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Reviewed Article:

Experimental Archaeology as Participant Observation: A Perspective from Medieval Food

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Central to anthropology is the concept of participant observation, where a researcher engages in immersive learning through ethnographic fieldwork. This concept is also important for archaeologists as immersive learning provides an avenue for more robust interpretation and the development of better research questions. Participant observation is not directly possible in the study of medieval archaeology, but replication studies of food

culture can serve as one avenue toward immersive learning in archaeology. Replication studies of medieval food, notably the use of medieval cookbooks and replicated medieval vessels, offer insights into medieval life and everyday practice. This paper will discuss two specific examples: replicating a medieval beverage from a fourteenth century cookbook and replicating possible foods cooked in pots from a fifteenth-century tavern in Nuremberg.

> “Food culture or cuisine is a particularly apt arena for experiential experimental archaeology. (…) Food is an embodiment of culture, and many aspects of culture, including production, trade, health, cosmology, status, and identity, can be identified through the study of food and cuisine.

A common goal in archaeology is learning about past cultures, but this is limited by preservation, sample size, and obstacles rooted in interpretation. In cultural anthropology, the typical approach to learning culture is through immersion in society, the same way any human learns their own culture: by living within it. Typically, this is done through participant observation, where a researcher goes and lives within a society, both observing and participating in a wide range of activities within that culture group (Musante, 2014). The approach of narrative ethnography then has the researcher present both their own experiences and that of the observed group as the product of their research (Tedlock, 1991). Narrative ethnography is based on the idea that any form of anthropological study is rooted in the individual conducting the study, and the experience of observation is rooted in experience, the analysis of ethnographic data, and reflection upon how that experience created the knowledge being presented in the analysis (Tedlock 1991, p.77). Participant observation is of value because it enhances the quality of the data collected, and interpretation of the data is improved through the development of “tacit understanding,” allowing new research questions to arise from the process of participating in the culture (Musante, 2014, pp.260-261).

For anthropological archaeologists, we cannot engage in participant observation in the same fashion as cultural anthropologists because our subjects lie in the past. For some past societies, particularly those whose writings have been preserved and are accessible, we can read their letters and literature, study their religion and philosophy, and gain a measure of their voices and thoughts which have come down to the present. For both those documentary societies and societies for whom we either cannot understand their writing or who left no written record, we rely instead on interpreting material evidence to develop our interpretations of the past. A broader range of material available allows for a more robust approach to interpretation; attempting to make an interpretation from only one aspect of a society will be more limited than those interpretations which are built on a broader evidence base. The limits on evidence sometimes lead archaeologists to focus on specific questions of technology, subsistence, or chronology for which we have fairly clear evidence, and require

little in the way of analysis or interpretation. Building interpretative models which require a more analytical approach or interpret evidence in new ways have been encouraged as well (Kintigh, et al., 2014, pp.3-4). Analogy, ethnoarchaeology, and experimental archaeology can fill gaps in existing evidence, or provide an understanding of the practice behind the material remains recovered by archaeologists.

Replication studies as practiced today are fragmented into two arenas: rigorous, question-driven archaeological experiments designed to test models and hypotheses, and experiential events mainly directed at public education. The experiential aspect is sometimes considered to have limited value by those who engage in research-oriented experimental archaeology. However, bringing experience-based studies into more academic settings will only improve the quality of academic research, drawing on sensory and emotional aspects of human life in the past (Petersson, 2011, pp.13-14). Outram (2008, p.2) raises the argument that experimental archaeology does not actually recreate any aspect of the past, as we do not actually know what the past was like and so aspects of any experiment are purely hypothetical. Instead, we engage in "actualistic" studies, attempting to go beyond the controlled conditions of laboratory experimentation, investigating what might have happened using methods and materials available in past societies. These actualistic studies rely on laboratory studies for their experiments, but draw on materials, techniques, or practices which are uncommon or rare in modern society (Outram, 2008, p.2). Actualistic studies provide an avenue to learn about how people of the past engaged in the tasks of life, whether mundane or unusual, and provide experience-based models for researchers making interpretations of the archaeological record.

