

The Social Role of Technology in Coastal Alaska

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Abstract Novel technologies linked to women and men through identity-demarcated tasks and knowledge sets can potentially have differential and even long-term effects on each group. This study follows the trajectory of two significant imports into the coastal western Alaskan system, the firearm and the metal cook pot. These imports had different implications for coastal Yup'ik women and men, young and old. Over time the gun became an integral piece of a man's tool kit and one that had the potential to boost production and thus a man's access to status-building. However, these same tools had the potential to undermine the apprenticeship system of male authority. Likewise, the metal cook pot replaced the productive oversight and skill set of elder women's ceramic production but created paths of independence for younger Yup'ik women. These changes in technology destabilized relative balances of gender and age based status, security, and authority and fashioned new gender and age based social and economic opportunities and limitations.

Keywords Colonialism · Identity collectives · Technology · Arctic

Introduction

As a principal medium of human interaction technology has the capacity to transform social roles and economic interactions and meanings. Archaeologists continue to ask what mechanisms prompt a particular group to revise their tools and technological processes and how material transitions change lives; pondering the influence of environmental change, motivations of necessity, efficiency, economics, politics, and sociality (Bright et al. 2002; Miller 2007; Rogers 1990). This article examines a rather underutilized yet central aspect of change and seeks to understand

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how identity, specifically of gender and age, impacts the interaction with technology and how technology influences social group relations (see Nassaney 2004a).

Cross-cultural evidence demonstrates that in subsistence economies tools are remarkably linked with *identity collectives* such as age-sets of women and men. For example Brumfiel (2006) demonstrates the archaeologically significant link between social identity and the meaning of weaving through time in Mesoamerica (see also Hoffman 2002; Smith 2007). But too few archaeologists address identity as a primary variable in discerning cultural interactions with technology (Frink and Weedman 2005; Hendon 2006; Sassaman 1992). How and why technology is used and the complex meanings and repercussions of change however, are inextricably tied to social group organization, practice, and ideology (Ridington 1988; Whitridge 2002). A conscious focus on gender, age and technology, therefore, will enrich and strengthen our archaeological interpretations (e.g., see Beaudry et al. 1991; LeMoine 2003; Nassaney 2004b; Nassaney and Volmar 2003). Women and men as groups can be agents in processes of change they can also be part of cultural revisions with unintended beneficial or unfavorable consequences (Hegmon et al. 2000; Kelly 2002). New technologies linked to women and men, old and young, through identity-demarcated tasks and knowledge sets can potentially have differential and even long-term effects on each group.

In this article I build a heuristic model focused on two significant tools in Arctic Alaska, the firearm and the metal cook pot, both colonial imports. I explore how descendent Alaskan women and men interacted with and were influenced by imported technology and suggest that the inclusion of the firearm in the hunting tool kit had the capacity to heighten men's access to status seated in their productive contributions and yet at the same time undermined the apprenticeship system of older male authority. Likewise the incorporation of the metal pot at the expense of the ceramic cook vessel may have partially supplanted elder women's productive control and expertise, undermining their claims to authority. These new technologies shifted the balances of relative power, authority, and security and created new gender and age based social and economic opportunities and limitations (see also Sharp 1952).

Imports not only changed the way people worked, but could serve as a venue for an altered meaning of production (Silliman 2001). In subsistence-based communities, the performance of production in many ways defines the opportunities and limitations not only for individuals but also for identity collectives (see for example Lantis 1946; Wesson 1999). Therefore, the indigenous internal reinterpretation of production, initiated by colonial imports, could have significant impact on what the act or product meant and therefore the social significance or security it provided the producer. It may be that a new commodity may free up producers to reinvest their labor elsewhere. For instance, European clothing "would have placed fewer demands on women to produce fur clothing" (Nassaney 2004a, p. 346). But, if this same highly skilled production of fur clothing was a cornerstone to identity, power, and influence the replacement and undermining of the control of practice and expertise of manufacture has profound long term economic and political implications for that collective (see Frink 2005; Habicht-Mauche 2005).

