2012

Bill Helwig passed away July 12, 2012 after a short illness.

Bill was well known among enamelers, other artists, art enthusiasts and Thompson customers. He was the teachers’s teacher and a cheerleader for enamel. His artwork achieved international renown. His stimulating enamel workshop instruction was also a performance. When teaching or in conversation his theatrics and wit were sometimes startling but had the effect of burning an image or thought into your memory.

I had the good fortune to work with him here at Thompson Enamel for 19 years. I first met Bill at one of his enamel workshops at Arrowmont school in 1981. One exercise involved using floor sweepings and the contents of a dirty ashtray as part of an underglaze concoction for decorating our enamel project. He wanted us to make the connection that ceramic pigments come from the earth and could be thought of as ‘dirt’. He was thinking ‘outside the box’ before that phrase became popular.

Bill showed us how the result of every firing would ‘speak,’ guiding us to the next consideration, application and firing. A part of every critique was to look at the back of the piece to see what information may be given there.

In his workshops he would demonstrate the most ergonomic-correct body position when engaged in an activity such as painting, sifting enamel, drawing, sawing metal, any of the procedures used in art making. Learning the correct body posturing made these activities much easier to do.

In the 27 years that Bill worked for The Ceramic Coating Company and Thompson Enamel, he enameled every day. It might be product samples from the manufacturing process or something sent in by a customer with questions. It might be an idea he had. He was always observing and processing what he saw. Sometimes his observations became works of art such as the ‘Stone Stories’, ‘Wraptures’ and ‘Conductor’ series.

Self portrait, enamel on aluminum, 8 inches in diameter.
W.W. Carpenter Enamel Museum.

Early photo of Bill, at right.

His instinctive curiosity was the foundation to his amazing observation skills. Trying to process what he saw was almost a game to him. When looking at anything - magazine ads, photos, TV programs, news events - even football, he would dissect, identify, configure, look for patterns, find things out of place, or odd or impressive or inspiring. He looked for things to find.

When he had an idea for an artistic work, he would not just make one or two of the same idea, but more like 30 or 40 works. He would exhaust the potential.

He was skillful. When working with R&D and quality control at Thompson and when working on his art, Bill was in control of his every movement and motion, made precisely to accomplish what he was working on. He used to say he was ‘lazy’, but in reality he just eliminated anything that wasn’t necessary.

Bill had his own intuitive ‘feng shui.’ Arranging things in their own space was important to him. His desk at work was usually covered from edge to edge with work items in process, but Bill knew what was in each pile.

He had an eye for arranging artworks in a museum collection or an art show. His beloved garden was carefully considered each year with placement of new additions and the maintaining of existing flora and fauna.

‘Wraptures,’ 4 x 5 inch enamel on copper, W.W. Carpenter Enamel Museum.

Cut out face figure, 6 inch diameter, enamel on copper, grisaille, fumed. W.W. Carpenter Enamel Museum.
He was accessible to those genuinely interested in learning to enamel. There was no question that was too elementary from the sincere; however, he did not waste time on people who wanted answers with no effort or desire to understand on their part. He would gladly give unabridged information to those who were truly interested but would dismiss those he perceived impatient wanting an easy ‘yes’ or ‘no’.

Bill was the first editor of Glass on Metal magazine from 1982-1985. He continued as contributing author and consultant to the magazine up until his death. He served on the board of the Enamelist Society from 1991 to 1998 and received the Society’s prestigious Creative Arts Award in 2001. At the Society’s conference auctions, Bill’s purchases and contributions were often a considerable percentage of the total income.

Bill’s most outstanding character was his tremendous creativity. He was an amazing enamelist. His art achieved transcendence. His work inspires contemplation. He used his vast knowledge of enameling procedure and materials to evoke his inner thoughts and visions into rich and precious objects.

Tom Ellis
Obituary
Harold Bill Helwig, 73, died July 12, 2012 at St. Elizabeth Hospital, Ft. Thomas, Kentucky from complication of colon cancer. He was the son of the late Fred and Oleva Helwig of Hoisington Kansas.

Bill graduated from Hoisington High School, Hoisington Kansas in 1956 and from T. Hays State College, Hays, Kansas with a BS in Art in 1960 and with a Masters degree in Watercolor in 1961.

He served in the US Army from 1961 to 1963. He was stationed for a time in Germany and visited many art museums. He married Lenore Davis on December 21, 1968 at her home in Mt. Carmel, Connecticut. They lived in Buffalo, New York where Bill was Associate Director of the Creative Craft Center at the State University of New York, Buffalo. In 1977 Bill accepted a position at Woodrow W. Carpenter’s Ceramic Coating Company and moved to Newport, Kentucky. This company later purchased Thompson Enamel where Bill worked up until his death. He was well known and respected in the field of enameling. Survivors include his brother, Gary and his wife Laura of Crystal City, Missouri; sister Oleva and her husband David Gatlin of Wichita, Kansas; cousins, numerous nieces, nephews, great nieces and many friends.

He was preceded in death by his wife, Lenore Davis; parents, Fred and Oleva Helwig; birth father Harold Littrell; sister, Maribeth Helwig and his favorite aunt, Elouise Schwab. Cremation has taken place.
I once read that people who embrace “possibility thinking” are capable of accomplishing tasks that seem impossible because they believe in solutions.

