

*Rethinking Technological Change*  
1640-1683  
MARCO

## BASSIN DE LA FLORIDE



# EUROPEAN METALS IN NATIVE HANDS

Rethinking the Dynamics of Technological  
Change 1640–1683

KATHLEEN L. EHRHARDT

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# 1 / Native Technologies, European Contact, and the Processes and Meanings of Material Change

Archaeologists have always been intrigued by the ways people make and use things. Exploring “continuity and change” in past material, technological, and social systems—that is, asking why *things* change and why they stay the same—has long been at the very heart of inquiry. These questions become even more provocative in situations of early cross-cultural encounter when foreign goods and materials first begin to change hands. For researchers in northeastern North America, recovering native peoples’ initial responses to Europeans and their merchandise and identifying the earliest contexts and processes of persistence and change in their material and social systems are a particularly complex and challenging set of problems. As investigators are well aware, within decades of their availability, many European-derived objects and materials appear to have gone quickly from being novelties (desired but not required) to necessities (required) for the native groups who had face-to-face interactions with Europeans and for those who lived farther afield and received them only indirectly through intergroup trade or gift-giving networks. As indigenous demand for and consumption of European goods increased, material repertoires once made up entirely of native manufactures began to transform. In seemingly short order, many “traditional” technologies were altered significantly or abandoned altogether as European objects, materials, and ideas continued to be drawn into native worlds.

Material transformations took place during the same time in which escalating historical, political, economic, and demographic conditions were also exerting disruptive pressures on native social and ideational systems (Rogers



1990:13). Epidemic disease was taking (and in many cases, had already taken [Merrell 1988:96]) its toll on native populations. Demographic upheaval and decline resulted in new kinds of living and group interaction arrangements. Intergroup hostilities escalated as a result of new economic and political alliances forged as a consequence of contact with Europeans and a growing desire not only for their goods but also for their protection against new and old enemies. Subsistence modes, settlement patterns, and daily activities were altered to accommodate European demands for resources. At the same time, missionization and conversion to Christianity effected large-scale changes in native social organization and belief systems.

Trade goods moved quickly into interior North America, often reaching native hands long before Europeans themselves arrived. By the mid-seventeenth century, objects and materials of foreign manufacture had made their way to native peoples of the Western Great Lakes and Upper Mississippi Valley. Goods moved through direct (however sporadic) or indirect contact with French traders, missionaries, and explorers making their way into the interior from the lower St. Lawrence River. Materials also appeared in the interior through various types of exchange activities with other indigenous groups farther to the east. It is also possible that some commodities reaching the midcontinent during this time originated from early Spanish sources in the Southeast or Southwest or from Dutch or English distributors in the East (Drooker 1996a, b). In any case, like their eastern counterparts before them, native peoples in the midcontinent began to accept certain European tools, raw materials, and technologies into their material repertoires. These early responses set in motion important processes of alteration, innovation, and change in their material and technological systems. These are the same patterns of transformation seen in the initial phases of trade farther to the east (Cleland 1992:77).

## TECHNOLOGIES IN TRANSITION: GETTING TO THE ROOTS OF CHANGE

In native North American/European contact contexts, indigenous material culture change appears to be alarmingly fast-paced (in many cases), apparently irreversible, yet imminently transformative. For archaeologists, one of the most important measures of early European impact on native cultural systems has traditionally been the extent to which European products were integrated into native material culture repertoires and the increasingly signifi-



cant role they played in transforming native cultures as contact intensified. Yet, while the final outcome of long-term, sustained native exposure to European manufactured goods has long been known, its beginning phases and earliest contexts are not well documented. Archaeologists have often asserted that initially, assimilation of European objects into native repertoires probably had little effect on native cultural systems, but this assumption largely remains a hypothesis that requires testing at the level of individual cultures (Emerson and Brown 1992:78). Particular cultures and their potentially distinctive culture- and historic-specific responses to the availability of European merchandise, and the technological, social, political, and economic meaning(s) of these responses bear further investigation (Fitzhugh 1985:6). How and why particular groups of native people may have initially sought out and acquired specific types of European-introduced products and materials, what they did with them, in what contexts they used them, and what initial impact they may have had on precontact ways of life have not been adequately researched (but see Bradley 1987; Branstner 1991, 1992; Rogers 1990; Trigger 1985, 1987; White 1983 for notable exceptions).

