Ceramic Research in New England: Breaking the Typological Mold

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Ceramic analysis and description as now practiced in the [Northeast] are more art than science. . . . Tests of firing temperature, mineral composition, friability and cohesiveness are not usually undertaken. Although admittedly expensive of time and money, the results of such tests would at least provide information which is directly relevant to cultural interpretation. (Dincauze 1975a:5)

Important technical and theoretical changes have taken place over the past thirty years in the way archaeological ceramics are analyzed in the United States (Nelson 1985:1). These changes have been slow in their diffusion to the Northeast. Ceramic classifications in this region have been based largely on decorative attributes, with time and space viewed as significant determinants of change. Because of an emphasis on cultural-historical questions, archaeologists have most often focused on attributes of ceramics that are thought to vary the most through time and are the easiest to identify, namely, decoration and rim characteristics. As a result, there has been relatively little research on variation in technical attributes of ceramics, such as paste, vessel size and shape, and evidence of firing conditions. Thus archaeologists have not adequately addressed the variety of choices made by potters along the production sequence. While there has been greater attention to technical attributes of ceramics in the last twenty years in the region, they are most often employed for description (e.g., Dincauze and Gramly 1973; McGahan 1989) or for answering cultural-historical questions within local areas (e.g., Luedke 1986).

In this chapter I examine an alternative to the use of extant ceramic classifications in the New England interior for the Late Woodland Period (A.D. 1000-1600). In the greater Northeast, especially for the New York Iroquois, the Late Woodland period is perceived as culturally dynamic: agriculture becomes important for subsistence, communities become more sedentary, and population and
the incidence of intercommunity conflict increase (Fenton 1978). However, for Algonquian peoples in the New England interior, particularly in the middle Connecticut River valley, there is no evidence for large, fortified settlements and intensive horticulture (Thornton 1988; cf. Chapter 9, this volume). In fact, there is no evidence that maize was anything more than a dietary supplement in the interior prior to European settlement (Dincauze 1990:30, contra Snow 1980:333). Instead, archaeologists encounter highly variable and short-term horticultural settlements that do not fit established cultural classifications (Chilton 1996b; Johnson 1992).

It is generally accepted that Native ceramics in the Northeast “evolved” over time from crude to fine: vessel walls became increasingly thinner, temper (crushed rock or other substance added to the clay) became smaller, and decoration or surface treatment became more elaborate and sophisticated (Fowler 1966; Snow 1980). Luethke (1986) has shown these trends to generally hold true in eastern Massachusetts. As I will explore in this chapter, aside from evolutionary reasons, there are utilitarian reasons for choices of temper, wall thickness, and surface treatment (see Braun 1983; Luethke 1986). In this chapter I examine some of these other explanations through an analysis of ceramics from three Late Woodland sites in the Northeast. First, I begin with an overview of Late Woodland ceramic research in New England.

NEW ENGLAND CERAMIC CLASSIFICATIONS

In southern New England, ceramic classifications are largely based on the work of Fowler (1945), Lavin (1986, 1988), Pope (1953), Rouse (1945, 1947), and Smith (1944, 1947, 1950). Ritchie’s extensive work in central New York (e.g., Ritchie 1944) on the development of classification schemes was probably the impetus behind the development of similar schemes for coastal New York and Connecticut (McBride 1984:4). Ceramic classifications consist of types within larger ceramic traditions. These type-names serve as a kind of shorthand for a range of stylistic attributes and are used to refer to distinct archaeological cultures, which archaeologists in the region often conflate with ethnic groups (Lizee 1944a:4). Because most excavated ceramic sherds in New England tend to be small and fragmentary, little emphasis has been placed on using design motifs, as for the New York Iroquois; instead, decorative technique or surface treatment has been the primary focus of study (Childs 1984:186).

The principle Late Woodland ceramic traditions described by archaeologists in southern New England include Windsor, East River, Guida, and Mohawk (Table 6.1). I have not included Contact Period ceramics, such as Hackney Pond Phase [McBride 1984] or Shantok ceramics [Johnson 1993]. Smith (1947, 1950) and Rouse (1947) use paste characteristics to separate traditions, and then use surface treatment, decoration, and rim form to distinguish types. Following these researchers, Lavin has continued to build on the existing typologies for southern New England (Lavin 1986; Lavin and Mirroff 1992).
A striking amount of overlap exists among the traditions and types of New England's ceramic typologies (see Table 6.1). For example, attributes such as incised decoration, shell tempering, or cord-marked surface treatment crosscut many of the ceramic traditions. Lavin has often expanded the ceramic type descriptions of Smith (1950) and Rouse (1947) when she has encountered attribute combinations that do not fit the existing types (Lavin and Kra 1994). This adding of traits and noting of “exceptions” to the original type descriptions has contributed to a blurring of the distinctions between types. Lavin (1988:15) has admitted that it is often difficult to place sherds within known types, because they may exhibit traits belonging to more than one tradition.

