TEACHING THE HISTORICAL AND TECHNICAL DEVELOPMENT OF POTTERY

Master of Education Degree Program

University of Minnesota--Duluth

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Spring, 1976

ACKNOWLEDGMENT

Thank you to Professor Glenn C. Nelson who sparked my interest in the subject of pottery and history.

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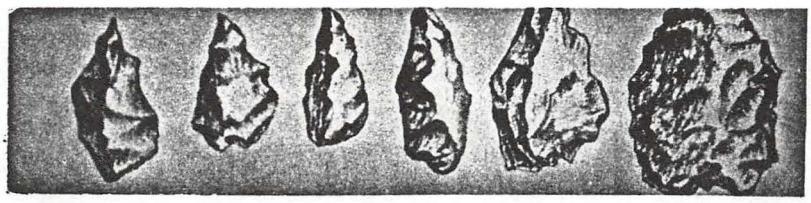
HISTORY OF MAN AND CLAY

Teaching ceramics should involve more than just the instruction of the processes needed to change a lump of wet clay into a fired piece of pottery. The student should be made aware of the historical development and importance of pottery. If students understand the importance of a pottery tradition, they will be able to work more easily in our present complex society and can benefit from early man's experiences in pottery making, decorating and firing.

In teaching, I would want to hold most of the classes outside on the school grounds. Here, away from the restriction of a traditional classroom, I would start talking about what was important to primitive man. The most important thing for man's existance is food. In early prehistoric times wealth was measured in food. Early man spent most of his time each day gathering food such as nuts, berries, fruits, eggs, plant roots and small, slow animals.

Early man was almost helpless against predators until he learned to use and make tools. These tools--spears, clubs, arrows, knives and scrapers protected man and also made it easier for him to get food.



(1) Chipped stone artifacts from Siberia.
Jennings, Prehistory of North America, page 74.

Fire was an important tool that man learned to use. It is not known when or how man obtained fire, but it was probably from some natural phenomena such as lightning. Fire was carefully guarded; if it was allowed to die, it was difficult to get again. The fire tender was as important as the hunter.

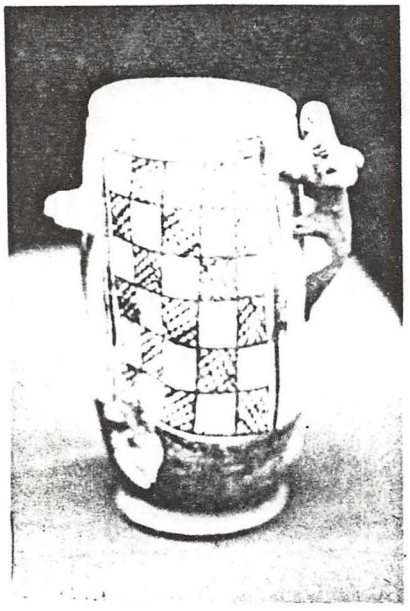
(2) Yahgon People of the Tierra del Fuego. Burland, The People of the Ancient Americas, page 16.

Fire allowed man to have more control over his environment. He could cook his food with it; he could protect himself from animals and spirits that were lurking in the dark of night.

Another tool that man learned to use was the dog. This animal was domesticated and learned to live in partnership with man. Dogs were used to help with a hunt and to protect man from his enemies. The dogs used their keen sense of smell and hearing and would give warning when danger was present.

With his friend, the dog, man hunted for meat and gathered plants for thousands of years. It was not until about 10,000 years ago that man learned to control plants. Man must have noticed how the same plants could be found in the same area year after year. It was from this observation that he noticed that small plants came from the seeds that he had used as food. Agriculture enabled man to have more control

of his food production which, in turn, helped his population to grow. Farming developed in the Americas about 9,000 years ago. The basic grain was maize, a small grass bearing two seeds about the size of a kernal of corn. In a few centuries this small wild plant improved until it was about the size of a human thumb with thirty to forty kernals.

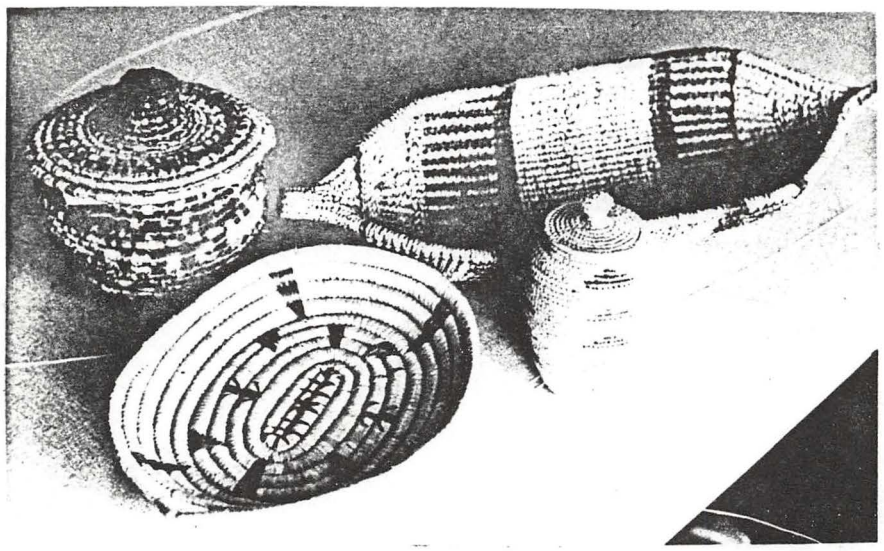


(3) Corn decorated Pot from Mexico.
Museum of Natural Historic
Chicago, Illinois.

Villages were only temporary for after the crop was planted the people would move away to hunting grounds until the crop was ready to harvest. This semi-fixed village system was responsible for the people settling down. Other crops were grown in the Americas. They were potatoes, beans, squash, and peanuts. This food helped the people through the winter months. The food had to be stored; it was about this point in civilization that pottery was discovered. Until about the year 1600 A.D., agriculture and pottery were common across North America. As the farm land was planted the people would move to the villages. Animals

were hunted during the off season and the meat and oils were preserved for later use. The eastern woodland farmers were more organized than farmers of the plains. Villages were built on defensible places close to water and food supplies. The rivers were fished with woven basket traps and the sugar maple juices were boiled down into a thick sweet syrup. These organized methods of farming and fishing enabled man to have more stable and larger village complexes.

Now that man was less mobile he needed to be able to preserve and store his food. Meats were sun dryed or smoked. They were kept in leather pouches, birch bark and woven baskets.



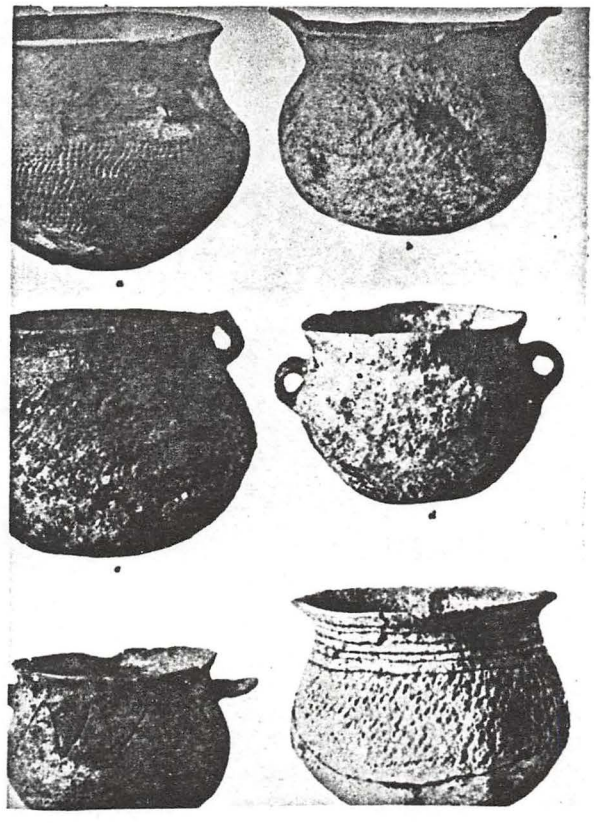
(4) Baskets, contemporary American Indians.

The grain and small seed were kept in finely woven baskets, some of which were lined with clay so that the small seeds did not pass through the fibers.

