

A Ceramics Monthly Handbook



Barrel, Pit, and Saggar Firing

A Collection of Articles from *Ceramics Monthly*

Edited by Sumi von Dassow



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PREFACE

This book was created in response to a growing interest in pit firing and related techniques in the pottery-making community, as reflected in ceramic art shows and in the ceramic art press. As issues of function have decreased in importance in the minds of the public and potters alike, and the line between pottery and art has blurred, such firing methods cease to be thought of as “alternative” or “experimental.” Potters, ceramic artists, and sculptors wish to use whatever forming, decorating, and firing techniques are necessary to articulate their vision.

The articles included in this book were carefully selected from the pages of *Ceramics Monthly* magazine to illustrate the multiplicity of approaches to barrel, pit, and saggar firing. Herein are works of art ranging from wheel-thrown and coil-built pots to complex sculptures, tied together by a similarity in the firing process. Some of the articles were chosen because they illuminate the basic or “standard” version of barrel, pit, or saggar firing; others to illustrate variations on the theme; and still others to demonstrate some of the techniques used to create pottery or sculpture destined for the pit or the saggar.

It is the earnest hope of the editors of The American Ceramic Society, *Ceramics Monthly* magazine, and of this book that artists, teachers, students, and collectors alike will find value in these pages. Whether that is by ceramic artists and students as inspiration for new work, or by teachers as a source of ideas for projects or workshops, or by pottery aficionados as a stepping stone to greater understanding of the art, we hope it brings enjoyment to all who read it.

—Sumi von Dassow

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INTRODUCTION

The Allure of Pit and Saggar Firing

Since the first fired clay pot was made, perhaps accidentally by leaving a mud-lined basket too close to a fire, the potter has had fire as an active collaborator. During the millennia since then, progress in pottery technology has usually meant taming the fire—making it hotter, cleaner, more controlled, and more predictable. In much of the world, firing on the open ground gave way to firing inside a pit, then kilns were built to contain the fire. Refinements including chimneys and air intakes to improve air flow and control the temperature and atmosphere; fireboxes to separate the fuel from the ware; and saggars to protect the ware from the smoke, all served to reduce the direct contact of fire with clay. The ultimate advance in this direction, the electric kiln, allows the potter to apply heat to clay without requiring any flame at all. For many potters, this advance has eased the task of creating functional pottery; it has opened up the pursuit of pottery to many as a hobby, removed much of the stress of firing delicate work, and furthered the development of beautiful new glaze types.

However, along with the stress, the electric kiln has removed much of the excitement of firing, the sense of having an inanimate and unpredictable collaborator, and the eager anticipation attending a kiln opening. If the flame and the smoke aren't present to ruin pots, neither are they there to enhance them. Thus, since the electric kiln has become ubiquitous and indispensable, interest has mounted in alternative firing methods involving fuel and flame. This interest has extended in two directions. Though time-consuming and labor-intensive, high-temperature wood-firing has captured the enthusiasm of many potters. In a wood kiln, the element of the unpredictable comes to play in the way the fire colors glazes applied before firing, as well as in allowing the ash produced in firing to form a glaze wherever it



lands on the unglazed pottery. In either case, the result is fully vitreous, glazed or partially glazed pottery.

Other potters have taken quite a different approach to playing with fire. Potters working without a kiln at all, without glazes, arranging fuel and ware on the ground or in simple containers, can produce beautiful works of art colored only by smoke and fumes. While Native American or African potters firing in the open without electricity or kilns may regard smoke marks as a defect, many potters from industrialized countries are delighted with precisely such unpredictable effects and seek to capture them in a variety of firing methods. Along with the growing popularity of raku, the last quarter of the 20th century has seen experimentation with firing in pits and barrels packed with sawdust, newspaper, pine needles, and other combustibles. The saggar, invented to protect glazed pottery from the sulphur produced by coal-burning kilns, now has a new function—packed with pottery, combustibles, and volatile materials, and placed inside a gas kiln, it brings back the drama of firing.

Whether in a pit or a barrel, or in a saggar inside a gas kiln, the firing methods under discussion have several features in common. They are generally low-temperature techniques, not usually requiring large amounts of time, fuel, or manpower. The low temperature and usually short firing time means that the results of a firing are known quickly, and firings can take place frequently. They do not involve glaze, relying on smoke and volatile materials for effect. Thus, the resulting pots are decorative rather than functional, and relatively fragile. This means, however, that such a firing may take place with less preparation time. In addition, the equipment requirements are minimal and easy to improvise. Low-temperature smoke firing can be adapted to fire one piece at a time, or many. The investment in a single firing is smaller, allowing the potter to indulge in the urge to experiment. All of these features make this type of firing an attractive possibility for many who would like to collaborate with fire but do not have access to an wood-burning kiln.

