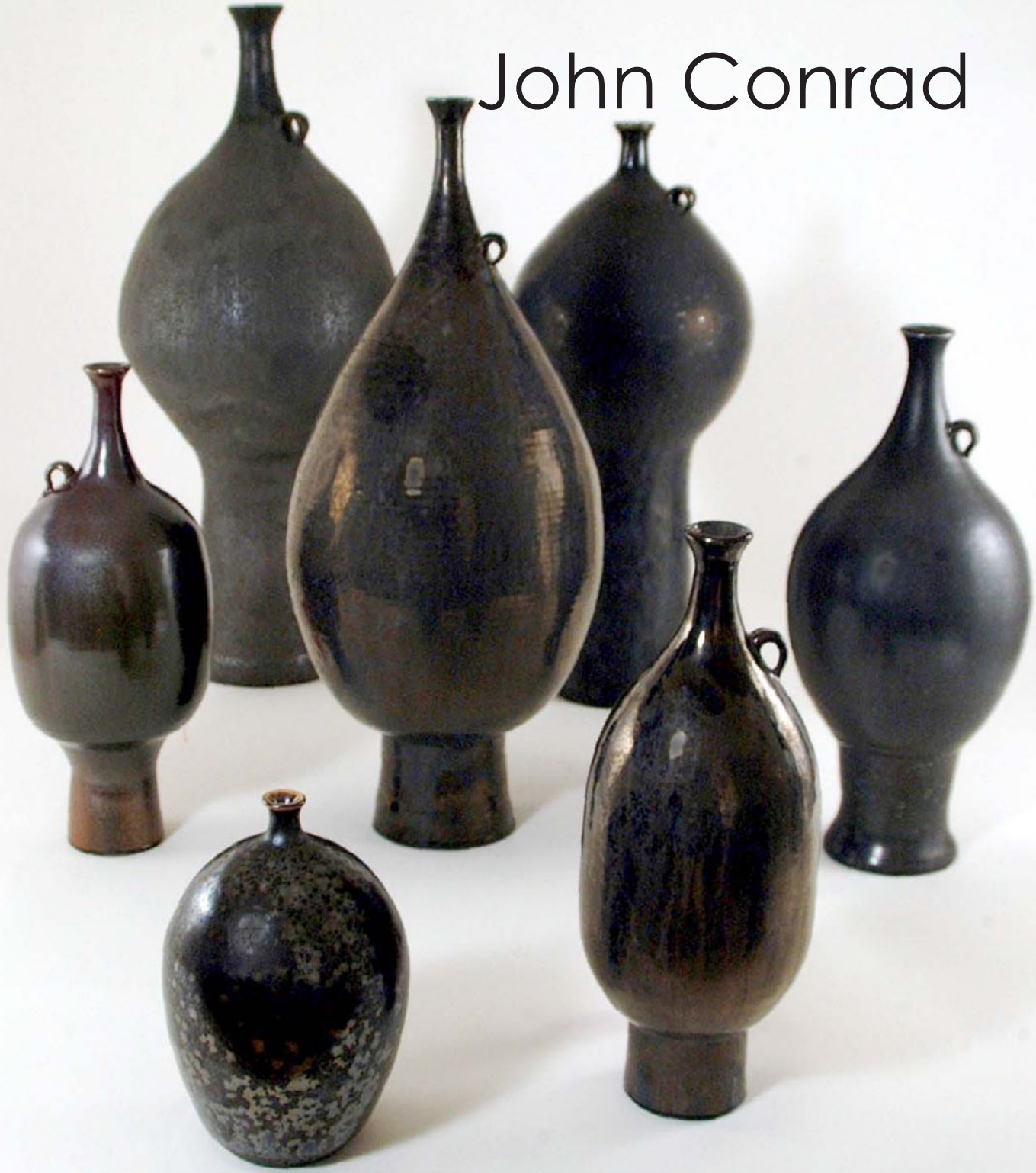


John Conrad



*Jack Hachigian PhD describes
Conrad's search for the Black
Pearl, a saturated metallic glaze*

*Cluster of Black Pearl Bottles.
Photo by John Conrad.*

ON THE SECOND OF SEVEN TRIPS TO CHINA at the invitation of the Chinese Government, John Conrad spotted a small bowl while visiting the Beijing National Museum. The glaze on this bowl caught Conrad's attention and fascination. His career as a research ceramist has focused on glazes and glazing and, from this perspective, he noticed that this was an unusual and exciting glaze.