There are two theories about how man discovered that clay when it is heated to a red glow in a camp fire of about 600 degrees centigrade is turned to an almost rock-like state. It is probable that the

idea developed over a considerable period of time. The first and more valid theory is called the hearth theory. Fire was a valuable and vital part of man's early existence. Holes were made in the ground and these could well have been lined with clay. The fire kept in them would turn the clay into fired pottery and when the fire was put out a crude vessel would be left.

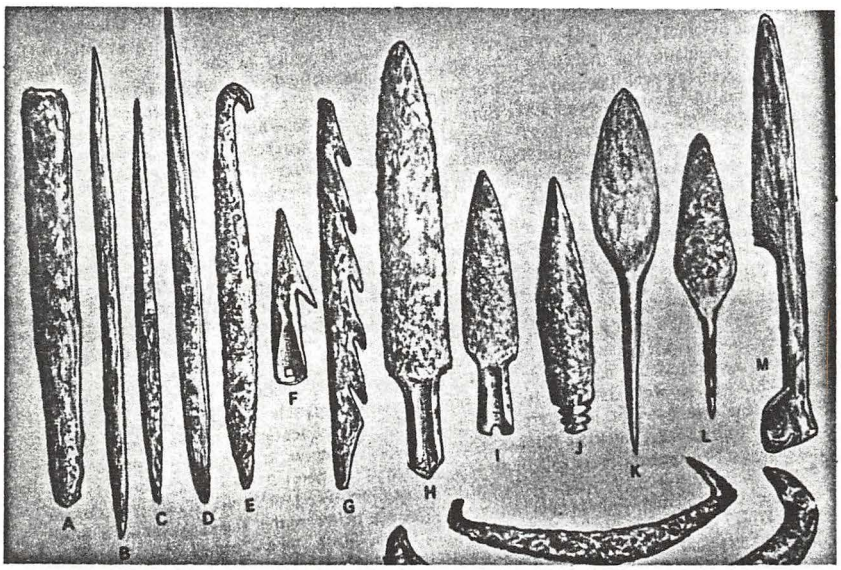
The second theory is that baskets would have been lined with clay to make them waterproof and, in due course, as the clay dried out and contracted, a simple pot would be formed which could have either held fire or been put in the fire. Another possibility is that their clay lined baskets could have been burned in the fire leaving a simple decorated pot.



(5) Cooking pots with cord direcation.

Pottery was a useful tool for man. The fired pottery would hold water and other liquids and could take the heat of a cooking fire. Both dry and moist food could be stored in pottery and kept safe from insects and rodents. The first pots were simple in form with a round bottom and wide mouth. The simple, early decorations resembled basketry and rolled cord.

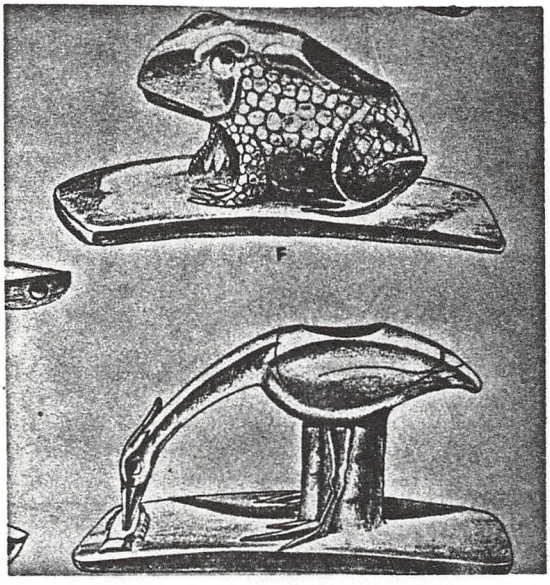
The more that man could control his food supplies the more free time he had to think and create. His tools for both hunting and farming were more complex and the size of his villages grew. The pottery became more ornate and the decoration more complex. He was carving bone and soft stones into beads and sculptural forms.



(6) Copper artifacts
a. chisel b-c. awls d-e. punches f-g. harpoons
h-l. spear points m. knife
Jennings, Prehistory of North America, page 46.

Copper was mined in Northern Wisconsin and Minnesota and was made into weapons, tools and body decorations such as beads and earrings. Shells, flint, copper and stone (such as pipestone) were being traded all over

North America.

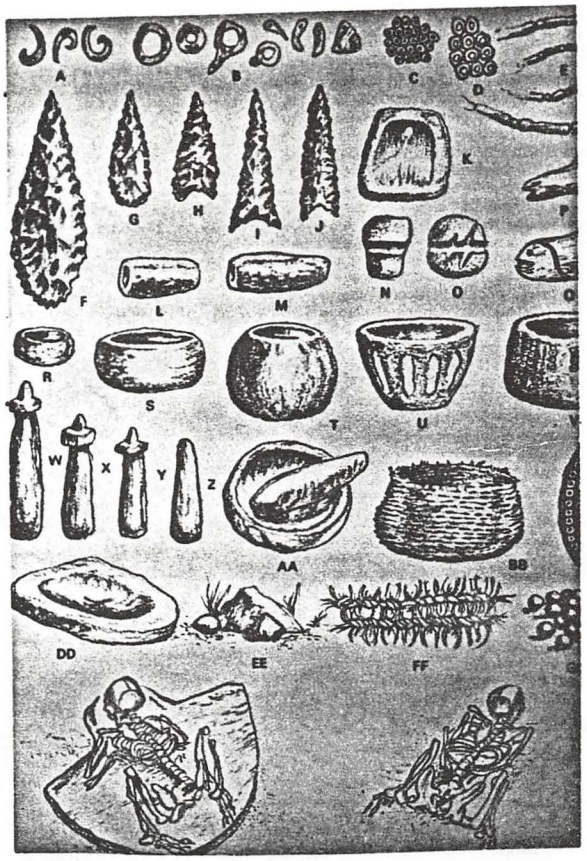


(7) Hopewell stone pipe sculptures
Toad, hearon.
Jennings, Prehistory of North America,
page 237.

We do know that early man must have believed in a life after death for we find many tools, jewelry and possessions that were used by the living buried with him. Their early graves contained stone tools, animal bones, shells, and the remains of both pottery and baskets. Later graves, after contact with the European have even more riches.

A wealthy burial mound contained even more beads, shells, stone and bone carvings, flints for a rifle, extra lead, iron and brass kettles. His wife's burial mound would have beads, flints, food, silver and copper jewelry, shells and Chinese Ming blue and white trade porcelain.

The introduction of the horse or "magic dog" to the new world had a definite effect on the American Indians. At first the horse



(8) Burial Goods.
a. shell fish hook, b. shell pendants, c-d. shell ornament, e. beads, f-j. spear and projectile points, k. lomol, l-m. stone points, n-o. arrow shaft straightener, p-q. wale effigies, r. mortor, s. stone bowl, t. steatite olla, u. sandstone bowl, v. inlaid bowl, w-z. pestles. aa. mortar and pestle, bb. basket, dd. stone dish, ee. burial marker, ff. woven seagrass, hh. flexed reburial.
Jennings, Prehistory of North America, page 178.

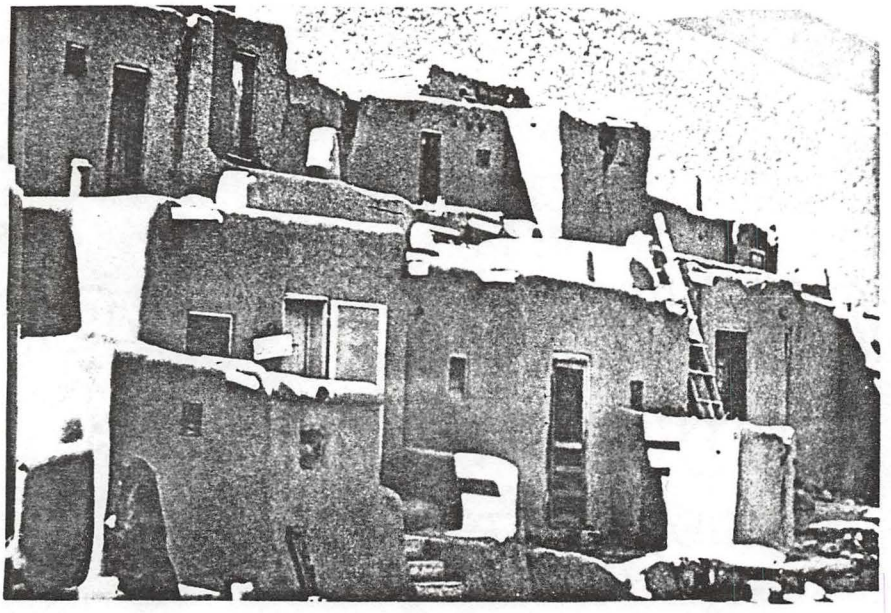
frightened the Indians. Later as these horses escaped and multiplied in the wild, the Indians learned to catch and train these horses. The horse gave the Indian a new life style. The "magic dog" made it easier to hunt the larger animals such as the buffalo. It also made the Indian more powerful and wealthy. The wealth also worked against the Indians in that they became war-like and more violent in their efforts to protect and acquire more horses.