Pit and saggar firing are versatile techniques. There is no right or wrong firing technique, no correct outcome. Success or failure are entirely subjective concepts. The variables involved in pit and saggar firing are so many: the types of clay and fuel; the size, surface and bisque temperature of the ware to be fired; the climate and the condition of the earth into which the pit is dug; the type and size of barrel or saggar; and other differences from one potter to another, often render futile any attempt to duplicate exactly another's results. Therefore, there are as many ways of pit and saggar firing as there are potters. Each potter who begins working in this evolving field embarks on a journey of discovery, guided by the happy

accident, on which a personal style of firing is developed. The artists profiled in the following pages combine the elements of pottery, combustible materials, and flame in unique ways that satisfy their own aesthetic sense. Reading about their discoveries may inspire some to embark on their own journey; others may simply realize a greater appreciation for the effort which went into creating each beautiful or intriguing work of earth and fire.

If you are reading this book because you are interested in trying some of these firing methods, you may find it helpful to consider your own circumstances and the types of clay, equipment and fuel at your disposal. Before you read about the (perhaps bewildering) variety of possible firing techniques, I offer a brief section of questions and answers to help with this process of sorting out the possibilities.

Which Kind of Firing is Right for You?

Your choice of firing method depends either on your circumstances or the particular effect you desire. If you have access to a beach and can get permission to dig a pit and fire there, pit firing is fun and exciting. If you want to fire a small number of pots at one time, or can't dig a pit, you may want to try a barrel or saggar firing. If you have concerns about annoying the neighbors with smoky outdoor firings, or you want greater control over the results of each firing, saggar firing may be your best option. If you are not sure whether you want to fire in a pit, a barrel, or a saggar the following questions and answers will help you decide.

What are the best choices for color development?

A protracted firing in a pit or a large brick chamber, such as Peter Gibbs describes, will give the best chance for color development. Edge Barnes and Zoie Holtzknecht add copper to produce red flashing, in the form of copper sulfate and wire. For yellow colors they sprinkle salt and baking soda into the pit. Carol Molly Prier uses copper carbonate instead of sulfate, and adds seaweed to her pits as another source of salt. Other possible treatments for interesting color development are spraying or soaking bisqueware in solutions of cobalt or iron sulfate, as Gibbs does. To vary the results from pot to pot within a single pit, Embree de Persiis places pierced pieces of stovepipe over pots in the pit. Barnes and Holtzknecht may use steel or clay bowls as saggars for individual pots, or wrap pots in newspaper to hold various combustible and volatile materials close to the pot's surface. Rebecca Urlacher speeds up her pit firings a bit by setting preheated pots onto a bed of hot coals covered with additional fuel and volatile materials.

Pit firing is a great project for classes, workshops, and cooperative groups since a pit can be as large as needed and there will be plenty of work for all. Pit

firing can be used for a small number of pots, as well, simply by digging a smaller pit. However, digging a pit each time you have a few pots to fire, then filling it in and removing ashes and coals afterwards means preparation and cleanup become a time-consuming chore for an individual potter. Digging a permanent pit or building a firing chamber can solve this problem, but you may then have to wait for enough pots to fill it up before you can fire.

What if I want color but don't have a place to dig a pit or room to build a brick chamber?

You can achieve a similar look working on a smaller scale in a barrel or can with air-holes punched in. Before firing pots in any such container it should be prepared by building a fire in it to burn off any volatile materials it may have been coated with. Since such a firing won't get as hot nor last quite so long as in a large pit, it is possible to encourage color development by spraying a copper matte solution on pots before firing, as Jeff Kell does. Glenn Spangler soaks wood shavings in soluble materials, including copper sulfate and fabric paint, before loading shavings and pots into a can for firing.

Barrel or can firing is ideal for small batches of one to several pots, and containers of various sizes—from an oil drum or garbage can, to a popcorn tin—can be used. Since the cans are permanent firing chambers, setup and cleanup time may be reduced over pit firing, though for a group of potters with a large number of pots it may be tedious to prepare enough cans and barrels.