Scholars demonstrate that colonialism tended to agitate and exploit extant internal contradictions among social groups and may have led to tensions among group members (Kelly 1997; Scott 1990). As a fundamental cross-cultural organizing

principle, age and gender are building blocks for complexity and inequality. Identity collectives are interdependent yet autonomous social groups with their own economic and political aspirations, opportunities, and limitations within a community. Women and men as social groups attempted to better their social and economic loci not only through production but also from expertise (see Crown 2000; Szuter 2000). The shuffling of social, economic, and political orders could be triggered by imports, but changes were founded in the tensions already present in the community (Comaroff 1985; Sahlins 1985).

This examination focuses on indigenous Yup'ik Eskimo communities in the Yukon-Kuskokwim delta coastal region (Fig. 1). Similar to other Arctic regions, even though few Anglo-Americans settled in the region until the early 1900s coastal people were privy to colonial imports prior to colonial settlement (Mishler and Simeone 2004; Nelson 1983). And these interactions with imported technologies undoubtedly stimulated complex internal dialogue and the reconstitution, wielding, and negotiation of group identities (e.g., Brumfiel 1992; Lightfoot and Martinez 1995).

Coastal western Alaska has a somewhat dissimilar colonial history than some other regions of Native North America. Though many of the patterns of colonialism are similar, a significant difference is that most indigenous Alaskans were not removed from their land or irrevocably distanced from daily subsistence practices—a noteworthy contextual caveat when evaluating contemporary and historic evidence (Fienup-Riordan 1983; Friesen 2002; Griffin 2004; Jarvenpa and Brumbach 2006).

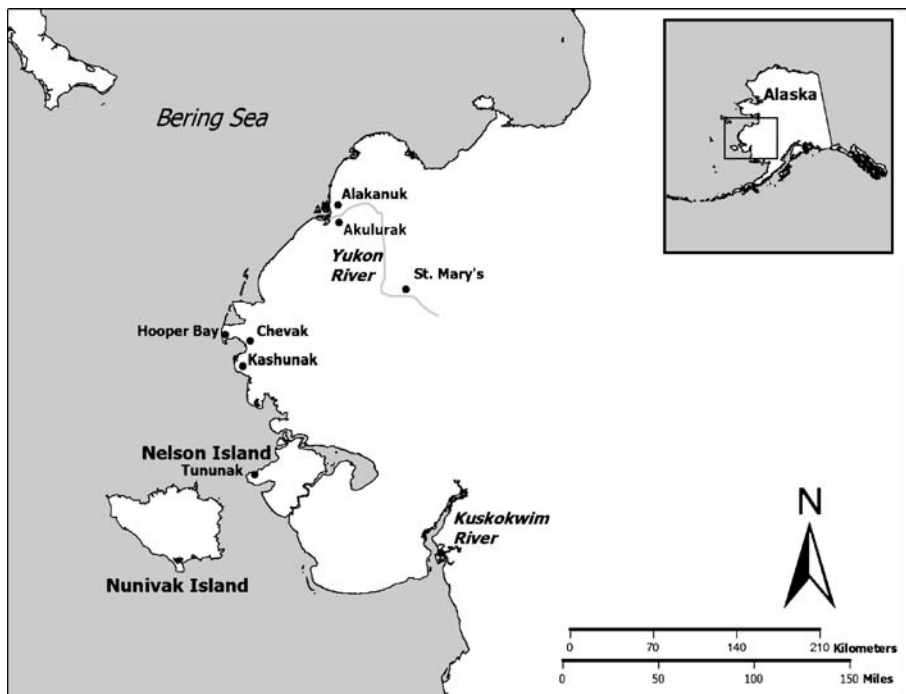


Fig. 1 Map of Yukon-Kuskokwim Delta coast

For instance Yup'ik people along the coast continue to practice subsistence pursuits in a mixed-economy (Fienup-Riordan 1986). On the other hand, coastal Alaskans have been entangled in colonial/post-colonial and cultural revision for several generations, but the continuity of place and subsistence has supported a distinct and complex context of social and economic transformation and resilience.

The multiple lines of data used for this paper stem from Arctic and cross-cultural comparisons of anthropological and archaeological research, historic records of Russian and Anglo-American explorers, missionaries, and traders (see Nassaney and Johnson 2000). And because Yup'ik people continue to be connected to their land, technological customs, and many subsistence practices, I include primary ethno-archaeological observations and interviews with Yup'ik women and men in coastal villages since 1997. Additionally I integrate archived interview data with elders in the coastal region collected in the 1980s as a response to the Alaska Native Claims Settlement Act or ANCSA. (I do not publish the names of my consultants [see also Hensel 1996], however, the ANCSA interviews are considered a matter of public record.)