(9) 16th Century Indians. The horse introduced by Spanish settlers, had radically altered the basic culture of the tribes who had normally subsisted by hunting on foot. Burland, The People of the Ancient Americas, page 17.

(10) Leather War Shirt by Plains Indians Museum of the American Indian, New York, New York.

The villages were mobile as the Indians followed the great buffalo herds. Pottery was too fragile and heavy and almost completely abandoned by the plains Indians. Farming was also abandoned.

As the Indian was integrated into white man's society, many of his old ways were lost. Pottery survived in only a few places in the Southwest among the farming and ranching society of the Pueblos.



A modern Indian multi-story Pueblo house block in New Mexico. Burland, The People of the Ancient Americas, page 23.

With the help of Maria Martinez a rebirth of old and forgotten pottery techniques has occurred in the Southwest.

THE TECHNICAL ASPECTS OF CLAY

"Clay is one of the most common minerals found in nature and is a result of the decomposition of granite, feldspathic or pegmatite rocks. The impurities or variations in this basic formula of Al_2O_3 . 2 Si O_2 . 2 H_2O accounts for the differing characteristics."[1] Clay occurs naturally as a dry, powdery solid. It can also be a sticky but plastic lump or a lumpy liquid. "The particles of clay are flat and plate-like and the additions of water enables them to slide over each other without breaking apart."[2] This ability to slide without breaking is called plasticity. There are many types of clay that occur in nature, but they can be grouped into two categories--residual and sedimentary. "The sedimentary clays are those that by the action of wind or water have been transported far from the site of origin. These particles are usually the smallest in size and the most plastic. The residual clays are those that remain more or less at the site of the original rock formation. As a rule they are less plastic and have a larger particle size."[3]

There are many types of clay and each has its own properties such as particle size, plasticity, impurities, color and firing temperature. Early man noticed the difference in clays and used them to his advantage. Kaolin, which is the most pure form of clay, is white in color and the most refractory. Refractory means that it will take a great deal of heat to vitrify. It is not suitable for a primitive type

of pottery.

Ball clay is a very plastic sedimentary clay, dark gray in color when raw and white when fired. It is a good clay to use as a slip decoration over a darker clay body.

Stoneware and fire clay are very common in nature having many impurities; they are not very strong when fired to a low temperature. "Earthenware clay is the most common and is the most useful for making low fire pottery. This clay is found in almost every state and its raw color may be red, yellow, green, blue or gray."[4]

The colors are useful in decorating. This clay will usually burnish very well and retain its shine after the fire. It is important to a potter that the earthenware clay does not have small particles of shale. This shale will expand after the pots have been fired and cause ruptures and white holes in the pot. Plaster will give the same results to a modern potter.

Where does one look for clay?

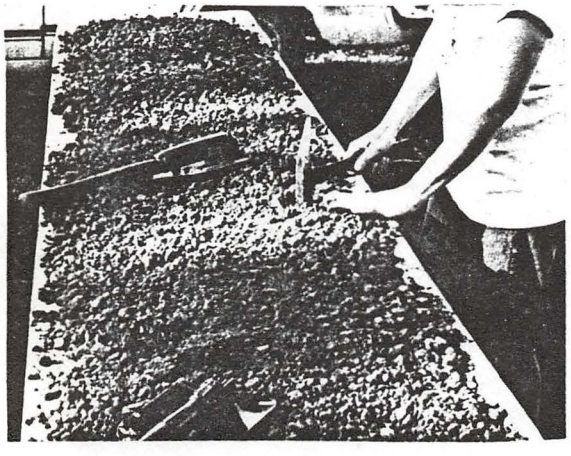
A good place to find surface deposits of clay is along a river bank or road cut or a building excavation. The clay should be free of

(12) Clay hill near Delhi, Minnesota.

sand or soil. Clay that has washed down from a hillside and has settled out in a dry puddle is usually good. The cracked and curled up clay means that its particle size is small and usually very plastic.

Dry clay, washed by rain into large depression. Death Valley, California. Riegger, Primitive Pottery, page 12.

How can clay be processed and tested?



(13) Drying and pulvering clay.

(14) Pouring liquid clay slip onto plaster to stiffen.

The sample of clay should first be dried and pulverized. Then it should be setted down into a thin slip (to a liquid state of clay). This clay slip is then screened through a thirty mesh sieve. This will remove the coarser particles and small bits of shale. If the clay seems to be too sandy, then the slip should be mixed up and allowed to settle. After it has settled for a few minutes the top three fourths can be poured off and saved. The bottom fourth is the heavy clay and sand; it can be discarded. "This thin, fine slip is then dried on plaster which will absorb the excess water."[6] When the clay is the correct consistency it may be kneaded until it is ready to use.

How should a person test this clay to see if it has the desirable characteristics for pottery clay?

An important characteristic that clay should have is plasticity. This allows the clay to be pinched, molded and coiled into almost any shape or form. "A standard and simple test is to loop a pencil sized coil around one's finger. If the coil cracks excessively, then the clay is not very plastic."[7] Aging the clay in its wet state will help to improve its plasticity. Another way to improve a non-plastic clay or short clay is to add a small amount (up to one fourth) ball clay. Many naturally occurring earthenware clays are too plastic and they need coarse material such as fire clay, a temper such as sand, a fibrous material or small particles of fired clay which is called grog. These make the clay more useable for the potter. Clays that are too plastic will sometimes crack when they are drying.

Clay should also be tested for porosity which is directly related to the hardness of the clay after it has been fired. In making

a porosity test, an unglazed, fired clay sample is weighed and then is soaked overnight in water. The percentage gain in weight will be the porosity of the clay body.

Another test of the new clay is to check its shrinkage. "The more plastic clays shrink the most."[8] To test for shrinkage, first roll out a plastic slab of clay and mark or cut a measurement. When the clay is bone dry check the measurement. This distance subtracted from the wet distance will give the drying shrinkage. Finally, fire the same dry slab and measure it again. The difference between wet and fired is the total shrinkage. Shrinkage for most earthenware clay is between 15 and 20 percent.

The final test of a new clay is to make it into a pot. It's good to feel how the clay acts as it is being shaped. Water is needed to make it workable. The color of the clay and how well it can be burnished is also important. The final test is to fire the pot and see what happens. Can and will it take the heat of the fire? What color is it? Is an open fire of about 600 C. enough to make the clay strong? These are the questions that a potter must ask himself about the clay.

Where and what is the best way to locate clay in your area?

First ask your students if they have clay in their yards, farms or if they have noticed it along the highway, river or along an excavation for a new building. People who work the soil in your area should also know about surface deposits of clay. Local farmers, small town construction companies and the geology departments of most colleges or universities know where clay can be found. Finally most towns will have a farm extension or U. S. Department of Agriculture office and

they are usually eager to help.

How did early man process clay?

Preparing the clay requires several steps. The potter often travels considerable distances to get fire clay from highly prized deposits. Even the best clay must first be pulverized before it can be used.

(15)

(16)

(17)

(15) Preparing clay: pulverizing clay, grinding to a powder with a mano and metate.
Whiteford, North American Indian Arts, page 10.

(16) Cleaning clay, air sifting.
Whiteford, North American Indian Arts, page 10.

(17) Wetting and adding temper.
Whiteford, North American Indian Arts, page 10.

"The potter crushes the lumps with a stone hammer or club. Then the dry clay is ground into a fine powder with a mano and metate like those used in grinding corn (see illustration). After the clay has been ground, the large lumps and pebbles are removed by sifting or tossing the clay in a winnowing basket. The lumps and rocks drop back into the basket while the fine clay is blown into a blanket that is spread out down wind. The fine powder clay is stored until the potter is ready to make

pots. Wetting and tempering the clay are the final steps in getting the clay ready to use."[9] The potter adds water and kneads the wet clay on a skin or flat stone. As the clay is kneaded, temper is added. The temper is a fine crushed material that prevents the pot from cracking during drying or firing. If too much temper is used the clay is gritty and difficult to work.

