**Lab 11: Introduction to Ceramic Analysis**
**(ANTH B101) Fall 2019**

## Introduction

In this class we have studied human behavior and culture through the analysis of material culture – artifacts, ecofacts, and features. Throughout the semester, we have seen examples of stone tool technologies and how stone tool manufacture and use changed through time. As we've discussed, stone tools can tell us a lot about a range of human activities, and archaeologists benefit because stone tools and flaking debris easily preserve in the ground through time. Ceramic artifacts are another common item of material culture studied by archaeologists, and just like with stone tools, we are lucky because ceramic vessels (usually recovered broken into smaller pieces called sherds) are durable and often preserved in the archaeological record!

The term ***ceramic*** can be defined as an **object made of clay that has been heated to make a final product that is hard and durable and one that maintains its shape during use**. The earliest known use of ceramic technology dates back to the Upper Paleolithic period in the form of ceramic figurines. Later on, near the end of the Upper Paleolithic in some world regions (and more commonly during the subsequent Neolithic period), humans began to make pottery vessels using ceramic technology. ***Pottery*** refers to human-made **ceramic containers that are used for the storage, preparation/cooking, and serving of food and/or liquid**. When human groups around the world adopted farming and a more sedentary lifestyle, pottery often became a critical element of their material culture. Archaeologists can learn a lot from the study of pottery remains, and in this lab we will get a basic introduction to ceramic analysis.

**Pottery Analysis**

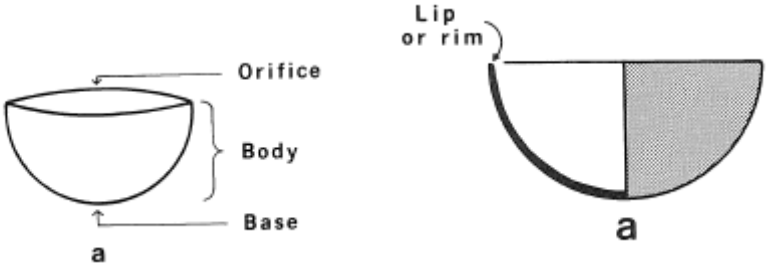
Once recovered by archaeologists, there are several kinds of ceramic analyses that can be conducted to learn about human behaviors and culture. Archaeologists can try to piece back together broken vessels to see the complete vessel. Using certain types of absolute dating techniques (e.g., thermoluminescence), pottery is sometimes dated to know its age. Archaeologists can also study macroscopic and microscopic "use-wear" abrasions to find out how the vessel was used. The clay used to make a pot can be sourced to where it was mined in order to know where a pot was made – this can be done via visual inspection or through geochemical analyses to link a pot to a specific clay source on the landscape. Researchers can also collect samples of materials trapped in the porous walls of a vessel to assess what type of food or liquid was once kept inside.

Archaeologists most often find pottery after it has been broken into numerous pieces. We call these pieces pottery ***sherds (or shards)***. Although some may think that broken sherds are useless to the researcher, archaeologists have devised a number of methodologies that allow us to study an assemblage of sherds. In the activities below, you will analyze an assemblage of broken pottery sherds using some basic methods that will allow you to begin to learn about the original pottery and the range of behaviors associated with how humans used these vessels in the past.

**Form (morphology):**

Pottery vessels come in all shapes and sizes. A vessel's intended use is often related to its shape or morphology. For example, vessels made for drinking normally are taller and thinner, with restricted rim orifices at the top – this makes it easier not to spill your drink. Vessels used for the display of certain foods may be shallower and flatter than drinking vessels. A shallow or flat shape is often associated with food presentation, as it is easier to eat out of a more open and shallow vessel. A vessel used for storage is often larger than individual eating vessels, and they are usually more globular in shape (to increase interior volume for more storage capacity) and sometimes have a moderately constricted rim orifice at the top (to reduce spillage, but open enough to allow someone to scoop out food or liquids).

Archaeologists can tell the form of a vessel by looking at certain sherds. For example, a **rim sherd** is the best piece from which to tell the original shape of a vessel (a rim sherd is one from the top or lip of a vessel, like the edge of a plate or very top of a drinking glass). Look at your water bottle or coffee mug, or think about a drinking glass or a dinner plate – where is the rim (or lip)?



When archaeologists excavate a site that contains pottery, they can look at the entire **assemblage** of sherds to assess the range of variability in vessel form. This allows archaeologists to construct a typology of vessel forms, which allows them to start to understand how vessels were used at the site for storage, food preparation, and the serving of foods and beverages. The image below shows the range of vessel forms that were in use by the inhabitants of a village in Alabama that was occupied roughly 900-700 years ago. The archaeologist who analyzed this assemblage was able to detect the presence of three main vessel shapes (bottles, bowls, and jars), and noted some variation within these three basic shape categories. When looking at this figure below, think about the types of sherds you would need to look at in order to understand vessel forms.