Framing Technology and Cultural Change

For archaeologists one of the key motivations for adopting a new technology is efficiency or “need-driven” (Pfaffenberger 1992, p. 495). The introduced tool settles a problem better than the current technology being used (Nelson 1991). Nonetheless, even if a new technology is more efficient or durable, the acceptance of it can be complex. Bamforth (1993, p. 50) found that the use of stone tools persisted among Native people of Alta California, despite access to imported steel. The adopted or invented technology is steadfastly interwoven with social and economic factors beyond efficiency and problem-solving (Dobres 2000; Hoffman 2002; Rubertone 2001; Schiffer 2001).

Additionally we cannot assume that introduced material culture may simply substitute as an equivalent replacement (Branstner 1992) but can act as a “change factor” (Spector 1983, p. 95, 1993). For example, currently most Alaskan coastal villages have running water in households. While plumbing is incontestably a welcome addition to Native life (especially for women) it is not without consequence. Firebathing and steaming have been a community and familial activity for hundreds, if not thousands of years for men, and since the late 1970s for women and children. Steaming is not only a means to cleanse oneself but also a principal social, political, and even spiritual practice. An invitation to steam is an invitation to social interaction. But, the introduction of household plumbing is redirecting practice, particularly for young people. Instead of communal steaming (commonly in same gender groups), young people are tending to shower (a functional equivalent) in houses; undoubtedly over time restructuring networks of relationships, identity, and influence.

Evocative of Spector's ground-breaking approach to gender task divisions and meaning, here I examine the processes and contexts of technological introduction and change. After discussion of these contexts I will present a case study of technology and transformed identity from western Alaska.

Contextualizing Identity and Technological Change

Tools can have multiple and layered practical, personal, political, and esoteric values to an individual, family, and community. Studies suggest that the adoption, resistance, reconfiguration, or rejection of a given technology is inextricably linked to the local “cultural logic” to which the technology is entering (Rubertone 2000, p. 431). Indigenous people made judgments toward introduced material culture and could actively reinterpret an imports’ use (Ehrhardt 2005). Therefore we must consider the palimpsest of process and contexts to appropriately interpret the corollaries between material culture and social transformation (Sharp 1952).

Hence, we can examine what role the “traditional” tool fulfilled and how the new technology may satisfy this function (be it practical or political) or be otherwise tasked. For instance, was the introduced technology revolutionary such as the fish wheel, introduced by miners in Alaska in the late 1800s, which was an innovative approach to harvesting fish (Oswalt 1963)? Or rather was the import a functional counterpart to that which it replaced. For instance, manufactured cloth was intended as a replacement for Native Alaskan seal, caribou, or fish skin garments (Buijs 1997). The reaction to a new technology may stem from perceived quality, political motivations, or a complex admixture of emic and etic factors. Among Arctic Alaskan groups, women decoratively attached imported steel thimbles upon their parkas and continued to sew with their seal skin versions which Eskimo seamstresses considered superior (Frink et al. 2003). Used beyond their intended use, the thimbles may have instead been manipulated for display and social brokering, possibly reconceived of as “holders of special powers” (Rogers and Wilson 1993, p. 4).

There are numerous cross-cultural examples of the connections of groups to specific subsistence tools, activities, and expertise. As Gilmore (2005, p. 19) points out, tools such as the composite scraper were strongly associated with Plains Indian women and “some of them were handed down from mother to daughter for generations.” This is not to say that men never use certain styles of tools (Jarvenpa and Brumbach 2006), however, in many cultural situations an identity group is primarily connected to a certain tool, associated tasks, and valued expertise. And not only are they coupled with the productive task but the associated tools are closely linked to social identity (Costin 1996, p. 113). Therefore, the changed control of production and meaning will influence how the construction of identity and sociopolitical context may be re-imagined over time (Wright 1991).