What kind of material is used to temper clay?

This will vary from one part of the country to another. Many kinds of rocks and organic material were used. There is also the equivalent or grog (which is made from ground up, fired pot shards). "Some of the ground rocks include sandstone, limestone, dolomite and volcanic ash."[10] Organic tempers were also common. They included shells, sponges, plant fiber, bark, feathers and shredded grasses. "Sand is occasionally used but it is not a good temper because the small particles are smooth and round. Clay forms a poorer bond with smooth temper than with a rough surface."[11]

MAKING POTTERY

What are some of the techniques used by early man to make pottery?

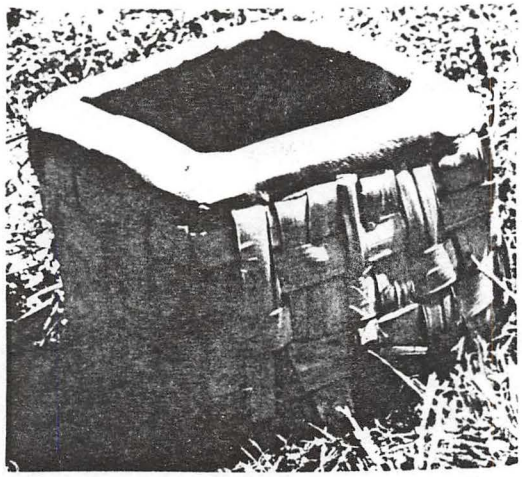
One of the simplest and most direct ways to make something out of clay is to pinch and squeeze the clay out into the desired shape. "It is often presented to the beginner as the first and not very important step towards making real pots; this is too seriously underestimated. Not only can one's fancy run free but with practice quite large, thin-walled shapes can be achieved."[12]

"Coiling is another technique of building pots. It is done by laying coils or ropes of clay one upon another and then working them together."[13] Some people use separate rings of clay instead of a continuous coil. A coiled pot is similar to a coiled basket and many early pots have a basket-like design. The coil pots are first started as a pinch pot or slab pressed into a shallow basket or bowl which is sometimes called a puki. Then more coils are added. Shaping the pot goes slowly because the walls must dry enough to support the weight of the next coils.

Molding and paddling is a technique whereby a large pancake is laid over the bottom of an inverted jar which serves as the mold. "The potter turns the mold and pats the clay thinner spreading it into an even layer. The shaping comes when the clay has stiffened slightly and the pot is removed from the mold."[14] A smooth rock is now used inside and a paddle used outside the pot. The potter beats it into shape and

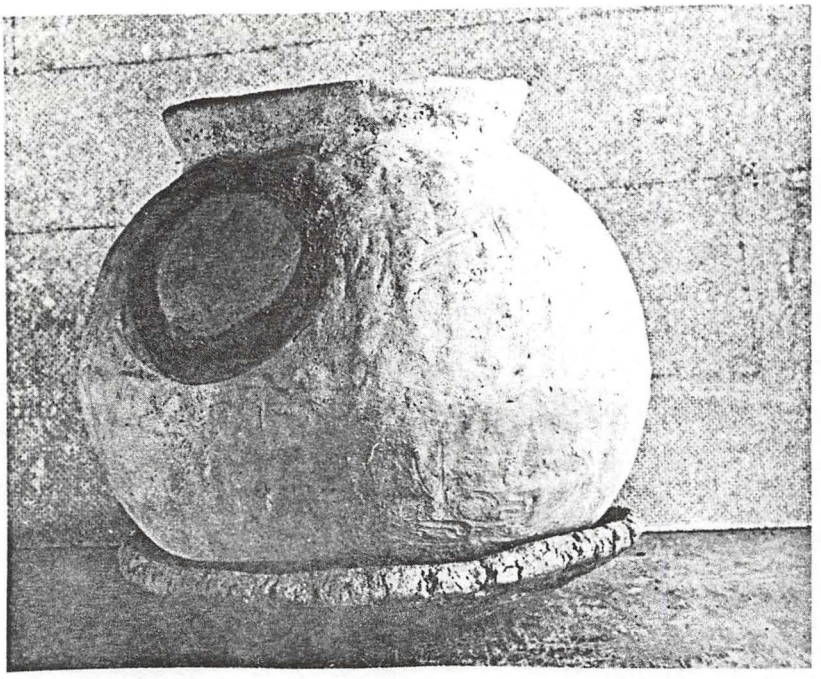
makes it thinner. This process is called hammer and anvil. Sometimes coils are also added to control the final shape.

A molding process that was used by early man was to build the pot completely inside a woven basket. Large, thin pots could be constructed in this manner. The baskets could be either twined, coiled or plated. The coils of clay were pressed into the basket, then scraped smooth and thinned on the inside. When the clay was dry the basket was burned off in the firing. A texture was left on the final pot.



(18) Woven basket)plaiting technique)
with clay.

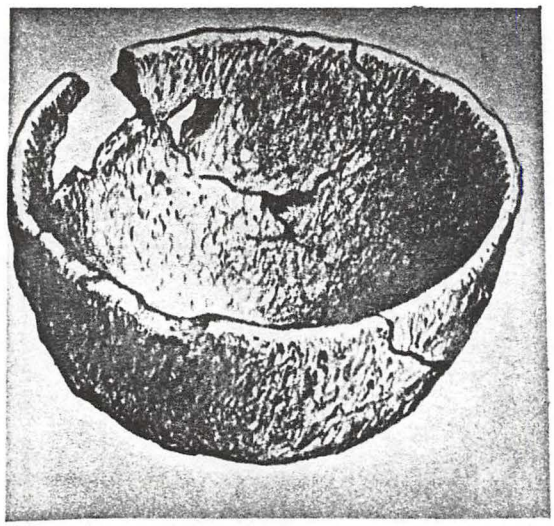
Round bottom pots are built in a shallow hole in the ground or in a puki. A puki is a bisqued, shallow dish. The purpose of the puki is to evenly support the weight of the pot so that its bottom will be round. The puki also makes adding coils easier because it acts like a wheel. In some parts of Mexico a second puki was used and the coils were smoothed by turning of one puki or another. The technique is very much like throwing on a potters wheel.



Correct use of a puki; the pot curves upwards before reaching the puki's edge.
Riegger, "Primitive Pottery", page 39.

DECORATING POTTERY

Early pottery was finished and decorated in many different ways. The earliest pots were just scraped smooth and fired. The color would be left up to accidental firing of both oxidation or reduction.

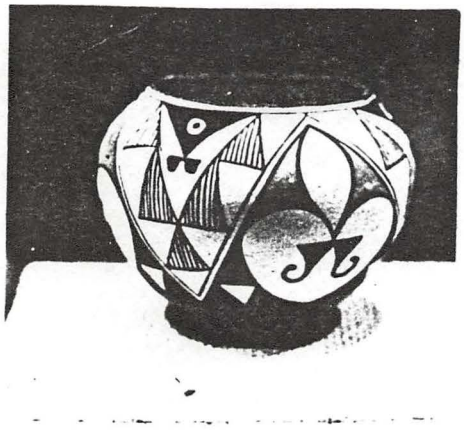


(19) Basket shaped pottery showing fiberous temper with accidental firing.

If a pot is cooled in an open flame then the pot is said to have been oxidized and color can range from a light tan to a brick red. A reduction fire or smudging is achieved by smothering the fire with fine shredded animal dung, straw or sawdust. "This closed fire with little draft produces a dense smoke which impregnates the pottery with carbon and gives it a black finish."[15] Burnishing or polishing is another way to decorate a pot. First the dry pot is coated with a creamy mixture of clay and water. This clay slip fills the pores and gives the pot smooth