Experience-based experimental archaeology studies serve as the parallel to participant observation for archaeologists. Archaeological fieldwork relies on the experience of being at an archaeological site, engaging in the material culture and the landscape, and using the multitude of different aspects of that experience to help interpret the material remains of past societies. Archaeological field schools are designed around this aspect of learning how to become an archaeologist (Baxter, 2009). However, there are limits to the experiences which come from archaeological excavation. Discovering, excavating, and recording a set of faunal remains, for example, does not convey the experience of eating the food which those faunal remains represent. Replication studies, however, can provide that particular experience, which need to be built upon the material evidence from controlled excavation and recording.

Experiential studies of the past have been critiqued as theater or as even "the satisfaction of character deficiencies" (Reynolds, 1999, p.156), particularly when practiced by re-enactors. Outram rejects that strong denial of the value of experiential re-enactment, arguing instead for the pedagogical value of presenting the results of archaeological research in an engaging manner (2008, p.3). I would argue that the pedagogical value extends not just to the general public, but to researchers as well, as it provides an avenue for immersive learning, and opens

a range of new opportunities to learn about and thus extend both understanding and interpretive strength to other studies of the past. Cunningham makes a critique of Reynolds (1999) in saying that if we follow an exclusively scientific methodology we are in danger of losing the human side of decision making and problem solving (2005, p.64). Experiential studies adopt the approach that understanding human action, perception, and skills in an experimental practice contribute to our understanding of the past (Doonan and Dungworth, 2013, p.2). The limits of experiential archaeology are set by the questions we ask, and as excavation techniques and theoretical perspectives become more refined, experimental studies will become more refined as well and can be used to connect disparate aspects of knowledge of the human past (Doonan and Dungworth, 2013, pp.3-4).

There are limits to experience-based experimental archaeology in regard to the development of tacit understanding comparable to participant observation. The experience of experimental archaeology is constrained to the experiment itself, and that experiment is far more limited in scope than the holistic experience of going to and living among a population. Holistic experience is also limited, though, by the biases and predispositions we bring to our studies. This is not an obstacle, but instead these are simply an empirical matter to include in the analysis, and should be identified to determine how those biases influence any interpretation (Musante, 2014, pp.272-273). The rigorous, question-driven experiments conducted in experimental archaeology already include an explicit discussion of perspective and intent (Carrell, 1992, pp.5-6), and incorporating that approach in experiential experiments will allay the concerns over participant bias in developing interpretations. As Outram says, actualistic studies rely on a rigorous approach, but one that differs from laboratory experiments and that rigor can be hard to maintain (2008, pp.2-3).

Replicative experimental archaeology is a way to develop competence or expertise in past social or cultural practices which are no longer extant (Outram, 2008, p.3). Replication studies allow for the reexamination of accepted models of past behavior, and new models which can better fit the existing data, incorporate new data which existing models could not, or better account for either material culture or past behavior (Carrell, 1992, p.8). Experiential experimental archaeology can do precisely the same: allow for the development of new or alternative models for interpreting the material evidence of the past. In this case, the replication experiments replicate behavior or practice rather than replicating objects.

Food culture or cuisine is a particularly apt arena for experiential experimental archaeology. Replicating food items require the replication of practice in the process of making the food items. The study of food from medieval Europe is gaining popularity in medieval studies. The theme for the 2016 Leeds International Medieval Congress was “Food, Feast, and Famine,” bringing recent research into medieval food to the fore (e.g. Woolgar, 2006; 2010; Freedman, 2008). The focus on food has arisen due to the central place food plays in society, from economics to political power (Mintz, 1986). Food also brings out complex aspects of social