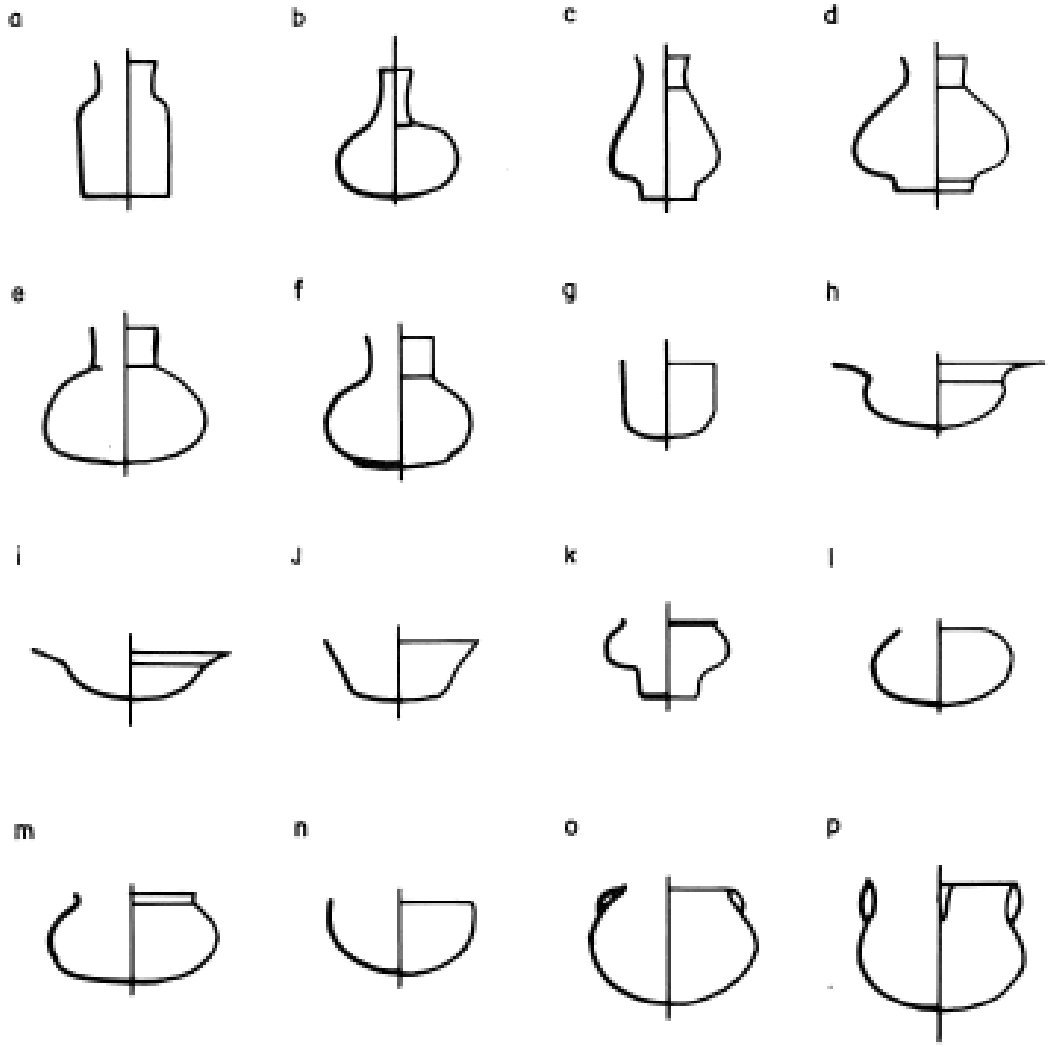



FIGURE 22 Basic shapes: (a) cylindrical bottle, (b) narrow-neck bottle, (c) slender ovoid bottle, (d) subglobular bottle with pedestal base, (e) subglobular bottle with simple base, (f) subglobular bottle with slab base, (g) cylindrical bowl, (h) flaring-rim bowl (deep), (i) flaring-rim bowl (shallow), (j) outslanting bowl, (k) pedestaled bowl, (l) restricted bowl, (m) short-neck bowl, (n) simple bowl, (o) neckless jar, and (p) standard jar.

from: Steponaitis, Vincas. 1983. *Ceramics Chronology, and Community Patterns: An Archaeological Study at Moundville*. Academic Press, New York.

**Activity**:

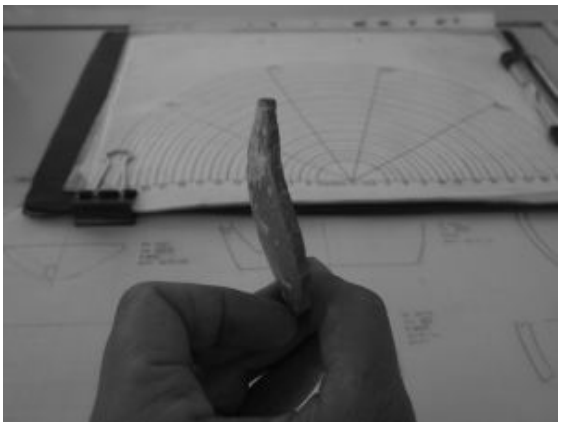
## Pottery sherds can be very sharp! Be careful not to cut yourself!