Cross-culturally, elder men and women are often not only the experts in making and using specific technologies but can gain significant influential ground based on their earned expertise and junior-senior debt system of learning (Dickerson-Putnam and Brown 1994; Ingold 2001). For example, the cooks of Catalhoyuk began to use ceramic vessels for direct cooking instead of clay balls previously used for indirect boiling in baskets or skins (Atalay and Hastorf 2006). Given the skilled aspects of making vessels and knowledge of cuisine, this technological shift would have affected women who had knowledge of making and using cooking baskets and those with curated recipes handed down through the generations (see Crown 2000). When cooking practices changed, older women may have lost a measure of esteem and power given their expertise in indirect cooking technology and technique. And at the

same time, a different set of Catalhoyuk (young) women, under the auspice of re-management of time, could have excelled at ceramic vessel production and revised cuisine techniques. The transformation of equipment and expertise had the potential to deflate the skill-based influence of the former and afforded a new path to status for the innovators (see Crown 2000, p. 266).

Additionally, did the replacement of one technology for another occur during a culturally stressful period correlative with other changes or during a time of relative calm. Crucial here is to contextualize the transformation of a technology on a long-term and contingent historical continuum to provide a useful relative scale for understanding the overall influence of a changed technology. For example, Atalay and Hastorf (2006, p. 315) surmise that the need for time-management and the “desire for multitasking during meal preparation” was a primary motivation in the change in tool and practice among Catalhoyuk cooks. This transition was apparently not part of a significant socioeconomic, political, or dietary shift among the Catalhoyuk people, but an internal technological innovation.

Contrary to this phenomena of emic-generated technological transformations are changes couched in stressful and opportunistic circumstances such as colonialism (Kent 2002). A prominent element of colonialism was the patriarchal practices of immigrant colonists and competitive tactics of Native men (Brown 1975; Devens 1991, 1992; Fiske 1991). Scholars have demonstrated that in Native North America there was “differential development” in that the dispersal of imported material culture was uneven among women and men (Gonzalez 1981, p. 111). Although early colonial situations could benefit some women, especially Native women who positioned themselves at the matrix of trade and communication by way of marriage, differential access of women to resources (material and political) by alternative routes was eventually trumped by indigenous men and patriarchal ideology (Van Kirk 1980).

Research continues to demonstrate that prior to colonial settlement Native North American people interacted with and redefined imported material culture. Ehrhardt (2005) found that during the early trade period in the Great Lakes region, long before immigrant colonists settled, Native Illinoisans were manipulating imported goods such as copper-base metal kettles. She found that during the early period the metal cooking kettle, one of the most popular of early imports in Native North America, was not used in a domestic context but rather dismantled and used for ornamental display (Ehrhardt 2005, p. 184). Ehrhardt suggests that metal from the kettles may have been used to control interior trade routes (dominated by men) and/or for ceremonial purpose.

But what role did identity play in the Illinoisan decisions of reconceptualization and differential use of the metal kettles. Were (young) men who traded for the metal kettles appropriating the artifact, thus essentially shutting out women who may have preferred to use them for their targeted domestic purpose (which they do later in the cultural sequence)? Or was the metal imbued with a different meaning and use and utilized by both women and men. In other words, were Illinoisan women implicated in the re-characterization of metal kettles for their own political purpose since the possible loss of the direct control of access to construction materials, manufacturing expertise, and proper use of ceramic pots threatened an arena of their authority (Nassaney 2004a, p. 346)? This type of inquiry will help us ferret out the complex

issues, tensions, and choices people made when archaeologists find coincident new and old technology (see Bamforth 1993).

Finally, we can examine the context of impact especially in light of groups who may have promoted a new technology for their benefit and also those who may have resisted for fear of loss. Pfaffenberger (1992, p. 506) suggests that interest groups become “impact constituencies” and when a new material culture is introduced, groups “engage in strategies to compensate the loss of self-esteem, social prestige, and social power caused by technology.” This does not imply that identity collectives can suffer a “loss of identity” (Ehrhardt 2005, p. 21), but rather a possible re-characterization of their identity—with the concomitant capacity to enhance or diminish their access to social and material goods and political standing based on the control and meaning of production (Habicht-Mauche 2005; Nassaney and Volmar 2003; Webley 2005).

As demonstrated, queries focused on the complex contexts of the interaction of identity and technology and how new technologies can alter the balances of tensions that are present among gender and age groups are part of the “technological drama” that engulfs cultural change (Pfaffenberger 1992, p. 506). Scholars are finding that indigenous communities were active participants, and that local context is a lynchpin to resilience and transformation during the long-term and multifaceted development of colonialism (Mishler and Simeone 2004; Silliman 2005; Voss 2000).