experience, including but not limited to issues of health, cosmology, social hierarchy, and identity; food culture and cuisine are shaped by these various and complex systems, but are also maintained and replicated through the acceptance and practice of those aspects of food culture (Fischler, 1988). By studying food, we learn about basic categories of culture and social practice. As culture changes through time, food does as well. Issues such as symbolism, fashion, and aesthetics have a direct impact on the presentation of food, while trade and the technology of food production have a direct influence on ingredients. The combination of factors allows for many different elements of society to be understood, but from an experiential standpoint, among the most important is the sensory aspect, parallel to the immersive learning of participant observation. Taste and food serve to bring out the complexities of social experience and allow the researcher to understand the sensory and sensual experience of society, providing context which goes beyond the presentation of social structures and patterns (Stoller, 1989, pp.25-32).

Archaeological evidence can provide information on vessel form, which provides some evidence for method of cooking, and plant and animal foods which were used during a particular time and place. These are limited by preservation and recovery, but the materials which are recovered provide a minimum of foods used, but with likely omissions. For societies with documentary records, cook books can provide specific recipes revealing combinations of individual food items and cooking methods. Among the oldest known recipes are those from Mesopotamia, dated to over 3500 years ago (Bottero, 2004). There is a large corpus of late medieval cook books, mainly dating from the mid-fourteenth and fifteenth centuries. Earlier recipes are generally found within medical texts. Most of these cook books are written for the upper and middling classes, and often include unusual dishes. The production of common foods and the food experience of the lower classes is generally not recorded; that evidence instead lies mainly in excavated material and even that is somewhat limited. However, the cook books do provide a view into at least part of medieval European society, making their exploration worthwhile as one avenue to understand medieval culture.

Kahsnitz and Brandl (1984) present a group of ceramic vessels used for eating and drinking at a tavern in Nürnberg, Germany from the early fifteenth century. The main cooking vessels are approximately 20 cm tall, with a wide body and neck. In 2016, the author collaborated with a group of ceramics students at Indiana University East as part of that institution's *You Are What You Eat: Events in Food, Culture, and Diversity* event to replicate the cooking vessels and then use them to cook food from medieval recipes. The replication project had three main goals: 1) provide the ceramics students the opportunity to have their pieces used for cooking, expanding their understanding of the ceramic production process to use; 2) present the experience of cooking on a wood hearth for the participants of the *You Are What You Eat* event; and 3) gain an understanding of medieval food not just as subsistence but as a multi-sensory experience. Carrie Warvel Longley, assistant professor and coordinator of the Fine Arts program, oversaw the students and provided them with a template to produce the

vessels based on those in Kahsnitz and Brandl (1984, p.32) (See Figure 1). For the cooking replication, five vessels were selected and three were used. The recipes used came from two sources: the Inntalkochbuch, c. 1500 (Danner, 1970), and Le Menagier de Paris, 1393 (Power, 1928).

Many varieties of cooking vessels were used in medieval Europe, from iron cauldrons to ceramic frying pans. The vessels used in this replication experiment were ceramic vessels best used for boiling. Images from the later 15th century show vessels of this form used on a raised hearth fired with wood (e.g. Kahsnitz and Brandl, 1984, p.20). This approach was used for this replication. Identifying what was cooked in the vessels was difficult to determine. The mid-fourteenth century *Das Buch von Guter Speise* has one recipe which specifically calls for an earthen pot, used to cook a goose: 42 - *Ein geriht von einer gense* (A dish of a goose) (Atlas 1993). The remaining recipes which call for a pot ("*hafen*") do not specify, so could be ceramic or metal, and include dishes which are baked; for example, a dish of baked pears: 12 - *Ein gute fülle* (A good filling), "Then cover the pot with a broad cover and lay there about glowing coals and let it slowly bake" (Atlas 1993). Two recipes among the many possibilities were selected to provide an effective demonstration for the IUE event. These two dishes were cooked on a raised hearth using wood as fuel (See Figure 2). A parallel set of dishes was prepared by the college food service to provide enough for the participants at the event. The first recipe came from The Goodman of Paris, called German Brewet. It was selected because common foods are generally not recorded in their home territory, but can be described by travelers from other places. The recipe is translated as:

