Vince Pitelka, 2016

Bonfire-Firing

The bonfire is the oldest and most primitive of all firing methods. It is unfortunate that so few people in ceramics never experienced this type of firing. As in many art/craft processes, we too often assume that a "primitive" or "old fashioned" approach is somehow aesthetically or technically limiting. Even a cursory examination of the historic and contemporary tribal pottery traditions of Central America, Peru, Africa, or the American Southwest illustrates that this work is very sophisticated aesthetically and is among the most beautiful and accomplished of world pottery. This "old-fashioned" method offers a remarkable range of surface effect available through no other firing process. The bonfiring is an extraordinary occasion - part technical process, part performance, part ritual. Every bonfiring carries an inevitable connection with 25,000 years of past cultures. This is a process where the participant becomes a performer, and the firing becomes a major component of the art expression.

How to Do a Bonfire-Firing

Find a *safe*, *dry* place to build the bonfire, with no structures or flammable grass or brush anywhere nearby. *Always* get approval from the local fire-marshal, and make sure that there is a water faucet and hose on location just in case. If the surface where you dig your pit is very wet, it is a good idea to build a fire ahead of time to dry it out. If the area is characteristically wet, build up a large mound of dirt above ground-level and build your bonfire in a hollow within this mound. A little dampness will not do any harm, but excessive moisture or standing water in the pit must be avoided, as it can adversely affect the burnished surfaces and the degree of smoke effects. The sand or dirt that you use to smother the fire (if you are doing a blackware firing) should also be as dry as possible. This may be accomplished simply by covering your dirt/sand pile with a tarp a week before firing.

Selecting the Clay and Preparing the Wares

Use a claybody containing at least 25% fine sand or grog and at least 25% fire clay. This gives a open, porous, refractory body with high thermal-shock resistance. My favorite claybody for bonfire is equal parts stoneware clay (like Goldart), fireclay, ball clay, and extra fine grog.

To minimize loss, it is best to do a very low temperature (cone 018) bisque-firing. This is not high enough to damage polished terra sig or burnished surfaces, but is adequate to drive off all atmospheric and chemical water and allow the bonfire to proceed very quickly with minimal loss. If you are unable to do the pre-bisque or don't wish to, make sure that wares to be bonfired are thoroughly dry. In a very dry climate wares can be left out for a week or so and then bonfired with minimal loss from escaping moisture. In a more humid climate, losses will be very high unless wares are absolutely bone-dry. Problems may be reduced by drying wares overnight in a 200 degree oven or a kiln on very low heat. When bonfiring un-bisqued wares, no matter how carefully, I have always experienced a significant amount of loss.

Whether you preheat wares in a kiln/oven, or do a low bisque, do not transfer the wares from the warm kiln or oven to the bonfire setup until the last minute, as they can quickly absorb moisture from the atmosphere.

Selecting and Preparing the Fuel and Sawdust

The wood used in bonfiring can be any *dry* wood such as construction leftovers or thin branches gathered from the wood. ***Avoid all pressure-treated lumber***, such as is used to build decks and garden fixtures. Whatever wood you use, avoid pieces larger than one inch thick, and split wider boards to 1”-2” in width. In other words, you can use scrap 2x4s as long as you split them into 1”-thick strips. You can use a mix of lengths, but a good portion of it should be at least two or three feet long, to facilitate building the fire up tepee-style around the grate or cage in the latter part of the firing.

For smothering a blackware firing, try to get fairly coarse sawdust, and avoid sawdust with a large fraction of very fine powder such as is produced by sanders, because it is explosive when tossed into the fire. One large garbage can of sawdust is adequate as long as it is tossed onto the fire carefully.

Preparing the Pit for Blackware Firing

If you are doing a blackware firing, unless you have a large pile of dirt or sand handy, dig a 36' square fire-pit approximately 18” deep. You will need the dirt anyway to smother the fire. Both the pit and the dirt or sand should be as dry as possible. If not, it will diminish the degree of blackness and shine on the fired wares.