How can I achieve the effect of a pit firing if open burning is not feasible?

If you have a gas kiln you can place your work in a saggar, along with combustible and volatile materials, and fire to a relatively low temperature. R. Bede Clarke applies soluble materials directly to bisqueware by brushing, spraying, pouring or dipping. Ruth Allan uses wire and filings of various metals, and even masking tape, to enhance color.

Traditionally, a large lidded clay cylinder is made to serve as a saggar (see p.57 for saggar clay recipe). Clay or stainless steel bowls, or even terra cotta flower pots, can serve as ready-made saggars. Clarke and Allan find it simpler and more versatile to build a saggar of bricks around the pots inside the kiln. Elisabeth Anderson dispenses with the saggar, by firing inside out—she applies salt and wire to the outer surface of her pots, then fills them with sawdust before firing in a kiln. If smokestack emissions of saggar firing are a problem, Macy Dorf offers suggestions for smoke-free saggar firing.

How can I achieve smoke markings without added color?

Random markings from swirling smoke are easy to produce, and the firing needn't be very hot or very lengthy. Rebecca Urlacher, for example, smokes some of her forms using crumpled newspaper in a metal can for just two minutes before pulling the pieces out of the fire. Jerry Caplan also smokes his pots with newspaper for only a few minutes, though he uses a stream of forced air to raise the temperature of the fire.

If newspaper smoking doesn't produce an interesting enough surface, pots can be buried in sawdust or wood shavings in a barrel or brick chamber, set alight with the aid of crumpled newspaper, kindling, and charcoal lighter fluid. Depending on the size of the container, a sawdust fire may burn overnight before going out. Sawdust-fired pots may emerge almost black, or merely marked with a few dark clouds—the variables being the type of clay, temperature to which it was bisqued, how much air gets into the firing chamber, and how thoroughly the sawdust burns. Jane Perryman fires this way to allow carbon to penetrate deeply into the clay.

Smoke-markings can also be produced by firing pots in a saggar in a gas kiln. Dick Lehman has developed a uniquely controlled firing process in which he is able to print the silhouettes of vegetation onto his pots in a sawdust-filled saggar. Marsha Judd fires in a brick saggar using manure as her fuel, and her sense of smell to let her know when to shut off the kiln. It is also possible to do the same thing using sawdust or wood shavings. The firing is essentially the same as saggar firing for color, without the need for adding volatile materials or oxides.

How can I produce completely black pots?

Curiously enough, a perfectly black surface can be the most difficult to achieve. Often a sawdust firing will produce pots that are almost all black, but achieving a uniformly black surface this way is hit-or-miss. Blackening a pot depends on building a fire hot enough to allow carbon to penetrate the clay, then smothering the fire so the clay doesn't reoxidize. Marsha Judd embeds her pots in manure in a saggar, and fires until the manure smokes but hasn't yet burned away. This is similar in technique to a sawdust firing—the difference is that manure naturally creates a heavy ash, which prevents oxygen from reaching the pots.

Often, however, it is best to isolate the clay from the fuel so the smoke can reach all parts of the pot and there is no danger that unburned fuel will blanket some part of the pot and keep it from becoming black. Michael Wisner has developed two ways to accomplish this. To fire outside, he stacks pots on firing stands over sawdust, then covers the stack with a barrel. He builds a fire around the barrel, to create enough heat to cause the sawdust inside to smoke. Alternatively, he

can stack pots the same way inside a gas kiln, using a metal barrel as a saggar. I wrap pots in newspaper and then in tin foil, and fire in a kiln just until the newspaper smokes, which I refer to as a “modified saggar firing.”

Trickiest of all is a silvery black surface. This can be encouraged by firing with damp fuel, so Judd sometimes dampens some of the manure in her saggar. If the silvery surface develops, it’s great; if not, the pots are still a rich, deep black. Wisner’s secret to the coveted silvery color is to burnish with graphite.

What Type of Clay Should You Use?

There is, of course, no one type of clay that will work best for the many different types of low-temperature smoke firing. Some potters use porcelain for the whiteness; others use a buff clay for a little extra color. For some effects, a red clay is most desirable. A raku-type clay may be appropriate, if the firing will be quick, to reduce firing losses. Though pit, barrel, and saggar firing are all low-temperature techniques, it does not necessarily follow that a low-temperature clay is best. You will want to select the clay according to the type of firing you plan to do, and the effects you want to achieve—though if you have a favorite clay, it may be equally appropriate to experiment with a variety of firing methods to find the one that suits the clay best.