(20) San Ildefonso, reduction blackware.
Maria Martinez

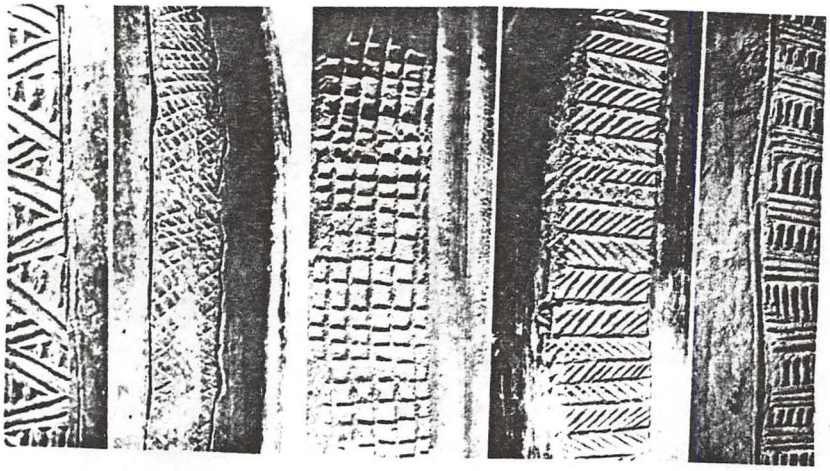
surface. With the slip still moist the pot is polished with a smooth stone. This burnishing takes hours. When the pot is bone dry it is polished again only this time a small amount of animal fat is applied before the final burnish. Decorating is done by a variety of techniques. Painting was widely used to decorate pots. Early man would decorate his work with clay of contrasting color. He also used ground materials such as iron oxide and mixed them with clay. "Indians painted their designs with sticks, feathers and brushes made from the yucca plant."[16] Negative



(21) Acoma Indian Pottery

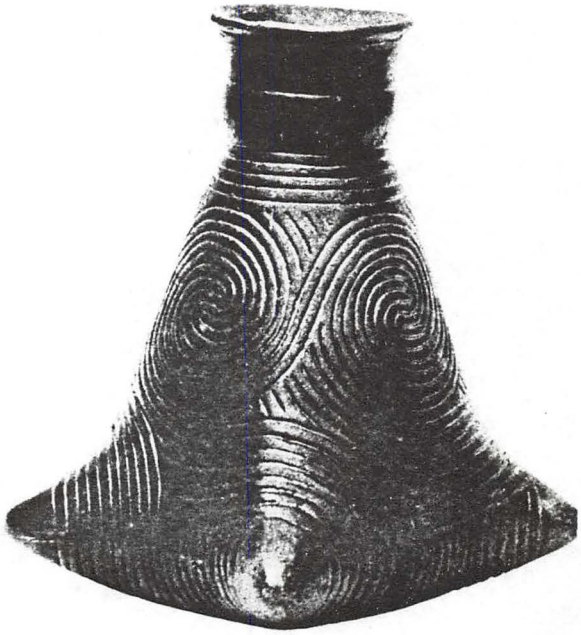
(22) Engraved stones.
Mexico.

designs were painted with a wax resist process. The was resisted the next coat of colored slip. Corrugation designs were made to resemble fiber baskets. They were created by smoothing the inside coils and only a few of the outside ones. Impressed designs were made with cord, net, baskets, shells, carved wooden stamps, and bisque clay stamps and roller stamps.

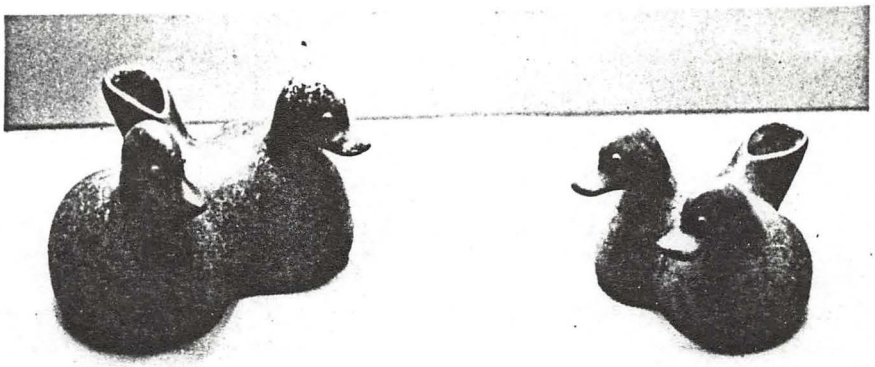


Roller Stamp Designs.

"Incising or scratching designs was done with a wood or bone tool in the soft clay."[17] Engraving is similar to incising (carving) only the lines are finer and usually the clay is bone dry or sometimes already fired.



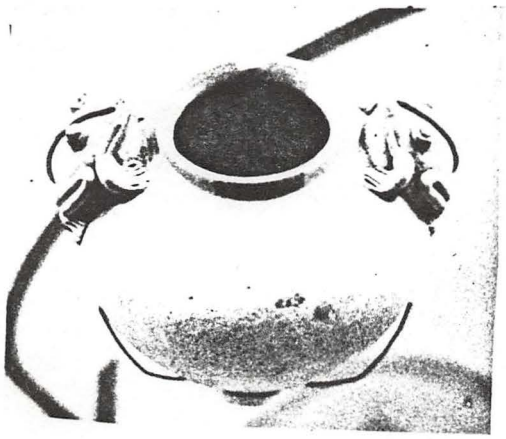
Engraved pot, Mississippi valley culture.



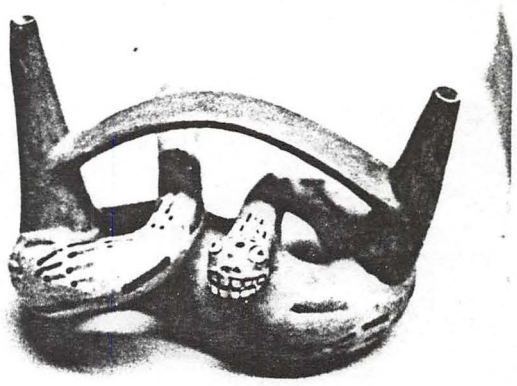
(25) Molded ducks from Peru.
Chicago Museum of Natural History.

Some pots were molded by hand into animal or human forms. Effigy figures were molded into pots, piped and are found as complete sculptures. Pottery shapes were influenced by function, nature and other man-made objects. Early man used his light weight baskets as a model for his pots.

Natural forms like shells, eggs, gords and animals were adopted

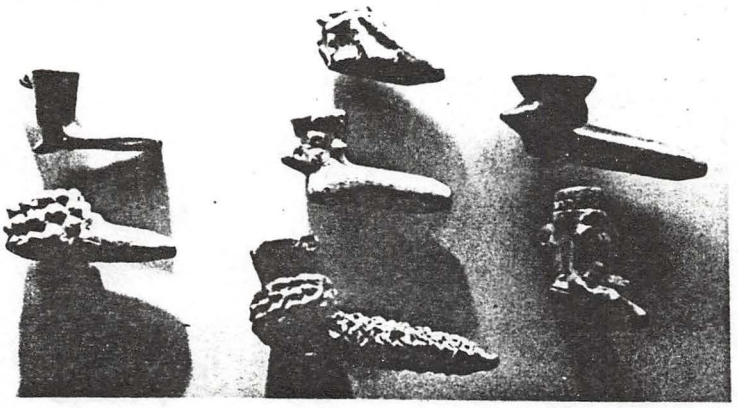


(26) Panama frog effigy pots.
Museum of Natural History
of Chicago, Illinois.



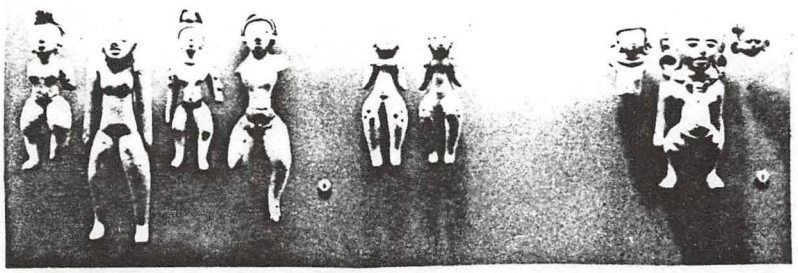
(27) Effigy pot.
Art Institute of Minneapolis,
Minnesota.

into clay vessels. It is difficult to classify the shape of a pot according to function. Prehistoric man may have used the same form for many things.



(28) Clay pipes.
Museum of Natural History of Chicago, Illinois.

The use of molds was very common in early times. The molds were usually man-made. They could consist of pressing clay in or over an existing form or making a special form. In Mexico and South America fired clay molds called "bisque molds" were used.



(29) Clay figures, Mexico.
Museum of Natural History of Chicago, Illinois.