In 2009, I embraced “possibility thinking,” after an enameling friend grew tired of listening to my frustrations, and suggested I start a global web site for Enamel Artists. That small idea became a major undertaking.

The first step in becoming a “possibility thinker,” is to stop yourself from searching and dwelling on what is wrong with any given situation, but to broaden your horizons and dream bigger. That advice has led me along a successful career path in the past and I saw no reason why I couldn’t apply it again.

There was just one major problem. The impossible task I was about to undertake was gaining a lifetime of knowledge in an area I knew nothing about in a very short period of time. I would have to peddle fast into the black hole of “geek land” to learn about the internet, social networking, network providers, web registrars, web site designers, web site crawlers and the intricate language of CSS and HTML, before someone else came up with my idea. Not much to ask of a person who could barely explain the difference between a blog and a forum and only functioned on an email level.

But, you can’t help but become more confident and think bigger when you are around possibility thinkers. I have one in my friend and enamel artist, Vera Meyer, who was the wind beneath my wings. Although, we lived in two different states, Vera wasted no time burning up the telephone lines and Internet with vast pages of network information to turn me from novice to graduate in four quick months.

In December 2009, Grains of Glass Open Studio website was born and within its first year was already at the top of the charts on Google listings. Build it and they will come, and over 1,000 enamel artists have from 48 countries around the world. From beginner to well-seasoned professional enamel artists, Grains of Glass has become a meeting place to share friendship and knowledge.
Popular thinking considered building a social network for enamel artists a waste of my time. They argued that Facebook had it covered, as well as many other craft and jewelry websites. But popular thinking has proved to be wrong and limiting.

My reply is this: In every small town, city, state and country across the globe, there are anonymous artists and students working, creating and learning the Art of Enameling. How many do you know? How much of their work have you seen? How do you become friends and share your art and knowledge with a person thousands of miles away that you will never have the opportunity to meet? How would you find their website, if you never knew they existed?

My desire is to take the word “anonymous” out of the enamel artist community and have one giant meeting place of global sharing and friendship without leaving home. I love the idea of interviewing members about their lives, culture and their interest in the art of enameling. Reading about a featured artist on the website, isn’t about reading a sterile artist statement, but a warm and well written story in their own words about their life’s journey and their passion for the art.

Grains of Glass offers groups in every enameling technique, videos, tutorials from well known artists, links, international guild information, workshops, exhibitions, call for entries, suppliers, a library, conference information, jewelry & bead show dates, studio tours, and the best of all Notebooks containing information from so many artists which have become a resource for everyone.

Everything begins with a thought – this was mine – Grains of Glass Open Studio - A worldwide network to bring together enamel artists to share their art, friendship and knowledge all under one roof. Visit: www.grainsofglass.com and enjoy our company!

“No matter what you are trying to accomplish, you can do it better with shared thinking…”
—John C. Maxwell, How Successful People Think
Seamless Copper Beads

By Tom Ellis

Thompson Enamel has four sizes of seamless copper beads; small (RCB-3), medium (RCB-2), and large (RCB-1) spherical copper beads and one that is oval (OCB-1) in shape. Thompson also sells a bead firing rack (BR-2) which comes with 4 mandrels that fit through the holes in the beads (fig. 1).

These copper beads are meant to be fired in a furnace. The beads are hollow. There are holes on each end or side of the bead.

An easy way to prepare the copper beads for enameling is to anneal the bead to 'green'. The bead is threaded through a mandrel and placed on the bead rack. It is placed into a 1450°F furnace for approximately 40 to 60 seconds. Practice may be necessary to get a feel for how long to leave it in the furnace. It will first start to turn a red/purple. If you see this color, remove immediately. It then turns a gray/green color. The bead will become black if left in too long. See Glass on Metal, Vol. 10, No. 3 pp.183. Annealing to green will remove any oil or grease on the surface allowing water based adhesives to sheet across the surface during the application of enamel (fig. 2).

A sprayer (Preval sprayer, A-7) that will produce a fine mist containing 1 part Klyr Fire and 3 parts water is needed for the process of applying enamel to the copper bead surface (fig. 3).
After annealing to green, hold the mandrel with the copper bead sitting on top of thumb and forefinger (fig. 4).

Spray the copper bead lightly with the Klyr-Fire mixture on the top half of the bead. Keep the sprayer 1-1/2 feet away from the bead and hold the sprayer vertically. Lightly sift 80 mesh enamel onto the top half of the bead. It is not important to achieve a complete coating on this first go-round.

Spray lightly again. This should show the areas which have more enamel or less enamel (fig. 5).

Sift lightly again, trying to hit the areas which have less enamel and staying away from the areas that have more. Repeat the light spray and light sift (usually one or two more times) until an even, uniform coat of enamel has been achieved. The enamel should look damp from the Klyr-fire mixture (fig. 6).

Next, carefully move the mandrel and bead into a horizontal position (fig. 7).