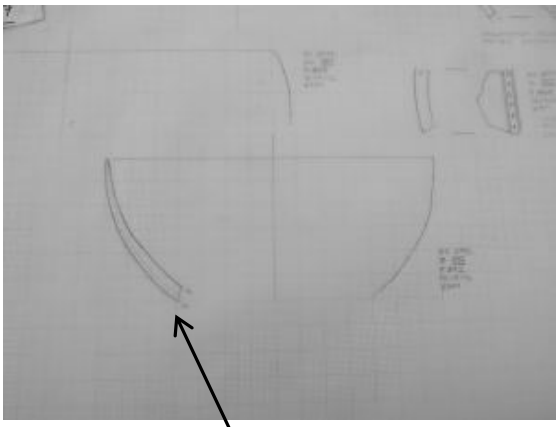
Working with everyone in your group, ***carefully* remove** all the sherds from the brown paper bag and lay them out on the table. Note that all of these are rim sherds. Now, carefully start looking at all of the rim sherds and see if you notice differences in shape characteristics. Work with your group, and try to separate them into different shape categories. Luckily, these sherds are from a modern ceramic assemblage from Philadelphia, so we should all be familiar with these types of vessels and perhaps what they were used for. [Note: You will not necessarily find the same types as on the example shown on the previous page. You will make your own typology.]

1. How many different vessel forms did your group classify? Give each type a name, and list them below.

2. Write down what you think each of these vessel forms may have been used for.

3. It is important that archaeologists write reports about each of their archaeological excavations and the material culture remains they find. This ensures that other researchers can learn about their excavations and analyses. In reports and publications, it is important for archaeologists to provide photographs and illustrations of artifacts (or an example of each kind of artifact). Because of this, archaeologists provide drawings in profile view of rim sherds so that other archaeologists can understand variations in shape. This allows archaeologists to compare their pottery sherds to those from other excavations. The photos below show a profile drawing of a rim sherd from a broken bowl. On the left is the actual sherd, and on the right is the rim profile drawing. Note how the illustrator orients the rim sherd to its proper angle, and draws it as if it were sitting up on a flat surface.





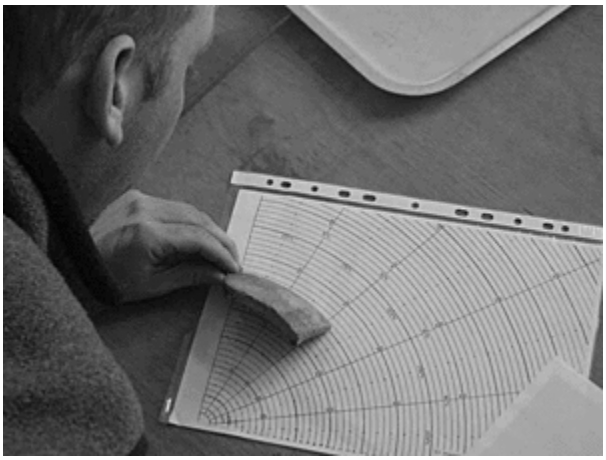
*Actual rim sherd from a broken bowl* *rim sherd profile drawing*

Choose one rim sherd from **<u>each</u>** of your vessel form categories. On the next page **<u>draw</u>** each sherd in profile view (oriented as shown above, you can add in the horizontal and vertical lines to show where the top and center of the pot would be) and **<u>label</u>** your drawing with the form name you gave it in question 1.

Don't hesitate to ask your professor or TA if you are orienting it correctly before you draw!

Sherd drawings for each category:

4. Archaeologists can also estimate the size of vessels from their rim sherds. Several studies demonstrate that the diameter of a rim's orifice is related to the size of a vessel. This kind of information is important; it can allow archaeologists to compare average vessel sizes between sites, or even between individual households at a single site. Size data can be used to answer several research questions of anthropological importance; e.g., did some households store and cook more food than other households at a village?



Archaeologists often use the angle of curvature of a rim sherd to estimate the diameter of a vessel's orifice. This diameter can be used as a proxy to estimate the overall size of the vessel. In order to estimate orifice diameter, archaeologists often use a rim diameter template sheet. As seen in the image above, a rim diameter template sheet is composed of a series of concentric arcs. **(1)** The archaeologist in this image first orients the rim (just as you did to draw them) and then turns it upside down. **(2)** Then, the archaeologist lines the outside of the rim to match the appropriate arc. **(3)** Then, the number corresponding to that arc can be doubled to estimate the diameter of the vessel's rim orifice. Do not hesitate to ask your professor or TA to demonstrate this procedure!

Select one rim from each of your vessel form categories and match it to the correct arc on the diameter template sheet. Then, double the number corresponding to that arc to arrive at the estimated rim orifice diameter. In the table below (which has space for a lot of categories; you may not have that many), record the rim orifice diameter for each category. Again, don't hesitate to ask your professor or TA if you are taking the measurements correctly. Make sure that everyone in your group participates in measuring the rims!

| Form category name | Rim orfice diameter (cm) |
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