POTTERY TECHNOLOGY

PURPOSE

Pottery, or Pottery Technology, is an introductory course in archaeological pottery technology with emphasis upon the American Southwest. The only prerequisites are current membership in the Arizona Archaeological Society and the AAS course, Prehistory of the Southwest or an approved equivalent. Prehistory of the Southwest may be taken concurrently.

Lectures, laboratory, and field trips will cover characteristics of clays and clay bodies, methods of form and decoration used prehistorically, the uses of pottery by the archaeologist, and an introduction to the identification of the ware of one cultural tradition.

There are twenty (20) hours of lecture and approximately forty (40) hours devoted to other activities of a hands-on nature.

OBJECTIVES

At the end of the course the student can perform the following:

1. Name the principal characteristics of clays as they apply to hand built pottery.
2. Discuss the characteristics and functions of the various tempers used prehistorically.
3. Describe the two major methods of forming pottery and the geographic and cultural extent of these methods in the prehistoric Southwest.
4. Describe the principal organic and mineral paints used prehistorically.
5. Discuss the principal uses of pottery by the archaeologist in dating and in cultural analysis.
6. Discuss briefly the concepts of ware and type as used in the Southwest.
7. Describe the system used in naming and classifying pottery.
8. Identify and give the characteristics of four types of vessels from the cultural area studied.
9. Collect, form, and fire a vessel of native clay.
10. Demonstrate the ability to form, decorate, and successfully fire a vessel of acceptable thinness and symmetry, at least six inches in diameter, in an identifiable style (as, for example, Sacaton Red on Buff).

COURSE OUTLINE

A. Introduction to archaeological pottery
   1. The importance of pottery to the archaeologist
   2. Emphasis upon Southwest pottery
   3. The beginnings of pottery in the Southwest
      a. Mogollon
      b. Hohokam
      c. Anasazi
   4. Standard naming system: Locality followed by the color added to the vessel and the color of the vessel surface, as, for example, Mesa Verde B/W or Gila Polychrome, for more than two colors including the background color.
   5. The concept of type and ware
      a. Pottery attributes
      b. How an archaeologist describes vessels or assemblages of vessels

B. Clay and temper
   1. Characteristics of clays
      a. Chemical structures - Hydrated Aluminum Silicates - (Kaolins, Bentonites)
      b. Physical properties of clays
         - Texture (fat and lean)
         - Plasticity
         - Color of clays and of pottery including use of Munsell Soil Color Charts
         - Drying properties
      c. Origin from granitic minerals, basalts, volcanic ash, and others
      d. Occurrence: Primary or residual and sedimentary, marine, aquatic, glacial, shale clay
      e. Impurities of clay and their effects
         - Quartz, sand and silt
         - Calcium carbonate
         - Iron oxide, hematite, limonite, magnetite
         - Organic matter
      f. Effects of heat on clay and pottery
         500 - 1000 degrees Centigrade
      g. Identification of clay source
      h. Slips and pastes

2. Temper
   a. Function of non plastics in the clay
      - Effects upon shrinkage
      - Effects upon strength of pottery
   b. Types of temper
      - Organic
        - Plant fibers
        - Shell
        - Diatomaceous earth
      - Inorganic
        - Ground rock
        - Ground sherd
        - Sands
        - Volcanic ash
   c. Microscopic examination of temper
      - Crushed sherds
      - Thin cut sherds
      - Thin section of sherds, positive identification of minerals may require petrographic microscope
   d. Importance of temper analysis in archaeology

C. Methods of forming vessels - the conservatism of the basic methods through time
   1. Paddle and Anvil tradition: started on outside of form. Hohokam, Sinagua, Papago, Maricopa, Lower Colorado River tribes. Wooden paddles; anvils of stone or ceramic
   2. Coil and Scrape tradition: started in a form (Puka). Casas Grandes, Mogollon, Anasazi, New Mexico Pueblos, Hopi Mesas (centered on First Mesa at this time).
      Scrapers of wood, gourd, sherd