Bonfiring With a Grate, Cage, or Drum

I have always had good luck firing the wares on a grate or in a cage, as is done by many of the Native American potters of the Southwest. The grate or cage should be at least 24”-square, raised up on legs or bricks 10” off the ground. For the best results, the grate should be welded together from 5/8" rebar (concrete reinforcing bar), with 10” legs on each corner, but any suitable-sized steel grate set up on bricks will serve the purpose. The very best grate is more like an open-topped cage with sides twelve inches tall. You will be amazed at the amount of wares which can be fired in such a cage. 24” square by 12” tall is four cubic feet, and you can mound the wares up quite high above the walls, giving this cage a capacity of at least six cubic feet. The standard 23”-inside-diameter toploader electric is seven cubic feet.

Another simple option is to use a half drum (half of a 55-gallon steel drum) with a grid of ½” holes drilled on 4”-centers in the bottom and sides of the drum. Place the drum open-side-up on bricks to give a space at least 10”-high beneath. The open top can be covered either with sheet-metal scraps or with an old drum lid, which should also have ½”-holes on 4”-centers.

For a blackware firing set up the grate/cage in the bottom of the fire-pit. For a oxidation bonfire place it on any safe open space as discussed above. The grate or cage must be lined with pieces of steel sheet-metal (not aluminum flashing material!), and the wares are covered with more sheet-metal. Avoid galvanized steel sheet-metal, as it gives off poisonous zinc fumes. Any sheet-metal

shop should be able to give you ample scraps of appropriate thin, sheet steel (no thicker than 18-gauge). Any appropriate scraps large enough to not fall through the cage openings will work, but an excellent source is #10 cans such as commercial foods are often packed in. Remove the bottoms of the cans, cut them up one side with metal snips, and flatten them into a strip of sheet-metal. Any sheet steel will work, but if you use large pieces that cover a significant portion of the cage, drill holes on 4" centers. That is essential for transference of heat and smoke. If you are using #10 can strips or smaller overlapping sheet-metal pieces you do not have to drill holes.

Stacking and Covering the Wares

Place a layer of scrap sheet-metal pieces over the bottom of the grate/cage before setting the wares, and if you are using a cage place sheet metal pieces against the walls as well. #10 can strips or any thin sheet-metal pieces can be bent over the top of the cage to hold them in place. Overlap the pieces to minimize the gaps, but small gaps do not matter. Set the larger, heavier pieces in place first, and if vessels place them mouth-down unless the rim is fragile. Place scraps of newspaper beneath and between the wares during stacking. Even after combusting, this newspaper leaves a film of carbon or ash between the pots, which will reduce abrasion. As you are loading, place sturdy small pieces between larger ones, and always place pieces so that they do not wedge tightly between one another. If using a grate, the pieces must be very carefully stacked pyramid-style so as to give a stable pile. If care is taken, it is possible to stack many pieces without applying undue stress on any single piece. Fragile pieces must be placed very carefully, but with a little care can be placed so that the fragile parts are protected. It is best to make note of the location of any especially fragile pieces so that you will remember to exercise proper care in unstacking the wares after the firing. After a blackware bonfiring the wares are largely immersed in burnt and unburnt sawdust, and uncovering them is a little like an archaeological dig.

If using a cage, cover the wares at the top of the cage with sheet-metal scraps. If using a grate without sides, cover the entire pile of wares above the grate with sheet-metal pieces, wiring them in place with cheap steel utility wire as is used in building foundation work.