Grab the other end of the mandrel and let the enamel-covered end of the bead rest on your thumb (fig. 8).
The top of the bead is ready for enamel application. Repeat the above application procedure until the bead is completely covered. Make sure enough Klyr-fire mixture has been applied so that all particles have some Klyr-fire mixture on them (fig. 9), however, do not apply so much Klyr-fire mixture that it forms a drop of liquid at the bottom of the bead.

After bead has cooled, it must be removed from the mandrel. This may require that the mandrel is bent back and forth until the bead breaks loose. In the firing process some enamel may fuse the mandrel and bead together where the bead touches the mandrel (fig. 12). It is this connection that must be broken. Wear safety glasses.

Place bead on mandrel onto the bead rack. Using a small brush, remove the over-sift enamel at each side of the bead from the mandrel (fig. 10).

Dry bead for 20 minutes under a heat lamp or on top of the furnace (make sure it is thoroughly dry). Fire bead for 3 to 4 minutes at 1450°F. (fig. 11).

Figure 9

Figure 10

Figure 11

Place bead on mandrel onto the bead rack. Using a small brush, remove the over-sift enamel at each side of the bead from the mandrel (fig. 10).

Dry bead for 20 minutes under a heat lamp or on top of the furnace (make sure it is thoroughly dry). Fire bead for 3 to 4 minutes at 1450°F. (fig. 11).

If it is intended that the bead will not receive any more enamel (second coat or decoration) then the bead is threaded onto the clean mandrel and refired. This will heal any cracks in the enamel around the holes which were made when the mandrel was removed from the bead after the first firing.

At this point the bead may be left as is (fig. 14) or it could be further worked with more decoration. Additional decoration procedure options will be the focus of a future article in Glass on Metal.
"The Real Thing"

By Pam East

My piece, titled “The Real Thing,” was made using Art Clay Silver metal clay and enamel (see fig. 1). It was created in response to a call I got from Reed Caldwell of the John C. Campbell Folk School. He asked if I would submit a piece for a fund raising auction being sponsored by Coca-Cola. Almost immediately I had an image in my mind of what I wanted to do. I was inspired by the fluid, elegant lines of the coke logo and wanted to abstract them to create ribbon like effects in a champlévé piece. I was also anxious to push the envelope of what was being accomplished with metal clay and enameling. So much of what is being done with metal clay is fairly organic, but I knew it was possible to produce precision designs, and indeed, I have been doing so for some time now. The Coke project gave me the opportunity to push it to the next level and showcase it.

The key to precision champlévé in metal clay is the use of Photo-Polymer Plates (PPP). Photo-Polymer is a light sensitive polymer material which was originally developed for the commercial printing industry to make printing plates, but has been adapted beautifully to the metal clay market. To create a plate I start by producing my designs in black and white; either directly in computer graphics software, or on paper and then scanning it in to the computer. The image is then sized appropriately and printed onto transparency. The transparency is placed on the Photo-Polymer Plate and exposed to UV light. After exposure the plate is washed out in warm water and re-exposed to finish the curing process. The resulting plate has good depth, and crisp, sharp lines. It can then be used to create very clear impressions in the metal clay (see fig. 3).

The next challenge was getting a true “coke red” enamel to fire onto fine silver. I tried transparents. I tried opaques. I fired over flux, I fired over gold, I fired over white, I exhausted every shade of red I had in my collection, in nearly every possible combination. Most of it was either too raspberry, too flat, or turned ugly brown when fired on silver. By the time I was done I had made countless test strips. Most of them contained as many as eight combinations per strip. One particularly notable test block had 21 unique combinations laid out in a grid pattern. I’m not sure if this exercise qualifies me for the “test strip hall of fame” or an all expenses paid trip to a lunatic asylum (see fig. 2).

The final winning combination was Soyer 2000 layered over Soyer 289, and the entire enameled area was lined with 24K gold foil to prevent the silver from discoloring the red. I have to say, completely covering up that much gold was almost painful, but it worked! Ultimately, it was worth all the effort. My piece, titled “The Real Thing” was selected to be the “Featured Coke item” for the auction.

The pieces in the exhibition were on display at the Coca-Cola Corporate Headquarters for the month of January. On February 4th the exhibition was moved to the Woodruff Arts Center in Atlanta, where many of the pieces were auctioned to raise funds for the Folk School, a non-profit organization. On February the 8th “The Real Thing” necklace continued its journey traveling to New York City to be worn by Trudy Straw, Director of Wellness Outreach for the Coca-Cola Company, at the annual Red Dress Collection Fashion Show. Sponsored by Diet Coke, The Heart Truth signature event is part of Fashion Week in New York, and is dedicated to raising public awareness of the risks of heart disease, the number one killer of women.

Visit my website for more information, www.pameast.net
Another way to create texture on copper quickly and chemical-free, versus acid etching is corrugating thin copper. A requirement for earrings is that they are lightweight, whatever enameling technique they are made in. So I found that 30 gauge copper sheet is ideal to run through the corrugator where it becomes very sturdy and ready for enameling front and back; and Thompson’s transparent unleaded enamels are just the perfect combination. A fun project for my adult classes at any level.

Special Tools
Microfold Brake, (forming tools, Rio Grande) or a small steel tube wringer, Rio Rolling Mill (I used a small Paragon digital kiln)

Looking at my test samples of transparents, I decided which colors are the most suited for this technique. They are the ones used directly on the metal.