One of the major repercussions of overlapping ceramic typologies in the Northeast is that incised, castellated ceramics found in the New England interior are often deemed “Iroquoian” (Dincauze 1974) and considered by archaeologists to be the result of social interaction, diffusion, migration, trade, or female capture (e.g., Brooks 1946; Byers and Rouse 1960; Engelbrecht 1972; Lavin 1988; Snow 1992a). Unfortunately, the direction and source of presumed cultural influences are influenced by where the type names were first applied. For example, when Windsor Tradition pottery, first defined on the coast of New England, is found in the New England interior, it is often thought to be the result of coastal influences—without archaeologists having to demonstrate where and when the Windsor traits originated (e.g., Lavin and Mirick 1992; Lavin et al. 1993). Likewise, Byers and Rouse (1960), in their analysis of Guida ceramics, conclude that many of the incised design motifs are “Iroquoian.” They suggest that this influence is indicative of direct trade in some cases, and the diffusion of “collars and incised designs” in others (Byers and Rouse 1960:28).

Ceramics of the New England Interior

There is relatively little published archaeological research on the interior of New England, particularly for the middle or Massachusetts portion of the Connecticut River valley (Snow 1980:330). No one has developed a ceramic classification specifically for the region; type names are often borrowed from New York and southern New England, with the assumption that New England peoples were greatly influenced by groups to the south and west (e.g., Byers and Rouse 1960; Johnson and Bradley 1987). Because the direction of change is not rigorously investigated, this assumption is self-validating.

The only ceramic type/tradition created specifically for the New England interior is the Guida Tradition. Byers and Rouse (1960) defined the Guida Tradition on the basis of collections from the Guida Farm site, Westfield, Massachusetts (Figure 6.1). Shortly thereafter, Fowler (1961:21) criticized Byers and Rouse for following a “questionable course of action in trying to superimpose an arbitrarily created Guida Tradition over all central New England ceramics.” On the basis of my analysis of the Young collection from Guida Farm (Chilton 1996a), which includes the original type collection, it is clear that the Guida

Figure 6.1
Map of Southern New England and Eastern New York, Showing Location of Study Sites

Tradition is nothing more than a residual category. That is, sherds that could not be attributed to other known ceramic traditions were relegated to the Guida Tradition. Importantly, because micaeous inclusions (muscovite) are the chief diagnostic trait of Guida ceramics, according to Byers and Rouse (1960), they may reflect simply the use of a specific set of clay or temper resources at the type site, not a “tradition” per se.

ATTRIBUTE ANALYSIS

What does it mean that we can't recognize pottery types ... in Massachusetts? (Dincauze 1978a:6)

Archaeologists have come to realize in the past 20 years, that ceramic typologies have little utility in Massachusetts (Dincauze 1978a; Luedtke 1986). Archaeologists have sought an alternative in attribute analysis. The word attribute is probably the most misused and poorly defined term in analyses of
material culture. In this analysis, I define an attribute as one variable of a ceramic vessel, such as surface treatment, color, inclusion type, or rim shape. An attribute state is thus one of any possible value or state for that variable, such as "cordmarked," "quartz," or "23 mm." Thus, each attribute has an infinite number of possible attribute states.

An attribute analysis can be the first step in the synthesis of a typology, since a type is considered to be a cluster or nonrandom association of attribute states. For example, Lavin (1986:3) viewed attribute analysis and typology as "complementary stages in the ordering of... data." However, attribute analysis does not necessarily lead to typology. In the previous section I described some of the problems associated with the typological approach as used in New England archaeology. While the creation of cultural-historical types continues to dominate ceramic studies in the region, in recent years there has been an increase in the use of attribute analyses that do not result in the formulation of cultural-historical types (e.g., Brumback 1975; Chilton 1994; Dincanze 1975a; Dincanze and Gramly 1973; Finlayson 1977; Goodby 1992; Kenyon 1979; Kristmanson and Deal 1993; Lizee 1994a; Luedtke 1986; McGahan 1989; Pendergast 1973; Petersen 1980, 1985; Preziano 1986; Ramsden 1977; Stothers 1977). In New England, Dincanze (1975a) and Kenyon (1979) paved the way for analyses of physical attributes of ceramics, such as characteristics of clay, aplitic inclusions, and the effects of firing.