Elucidating these processes and their historical and cultural implications at the scale of specific cultures is an ambitious undertaking. It involves integrating scant historical evidence from contemporary documentary sources with archaeological data to bring to light the timing, contexts, and particular historical conditions of individual native response to the availability of European items. It also entails exploring the technical, social, and ideological choices involved in acquiring, transforming, and using European objects and materials as they were incorporated into cultural matrices that were also experiencing significant pressures from other sources of disruption such as missionization, epidemic disease, and escalating intergroup warfare.

For researchers in the Western Great Lakes and Upper Mississippi Valley, investigating the nature and timing of material change and attempting to interpret how and in what domains of native life these early transformations first took place have been especially difficult. In many contact situations, material change is thought to have taken place so rapidly as to be barely visible archaeologically. Sites dating to the protohistoric, or "that shadowy period . . . when tangible archaeological evidence indicates European contact well before the advent of written history," are extremely rare (Emerson and Brown 1992:78). Few protohistoric sites or site contexts have been located that contain the earliest evidence of material influence, that is, smatterings of European trade goods of various materials such as iron, copper-base metals, and



glass occurring within otherwise indigenous material assemblages. In addition, archaeologists have had an extremely difficult time linking the site locations they do find with specific groups and locales mentioned in contemporary documentary sources. In large part, this has been due to the intense geographic upheaval and dislocation many native peoples of the interior experienced during the mid-seventeenth century as a result of the Iroquois wars (White 1991). Such tangled historical and demographic circumstances have made identifying and tracking individual ethnic groups and the meaning of change in material distribution and use problematic at best.

Yet, it is the material record from these very early contact period sites that remains a most critical and sought after source of data from which to investigate the dynamics of the period and to make interpretations concerning persistence, transition, and/or transformation in selection and use of such raw materials as lithics, clay, osseous materials, glass, and metals (Schortman and Urban 1998:103–104). Archaeologists recognize that these assemblages reflect the availability, acceptance, and integration of certain European weapons, raw materials, and technologies into native material repertoires. As such, they represent the material manifestation of the earliest phases of alteration, innovation, and change in technological systems. Using increasingly sophisticated laboratory, experimental, and contextual approaches, our aim has been to understand more thoroughly the varied roles materials and technologies have played in processes of stability, innovation, interaction, and transformation within and among cultural systems during this crucial, but poorly understood time.

## GOALS AND OBJECTIVES OF THIS RESEARCH

In-depth analytical studies aimed at explaining how and in what specific contexts individual native groups, especially those of the Western Great Lakes/Upper Mississippi Valley, responded technologically to the availability of particular types of European trade goods have seldom been undertaken. This work focuses specifically on investigating the responses of one particular native group, the mid-seventeenth-century (late protohistoric/early contact) Illinois, to the availability of one popular type of European-introduced material, copper-base trade metal. The analysis is approached from a technological point of view. Such an approach is not new. In Western Great Lakes archaeology, researchers have frequently attempted to explain processes of native material culture change in contact contexts in technological terms. Tradition-



ally, many of these explanations have focused, either explicitly or implicitly, on the *causative* role that newly available “superior” European goods and technologies played both driving and directing the processes of material and cultural change in native systems. Traditional “acculturation” scenarios featuring native peoples’ initial attraction to and ever-increasing but irresistible dependency on technologically superior European goods and materials emphasized their quick and total abandonment of native craft industries, their inevitable cultural dissolution, and their eventual but predictable assimilation to European ways of life (Quimby 1966). Alternatively, “adaptationist” models focused on native need-driven acceptance of recognizably superior European goods to better “fit” them technologically to their environment (Fitting 1976).

Only recently have revisionist approaches arisen wherein archaeologists have begun to view native peoples as independent, active architects of their own histories, exercising a great deal of control over the trajectory, pace, and contexts of transformation within their own cultural systems (Dobres and Hoffman 1994; Rogers 1990; Trigger 1986:258). In terms of their appropriation of European objects and materials, they are no longer assumed to have been “copiers” or “imitators” of European technologies, but to have been creative and innovative in their uses of them (Rubertone 1989:36). Native decisions to accept, reject, redesign, and use European items are based on their own structures of activity, value, and meaning (Branstner 1992; Hosler 1994; Rogers 1990). These realizations have led archaeologists to ask new questions about the complex nature of interactions among native technologies, the availability of new material culture, and continuity and change in technological and social systems in European contact contexts (Branstner 1991, 1992).