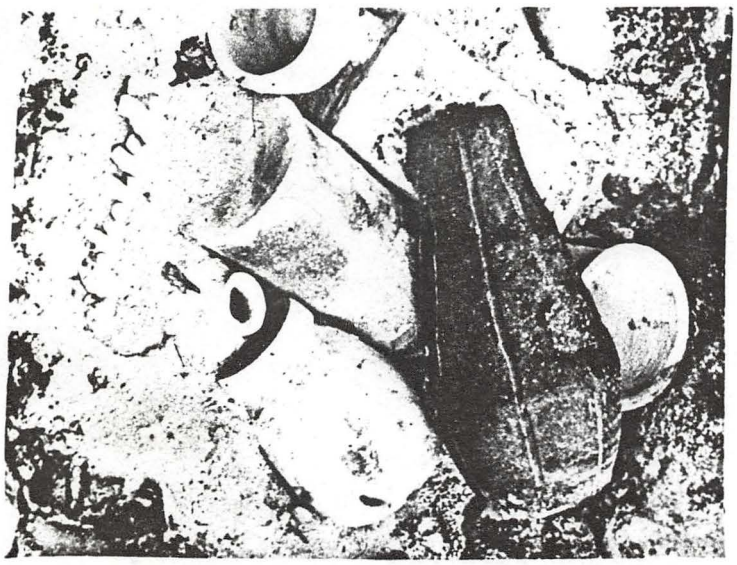
Small pots, pipes and effigy heads were molded and then used in the construction of other pots. Pots made from molds could be made in less time and they were lighter in weight.

FIRING POTTERY

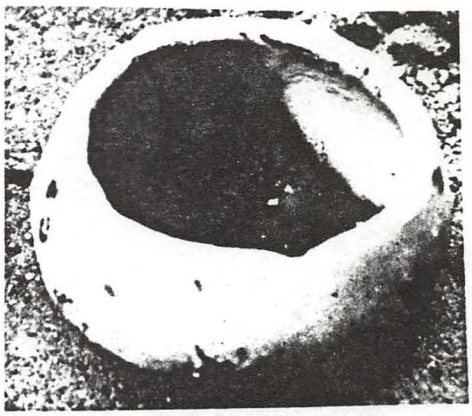
How are pots fired?

The easiest way that early man fired his pottery was to build a fire on top of the pots. When the fire was burned down and the pots were cool, the process was complete. Pottery fired this way will come out with a varigated color ranging from gray to black.

Pottery in the pit firing.



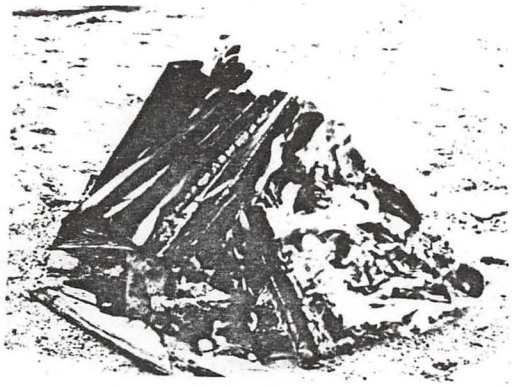
Cooking pots, cooling in pit fire.



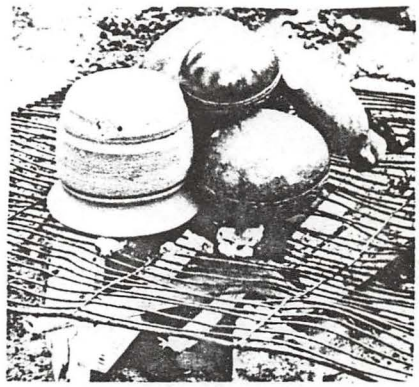
Fired pinch pot.

The black color comes from cooling in a reduction atmosphere and the gray, tan or red cooled in an oxidization fire.

A more contemporary way to fire the pots would include the following steps: first the pots must be bone dry with an even consistant thickness of three-eighths of an inch or less.

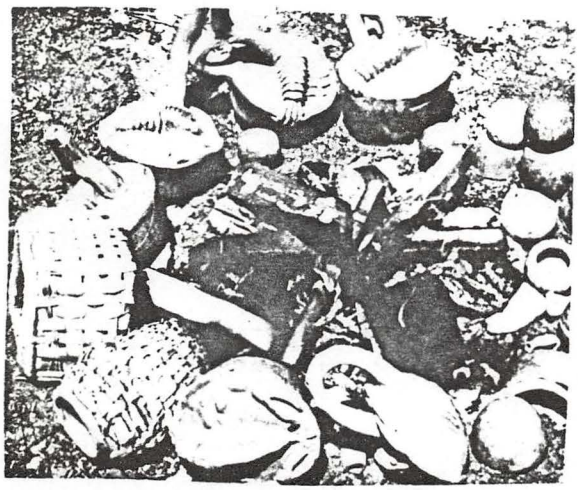


Quickly burning fire to get coals for preheating the pottery.



Pottery heating slowly over coals.

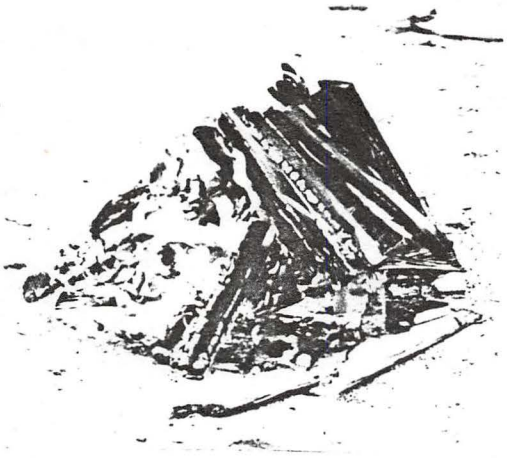
Next, a small fire is built and allowed to burn down to coals. The pots should be placed around this fire to start them warming. The coals should be scraped from the center so that there is a ring of coals and fire.



Pottery preheating around small fire.

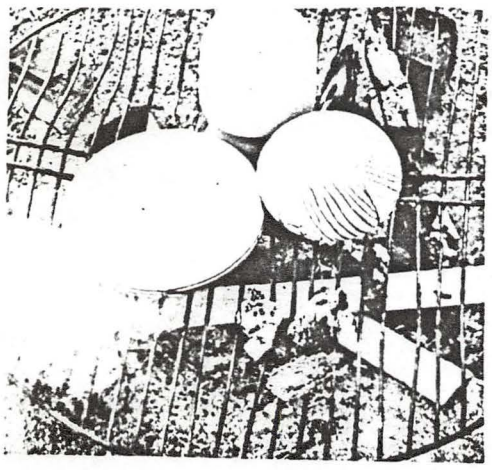
Pottery in a ring of fire to heat slowly.

The pots should be placed in the center of the coals on stone or brick supports. It is important that the pots do not heat too quickly because the moisture in the clay will turn to steam and the pots will break. The fire can be made larger and grought closer to the pots. After an hour or so; if the pots have not broken, the flames can start touching the clay.

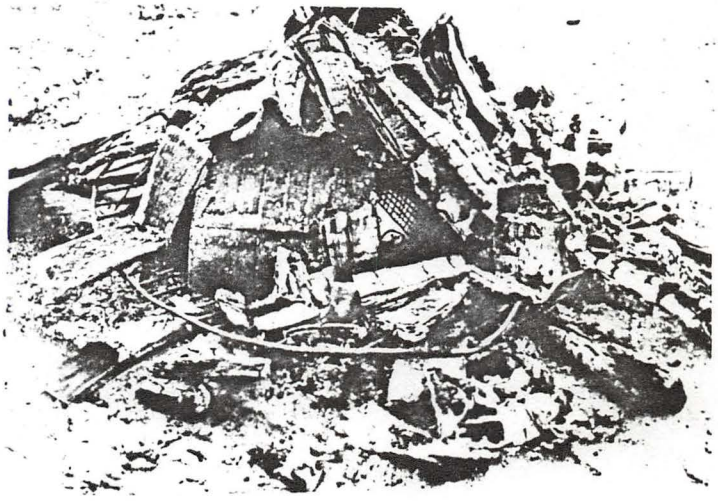


Fire and coals on pottery.

The firing should still be slow enough that a half hour passes before the pots are completely covered by flames. When the pots are hot enough to glow, the firing is complete. If designs have been painted on the pots, the pots should be fired in an oxidizing atmosphere and allowed to cool in the open fire.



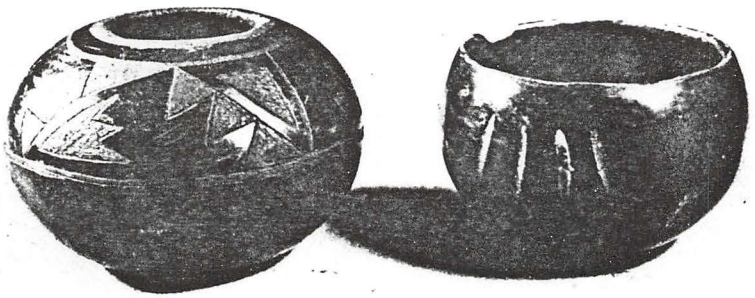
Oxidation fire pre-heating.