> German Soup
>
> *German Soup. Take coney flesh, fowls or veal, and cut in pieces: then half cook in water, then fry in bacon fat; then have finely minced onion in a pot, on the coals, and some fat in the pot, and shake the pot often: then grind ginger, cinnamon, grain of Paradise, nutmegs, livers roasted on a spit on the grill, and saffron mixed with verjuice, and this is the yellow coloring and the liaison. And first bread browned on the grill, ground and sieved; and at serving, put three or four pieces of your meat in the bowl and the soup over, and sugar on the soup* (Power, 1928, p.173).

One vessel was used for cooking the onions (See Figure 3) and the second was used to heat the broth (See Figure 4). The broth was then added with the sauce and bread to make the final dish (See Figure 5).

The second dish selected was from a German cookbook, and is a pudding-type dish to show the range of foods produced in medieval Germany. The Inntal cookbook dates to the late fifteenth or early sixteenth century. The selected dish was: 34 - *Ein rein mues an ayer* (A spoon dish without eggs).

A spoon dish

> *Put good milk into a clean pan and add grated white bread to thicken it. Make it yellow with saffron and add spices and a little honey. Let it boil over coals until it is as dry as pleases you* (Danner, 1970).

One vessel was used for this dish, heating the milk, adding the bread, saffron, honey, and spices (See Figure 6). This was called Golden Bread Pudding by the participants.

The food replication project had several results. The first was the demonstration of medieval food culture to the participants at the event, and how the foods of medieval Europe were similar to and different from modern cuisine. Many students remarked on the flavors as good but different from what they were used to, and the golden bread pudding was particularly popular. A second result was the demonstration of the process of cooking over a wood fire using ceramic vessels, a practice common throughout the world and in the past, but rare in modern American society. A third result was the technical observation of what happens to ceramic vessels used for cooking on a fire, specifically for the ceramic students who produced the vessels. During cooking, cracks developed in the vessel used to heat the broth (See Figure 7). The pots were fired to stoneware temperatures to minimize absorption of food residues during cooking. However, stoneware is not effective at limiting cracks caused by thermal stress due to the vitrified body. The ceramics students learned that this type of cracking is less likely in earthenware due to porosity of the ceramic body. The reason for this is that if thermal stress develops due to uneven heating, the cracks will stop propagating when they encounter a void in the ceramic vessel fabric as is typical in an earthenware body (Rice, 1987, pp.367-368). The crack in the vitrified stoneware, once it began, propagated from the lip to the shoulder. The over-riding result was that the replication allowed the students and other participants to explore and appreciate the role food played in medieval culture through both observation and participation in an event which crossed disciplinary boundaries for a more holistic understanding of medieval life.

A second replication experiment was the production of a mid-fourteenth century mead (honey wine) from *Das Buch von Guter Speise*, written in Würzburg circa 1350. The original recipe is in Blume (2004, pp.210-211), but Blume's parallel modern recipe is a reinterpretation rather than a redaction as it calls for either apple or grape juice which do not appear in the original recipe, and does not include hops or sage which are in the original. The rigorous approach to actualistic experimental studies (Outram, 2008, pp.2-3) requires foregoing a reinterpretation such as this. The Atlas translation, 14- *Wilt du guten met machen*(To Make a Good Mead), was used for this replication.