Grading my enamels earlier helped me to have several containers on hand with the courser material ready to use without the fines (325) that way they can be used in sifting as well as inlaying.

Procedure
Clean a copper strip approximately 5x2 inches, feed it in the corrugator and turn the handle; it will look ordinary like roofing tin when it comes out. Now anneal it 1 ½ minutes in the kiln, dry it and feed it in again, but this time on a slant or a different direction. Looks much more interesting.

Anneal the piece in preparation for the rolling mill. This is necessary to flatten the surface for enameling. If you don’t do this, an uneven coverage of glass might result in oxidation spots. The enamel would have to be applied too thick to cover the dimensional texture completely. I am striving for thin but complete. After milling, cut out your shapes with shears and make holes (see Fig. 2), anneal. They also can be formed further in a hydraulic press, (see heart shape in Fig. 1) or the edges can be turned back as in the brown rectangular earrings over the edge of a metal block (see Fig. 3).
Wash the pieces, pickle and clean them carefully with a brass brush (see fig. 4). The front of the pieces are painted with Scalex and dried.

The counter enamel (op. black) is inlaid thick enough to make the metal invisible (see fig. 5).

The three colors (aqua, cascade and concord) are prepared in three spoons with enough water and a drop of Klyfire (see fig. 6).

Firing time and temperature depend somewhat on the kiln you are using. Other variables to consider are: how many pieces on one trivet, size of rack and size of piece, as usual, testing is worth your time!

Blue earrings were counter enamelled black and then fired at 1450° for 2 min. and 30 sec. the first firing must be sufficient to dissolve all copper oxide (brown) for brilliant color (see fig. 8).

If your piece is thicker and larger it might take 30 sec. longer in the furnace. Often second firings are needed to add more color by sifting and to make the oxide go away if there was any left. On demo piece, a second firing was used to intensify the purple by sifting a thin coat while opaque backs were checked and repaired to keep them perfect.

After the first firing more grass green was added at the bottom and a light sifting of yellow at the top and some 2020 clear, 100m, to even the coat (see fig. 9). Then re-fired at 1450° for 2 min.

Earrings were filed and sanded smooth on the edges. Earwires (gold-filled or argentium-silver) were attached and matching glass beads chosen to compliment the color scheme.
The art of enamelling is that of decorating articles made of certain metals with a vitreous substance resembling the flint glass of commerce, but somewhat more fusible and coloured by means of various metallic salts, mainly the oxides, such as those of cobalt, copper, iron, manganese, etc. Enamels for all artistic and high-class metal work are prepared in comparatively small quantities, from two to four or five kilos at a melting. Certain fluxes, as we call the clear colourless enamels, are prepared in larger quantities, in the same manner as in flint glass, as are also the enamels for commercial use on a large scale, such as advertising signs, baths, domestic hardware, etc., but with these latter we have no present concern. Enamels are supplied for use in the form of cakes, lumps and occasionally rods. These are broken with an ordinary hammer to a suitable size and a sufficient quantity for immediate use is ground in plain water, in an agate mortar; the degree of fineness required will be determined partly by the nature of the particular enamel and partly by the nature of the article to be enamelled, but the average “grit” will be that of a fine sand. After grinding, the enamel is copiously washed with clean water to remove every trace of mud or silt which forms in the grinding, and is then placed in china or glass pots provided with covers. It is now ready for use.

The process of applying the enamel is this: The workman having his pots containing the various colours he requires ranged on the bench in front of him, and the article to be enamelled properly cleaned and dried, takes up on the end of a thin steel a blob of the wet enamel, which he applies to the proper place on the article, a dexterous little wiggle of the spatula spreads this blob fairly evenly; he then takes up another blob and applies it alongside the first, and so on, until the whole of the appointed place is covered. He then dries out the excess moisture by means of a piece of clean dry linen folded into a pad in the same manner as one folds a pocket handkerchief; this is gently pressed against the side of the enamel, and quickly absorbs the greater part of the moisture; the article is then placed near the furnace that every trace of moisture may be expelled and when this is completed, in from five to twenty minutes, the article is very carefully placed on a fireclay slab, or planche, and introduced into the furnace, which should be at its full working heat: in a short while, varying from a few seconds to several minutes according to the size and nature of the article, it will be noticed that the fine particles of enamel begin to fuse and run together. This is a critical moment, for while the process of fusion must be carried far enough, it must not proceed too far or the enamel will suffer, and in extreme cases the metal itself might actually melt; as soon as the fusion—or firing as we call it—is judged to be complete, the article is quickly withdrawn from the furnace and put on one side to cool. It will then be seen that the particles of enamel have coalesced and present a shiny, homogeneous, slightly undulating surface, and all being well this thin coating of enamel will adhere firmly to the metal; a further coat or coats, as may be necessary, are then applied and fired in the same manner as the first. In some cases the degree of “finish” thus attained will be sufficient; in others, the surface of the enamel is ground over with such abrasives as emery or carborundum and thoroughly cleansed with clear water. Any little hollows which may remain in the enamel are then filled in, and the article is again fired. A further touch over with a file may be necessary to remove any little lumpiness: then another thorough cleansing and a final firing to restore the glaze and the work is complete.