What type of clay is best for color development?

You will want a white or light-colored clay. A red clay will not show the subtle colors from copper and salt. Carol Molly Prier prefers a buff to tan clay body to develop darker oranges and reds. On the other hand, Rebecca Urlacher pit fires porcelain, and Glenn Spangler also uses porcelain for subtle color development from soluble materials. If you insist on using porcelain for its whiteness, you may have to accept a few losses from thermal shock, or carefully preheat pots before placing them in a pit or barrel. After having experienced a great number of such firing losses, Ruth Allan offers some suggestions for protecting porcelain from the stresses of sawdust firing in a saggar. Jeff Kell uses a heavily grogged sculpture clay to make his large forms, which are fired in a barrel.

Most potters bisque fire their pots before subjecting them to a pit or saggar fire, both to protect the pots from thermal shock and to ensure that the pots have been fired to sufficient hardness. The temperature of the bisque fire is usually between cone 012 and cone 06—the lower temperature is preferable if the pots have been burnished. If the bisque temperature is too high, the clay will be less receptive to color development. Thus, stoneware clay will tend to give better results than low-fire clay, because it will be less vitrified after bisque firing.

What type of clay is best for smoke firing *without* added colorants?

The same types of clays that work for pit firing will also work for smoking pots. Since you won't be concerned with developing colors from copper, salt, or sulfates you can choose a darker clay. Smoke markings on red clay can look very dramatic, though a white clay will show a greater range of grays and browns from the smoke. Just as for a pit firing, a stoneware clay bisqued between cone 012 and 06 will pick up more color than a clay bisqued to maturity. It is especially important to bisque fire pots first if you will be using only newspaper for smoking, since a newspaper fire will not achieve high temperatures.


Many potters who smoke fire like to burnish their pots, or at least smooth the surface with a rubber kidney rib. A smooth surface will stand up to close inspection better than a rough one, and the subtle cloud-like markings of smoke invite close observation. Therefore, a relatively smooth clay, allowing ease of burnishing, may be a good choice.

What type of clay is best for black firing?

I use a smooth cone 6 red clay for burnishing and black firing because it is easy to handbuild, is durable even when fired to quite a low temperature, burnishes well, and reduces to a rich black color. On the other hand, Michael Wisner uses a low-fire white clay, because it most closely duplicates the clay used by the Pueblo potters with whom he has studied. Marsha Judd uses a red earthenware and adds 5% pyrophyllite to achieve a brilliantly burnished surface. Clearly, there is some room for experimentation and personal preference—though a high-fire white clay or porcelain is not the best choice if a reasonable fired strength is desired.

For the best results when black firing, pots should be unbisqued or bisqued to a very low temperature such as cone 018. In general, to blacken pots completely, it is preferable to separate the pot from the combustible material so only the smoke reaches the clay. Thus, the pot doesn't reach the intensity of temperature of a pit fire, where the pot is nestled directly in sawdust. If a pot has been bisque fired at a temperature much higher than that attained in the black firing, it will not be receptive to the smoke. Therefore, your choice of clay needs to be influenced by the fired strength of the clay at such a low bisque temperature. In my experience, a white clay is not quite as strong as a red one, and a low-fire clay needs to be fired close to maturity—certainly higher than cone 018—before it achieves sufficient hardness.

Though it is not necessary to burnish a pot before blackening it, a burnished pot will appear blacker than an unburnished pot. If you do want to burnish, your choice of clay will be determined in part by ease of burnishing and the degree of



shine attainable with the various clays available to you. Clay bodies vary greatly in this regard but it is safe to say that a smooth body will be easier to burnish than a coarse one. Having tried to burnish many clay bodies, I have found that due to the non-clay materials added to lower their maturing temperature, low-fire bodies tend to be soft and chalky and difficult to burnish without scratching.

THE ROOTS OF PIT FIRING: Raku meets American Indian pottery and a new American firing technique is born

Modern pit firing evolved from a movement beginning in the 1960s toward appreciating pottery as a pre-industrial process, to get back to the basics of pottery. After the publication of Bernard Leach's *A Potter's Book*, American potters became intrigued with the Japanese technique of raku, seeing it as a more immediate pottery experience than firing in a standard kiln. In the 1970s, ambitious raku and wood-fired pottery workshops led participants to make pots from native clay and bisque fire them in large pits prior to glazing and refiring them in brick or stone kilns built on the spot. An appreciation for the smoke markings on the bisqued pots prompted some participants to stop short of the glazing part of the process.