Arctic Identity and Technology

The vast region between the outwashes of the Yukon and Kuskokwim Rivers is over nearly three quarters water (McNab and Avers 1994). The low, marshy, maritime tundra has discontinuous permafrost and supports a low vegetation of grasses, sedges, mosses, and lichens; alders and willows grow along major tributaries. Since it is a highly active alluvial environment full occupation of the delta is difficult but it is thought that people first settled the coast some 3,000 years ago (Okada et al. 1982).

The winters are long, severe, and dark; summer days are cool, humid, wet, and windy. Hence, life is characterized by alternating abundance and scarcity. Wolves and foxes and other terrestrial animals roam the upland areas of the delta year-round, and freshwater fish move beneath the ice; sea mammals swim along the Bering Sea coast and in the rivers of the interior in the late spring, summer, and early fall. Intensive seasonal harvests such as seal were traditionally critical and to a large extent remain so, since family groups stored food for the coming winter (Barker 1993; Frink 2002). Migrating birds and anadromous salmon are plentiful in the late spring and summer months but absent in winter.

The seasonal resources of the delta were first harvested by the archaeological culture group referred to as the Norton. Norton assemblages are found in the Arctic from northwestern Alaska to the Alaskan Peninsula and are distinctive in showing increased sedentism and demographic growth over time (Dumond and Bland 1995; Nowak 1988). Norton people started settling in large villages along the Bering Sea coast and these communities were fairly complex, and there is evidence for warfare and men’s houses (Okada et al. 1982).

The subsequent Thule material culture (1,000 CE) is considered ancestral to contemporary Eskimo populations. Thule groups lived in semisubterranean houses as had Norton groups, but their villages were larger. The use of the men's house increased, and there was a greater reliance on the use of sea mammals, fish, and caribou (Bockstoece 1973; Sheehan 1997). Up until the mid-twentieth century, people along the delta coast continued to live in aggregate winter villages and dispersed seasonal camps (Lantis 1946). Today, however, given the colonial histories of mercantile, education, and religious transformations, people are much more tethered to centralized villages than their ancestors were (see also Brumbach and Jarvenpa 1997). But, many of the Yup'ik residents of the small villages along the coast continue to rely on seasonal fishing, hunting, and gathering for their subsistence and sense of identity (Frink 2002, 2005).

Age and gender have remained entangled markers of self and fundamental organizing principles of Northern North American people's interactions, privileges, and duties (Jarvenpa and Brumbach 2006). A Yup'ik Eskimo woman's sphere of economic and social activity is complementary to that of a related man but autonomous. To accept an unflinching symmetrical status through time to these productive divisions is to deny the tensions and negotiations between women and men and their sometimes different economic and social strategies. What hunter-gatherer men and women do may be consistent over time but an activities' value is historically contingent (Frink 2007; see also Nassaney 2004a).

But, does this analytical frame unduly foist competition between Native Alaskan women and men? I do not think so. As anthropologists and archaeologists have noted cross-culturally there are tensions among competing interest sets and the development and introduction of new technologies can ignite these already present contestations (Brumfiel 1992, 2006; Comaroff 1985; Dickerson-Putnam and Brown 1994; Lepowsky 1993; Nassaney 2004b; Nassaney and Volmar 2003; Sharp 1952; Silliman 2001; Whitridge 2002). These internal strains can lie at the very heart of indigenous northern systems that stress "cooperation and solidarity" and yet despite ideologies of equality must deal with everyday issues of resource access, authority, power, and prestige especially when considering changed social parameters of colonialism and post-colonialism (Simeone 1995, pp. xviii, xxi; Nassaney 2004a, p. 344; see also Hensel 1996; Lantis 1972; Woodhouse-Beyer 1999).

As in subsistence economies throughout the world, age too is a primary factor in the negotiation of rights and authority of gendered individuals among Arctic groups. Even today, elder people, especially those productively accomplished, hold political and practical sway among their juniors in households and communities (Ellanna and Sherrod 1995). What Sharp has called "the prestige of age" (Sharp 1952, p. 453). There is great respect and reverence for elder people mixed with a hint of fear for their acquired knowledge and power. Young people work and provide for elders in junior-senior debt systems, not only to care for the elderly but to glean their wisdom of practical, political, and ritual knowledge (Cruikshank 1990).