That, briefly, is the method of enamelling—very simple in theory, but a very different matter in practice, when many factors come into play, such as the nature of the metal employed in making the article to be enamelled, e.g., gold, silver or copper, the quantity and composition of their alloys, the suitability or otherwise of any particular enamel for certain classes of work, and a multitude of details into which it is
impossible to enter here, but which I have described fully and practically elsewhere. ¹ I have, of course, only explained here the procedure with a simple article requiring at most three or four fires, but many articles, or varying styles of enamels, will require anything up to ten or a dozen firings, but, throughout, the principles remain exactly the same; in fact, it is interesting to remember also that in whatever age the art has been practised and in whatever land, the essential processes just described have remained virtually unchanged.

Improvements there have been, of course, but these have been purely on the mechanical side, better and more varied tools, a greater range of colours the use of lathes of various types and, especially, improved types of furnaces.

In Fig. 1 we have a rough design, so far as we can understand the description handed down to us, of the earliest known type of enamelling furnace, if we can call it a furnace: the lower part, indeed, is very much like the iron braziers used by the night-watchmen who guard our street excavations, and was filled with burning charcoal. When this was well alight, the article to be fired, resting on a sheet of iron, was placed on the hot charcoal; then the upper part, which was provided with a handle, was placed over this and covered also with charcoal, and the apprentice hopped round with a pair of bellows or a fan to keep the whole thing glowing. The master observed the progress of events through one of the holes in the upper part, which was kept clear for the purpose: when he judged that the firing was complete the burning charcoal was removed from the top and the whole contraption put on one side to cool, a chancy business at the best, and when I think of the wonderful results obtained by such inadequate means, I metaphorically raise my hat to those long-gone fellow craftsmen of mine.

The next development in this direction is shown in an interesting print² drawn by himself of the workshop of Etienne Delaune, a goldsmith of Paris, 1576, which, allowing for the difference in costume, could well represent a goldsmith's workshop of today, or if the wire-drawing bench on the left were replaced by a polishing bench, it would do equally well for that of an enameller, as there is a furnace on the right (the goldsmiths of those days were their own enamellers): this furnace is built into the chimney breast, the front, which is removable, being formed of a stout iron plate with suitable apertures; the fuel was charcoal, replaced at a later period by coke; the furnace was provided with a fireclay muffle arch to keep the fuel and dust off the work being fired. This type of furnace remained in use for a long period: in fact, in my young days, before gas was thought of, except for very small furnaces, I worked at such a furnace, and as the iron front used to get red hot, firing a large article was no pleasant task.

Another interesting picture² from Jacob's "Jeypore Enamels" shows a group of Jeypore enamellers at work, the period being about 1880. It will be noticed that, allowing for the difference in environment, there is quite a marked family resemblance between the workshop of the Frenchman, Etienne Delaune, and of the Sikh, Gumah Singh, although the furnace of the latter is very primitive and appears to be a development of the first type illustrated in Fig. 1.

In Fig. 2, we have the most modern type of gas-heated muffle furnace: the two injector burners use gas at the ordinary house pressure, but the air is pumped in at high pressure by means of a compressor. A furnace of this type will attain a heat of about 1100 Centigrade. The small furnace on the left is normally used without any forced draught; and it will be noticed that on the iron plate a few inches below the bottom of the furnace are two articles of which the enamel is drying in the manner already described. At the left, on the floor, is a kiln shaped gas furnace (the top has been removed) used for melting; there a skittle-shaped pot on the top of the larger furnace used for this purpose: this will take a charge of about 3 ½ lbs. of enamel.

That the art of enameling is of great antiquity there is no doubt, but as to when and where, or by whom, it was first practised we know nothing definite. I have my own theory, of course, which naturally differs from that of the other learned gentlemen who have written on the subject, but of these learned archaeologists, few, have had any practical experience and there has been considerable confusion between three types of decoration employed by the ancients, namely, true vitreous enamels, inlays of thin pieces of coloured glass and some kind of composition.


² Reproduced in "The Preparation of Precious and other Metals for Enamelling."
There are, however, a few examples of undoubtedly vitreous enamels dating back to the pre-Christian era, and I propose to show you some of these, together with examples from succeeding periods down to the present day, and leave it to you to form theories of your own if you are so inclined.

The earliest known type of enamels (and in this connection I now refer to the completed article) are in the cloisonné style; that is to say, the ‘cloisons’ or cells which contain the enamel were formed from thin flat wires bent to the required shapes and lightly soldered on to the surface of the articles to be enamelled. The spaces thus formed were then filled in with enamel in the manner I have already described, the surface being finally ground over and polished so that the upper edges of the wires and the surface of the enamel were perfectly level.