During this same time, the urge to practice and teach pottery as a non-industrial art "experience" led to a growing interest in American Indian pottery techniques. Potters were encouraged to dig their own clay, form pots without a wheel, decorate them by burnishing or incising, and fire them on the open ground to gain a holistic understanding of the process. Early practitioners of raku in America, such as Hal Riegger, were also active in experimenting with firing on the open ground or in pits as a way to develop insight into early potters' first advances beyond the bonfire.

Since then, pit firing has gone from being part of a spiritual or meditative process leading to a greater understanding of the earth and what it means to be a potter, to a process undertaken for the sake of its uniquely beautiful product. As potters and the consuming public grow away from the notion of function to accept that pots need not even pretend to be usable, alternative firing styles that result in entirely non-functional ware have increased in popularity.

Raku, as practiced in America, grew to resemble Japanese raku very little. Where Japanese raku pottery is quiet and contemplative, American raku pottery is big, bold, and eye-catching. Exactly when or how "postfiring reduction" was invented is open to debate, but to most modern American potters the practice of placing pots

hot from the kiln into a barrel of combustible material is the essence of raku. Perhaps it was an accidental discovery, but it may have also been inspired by the Pueblo Indian technique of producing blackened pots by smothering the fire. It is the direct contact of pots with combustible material, integral to both American-style raku and to Native American firing methods, that is at the heart of pit and saggar firing as well. Thus, pit firing is a uniquely American firing process born from the union of raku with Native American firing techniques.

Here, the pottery and firing techniques of Native American potters are described, followed by an overview of Hal Riegger's exploration of raku and pit firing. As he describes his own journey of discovery into raku



and "primitive" firing, we begin to see the birth of the broad continuum of firing techniques loosely termed pit and saggar firing.

Finding Oaxaca

by Eric Mindling



East Valley Zapotec potters tumblestack pots for a bonfiring; already fired pots and shards are used to insulate the stack.



As the wood settles during the firing, it is repositioned with a long agave stalk to prevent cold spots.

I went far into the south of Mexico to learn some Spanish and see if there was any truth to a couple of black-and-white photos I'd seen in an old book on Mexican pottery. One showed a potter sitting out in the open, making a fine round pot, apparently without a wheel. The other showed a stack of pots enveloped by the leaping flames of a brush and branch bonfire. Through the flames could be seen the sweaty face of the potter as she threw more fuel to the fire. The caption claimed the place to be Oaxaca (pronounced wha ha' ka).

I'd gazed at these photos long and hard through a rainy north coast winter, imagining a place far beyond the overflowing slop buckets and premixed glazes of the university ceramics stu-

dio. I envisioned a hard-edged and wide-awake existence in the world of that potter. Was there a place like this, where simple pottery was still being made, where branches and brush were all that were needed to fire a pot? And what kind of potter could make a symmetrical pot without a wheel?

Traveling 70 bus hours south of the small town where I was living put me deep into this other world, and arriving in the city of Oaxaca was like awakening to a dream. All the colors were strong, bright and clear. My eyes, so accustomed to gray Pacific drizzle, burned with the brilliance. I walked down stone streets closed in by yard-thick walls of 500-year-old adobe houses, their cool interior courtyards filled with banana and jasmine. (In the Pacific Northwest, the historic buildings dated to the late 1800s, their walls made of termite-infested wood.) Beyond those heavy low buildings I could see a mountain whose top had been leveled 2000 years ago to build the greatest of the Zapotec cities. The stepped pyramids defined the horizon.

I was told that pottery was being made in two nearby villages, Atzompa and Coyotepec. The potters of Atzompa produced so much functional ware that the work could be found in just about every kitchen in the state. Coyotepec was known for its beautifully burnished, jet black reduction ware. Visiting both of these villages in my first weeks in Oaxaca deeply moved me. I felt as though I could spend the rest of my life learning pottery in either place. But when I looked again at photocopies of those old photos, I could see that they had been taken elsewhere.

Atzompa and Coyotepec were filled with stone and adobe kilns, the houses close together, the comfortable civilization of the city was just minutes away. In the photo, the potter was firing right on the ground; beyond, there was nothing but open, mountainous country. It looked to be a place far removed from city life; it looked like a place where one's comfort came from the light of the sun and where the only avenues were those defined by the walls of the hills. It was those potters and that place that

I'd come here to find.