Using an "attribute analysis of technical choice" (Chilton 1996b), the goal is to look for both variation and covariation within and between objects—not to formulate a typology. In such analysis, vessels are seen as a cumulative record of sequential attribute choices. The use of rim or sherd frequencies to describe ceramic assemblages has a long history in Northeast archaeology (Petersen 1985:10). More recently, researchers in the Northeast have employed vessels as units of analysis (Dincanze 1975a, 1976; Dincanze and Gramly 1973; Luedtke 1980; Petersen 1980; and Wright 1980). Compared with sherds, vessels as units of analysis have greater relevance to interpretation of human behavior (Carr 1993) because vessels were the most likely units of meaning in prehistoric societies.

An attribute analysis of technical choice is designed to examine both technological and decorative aspects of material culture, both of which may exhibit "style" (Lechtman 1977). This kind of attribute analysis can and should be used in addition to existing typologies, as a means to acquire different kinds of information. For example, groupings of artifacts based on nonrandom associations of decorative attributes may crosscut groupings based on nonrandom associations of technical attributes (i.e., decorative style may or may not correlate with technical style).

The Data

As part of my dissertation research (Chilton 1996a), I analyzed ceramics from three Late Woodland sites in the Northeast: two in western Massachusetts (the Guida Farm site, Westfield, and the Pine Hill site, Deerfield) and one in the Mohawk Valley, New York (the Klock site, Ephraim; see Figure 6.1). These particular Massachusetts sites were chosen because they represent the best excavated and documented Late Woodland sites in the middle Connecticut River valley (see Chilton 1996a). The Klock site was chosen because it was one of the best documented Mohawk sites from the latter part of the Late Woodland period, and was, therefore, comparable in age to the Connecticut River valley sites. Because the study of Late Woodland ceramics in New England is strongly influenced by typologies created for the New York Iroquois, it was important to include an Iroquoian assemblage in this analysis.

Based on ethnohistoric accounts, the two Massachusetts sites are thought to have inhabited by Algonquian-speaking peoples of the Connecticut River valley (most likely the Pocumtucks at Pine Hill and the Woronocas at Guida Farm). The Klock site has been interpreted by Kuhn and Funk (1994) as an early protohistoric Mohawk settlement, and was most likely occupied by a Mohawk community.

Several hundred ceramic sherds were recovered from the Pine Hill site, which was tested by the University of Massachusetts Archaeological Field School in the summers of 1989, 1991, and 1993 (Keene and Chilton 1995). Nearly 500 sherds were large enough to be used in the analysis. From these, thirty-six distinct vessel lots were identified. The Young collection from the Guida Farm site contains approximately 1,000 sherds which were large enough to be used in this analysis. From these, 108 vessel lots were identified. The collection from the Klock site has over 15,000 ceramic fragments. A random sample of 100 vessel lots was chosen in order to make it comparable in size to the Guida and Pine Hill collections.

To establish a vessel lot—that is, a group of potsherds determined to be minimally from the same vessel—at least nine attributes were recorded for each sherd: modal vessel wall thickness, inclusion material (i.e., temper or naturally occurring particles), size, and density, exterior and interior color, surface treatment (including decoration), and location of the sherd on the vessel. Inclusions were identified using 10x magnification. Because it is extremely difficult to identify rock minerals in fired ceramic pastes, my inclusion designations are consistent, if not exact. Inclusion density was estimated using comparative charts (Terry and Chillingar 1955:229-234); because the amount of inclusion varies a great deal within ceramic pastes of hand-built pots, estimates of inclusion density are sufficient. The final vessel lot determination is based on overall similarity in the attributes analyzed.