There were certain difficulties in the way of obtaining photographs of these articles so I have had to resort to making sketches of them, but they serve to illustrate the old axiom, “There is nothing new under the sun,” for the rings Nos. 1 and 2 (Fig. 3), though quite modern in appearance, are of the Greek Mycenaean period and are considered to date from about 1100 B.C. They are cloisonné, the gold edges and lines having been applied as I have just described. I was privileged by the authorities of the British Museum to examine one of these rings very closely a good many years ago, and in my opinion it is undoubtedly vitreous enamel, but very much decomposed owing to the action of the damp earth in which it had been buried for many centuries, and it is the earliest example of enamelling of which I have personal knowledge. There is in the Boulak Museum, Cairo, an ornament from the tomb of Queen Aethelthryth, about 1700 B.C., said to be decorated with a kind of enamel, and if this statement is correct, it would set the date still earlier. The next authentic pieces to which a reasonably approximate date can be set are several gold enamelled ornaments found in the tumuli at Kerch in the Crimea about 1840. These are of Graeco-Scythian workmanship and date from the fourth to the third centuries B.C. I do not think any examples of these articles ever found their way to this country. No. 3, a flying hawk of typically Egyptian design, is in the British Museum, but, unfortunately, nothing is known of its origin. It is cloisonné enamel, and from the general style I am inclined to think it is of Greek workmanship, but probably of later date than the two rings. Of course, the dates I have mentioned are merely approximate, but (from this period we begin to walk on much firmer ground. The scene, however shifts from the East to the West of Europe, and in the first century B.C. we find the earliest of the well-known Keltic enamels. Whether the art was imported from the East, or whether, as is more probable, it sprang up spontaneously in the West, we have no means of deciding, but there is a significant difference or style. In Fig. 4, we get a variation in the method; here the spaces to be enamelled are sunk with the graving tool or chisel—that is the champlevé style—or the article is modelled and cast, the enamelled parts being recessed; broader bands and masses of metal separate the colours. The work of the Keltic (late Iron Age), and of the Anglo-Roman period which succeeded it, is marked by a correctness of design and a freedom of execution entirely lacking in the thin wire cloisonné work characteristic of the Eastern craftsmen. This example1 (Fig. 4) is part probably of a harness trapping and was found at Polden Hill, Somerset, and I would like you to compare this with Fig. 5. In addition to harness trappings, Keltic and Anglo-Roman enamels included such personal ornaments as brooches, pins, bracelets, and a variety of little boxes probably intended to contain scents or unguents. According to Philostratos, a Greek writer established in Rome in the early part of the 3rd century, the art was also practised in the Gallo-Roman colonies of Western Gaul. There seems, however, to have been no knowledge of it in Italy and during the wars and invasions which subsequently ravaged Europe, the art seems to have died out on the Continent, although it undoubtedly survived in England and Ireland: the beautiful Ardagh and Tassilio chalices bear typically Irish characteristics, and the date 758-78 is one of the earliest for enamels bearing figure subjects, and as far as we know these are among the earliest examples of enamel applied to purely ecclesiastical articles. A little later on, the rings of Ethelwulf and Ethelwith, 836-838, and another of the late Saxon period, with an engraved and enamelled inscription and geometrical ornamentation, have characteristics quite distinct from the schools of either Byzantium or Limoges. These three rings are in the British Museum, as are many examples of the Anglo-Roman period to which I have already referred.
On the Continent of Europe the art revived in about the ninth century at Byzantium, then the seat of most of the arts, and our museums possess several good examples of Byzantine craftsmanship. Fig. 5 shows a pocket reliquary of the 12th century notable for the technical perfection of its workmanship. It is about two inches in diameter and is made of nearly pure gold. The cloisons show very distinctly, and when the minuteness of the detail and the softness of the material are borne in mind one can but wonder at the skill and patience required, not only in bending the tiny pieces of flat wire into shape and affixing them to the base, but also in introducing the enamel into the cloisons and polishing the surface smooth without distorting the shapes. I would like you, however, to notice here the difference between this piece and the harness fitting (Fig. 4). In the Celtic piece the broad and varying shaped masses give a freedom and strength of design entirely lacking in the Byzantine work, which in spite of its wonderful technique is cold and flat. From this period enamels become at most entirely ecclesiastic in their character, and a panel of the mid 11th century in the Victoria and Albert Museum, with the figure of a dancing girl, is notable as one of the few secular Byzantine enamels of which we have knowledge.

From about the 12th century the art declined in the East, but had reappeared in the beginning of the 11th century in the West, in Aquitaine, Limoges being the centre from which the art spread throughout France and Germany. Its influence was also felt in England and Italy, although in the former country the Keltic influence was never lost and in the latter the Byzantine or Greek influence was predominant. Champleve had been practised in their later period by the Byzantines, first in conjunction with cloisonné, then independently, and was employed exclusively by the early Limoges school. The art found staunch supporters in such ecclesiastics as Suger, Abbot of St. Denis (died 1152), and was strengthened by the religious direction acquired by the Crusaders in the East, while a simple monk, Theophilus, himself no mean craftsman, wrote a treatise on the industrial arts of his time. There is a translation in the British Museum which is not only very interesting to the general reader, but might in these days of specialisation and mass production, be profitably studied by the craftsman, especially if of the younger generation. A very good example of the Limoges work in Champlève can be seen in Westminster Abbey. This is the cushion and sword-belt on the effigy of William de Valence. The date is about 1307.