Ask as I might, no one in the city could tell me anything more about pottery than what I'd already been told. Back home, I'd searched libraries for information on Oaxacan pottery, but there was nothing. So I decided to see for myself what was in those pyramid-capped mountains, heading out past the last stoplight to where the pavement ends and beyond. Before me was the state of Oaxaca, an immense area so varied and remote as to seem to be an entire country in itself.

I found a jumbled terrain with mountains and valleys, ridges and rivers, varying from high thorny deserts to low green jungle, with but a few decaying roads. The land was lined with arroyos

and donkey trails, and generously peppered with pueblos and tiny ranchos, gatherings of adobe houses surrounded by cornfields, and marked in the center by a white-washed stone church. These were backcountry villages, born along arroyos amid the scant flats, where the soil would hold a crop. And there were potters. Hundreds upon hundreds of potters, living in villages throughout the land, with each village keeping a large region well supplied.

Since that first trip into the dirt-road country of Oaxaca, I've spent years on dusty tracks, and have come across dozens of other pottery villages. To me, it is like finding El Dorado or Shangri-La. Each of these villages will have its own way of forming, of firing, of giving shape to



Strainer pot, 10 inches in height, handbuilt, slipped and roughly burnished, tumblestacked and bonfired, Nahuatl, Guerrero.



Water jug, 16 inches in height, slipped and roughly burnished, tumblestacked and bonfired with wood for about an hour, Nuhuatl Highland, Guerrero.

a pot or jug, but all have one thing in common—they are all dedicated to the production of functional pottery. They make the bean and tamale pots, water jugs, cisterns, strainers, spoons, canteens, barrels, bowls and mugs—all the simple, straightforward vessels that keep civilizations watered and fed.

Their work has been an essential part of the Oaxacan backcountry for 4000 years. This is the pottery learned from their mothers, who in turn were taught by their mothers, and so on for 200 generations. They continue to dig their clay from the same old spots, sift sand down by the creek, form round pots on a stone, slipping, burnishing and firing on the ground under a bright blue sky.

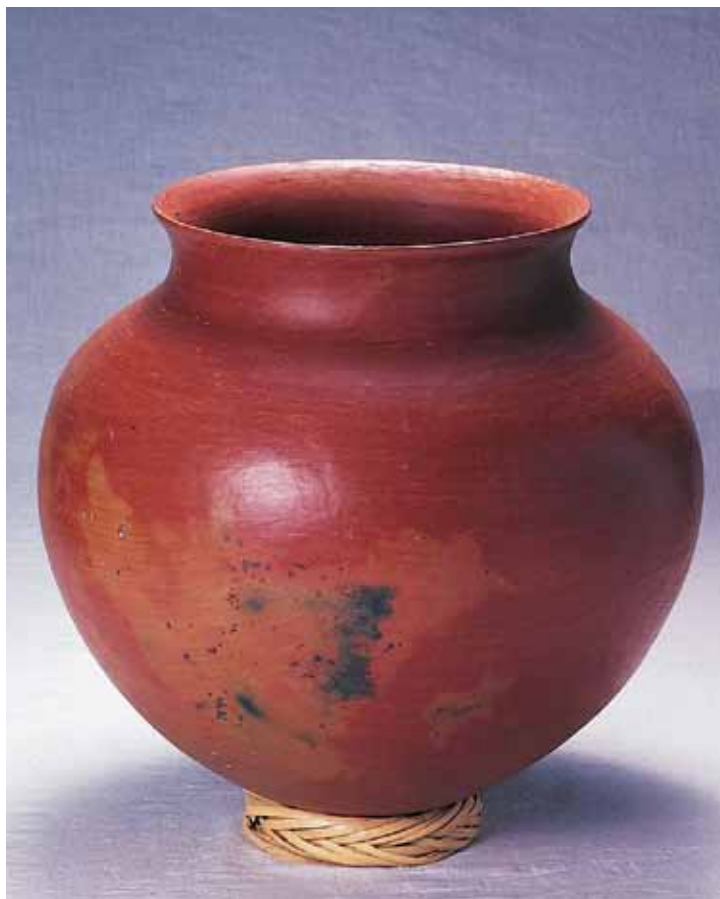
To my amazement, I found that the great variety in types of pottery from village to village and region to region was also reflected in the people, or vice versa. Mexico, when it was christened with that name some 500 years ago by the conquering Spanish, was a vast mosaic of nations, peoples and ethnicities. Uniting the land under one name did not cause those nations and peoples to evaporate into history; beyond the cities and the fanfare of the 20th century, they still live on. The potters of Oaxaca are Zapotec, Mixtec, Ayu'uk, Nahuatl. In all, there are 15 languages spoken in Oaxaca and 5 times as many dialects. Indeed, I've often found my hard-learned Spanish of little use. On the other hand, I'm proud to say that I can say "pot" in 7 languages.