Results

In this section I summarize a few of the more important technical attributes: other attributes analyzed, but not discussed here, include construction techniques, rim and lip form, and interior and exterior collar (see Chilton 1996a).
As might be expected, the ceramics from the Connecticut Valley Pine Hill and Guida Farm sites show many similarities. For example, the primary inclusion type at both sites was crushed quartz, followed by feldspar (Figure 6.2). In contrast, the most common inclusion types at the Mohawk Valley Klock site were feldspar (mostly plagioclase) and hornblende, which are both present in the metamorphic rocks of the nearby Adirondacks. It is important to note here that the optimal inclusion types for cooking vessels have thermal expansion coefficients similar or less than that of clay, such as grog, calcite, crushed burned shell, feldspar, and hornblende (Rice 1987:229). Quartz, on the other hand, is not an optimal inclusion type for cooking pots; it expands much more quickly than clay and can lead to crack initiation, especially if the particles are large. Therefore, on the basis of inclusion materials used, the Connecticut Valley ceramics would not have been ideal cooking pots, on the whole. Not only do the assemblages from the Connecticut Valley have different kinds of inclusions, but they also show a higher diversity of inclusion materials used, the implications of which I discuss later.

Inclusion density follows a similar, yet more striking pattern. Inclusion density was recorded as an ordinal variable (1 percent, 2 percent, 3 percent, 4 percent, etc.). The median inclusion densities for Pine Hill and Guida are 15 percent and 13 percent, respectively, while for Klock it is only 7 percent. The range of inclusion density is similar for Pine Hill and Guida: both have lower extremes of 3 percent, and upper extremes of 32 percent and 40 percent, respectively. Klock, on the other hand, has a range of 2 to 20 percent (note the much smaller maximum value). Usually, a densely tempered ceramic is stronger than one with lower density. However, the more temper in the paste, the more potential for shock from thermal expansion, especially if the temper is quartz (see Braun 1983, 1987). Therefore, the Connecticut Valley vessels would have been less resistant to thermal shock, but more resistant to mechanical stress, than the Klock site vessels.

Mean vessel wall thicknesses for assemblages from Pine Hill and Guida are 6.28 and 6.53 mm, respectively, with standard deviations of 2.4 and 1.9 mm. In contrast, the Klock site has a smaller mean thickness of 6.13 mm, and a lower standard deviation of 1.6, but the difference is not statistically significant. However, on the basis of body sherd curvature, the Klock vessels are, on average, 70 percent larger than those from Pine Hill and Guida (29 cm vs. 17 cm mean diameter). Because larger vessels are expected to have relatively thicker walls in order to support the additional weight, the wall thickness of the Klock assemblage is significantly thinner when vessel size is taken into account. Wall thickness directly affects vessel performance; vessels with thinner walls are more resistant to thermal stress but are less resistant to mechanical stress (Rice 1987).

Surface treatments (impressing, scraping, or smoothing of the surface of the clay before firing) on vessels from Guida and Pine Hill are also similar, while both differ significantly from the Klock site material (Figure 6.3). The Klock
sample is exclusively smoothed, wiped, incised, and notched, while the samples from both Guida and Pine Hill show much more diversity: cord-marked, dentate-stamped, punctate, rocker-stamped, fabric-impressed, scraped, linear punctated, scallop shell-impressed, as well as smooth, wiped, incised, and notched. All of the rim sherds from the Klock site fit neatly into the established Iroquoian ceramic typologies (Kuhn and Funk 1994), while only two vessel lots from Guida and one from Pine Hill are typable (barring the Guida Tradition type, for reasons previously discussed). In all attributes analyzed, the Connecticut River valley ceramics consistently showed more diversity (Figures 6.4 and 6.5).

On the basis of the traditional assumption by archaeologists that dentate-stamping and fabric-impressing belong to the Middle Woodland period (A.D. 0–1000) and therefore predate incising, the assemblages from Pine Hill and Guida might appear to have Middle Woodland components. However, there is evidence that dentate stamping may also be a Late Woodland and even a Contact period trait, at least in New England. For example, at Pine Hill, on two occasions incised vessel lots were found in the same feature lens with dentate-stamped vessel lots. One vessel lot from Pine Hill exhibits both incising and dentate stamping, and two vessel lots from Guida have dentate-stamped collars (collars are thought to be an exclusively Late Woodland trait). It is clear from these examples that in the Connecticut River valley, unilinear evolutionary changes in surface treatment cannot be assumed.