To Make a Good Mead

> *He, who wants to make good mead, warms clean water, so that he can just stand to put the hand in. And take two maz water and one honey. One stirs that with a stick and lets it set a while and then strains it through a clean cloth or through a hairsieve into a clean barrel. And boil then the same wort against an acre long there and back (as long as it takes to walk this distance and back) and remove the foam from the wort with a bowl with holes. The foam stays in the bowl and the wort does not. Next pour the mead in a clean barrel and cover it, so that vapor can not get out, until one can bear the hand there in. So take then a half maz pot and add until half full hops and a hand of sage and boil that with the wort against a half mile (as long as it takes to walk this distance) and give it then in the wort and take a half nut of fresh yeast (the amount that could be held in a nutshell) and give it there in and mix it together so that it will ferment. So cover also, so that the vapor can get out, a day and a night. So strain then the mead through a clean cloth or through a hairsieve and pour (it) in a clean barrel and let it ferment three days and three nights and fill (it) in all evenings. There after one lets it go down and looks that yeast comes therein. And let it lay for eight days, so that it falls and fill in all evenings. There after let it down in a resined barrel and let it lay eight days full and drink in the first six weeks or eight. So is it the best* (Atlas, 1993).

There are several points where this recipe is of interest. First are the proportions: *Take two maz water and one honey* (Atlas, 1993). Later recipes, such as those found in Digby (Stevenson and Davidson, 2010) call for half as much honey as this; generally four parts water to one part honey. However, once honey and water are mixed to about 30% sugar and 70% water, it will begin to ferment (McGovern, 2009, p.16), so this is the minimum addition of water to get the honey to ferment. An experiment as part of this test was to allow the diluted honey to ferment without the addition of yeast, and the wild yeast fermented easily and reached about 3.5% alcohol.

Two related points are tied to cooking times. First, *boil then the same wort against an acre long there and back and remove the foam from the wort* (Atlas, 1993). “An acre long” is a furlong, or 660 feet (English measurement), though German acres may have varied from this. Average human walking speed is about 3 mph, so an acre there and back would be 1320 feet, which takes about 5 minutes to walk. This duration of boiling kills wild yeast & denature proteins in honey, which causes the foaming. Without boiling, the final mead can be cloudy due to these proteins. Digby’s recipes call for this same process in the seventeenth century (Stevenson and Davidson, 2010). The next cooking time described is *take a half maz pot and add until half full hops and a hand of sage and boil that with the wort against a half mile* (Atlas, 1993). Würzburg was part of the medieval Duchy of Franconia, now included in northern Bavaria. The German mile was closer to 24,500 feet, but varied in different regions. Half a mile would be about 2 miles, or 40 minutes of walking. Boiling hops for this duration releases the bittering and preservative qualities of lupulin, the active ingredient of hops, and

many varieties of beer boil hops this long following modern recipes. Both of these steps are part of later mead and beer brewing practices.

What is of particular interest is how the author determines the passage of time before clocks are part of the everyday household. These are measures of some precision, even if we are uncertain what the measurements are due to variability in distance measures in this part of fourteenth century Germany. Clocks are introduced into monastic institutions and town halls in the fourteenth century, but the secular use of clocks in the household is only introduced in the fifteenth century. Households have limited access to precise time measurement, but this recipe calls for control over the brewing process. Time and the patterns tied to time are a central part of culture (Giddens, 1984). Performing everyday activities in time and space, such as the production of food and drink, is the origin of culture. Understanding the medieval view of time helps us understand medieval culture.

The ingredients for this recipe are honey, sage, and hops (See Figure 8). This replication used the honey-water mixture washed from a beekeeper's combs after the bulk of the honey was extracted, which turned out to be the same percentage of sugar as prior experiments mixing six pounds of honey with a gallon of water. The hops variety was Tettnanger, one of the Noble German hops, one of the varieties which may date back to the medieval period. The sage was standard garden sage, *Salvia officinalis*, which is the type which was available in medieval Germany. The mixture (wort) was heated to boiling, skimmed, (See Figure 9) then the hops and sage were added and boiled again (See Figure 10). When cooled, the wort was divided into two batches and fermented in glass jugs. Different yeast was used in each batch: a mead yeast (White Labs WLP 720) and an ale yeast (White Labs WLP 099). A hydrometer reading was taken prior to fermentation, with the sugar content at about 33%. The recipe calls for the mead to be consumed after six to eight weeks; at that time, the alcohol content was about 5-5.5% and the residual sugar was 23.5-27% in each batch (See Figure 11). Longer fermentation did not significantly change that alcohol content with these yeasts; wine and champagne yeasts, used in earlier experiments, have yielded higher-alcohol meads following the same process. The final product was quite sweet, but the addition of the hops and sage balanced the flavor in the same manner as in beer production. The mead was quite clear after eight weeks as a result of the initial step of boiling to remove the proteins and sufficient time to allow the yeast to settle (See Figure 12).