An earlier example of English figure work in champlève is a plaque (Fig. 6), “St. Paul arguing with the Jews and Greeks,” and is notable for its character and force. It is one of a series evidently by the same hand, “St. Paul being lowered from the walls of Damascus.” In the Victoria and Albert Museum; “St. James the Less and St. Jude,” in the British Museum; “St. Paul and his disciples,” in the Metropolitan Museum, New York; and “St. Peter essaying to walk on the waves,” in the Germania Museum, Nuremberg. The drawing, technique, and, in fact, the whole conception of these pieces is far superior to the German or even French work of the 12th century.

An altar cross by Godefroi de Clair of Huy on the Maas, about 1165 (Victoria and Albert Museum), shows a typical method of mounting small enamels on a wood base.

A very beautiful example of Rhenish Byzantine work of the 13th century is a shrine or reliquary, in the form of a domed temple (Victoria and Albert Museum); practically the whole of the metal work is decorated with Champlève enamel and the niches are filled with statuettes carved in walrus tusks. A very interesting piece of English enamel is the brass of Sir John D’Abernon at Stoke D’Abernon; the date is 1277, which is the earliest known enamelled brass in England. The enamelled portions are separate pieces let into the main brass. Somewhat later examples of English Champlève enamels are the shields on the tomb of Edward the Black Prince at Canterbury, and the “Bruce horn” has also enamels typical of the period.

Enamels, Secular and Ecclesiastic by H. de Koningh will continue in the next issue of Glass on Metal.
Enamel Sponge Painting

By Gillie Hoyte Byrom

Gillie Hoyte Byrom has over 20 years experience of painting enamel portrait miniatures to commission, following her training in Barcelona. She is now keen to pass on her knowledge of traditional painting techniques to those who have some artistic ability. Gillie offers intensive 1:1 tuition in fine vitreous enamel painting at her studio at Dartington Hall.

Separate from this she has developed an easier method of applying the same enamel paint using a sponge and lacquer resist. This serves as an introduction to enamel painting.

Enamel Sponge Painting

Traditional enamel painting is normally done with a brush and usually requires artistic ability, a steady hand and patience to be successful. The Sunshine Overglaze range of colours are finely ground vitreous enamel paints which can be mixed with either a water-based or oil medium. Paint is applied thinly and fires at about 750°C. Applying successive thin layers gradually builds up depth in the painting. At the same time a fine glaze is achieved whereby layers of pigment drop into the enamel base by a hair’s breadth during firing.

Applying the same onglaze vitreous enamel paints with a sponge using lacquer resist is a more free method of working and opens up new possibilities, accessing the medium to a wider audience.

Sponge painting is a well known pottery technique. While on a visit to Stoke-on-Trent, UK to visit W G Ball’s enamelling factory, I chanced upon Emma Bridgewater’s ceramics factory and made a tour to find out more about her decorating processes. There the sponges are cut into shapes and used to apply paint to the pre-glazed ceramics.

Since then I have developed the following method for sponge painting vitreous enamel:

- Create a design and trace the outline onto tracing paper.
- Rub the back of the tracing paper with pencil.
- Roll plasticine over the enamel plaque. Lay the tracing paper over the plaque and trace the outline. Remove any smears.
- Fire the plaque at 700°C to remove any grease and fix the pencil line to the base.
- Beware higher temperatures burn out the pencil.
- Enamel glows red and pencil remains as silvery grey matt line on the surface of the enamel.
- Paint water-based (red) lacquer resist on the enamel at an even redness. (See editor’s note.)
- Not too thin or it won’t peel away later.
- Hold the plaque at the front of the kiln or use a hairdryer to dry but NOT bake.
- If the lacquer resist hardens it will craze rather than peel.
- Using a palette knife, grind onglaze pigment(s) with water-based medium.
- Prepared paint should have the consistency of toothpaste.
- Apply paint with a piece of fine upholstery sponge (make-up sponge also works).
- Several paints can be applied and blended in one firing.
- Allow to dry a little to avoid drag marks in the paint when peeling away the resist.
- Use tweezers to peel away the dry red lacquer resist.
Similarities between Sponge Enamel Painting and Fine Enamel Painting techniques:

- Work cleanly and remove any dust
- Grind the enamel powder pigments finely to eliminate lumps
- Paint has the consistency of toothpaste
- Paints are intermixable though Cadmium colours are best mixed separately
- Don’t apply the paint too thickly, sequence thin layers between firings
- Work wet-in-wet but be very cautious about applying paint to a dried surface as too thick a layer will not fire properly and may remove the unfired paint below
- Layer the colour between firings – up to about 8 times on copper and steel plaques
- Make painterly marks
  - dab softly/heavily with the sponge and work into the paint without it getting “muddy”
  - pointillism or cross hatching or brush strokes with the paint brush
- Remove paint with a stylus, end of the paint brush or sponge to reveal the previously fired layer(s).

Editor’s Note: In the US, a ‘latex resist’ is used rather than a water based (red) lacquer. The ‘latex resist’ is available through pottery materials suppliers. Thompson Enamel’s Overglaze Painting Enamels (900E series) in dry powder could be used as the onglaze pigments suggested in the article. Thompson’s A-1 Klyr-fire or A-13 Acrylic Medium could be substituted for the ‘Unimedia.’