Oxidation fire cooling.

If you want a black pot or reduced effect then the fire should be smothered with green grass, dry dung or sawdust. The smothering will cut off the flow of oxygen and creates a reduction atmosphere. It works best to have a separate fire for the two effects. It is also good to have only a few pots in each fire.

Reducation using sawdust.



Two reduced and burnished pots, one with engraved background. John Schissel, University of Minnesota, Duluth, 1975.

a. b.

a. Reduced pottery with slip and burnish decoration.
b. Oxidized pot with iron decoration on buff clay.
John Schissel, University of Minnesota, Duluth, 1975.

Effigy Elephant
contemporary, oxidization fire. Student, Southwest State College, Marshall, Minnesota.

Some things to consider and some difficulties that one will run into in an open pit fire are the following:

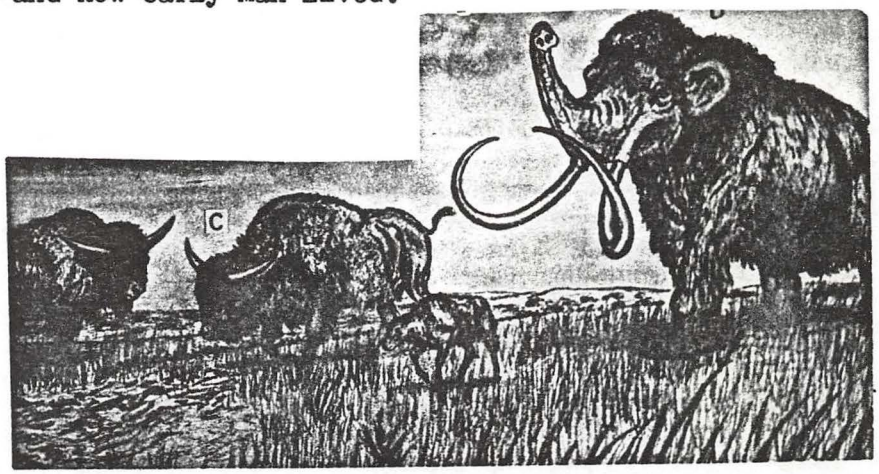
1. You must take your time in firing. The firing should take 2½ to 5 hours from start to finish.
2. If the pots are not dry and thin they will explode in the early part of the firing, or water smoke cycle. The first 212° F must go slowly so that the water will not turn to steam which will break the pot.
3. Cooling too quickly may crack the pots. This is called dunting.
4. In reduction the sawdust or straw will burn off and the pots will oxidize. The reduction material should be covered with sand or soil to cut off the air from the fire.
5. The pots will not vitrify (reach temperature) and are very fragile. The pot should be hot enough so that it will glow red to red orange in color.

6. The colored slip for decorating and burnishing will be fragile and can be scratched off after the fire. This means that the pot is not fired hot enough or the decorating slip is ment to fire at a higher temperature. A good low fire white slip is 60% talc and 40% boll clay. Coloring oxide can be added to this mixture for decorating the pottery.
7. The clay might have limestone that will take on moisture and cause small pop out marks. To avoid this the clay should be dryed, pulverized and finely ground. If the pop out marks persist then one should switch to a new clay.

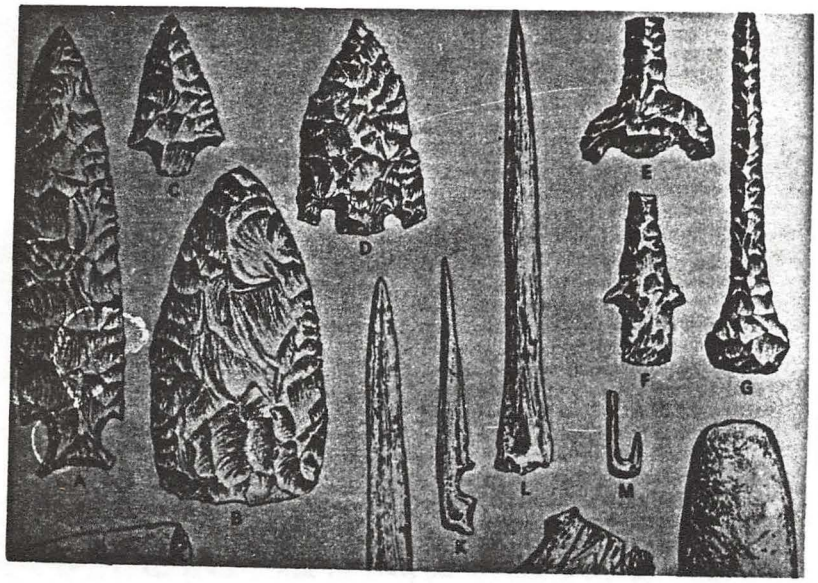
THREE WEEK LESSON PLAN OUTLINE

Day One

Introduction with slides showing the historical and technical development of pottery and how early man lived.



Bison and Mammoth similar to the ones hunted by man with stone weapons.



Tools used by early man.
a. flint benton point, b. bifacial blade, c. minnow point, d. eva point, f. stem drill, g. drill, k. awls, m. bone fishook. Jennings, Prehistory of North America, page 138.

Day Two

What is clay? How is it formed? How and where is it located? Plan a field trip to dig clay. Tools and equipment needed.

New Words - residual clay, stoneware, earthenware, ball clay, temper, ect.

Day Three

Field trip to collect clay. On trip have students make a small "magic object," do not tell what it is or what it is for.

Day Four

Process the new clay--dry, screen, pulverize, slake, rewet, add temper. Collect temper--grass, sand, grog, mica, shells, etc.

Day Five

Basket Theory.

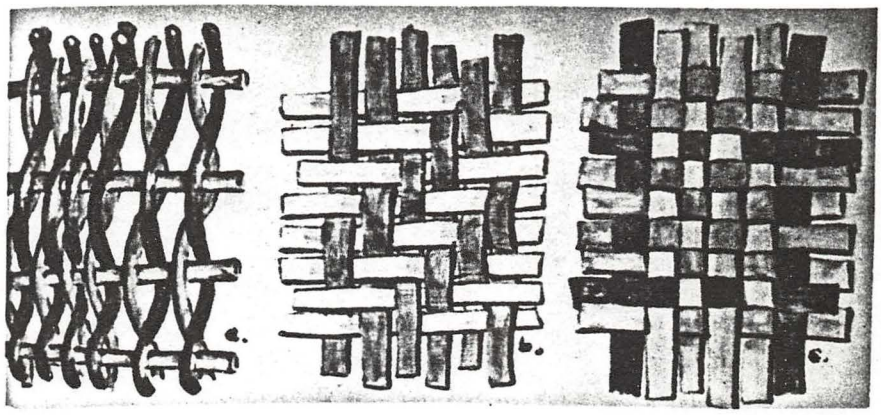
Hearth Theory.

Show slides--making a coil basket, early pots, baskets, designs, effigy figures.

Assignments--make a basket or copy of pot or effigy figure.

(52) Effigy Pottery.
10. Zuni
11. San Ildefonso
12. Sana Clare
13. Iriquis
14. San Ildefonso
Whiteford, North American Indian Arts.

Basket Techniques
a. wicker plaiting
b. twill plaiting
c. plain plaiting



Day Six

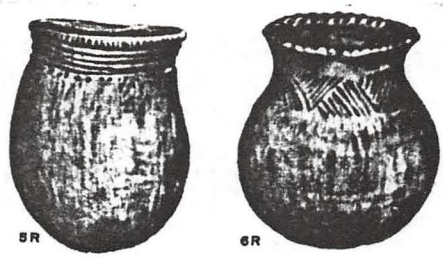
Importance of fire--how to make fire, drill and bow, flint and steel, etc; keep fire alive; cooking and preserving food.

Assignment--make a fire with flint or drill, also a two page paper assigned on the culture or style of your favorite pot from the slides or book--due last day of class.

Day Seven

Assignment--make a simple pot to hold fire, food, bones for the dead, etc.--use pinch, hammer and anvil. Show slides.

(47) Prehistoric pots from Wisconsin.