**DISCUSSION**

What might these technical variations mean in the larger contexts of Late Woodland culture? In his analysis of Midwestern ceramics, David Braun (1983, 1987) suggested that the evolution from thicker-walled, more densely tempered vessels to thinner-walled, smaller tempered vessels represented a change in the intended uses of pots, and not an evolutionary technological improvement per se. More specifically, pots with larger inclusions and thicker walls are more resistant to mechanical stress. Conversely, pots with thinner walls and smaller inclusions may be less apt to crack when heated. But, these thinner-walled pots are more likely to break as a result of mechanical stresses (see Rice 1987). Surface treatment can also affect vessel performance. A rough surface, such as that produced by cord marking, fabric impressing or scraping, can increase thermal shock resistance and thermal spalling (Schiffer et al. 1994); a rough surface will also make a pot less slippery and easier to transport (Rice 1987).

As discussed previously, the Iroquois were dependent on maize for subsistence and were semisedentary. Also, they apparently produced pots that were better suited for cooking than for transport. The variety of maize (*Zea mays*) used by the Iroquois was Northern Flint or closely related varieties (Fenton 1978:325). Northern Flint has a thicker kernel wall than other varieties of *Zea mays* which makes it harder to process (Galinat and Gunnerson 1963:123–125). The New England variety of Northern Flint may have had especially thick
Figure 6.4
Sherds from Vessel Lots 1, 19, and 24 from the Guida Farm Site

Vessel Lot 1

Vessel Lot 19

Vessel Lot 24

Figure 6.5
Sherds from Vessel Lots 5, 6, 15A, and 16A from the Klock Site

Vessel Lot 5

Vessel Lot 6

Vessel Lot 15A

Vessel Lot 16A
kernel walls, due to the relatively cold climate (Galinat and Gunnerson 1963: 123-125). The Iroquois most often cooked maize in stews that were simmered for a long period of time over a hot fire (Parker 1968). Thus, pots needed to be resistant to thermal stress.

In terms of settlement, the Iroquois resided in villages of 30 to 150 longhouses (Fenton 1978:306) for twenty-five to fifty years at a time (Tuck 1978: 326). Pots would have been made in similar social and ecological contexts each time, under predictable circumstances. In accordance with this expectation, the Iroquois ceramics in my sample show great internal homogeneity in terms of decorative and technological attributes.

In contrast to the Iroquois, the Algonquians of the Connecticut River valley were more mobile throughout the year and relied less heavily on maize and other seed crops (Chilton 1996a, 1996b). Accordingly, the Late Woodland ceramics of the Connecticut Valley were, on the whole, better suited for storing and transporting food than they were for cooking, as indicated by primarily dense quartz inclusions and slightly thicker walls.

Aside from issues of subsistence, there are social advantages to maintaining mobility. Johnson (1993) has suggested that mobility may have been a strategy of resistance to authority by the Algonquians of Southern New England—that is, the authority of certain native political leaders and (later) the English. By maintaining flexibility and mobility in their settlement practices, the Algonquians of the interior could literally “vote with their feet,” which may explain the infrequent occurrence of warfare, at least prior to European contact. If the Connecticut River valley Algonquians were more mobile, and the boundaries were more fluid than those of the Iroquois, then the social contexts of ceramic manufacture would have been more variable—pots would not have been made in the same place and with the same people every time. For example, if groups of people were moving seasonally, and were fissioning and fusing with other groups at various times of the year, then the social and environmental contexts of ceramic manufacture and use would have been quite variable. Accordingly, we could expect the Late Woodland ceramics of the Connecticut River valley to show much more variability in surface treatments, inclusion type and inclusion density, as is the case.

CONCLUSION

To return to the quote by Dena Dincauze at the beginning of this chapter, I have tried to show that attention to nondecorative, technological aspects of ceramics is the key to understanding Late Woodland ceramic traditions and cultural dynamics in New England. It should be clear from this case study that ceramic classifications should not be imported across cultural borders. Also, because ceramics from the New England interior show tremendous variability in nearly all attributes analyzed, I suggest that a typological approach in this region is simply not warranted. While ceramic types may be defined for limited (particularly coastal) regions, they have little utility over the region as a whole (Luedtke 1986). Instead, the attribute analysis of both technical and decorative attributes has the potential to provide information about environmental and social contexts of production; intended vessel function; technological traditions; and social boundaries (Stark 1998). The analysis of technical attributes of ceramics is challenging in any region, but, as Dincauze (1975a) warned, it is the key to cultural interpretation. Rather than forever hiding in the shadow of the Iroquois, by breaking the mold of ceramic typologies in New England, archaeologists in the region will be free to seek models of cultural variation and change that posit New England Algonquians as the “center” (Dincauze 1993a) of unique processes of human experience.

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