This work also challenges the claim that it was the assumed “superior” technological properties of European merchandise alone that initially drew native peoples to foreign weapons, tools, and materials and spurred them to accumulate more and more of them. While it cannot be denied that material change occurred and occurred quickly among some native groups, the notion that material transition was “inevitable,” and that the insatiable desire for European goods was uniquely responsible for eroded cultural traditions and crises in native cultural identity is discarded here. Putting aside such deterministic and extremist perspectives, I draw on concepts from the history of technology and the anthropology of technology to resituate technology’s role as a variable rather than as a prime mover in the early dynamics and trajectory of native material and social change. As is now well known to archaeologists, European technologies and the items produced from them were initially per-



ceived of and used in quite different ways by native people than their foreign manufacturers originally intended (Bradley 1987; Pfaffenberger 1992:511; N. Thomas 1991:4). These responses are entirely consistent with the notion that all technological activity, that is, the ideas people have about objects and materials, the choices they make, and the actions and processes they engage in when they procure materials and make and use things, is potentially innovative and creative. Importantly, it is imbued with multiple levels of social, economic, and ideological significance within specific cultural systems that are, in turn, acting in and reacting to new and intensifying historical circumstances.

Working within this restructured and resituated view of technology's place in the larger picture of early native/European material engagement, it remains for archaeologists to elucidate how these processes of change unfolded at the microlevel, or at the scale of individual cultures. That is what is new in this book. Herein, I demonstrate that technological responses of specific cultures to the introduction of particular European materials can be revealed through detailed, fine-grained historical and materials analysis, bringing into focus what has been termed the "microenvironments" of change in a culture contact context. Interpreting such "everyday" type responses to new materials has the potential not only to reveal unique reactions to European imports but also to make more explicit the case-specific ideas, activities, and interests that helped set larger scale processes of material and social change in motion. Such understandings provide valuable new insights into the role(s) that technology and technological change actually played within broader processes of material and social transformation as European influence intensified. At the same time, identifying the manners in which particular materials and products are (re)manufactured and used and the meanings attached to them extends our cognizance of and appreciation for the breadth of human technological creativity and inventiveness as it is played out in multiple contexts of individual and group self-interest and expression.

Within this framework, the goal here is to explain how the Illinois responded technologically to European-introduced copper-base metal (copper and brass) kettles and metal sheet when these materials became available to them in the mid-seventeenth century. In this analysis, technology is viewed as an inclusive *system* that encompasses all stages and dimensions of activity and perception involved in making and using objects, from material acquisition through artifact fabrication, distribution, use, and discard (after Kingery 1993). Analysis is focused on explaining why one particular material, copper



and brass, may have been attractive to the Illinois, and how and in what contexts they obtained and worked with it to fabricate and use decorative objects in particular social and symbolic contexts. The technical, behavioral, social, ideological, and historical dimensions of these technological processes are integrated to reconstruct what is referred to here as the “technological style” of Illinois copper-base metalworking and use (after Lechtman 1977). By using this approach, the early contexts of material continuity and change in Illinois technological systems are brought to light.

In concentrating here on bringing to the fore the technological “style” of one particular culture group, I am less concerned about how aspects of that particular style (operational sequences, technical choices) might differ from those inside or outside native interethnic boundaries (after Lemonnier 1986, 1993; Stark 1998). Rather, I am interested here in identifying and understanding how these and other features (as elements of larger technological *systems*) are expressed in contexts of action within and among cultures that are becoming increasingly exposed to European influences. It is these kinds of native responses that continually condition, redefine, and restructure native technological systems and social practices and thus, the ways in which material and cultural transformational processes take shape during this tenuous time.

## ANALYTICAL APPROACH

The technological “style” of Illinois copper-base metalworking and use is brought to light using a sample of over 800 copper-base metal artifacts excavated from the mid-seventeenth-century Illiniwek Village historic site, Clark County, Missouri. The 40.5 hectare village site has been conclusively associated with the mid-seventeenth-century Illinois, one of the largest and most sociopolitically active native groups in the early historic period Western Great Lakes/Upper Mississippi Valley during the seventeenth century. They are one of the few peoples occupying the region during this period whose ethnic identity has been unambiguously linked with a distinctive and time sensitive material culture assemblage (Ehrhardt 2004; Ehrhardt and Conrad 1994; Grantham 1993).