Conrad gave many lectures and demonstrations on ceramics in China but the fascination with the glaze of that bowl never left his mind. During these seven visits, he was asked for advice on many technical problems confronting the production of ceramics in China. During one of these seminars at the Lucien Academy, a Chinese professor lectured about an interesting shard a farmer had found. The farmer came upon the shard while plowing a field. He turned the shard over to the local authorities who, in turn, sent it to the Lucien Academy for study. Conrad realized the glaze on the shard was identical to that of the bowl in Beijing. He asked the Chinese lecturer about this shard and learned that the shard came from a kiln in Tain-mu Shan (Fukjien Province) which lies 100 miles from the North Korean border. A trip was arranged to visit what was left of this kiln, for it was in operation from the 12th to the 16th Century; after which time, it fell into rapid disuse.

The kiln is a large one, one of many of this type in China and ran up a hill for about 100 yards. It is of the Anagama (hillside) type, which are batch kilns. There are a number of these Anagama kilns still in operation. The producers at the time did not have kiln shelves and they used saggars with a piece of ball clay at the bottom, onto which the ceramic piece was placed. The saggars were shaped so that they could be stacked one atop another with the final result being thousands of bowls ready for firing. The length of the kiln was such that it required many fire boxes and was fired with what we suspect was red pine. The temperature of firing is estimated to be above 1200°C, undoubtedly with substantial variation. The kiln took five to six days to fire and five days to cool. The bowls were used for tea and rice. As it was explained to Conrad at the time, each member of a family had two bowls – one for rice and one for tea.

The products of this kiln were loaded on barges and shipped down the river to the coast of China to various cities for further distribution. These bowls also were shipped to Korea and Japan. The bowls so fascinated the Japanese that three monks made the long journey to visit the Tenmoku site to learn how to create this glaze. While there, they obtained and brought back a select number of these bowls to Japan, One of which survived and is now considered a national treasure of the Japanese nation.

Chinese lore has it that the demise of the kiln began as a result of a change in how the Chinese brewed tea. They began using all of the leaves on a tea bush, whereas tea up to that time was brewed only from first growths and not mature leaves. The colour of the tea changed from a light (green) tea to dark (black) tea. Lore has it that this change in the brewing of tea came about as a result of the British showing the Chinese how to roast or ferment the mature tea leaves. This notion conflicts with the fact that neither coffee nor tea was known in England in the 16th century.

The dark glazes that were produced at Tenmoku were ideal for the light teas since the glaze would shimmer through as tea was consumed, whereas the darker brew masked the glaze. The product of this Tenmoku



Top: Shards found at Tenmoku site.
 Above: **Bottle.** Slight reduction, 3 hour soak. 13.75 in.
 Below: Acres of shard rubble at Tenmoku.
 Photos by John Conrad.



Black Pearl Glaze

Potash feldspar	62
Manganese dioxide	19
Silica	09
Edgar Plastic kaolin	05
Whiting	02
Talc	02
	101



Top: Vase. Satin matt with many crystal dots, three hour soak. 17.25 in.

Above: View of Tenmoku Kiln.

Below: Placards at Tenmoku Shrine. Photos by John Conrad.



kiln fell out of favour. White bowls were in demand thereafter. Tain-mu Shan valley did not have the chemical ingredients to produce a white glaze.

The Tain-mu Shan kiln is now a national shrine of the Chinese government and they have built a shelter over it with various placards with scriptures around it describing its importance. Conrad visited the Tain-mu Shan valley on at least three different occasions. The areas surrounding what remained of the kiln looked like acres and acres of rubble. Searching through this rubble of shards, he found examples of the same glaze that caught his attention at both Beijing and the Lucien Academy. He also found an intact bowl with this glaze which he was allowed to take with him. Since this shard and bowl had a different and distinct appearance among the myriad of shards, it appears that it may have been an anomaly of the firing. These visits by Conrad began the quest to reproduce the glaze, which he has named the 'Black Pearl'.

Conrad was born in Pennsylvania where he took general art classes in high school. Upon graduation, he went to what was then called a Normal College, which was a teachers' preparatory college. This college later became Indiana University of Pennsylvania from which Conrad earned his undergraduate degree in Art. Not far away were the University of Pittsburgh and Carnegie Institute (now known as the Carnegie-Mellon University). Conrad enrolled and took a Master's degree from Carnegie Institute. His intention was to teach at the college level when he learned that Mesa College of San Diego was looking for someone to start a ceramics program. He became interested, interviewed for the position and was appointed to the faculty of the college. After a few years, he realized that in order to grow professionally in a college environment, it was necessary to have a doctorate. Conrad decided to pursue a doctorate degree in Ceramics and was presented with a challenge for his thesis. Up to that time, no one was able to fuse glass to a ceramic body. Nearby Corning Glassworks, had attempted for many years to fuse glass to a ceramic body but was unsuccessful. After three years of research, experiment and trials, Conrad was successful in fusing glass to ceramics, thereby solving the problem and was awarded his EdD from the University of Pittsburgh.