Kindling the Bonfire

If you are firing any pre-heated bone-dry greenware, start out with a very small kindling fire under the grate/cage, and build it up very slowly over three or four hours, until you have a good-sized bonfire built tepee-style around the grate and wares. If you are firing bisqued wares fresh from the kiln you can start with a good bed of kindling, and build the fire up to the maximum in about an hour. In either case, add wood beneath the cage to build up the fire, slowly expanding the fire outwards from the bottom of the cage by laying wood around the base of the cage. Continue to add wood beneath the fire throughout the fire until you let it die down for on oxidation firing, or smother it for a blackware firing. When the fire has been licking up all sides of the grate/cage for at least a half hour (while also inserting wood beneath the grate/cage), begin standing wood up against the sides tepee-style, and keep this going for fifteen minutes.

The Oxidizing Bonfire

If the objective is a clean oxidizing bonfire for redware or polychrome ware, simply allow the fire to burn down to ash and remove the wares with a stick or gloves. This kind of firing should not be done in windy weather, because the cooling wares cannot withstand the thermal shock of abrupt gusts of wind. Try to do this kind of bonfiring early in the morning when there is no wind at all.

The Blackware Bonfire

If you are doing a blackware firing, it is imperative that you have a supply of shovels handy and your sawdust ready in utility buckets or five-gallon buckets and then act very quickly in a choreographed sequence as soon as the fire is ready to smother. As soon as you have maintained the fire tee-pee style for fifteen minutes, let it die down just a bit, pull off the largest pieces of unburned wood, and immediately dump the equivalent of one standard trash can of sawdust on the fire, carefully tossing it from a safe distance using the buckets. At the same time, make sure the sawdust really does end up on the fire directly around the cage, with a small amount tossed on top of the cage. Use a long stick or shovel to push some of the sawdust under the cage. The instant you finish tossing on the sawdust, grab the shovels and *immediately* bury the whole thing in dirt or sand as quickly as possible. Don't mound the dirt too high on top of the cage, but apply plenty to the sides to make sure no oxygen can get in at the base, and shovel on more dirt or sand wherever you see any trace of smoke. Keep checking the pile over the next few hours as the fires settles and shovel on more sand or dirt to seal off any traces of smoke. If there is any chance of rain be sure to cover the mound with a tarp once it is cool enough.

Wait a minimum of three hours, or preferably overnight, before carefully uncovering the grate/cage. Dig away the dirt or sand from the sides of the cage, avoiding hitting the cage with the shovels, and then remove the dirt from atop the grate/cage by hand. Carefully remove the sheet-metal scraps and lift out the wares. Even if left overnight, things will still be hot enough to require good insulated gloves like welder's gloves. If left for a few days they may be cool enough to handle without gloves.

Cleaning the Wares

Whether fired in a blackware or oxidizing firing, carefully wipe all ash and soot from the surface with a soft cloth like tee-shirt material, rubbing vigorously where necessary, but I recommend leaving the fire scarring and shiny creosote markings as evidence of the process. Do not wash with water or wipe with your hands or anything abrasive.

Post-Firing Polishing

After a bonfiring, pit-firing, or sawdust firing, burnished or polished pieces may be further polished with any good oil-base or bee's-wax-base furniture polish wood-finishing oil like tung oil. If the latter, be sure to get pure tung oil without fast-drying additives. Regardless of the manufacturer's instructions, never allow the polish or oil to dry on the surface before polishing. After applying, buff immediately with soft cloth, and on large pieces polish only a small area at a time.

What are Bonfired Wares Good For?

Bonfired wares have an evocative beauty and celebratory quality, and will be especially valuable to those who have participated in the bonfiring process, but they should not be used with food, and the surface effects will diminish over time if they come in contact with water. They are porous and will absorb food materials, and water will seep through them. If used for food, bacteria will grow in the ancient clay and you will be rewarded with acute gastrointestinal distress. Ancient and tribal peoples were exposed to the use of bonfired wares from birth and were resistant to those bacteria. We're not.

Bonfired wares represent a tradition going back to the very first discovery of fired clay at least 25,000 years ago, and the continuation of that tradition is something to be celebrated in itself. Let the wares you produce be representative of that tradition and celebration, and don't try to use them for any purpose that could sicken you or damage the wares.