D. Materials and methods of decoration
   1. Plainware - painted - polychrome
   2. Corrugation - incised - punched - stamped - modeled - applique - slips - stucco
   3. Slips and burnish
   4. Organic paint: Bee Weed and Mesquite
   5. Mineral paint, how to distinguish from organic paint. Hematite
      - ochers - Limonite - Magnetite - Manganese
   6. Glaze paints - lead based - only as decoration
   7. Yucca brushes
   8. The popularity of organic paint beginning about the 12th century in Anasazi areas
   9. Fugitive paint conditions

E. Firing methods
   1. "Open" temporary kilns - kilns of Snaketown - at Hopi
   2. Control of the fire - oxidizing, reducing effects
   3. The fuel: wood, coal, manure later
   4. Temperature achieved in range of 500 to 900 degrees Centigrade

COURSE OUTLINE (continued)

F. The Ethnology of Southwest pottery
   1. The uses of ethnology in archaeology
   2. The prominent pottery families at Hano, San Ildefonso, Zuni, and Santa Clara.
      Jesse Fewkes, 1895 - Lesou and Nampeyo.
      The Nampeyo "Dynasty" - Maria and Julian Martinez
   3. Raising standards and innovation

G. Pottery and dating
   1. Chronologies and typologies - time and space considerations
   2. Dating
      a. Indirect: Dendrochronology, archaeomagnetic, Carbon 14, accelerator mass spectroscopy
      b. Direct: Seriology, Alpha trace dating of mica in sherds, Thermoluminescence
      c. Tests on sherds: Hardness, strength and porosity, refiring tests

H. Laboratory - workshop activities
   1. Prospecting for clay field trips - two required
   2. Pottery typology for local ware(s) - 6 hours
   3. Preparing clay and forming vessels - 6 hours
   4. Open firing, both oxidizing and reducing - two days
   5. Examination of the temper in sherds with the 20X microscope or lens - 2 hours

HANDS-ON POTTERY MAKING

Each student is to complete several pottery projects. One gradual sequence of items of increasing difficulty for beginners is Hohokam anvil, a ladle or scoop, a small vessel, a larger vessel using paddle and anvil, and another by coil and scrape.

It is useful to have at least two pounds of good proven clay on hand for each student. A selection of proven clays would be desirable. Students will use their own collected clays, of course, but "proven" clays reduce the variables which often produce disasters. A small electric or gas kiln is very useful so that students may see results each week of the course.

CLAY PROSPECTING FIELD TRIP

One Saturday field trip for gathering native clays is required. Two would be better. The instructor should have checked out the clay deposits along the route. Each student should be equipped with plastic buckets and/or plastic bags to carry his or her clay home. At each stop several simple tests should be made. A dropper bottle of dilute HCl is used to test for lime or Caliche. A canteen of water is carried to the clay and everyone works up a bit of clay, making a long 'pencil.' If this can be bent into a one-inch circle without cracking, the clay is a good candidate for further tests. At this time judgements are made about texture, plasticity, iron, and organic. Both residual and sedimentary

clay sources should be visited, if possible. An agreed upon name for the deposits, along with notes about the clay, should be included in the bucket or sack.

Instructions for cleaning, suggestions for tempering, and directions for making test tiles are given at this time. A tile 10 cm long by 2 cm wide and about 4 mm thick is a convenient size. Shrinkage, after drying and firing, is noted and converted to percentages easily. For example, after firing the tile is 8 mm shorter, therefore the shrinkage is 8%. A hole in the tile is convenient for tying to the clay bucket.

The distance to known sites from the clay bed is noted and the likelihood of its use prehistorically is commented on. The party may find likely sources of temper (we found a highly micacious silt).

See the next page for the course REFERENCES

REFERENCES

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See also REFERENCES following Ceramics Workshop Course Outline.

* (A) In Phoenix Chapter Archives