And what of the pottery itself? How does one make a symmetrical, round pot without a wheel? After many good hours spent with potters in the shade of a porch or under a tree in the courtyard, I've found the secret. Technically, it goes like this. A lump of clay, perhaps 2 pounds, perhaps 10, is formed into a cone. The point of this cone is then set onto a small piece of leather, a thin flat stone or a scrap of old soccer ball. This is then placed on the floor or a thick slab of stone with a handful of sand tossed beneath. This bit of sand acts as ball bearings upon which the piece of scrap material, together with the cone of clay, will rotate.

Working seated on the ground, the potter will rotate the cone as she uses her fist and forefinger, then corncobs



A scrap from a soccer ball nested in a depression in a large stone allows the pot to turn as Zapotec potter Alberta Mateo Cruz completes its shaping.



Cooking pot, 15 inches in height, slipped three times, burnished twice, tumblestacked and bonfired with wood, San Marcos, Oaxaca.

and a gourd piece to open, push, pull, compress and stretch the clay into a cylinder. If she needs to build up the pot more, she will form coils, and quickly smear and squeeze them onto the rim, using the gourd and corncob to thin and lift the clay. When the pot is well defined, the point of the cone upon which it is formed is trimmed off with a quick slice of a blade, and the base is scraped round.

One can watch a potter peacefully build a 3-foot-tall cylinder, shape, smooth and remove the pot, then go on to the next, all the while chatting away. The whole process looks wonderfully simple and pleasing. And it is. But from muddy experience, I can attest that making the point of that cone rotate nicely and have anything resembling symmetry happen between your hands and

the clay is anything but simple. So, while a clay cone, corncob roller and coiling might provide the technical explanation of how these wonderfully round pots (so light they almost seem to float when one lifts them) are made, they tell an empty story. There is much more to the tale.

Perhaps the most important element in the whole process is the potter's understanding of her materials. She digs her own clay, soaks and sieves it. She sifts in grog, mixing clay bodies by feel and taste, with adjustments for bowls, pots or platters. She makes her tools from gourds, leather, corncobs, old battery cores, discarded felt hats, metal banding, sardine cans, cactus spines, broken buckets and just about anything else that works. For firing, she gathers wood in the hills with burro

and machete, dries cow manure in the sun, collects waste from the agave fields, travels to the lumber mills for scrap, even chops up bug-eaten roof beams. She knows personally and perfectly everything that will go into a pot and how it will behave from forming to firing.

This thorough knowledge of materials is backed by practice. A potter is born into her trade, born into a family that has been making pots for perhaps a dozen generations, perhaps a hundred. She'll start seriously making pots in her adolescence; from then on, clay will be central to her life, until her hands are no longer capable of working. She may make 50,000 pots in her lifetime. When she is in her mid-twenties, she will be extremely adept at making those pots. By her mid-thirties, she will be able to make pots with her eyes closed. Coming



Librada Jose Bautista forms a pot on a large stone; a smaller stone disk at the base of the pot allows it to turn as she works.

into her fifties, it will seem as though she will simply have to look at the clay for the pots to be made.

I don't mean to imply that the potters here are production machines. They aren't; their work is slow and even paced, and their days and weeks are spent not only making pottery, but also

raising children, cooking meals, going to the market, celebrating Easter and Day of the Dead, spending a month with the harvest, etc. Throughout all this, the pottery work remains constant and sure. Her clay is beneath her feet, her tools are whatever's at hand, and her teacher lives under the same roof.

The pottery of Oaxaca has survived four millennia because it fulfills certain basic needs, such as carrying water and cooking food. Time has taught the potters to fit their forms to these needs. Water jugs are built with small mouths to contain splashing, but with wide bodies to hold volume. In regions where water must be drawn from deep wells, the jugs are ingeniously made with long, bluntly pointed bases and broad shoulders, which cause them to lean over and fill when hitting the water, righting again when full.