• Tidy up the design before firing.

• Fire at about 750°C (1382°F).
• Until the enamel is shiny rather than matt but best not to fully fire until the final firing.

• Above: Repeat process to build up colours in design.
• Left: add fine brush work; underglaze black, beads etc.
• Below: Finished piece.

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www.enamelportraitminiatures.co.uk
**Enamel News**

**DX Ross/Talismans**  
October 5, 2012 - January 6, 2013  
Florida Institute of Technology, Foosaner Art Museum  
1463 Highland Avenue, Melbourne, Florida 32955

A creator in every sense of the word, D. X. Ross (American, 1953 – 2008) was perhaps best known for her totemic jewelry: hand wrought, intricate metal work, with juxtaposed materials of precious and semi-precious stones, unusual shapes and sharp contrasts. Renowned for working in a distinctive form of enameling, termed grisaille (a monochromatic form of enameling), Ross was able to incorporate her drawings into a precious form, amulets, built with hidden spaces to allow room for the spirit of the piece to reside. She hoped that her jewelry was talismanic, bringing forth the mythic persona within each of us. Ross, a prolific artist, was also an etcher, lithographer, painter, and also created works in clay and fiber. Her work is in a number of collections, museum and private, including the Smithsonian American Art Museum.

For more information, visit Foosaner Art Exhibit web page at www.foosanerartmuseum.org/current-art-exhibitions.php

**Image credit:** D. X. Ross, Pendant (Boy with Green Parrot)  
c. 1989. Sterling silver, gold, enamel, 3 x 3 inches.  
On loan from Alice Ross Graham.

**Dutch Biennial Exhibition of Enamelled Art**  
November 24, 2012 through January 2013  
Official Opening; November 24, 2012 at Kempenhof

Address: Valkenhof  
Antwerpsebaan 3 - 5554 JV  
Valkenswaard - The Netherlands

Contact: Mary Mulder - marymulder11@hotmail.com

**Singing bird pistols- AMAZING !!!**

THIS will get your attention! Enjoy!

Simply incredible …you have to hang in there for a minute before you see what this is all about. Amazing.

This is a short video on a pair of 200+ year-old mechanical singing bird pistols; whether or not you are an antique gun aficionado, you’ll be glad you took a moment to watch. They are like great paintings…only on a much grander scale. These pistols sold for $5.8 million.  


James Madison University, in Harrisonburg, Virginia, is very pleased to announce the exhibition of Harlan W. Butt’s National Parks Series in our Sawhill Gallery, October 22-December 8, 2012.

Harlan W. Butt’s work is influenced by the colors, textures and shapes of the plants and animals where he has lived. His work have been exhibited in collections worldwide, including the Victoria and Albert Museum in London, the Renwick Gallery at the Smithsonian Institution, the Museum of Fine Arts in Boston, the National Gallery of Australia in Canberra and the Arrowmont School of Arts and Crafts.

For more information, contact Mark Rooker, 540-568-6410, or visit, www.mrooker.com

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Time: 9am-4:30pm both days
2012 Workshop Dates:
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December 1 & 2

To reserve a space for the WW Carpenter Enamel Workshop, call (859) 291-3800 or email, info@glass-on-metal.com

2013 Enamelist Society Conference
July 31 – August 7, 2013
Pre-conference workshops: July 31 - August 2
Conference: August 3 - 4
Post-conference workshops: August 5 – 7

The Next Enamelist Society Conference and exhibition will be held in Northern Kentucky, where we will have wonderful facilities for workshops and breakout sessions including at the W.W. Carpenter Enamel Foundation, Thompson Enamel, Northern Kentucky University and A.O. Smith Company.

THE ENAMELIST SOCIETY
www.enamelistsoociety.org

Miami Society of Goldsmiths Northeast Chapter

Begin the New Year in Florida with the Florida Society of Goldsmiths Northeast Chapter, as we host our 17th Annual Winter Workshop, January 13-18, 2013 at Atlantic Center for the Arts in New Smyrna Beach. Learn the secrets of creating clarity and brilliance in cloisonné enamel with Ricky Frank.

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Wet Inlay by Stell Shevis
A new, fresh approach to enameling! Stell demonstrates an unique technique producing extremely attractive enamels, with such ease that it appears to be magic. It makes enameling fun!

According to Stell, these are her ‘shortcuts’. She is referring to the firing. Most are fired ONE TIME. Some of the procedures were described in her article in Glass on Metal, Vol. 23, No. 1, pg. 6, but there is no substitute for seeing a demonstration.

Thought only one technique is described, we know of no better investment in the art of enameling than this thirty minute DVD. It does not take long to view it, and you will not wait long to try it. (about 30 minutes)

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Chris Hierholzer has made a new torch firing enamel DVD. It will be available through Enamel Work Supply Co., 1022 NE 86th St., Seattle, WA 98115, Ph. 1-800-596-3257.
All proceeds will go to the Enamelist Society Art Education Fund. The name is Torch-Fired Enamels Sgraffito on Gold Foil - DVD. Please consider supporting this worthy cause to educate and spread the knowledge of enameling!