The Ceramics Program at Mesa College, over the past many years of guidance by Conrad has grown and flourished. During his tenure at Mesa College, Conrad had focused on being a research ceramist. He has written seven books primarily on glazes and glazing (the seventh of which is titled *Black Pearl and Other Saturated Metallic Glazes*).

Recently, Conrad retired from a long teaching career; however this was not the end of his enthusiastic pursuit as a researcher of ceramic glazes. That bowl, that curious little bowl that he brought home with him from China, continued to intrigue and pique his curiosity as to how to create this glaze. When Conrad returned from the Tenmoku site, he came back with the prescription that was used for glazing. This formed the basis from which Conrad's research began. There was a problem with the prescription, in that chemicals in China are not pure and differ in composition than those found in the US.

Conrad's attitude towards research is demonstrated by his fondness of using a comment by Thomas Edison: "There are not 10,000 failures, but 10,000 ways by which to learn what does not work." With this attitude, Conrad has spent the last seven years pursuing the process by which to create the glaze for which he has coined the words 'Black Pearl'. The Black Pearl is one of the Tenmoku class of glazes which ranges from

brown-to-black with various different subcategories such as chocolate-dark, chocolate-light, brown, rabbit's fur and so forth.

Conrad's studio occupies a one-car garage where he houses all of the necessary chemicals as well as a wheel on which to throw pots. The type of kiln that Conrad uses is a gas-fired Olympic downdraft. Its exterior dimensions appear to be a five foot cube, whereas the interior dimensions are a three and a half foot cube. Because of it being a downdraft kiln, he is able to maintain a half-cone differential in the temperature from the top to bottom, which gives him consistency in his firing. Conrad fires his pieces at cone 12.5, after which he allows the kiln to cool to between 2240–2280°F followed by turning the burners on and the adjusting the dampers so that the kiln will hold this temperature for three hours (soak). Then the kiln is allowed to cool at its own rate with the dampers closed (this soaking technique is described in *Glazes for Special Effects* and *Contemporary Ceramic Techniques*). This leads me to believe that the glaze that Conrad has been pursuing all these years was created in hot spots of the Tenmoku kiln, which seems to be a reasonable conclusion since it is difficult to believe that a kiln of this size would have a uniform temperature throughout, especially if woodfired. It also gives credence to the notion that the glaze was an unintended result.

Conrad is so intent on the purity of the glaze he creates that he only uses porcelain (Coleman) which provides him with a white canvas ceramic body. He does not want impurities of the clay body to affect the outcome of his firing, allowing him to focus more intently on the formulation of the glaze. In many ways, he works like a chemist in a laboratory.

Over the years, Conrad has shown me the product of his work. Recently, he has felt confident that he has reached his goal of reproducing the Black Pearl on a consistent basis. When I viewed his work, I was taken by his unique bottle form resting on a table and was affected by his work in three profound ways. My initial reaction when I saw 70 of his pots on a table was the scope of his effort. My second reaction was a fascination with the unique handles on his pots. Initially, I did not know what Conrad's intent was until I asked; whereupon I learned he had created an abstract signature of the letter 'C' indicating that this is his work. My third and last reaction was one of awe. I was looking at a magnificent ceramic piece with a myriad of crystals cascading throughout. On close observation, you find crystals of iron, manganese, tin and copper.

My relationship with Conrad began around 1994. I had retired as a Mathematics professor from CUNY and moved to San Diego, California. My interest in creating Armenian crosses using ceramic materials led me to become interested in ceramics; I was introduced to Conrad at Mesa College by a mutual colleague. He was gracious in allowing me to audit his ceramic laboratory classes as well as utilize its facilities. After spending three years in the ceramics program, I have continued independently for the past 15 years to pursue my interest in ceramics. My relationship with Conrad, who shares his knowledge and expertise freely, has been rewarding. Dr. John Conrad's determination and single-minded pursuit of the Black Pearl is something to be admired.

Jack Hachigian is a retired professor of mathematics who became interested in ceramics during 1994. He studied ceramics with John Conrad for about 3 years after which he continued to pursue ceramic art on his own. He has previously published 30 peer-reviewed articles in mathematics journals and also a cookbook. He has taught at Cornell University and City University of New York.



Top: Vessel. Mirror-like finish.
13.25 in.

Above: Fired Down-Draft Kiln.