Consisting primarily of sheet metal reworked into personal adornment items and the scrap from their manufacture, the copper-base metals industry from the Illiniwek Village represents one early manifestation of the initial phases of important processes of alteration, innovation, and change in Illinois technological systems. Converging lines of laboratory (archaeometric), docu-



mentary, and archaeological evidence are used to analyze and interpret the artifacts, reconstruct the technological system, and place the materials in their social and historical context(s). A suite of complementary archaeometric (laboratory) methods is utilized to reveal the manufacturing history and composition of the metals. These include metric/microscopic analysis, metallography, compositional analysis by proton-induced x-ray emission spectrometry (PIXE), and instrumental neutron activation analysis (INAA). Results from these investigations are integrated with contextual evidence from archaeological investigations and examination of primary and secondary historical and archival sources to document not only the range of technical processes involved in Illinois copper-base metalworking and use, but also to place the technology within the behavioral, social, and ideological contexts into which these appropriated and reformed materials were absorbed. In this way, significant new insights are gained on larger-scale questions of continuity and change in indigenous copper-base metalworking technologies and in the complex relations among material, technological, and social aspects of native cultural systems as new objects and ideas are brought into them during the earliest years of European influence.

At its core, this study is a structural analysis. While viewing particular material objects as important components of human material and social structural systems in a synchronic sense, it is also a study of structural dynamics as they pertain to technological systems. As such, it has both contextual and historical (diachronic) dimensions. This research operationalizes ideas not only about how the interrelationships between technological and social systems are played out in practice but also about how and why they change in response to particular historical conditions over the *longue durée* of history. It extends the boundaries of traditional structuralism in that it considers "structure" to include the design, meanings, contexts, and relevance of objects in particular everyday life settings of social action (Conkey 1989:52). In these frameworks, actions come out of the ideational realm and are products of ideological, symbolic, and value systems; these systems orient activity and are played out in practice (Cobb 1991:202; Hodder 1986:85; Sahlins 1981:7). According to Margaret Conkey (1989:152), these new perspectives on structural analysis "can elucidate how structures 'make sense' in particular historical contexts of social action."

However, this study takes structural analysis as "contextual meaning" (Conkey 1989; Hodder 1986) one critical step further. While it places these systems within their social settings, it also addresses what happens to them when large-scale potentially culture-altering historical conditions, events, and



actions come into play within the long term. This is the diachronic dimension of structural analysis. Among others (Hodder 1986; Sahlins 1981; Trigger 1989 for example), Charles Cobb (1991) has posited that while systems are indeed structured over the long term, people are continually renegotiating and repositioning themselves with the passage of events (Dietler and Herbich 1998:246–247; Hegmon 1998:269). As members of open systems, individuals and/or the groups to which they belong are devising specific and particular forms of negotiation and relations within “conjunctures” or “smaller cycles of social histories that frequently alter structure to reach new points of equilibrium within the longer-lasting structural cycle” (Cobb 1991:171 after Braudel 1972:20–21). Cobb (1991:173) goes on to say that these continual transformations take place within groups and also in their external relationships “at various spatial scales.” Importantly, he makes the point that “preexisting conditions of technology and demography also represent important constraints upon the course of human action” (Cobb 1991:205).

In this way, technology is not seen as a *constraint* on social action and process. Rather, it is viewed as a dynamic, active force that contributed in no small way to redefining and reorienting social practice in ways that shook native structures to their roots. How, why, and in what contexts this happened initially are the major avenues of inquiry here. This study, then, is a focused investigation of one particular element of the structural system, the technological system, as one nexus of intense activity at the “conjuncture” of European contact. In a general sense, it is an analysis of the domains, meanings, and contexts of technological activity over the *longue durée*, but it focuses specifically on the “conjunctures” and “events” of shorter-term history. The conjunctures of which I speak are, of course, related to European contact. These new influences and relationships generated multiple conditions for change that occurred in varied form and in multiple domains. Technology and material exchange is one of the major spheres in which these transformations took place (see Dobres and Hoffman 1994:215; White 1991). As an escalating, multilayered historical process, we see native actors negotiating and renegotiating to find new “equilibrium(s)” as altered structures and relationships emerge and are transformed again and again at a seemingly dizzying pace.

Native responses to these conditions should not be assumed to be uniform or universal, but should be recognized for their multiplicity. They need to be investigated in their specific historical and ideological contexts (Rogers 1990). This technological study of the record of early Illinois material response is one example of the many ways in which structures of materials selection and use are altered and social reproduction and renegotiation occurs in a contact con-