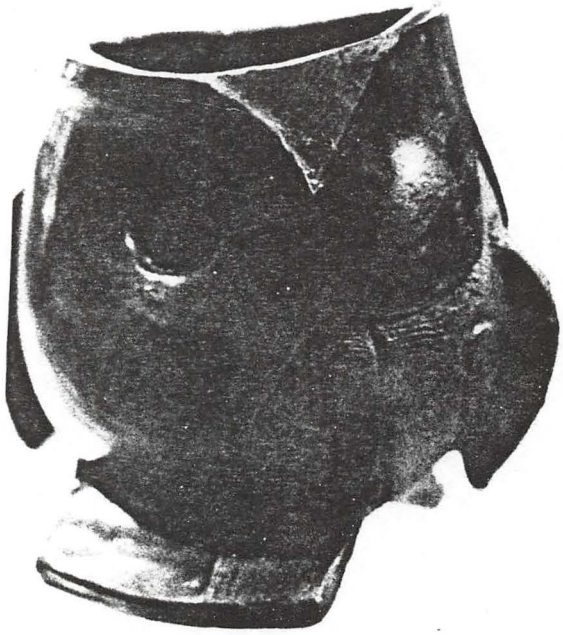


Day Eight

More work on pots from seventh day--forms from nature slides, gords, shells, fruit, animals.

Talk about thickness of pots--use of scraper and the puki and round bottom.

Assignment--bring in two forms from nature.



(58) Effigy blackware and burnished pottery. Bob Husby, University of Minnesota, Duluth, Minnesota.

Day Nine

Molds.

Slides of mold pots, simple molds, press molds, how to make a mold, bisque molds.

Assignment--make a pot that a mold will be made from.

Day Ten

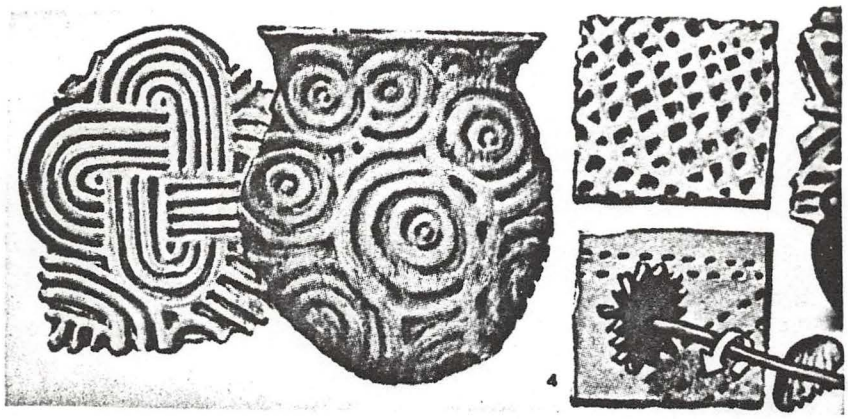
Make a mold of previous pots using clay or plaster.

Make two pots from the mold and trade one pot with another student.

Day Eleven

Introduce stamps with slides. History, what is a stamp? How used? Types of stamps--roller, positive, negative.

Make two or more stamps and use them.



Stamps.
Concentric circles, diamonds, check stamp, rouletting stamp. Whiteford, North American Indian Arts, page 15.

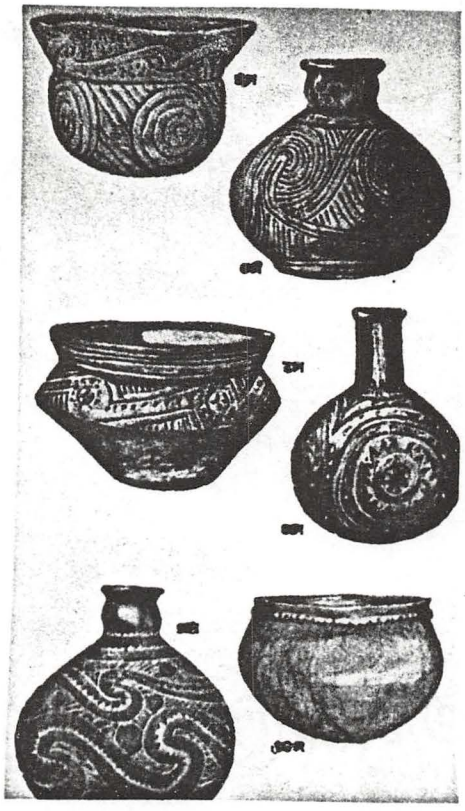
Day Twelve

Show slide of--carving clay, pipes, incising and engraving designs and effigy figures.

Make a simple pot to carve, engrave, etc. which is a copy from history.

Hunting magic figures.
Museum of Natural History, Chicago, Illinois.

Incised caddo pottery
Whiteford, North American
Indians Arts, page 23.



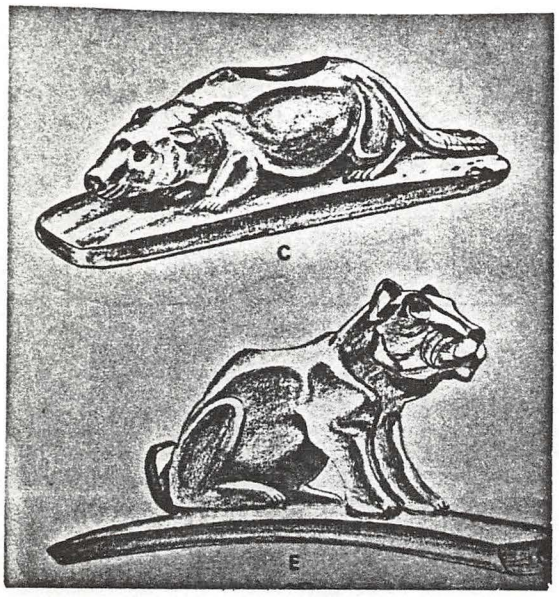
Day Thirteen

Effigy pot--make one to store magic objects, beads, etc. using a human or animal form.

Talk about other objects that early man felt had magical powers.

Day Fourteen

Slide of other art materials made by man--tools, weapons--using fiber, feathers, rocks, bones, shells, metal, beads, quills, fir, birch bark, talk about copper of Minnesota. How it was mined? Worked? When? Also, talk about pipestone (catlinate) and its importance.



Hopewell stone pipe sculptures.
Jennings, Prehistory of North America, page 237.

Maku Indian.
Burland, the People of the Ancient Americas, page 112.

Day Fifteen

While the pots are drying have the students make a tool or jewelry copy that can be worked on for several days.

Day Sixteen

Keep working on other projects while the pots are drying.

Day Seventeen

Show slides on how to fire pottery, how to control color. Oxidization, reduction, burnish.

Day Eighteen

Fire pots in small groups--also keep working on other project of a tool, jewelry or weapon, etc.

Zuni Pottery - oxidized. Buff and dark brown.

San Ildofenso.
Maria Martinez
Oxidized and burnished.

Day Nineteen

Clean carbon and polish pots.

Talk about what happened in firing--controls, colors, temperature, etc.

Day Twenty

Set up show of work--of pots, tools, jewelry, etc., for the rest of the school to see. Also turn in papers to accompany the pots.

I used this tentative lesson for three groups of students. First in a Duluth high school for a 3 week project. In most cases it was a success except that one hour is not a long enough time span to work on clay. The second problem was that many pots broke in the fire because they were too thick, too moist, and/or heated too fast.

Second group--an adult group in Thunder Bay, Canada. Fourteen students working 8 hours a day for 3 weekends of Saturday and Sunday. This was far more successful--all the classes were held outdoors and the students had time to work, the work had time to dry and the firing was successful.

The last group of students was at St. Cloud State University with a college evening class two nights a week, 3 hours a night for 3 weeks. Also a very successful project as there was enough time to work and dry and fire projects.

When students are sitting around a fire watching their pots, they become a part of historic ceramic tradition. They have had many of the same problems and questions about the locating and processing of clay, the building of their pots and the testing of the fire that early man encountered. Will the spirits be good to them and allow their pots

High school students, Duluth, Minnesota, Spring, 1975.

to survive or will they be blown to small shards? Now--only the clothing styles separate them from the past. The fire, air, water and clay are the same as is the question of what lies in the future. An experience with the primitive methods of working clay must lead a student into other areas of study, such as anthropology, geology, art, ethnology and archeology. The observation and study of ancient pots could lead to professions in the reconstruction or conservation of man's artifacts. If nothing more, the next time a student visits a museum he might have more respect for the objects that have been left to us by early man.

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