Understanding the reasons behind the directions in making this mead come from producing the mead following the recipe and knowing the more general process of small-scale brewing. The author of the mead recipe was following practices used today to make mead and beer, showing the substantive knowledge held by the medieval cook. Of greater note is that by following medieval recipes, we reveal aspects about culture we may not have expected, such as the understanding of time and its passage and measurement in medieval Europe. With no fixed means to measure time, the medieval cook needed to develop a solution that was

comprehensible to the readers, and so distance was used. This reveals the approach to problem solving used by these authors. This kind of understanding is not a product of compiling lists of faunal or botanical remains or ceramic types, but comes from a more holistic understanding through practice and replication.

Food is an embodiment of culture, and many aspects of culture, including production, trade, health, cosmology, status, and identity, can be identified through the study of food and cuisine. A holistic approach reveals how these and other aspects of society are expressed through practice, and replication studies, while incomplete models of past societies, help provide that holistic understanding. By replicating past practice through the use of medieval recipes, vessels, ingredients, and patterns of action recorded in cookbooks, we are engaging in participant observation. We are the participants and the recorders, and replication studies get us one step closer to interpreting past behavior and past culture.

14TH-CENTURY HERBED CHICKEN COOKED IN A REPLICA COOKING POT (SCOTT D. STULL)

Keywords cookery
experimental archaeology
ceramics

Country USA

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FIG 1. REPLICA CERAMIC COOKING VESSELS MADE AT INDIANA UNIVERSITY EAST, MODELED ON EXAMPLES FROM FIFTEENTH CENTURY NÜRNBERG.

FIG 2. REPLICA MEDIEVAL COOKING VESSELS IN USE ON A RAISED HEARTH USING WOOD AS FUEL. BRICKS WERE USED AS A WIND-BREAK AS THE EXPERIMENT WAS CONDUCTED OUTDOORS.

FIG 3. COOKING VESSEL IN USE DEMONSTRATING FRYING ONIONS AS DESCRIBED IN THE MEDIEVAL RECIPE FOR GERMAN BREWET (SOUP).

FIG 4. POURING HEATED BROTH INTO THE VESSEL USED TO COOK THE ONIONS. PHOTO BY JUSTIN CARROLL.

FIG 5. GERMAN BREWET (SOUP) COOKED IN THE REPLICA VESSEL.

FIG 6. “A SPOON DISH” OR GOLDEN BREAD PUDDING COOKED IN THE REPLICA VESSEL.

FIG 7. FRACTURE IN THE VESSEL USED TO HEAT THE BROTH CAUSED BY THERMAL STRESS. THE CRACK PROPAGATED FROM THE RIM TO THE SHOULDER.

FIG 8. INGREDIENTS FOR SWEET GERMAN MEAD: HONEY, TETTNANGER HOPS, SAGE.

FIG 9. THE “FOAM” REMOVED FROM THE HONEY BOILED IN WATER. THE FOAM COMES FROM DENATURED PROTEINS IN THE HONEY.

FIG 10. THE HOPS AND SAGE ADDED TO THE WORT (HONEY AND WATER MIXTURE).

FIG 11. A HYDROMETER WAS USED TO DETERMINE SUGAR AND ALCOHOL CONTENT. ONE READING WAS TAKEN PRIOR TO FERMENTATION AND ONE AFTER; THE DIFFERENCE INDICATES THE ALCOHOL CONTENT.

FIG 12. THE FINISHED MEAD IN A REPLICA GLASS BEAKER TO SHOW THE COLOR AND CLARITY.