Cooking pots are made with a rounded bottom, which helps the pot settle in among the coals and uniformly conduct the heat up the sides of the pot. This same roundness serves another important structural role. As this is very low-fired pottery, it is quite fragile. Most Oaxacan pots follow the lines of a sphere, the strongest form in nature. Also in the name of strength, a great deal of compressing and burnishing of the clay goes into the forming of the pot.

To these potters, the shape is primary. Decoration and finishes are more an afterthought. But what a wonderful afterthought they are! The Zapotec potters of the Southern Sierra paint their pots with a tannin dye made by boiling oak bark. This is splashed onto the pot, using a heavily twigged branch just as the pot is pulled from the hot coals of the firing. It gives the pot the look of ancient, tarnished bronze. These potters claim they dye their pots because the belief in the territory holds that the darker the pot, the better fired it is.

Many hours distant, in the barren Upper Mixteca, the potters of Tonaltepec use the same technique, but their pots are splattered, using oak-dye-soaked rags. The look is wild and modern, yet the best reason that I've heard for this bold finish is "that's how my grandmother did it."

The East Valley Zapotec potters of San Marcos slip their pots up to three times with a fine red clay. They are then thoroughly burnished until the pots shine like river-washed stones.

In the Sierra Madre, the potters of Tamazulapan scrape their pots with a

corncob. This isn't done for decoration, but simply because corncocks are handy tools there. As a result, their pots have wonderfully rough, textured and furrowed surfaces.

In many villages, aside from the gracefulness of the pot form itself, no decorating is done, except for that which happens in the path of the flames.

Which brings me to that all-powerful moment in a potter's life—firing. This is the way it's done in Oaxaca: A week or two of slow, careful, patient work is set in the sun to warm one morning. By the afternoon, the pots are made firm or made shard by bonfires similar to the one I'd seen in that photo. It is low-fired, single-fired, quick-fired pottery—fired just enough for the life it will lead.

The pots are tumblestacked into a low mound over a bed of wood. This mound is covered over with more wood, then coals from the kitchen are added to start the fire. A bonfiring usually lasts under an hour, with wood or brush added here and there as the potter sees fit. Somewhere in that sweaty hour the smoke changes color, the soot lifts, the pots glow a dull red. The potter knows her work is done. A pyrometer would tell us that this happens at about 1300°F.

At most, such firings consume five or six armloads of fuel. This is an important detail in an arid land where wood must be used not only for firing pots, but for cooking every meal. Its conservation is a must. Had it been necessary to fire this pottery with more wood for all these centuries, it is quite possible that neither the pottery nor these cultures would have survived. No wood, no pots, no cooking fires, no dinner, no people.

The pottery that emerges from such a firing is light and resilient, ideally suited to its purpose. On a cold mountain morning, a pot can be set straight into the flames of the cooking fire with nothing more than a sigh. The sudden heat is simply absorbed and spread throughout the porous clay. Or when filled with water and left to sit, the pot "sweats" as the water soaks through the open clay. Evaporation of the moisture on the surface cools the water inside, making for a fine way to store drinking water where there is no refrigeration.

Sweating pottery and resilience through extreme temperature variation are results of clay bodies that are more than 50% grog and the quick-firing process, which leaves the clay more like sand than glass.

There is a polished coarseness in this quick-fired pottery that I find exhilarating. The roaring flames, smoke, pitch and ash have their way with the surfaces. There is little control to be had, and no pot escapes the branding of the fire.

This wild firing, along with the evolved functionality of the pottery, has redefined what beauty in clay is for me. And the pottery offers a fine reflection of the people who create it. They too are finely coarse and wonderfully rough. They too are pleasingly straightforward, frank in their ways and not distracted by ruffle and finery.

Since that first bright-eyed day in Oaxaca, I have spent years exploring the backcountry, and continue to do so. I have yet to find the potter in that old photo. Truth be told, though, I stopped looking long ago. It wasn't a certain potter that I'd come to find; rather, it was a way of being and doing that I'd longed to find. And that I achieved, not after years of searching, but from the moment I ventured beyond the fast hum of the city and stumbled across a small hidden town filled with potters working hard for a pot of beans. ▲



Ceremonial pot, 40 inches in height, corncock scraped, tumblestacked and bonfired, Sierra Mixe, Oaxaca.