Identity is performed, parlayed, and reinforced through tool, task, and expertise. Tasks are not executed in a cultural void but are critical in the creation, negotiation, and maintenance of social and economic prospects, expectations, and limitations. Still today, the engagement of women and men in subsistence production is not only about the action of harvesting or post-dispatch processing. What a person does and

how successfully or not they do it and for how long in their lifetime in large part continue to define their position, rights, and status in a household, lineage, and community (Jolles 2002; Lantis 1946).

A Yup'ik persons' sense of self was and continues to be closely connected to the harvest for men and production management for women. A man's influence in a village, his former position in the hierarchically organized men's house wherein the older and more accomplished men would sit at the better lit and warmer back of the building, and his attainment and maintenance of a marriage correlated with his subsistence harvest production and age. The act of hunting and the expertise of making tools, implementation of techniques, and environmental knowledge were and continue to be a means to achieve status over a lifetime within a community. Even today, dispatching of a bearded seal is a signal to celebrate a boy's initiation as a productive Yup'ik man (Frink 2005).

Likewise, a Yup'ik woman's subsistence production is tied to a man's harvest, however her economic "discretionary income" (Brumfiel 2006, p. 869) and social standing that stem from her production and accumulation of knowledge are autonomous (Hensel 1996; Lantis 1946). Women, especially elder women controlled the post-dispatch harvest and made processing, distributive, and administrative decisions. The successful management and the expert knowledge of the properties of foods, approaches to storage, and thoughtful and politically savvy distribution through the long, often harsh, Arctic winters could confer authority and even as Ellanna and Sherrod (1995, p. 33) suggest for some Inupiaq elders, "big woman" status.

The tools connected to women or men are an extension of production and mark the productive sphere of influence and opportunity of the producer. A tool or suite of tools such as domestic or harvesting tool kits (though there can be overlapping of use [Jarvenpa and Brumbach 2006]), are often cross-culturally associated with a gendered group (Crown 2000; Frink 2009; LeMoine 2003). For example, the semi-lunar knife (or ulu), which by all archaeological, historical, and indigenous accounts, is strongly associated with Arctic women's production and their repertoire of tools (Frink et al. 2003). This does not mean that Eskimo men never use this form of knife (see Barker 1993, p. 83), nonetheless women use this class of blade on a daily basis and the knife is symbolically connected to women and thus robustly identity-demarcated.

Because of these strong associations between groups, expertise, and tools, technological transitions are rife with repercussion for both women and men through their life course. In hunter-gatherer subsistence systems like those on the Arctic coast where labor allocation and productive consequence were autonomous yet discretionarily interdependent, introduced technologies could stimulate a domino effect of change. As discussed, the fish wheel altered fishing techniques, harvesting potential, and the productive process. Women had to process more fish at one time and "had to work harder, since there were more fish to prepare for drying at one time" (Oswalt 1963, p. 44). As such, identity-linked tools are material markers of activities and substantial symbols of the larger contextual meaning of the task or suite of tasks performed. Consequently, the transformation of a tool can highlight gendered and aged tensions while also changing the task, the cultural worth of task, and the political cache of the group (Nassaney and Volmar 2003). It is in this context of social groups, expertise, tasks, and tools that I look at the context of two old and novel technologies among the people of the Arctic coast.

Men, Hunting, and the Gun

Given the environmental demands in the Arctic, hunting technology was incredibly sophisticated (Nelson 1983). Eskimo men developed a highly specialized suite of implements for hunting sea mammals, birds, and terrestrial animals (Fienup-Riordan 1986; Oswalt 1952, 1999). The complex specialized cluster of skills of the hunting process, from tool making to harvest, took a lifetime to learn and master and active associations with older hunters were critical for young coastal men (see also Ingold 2001). Even today, boys go fishing and hunting with their fathers, grandfathers, and uncles. This system of subsistence apprenticeship supported junior-senior debt relationships in which elders shared knowledge with younger people, but not without social and economic strings. A middle-aged Chevak man told me of how as a child he hauled water for elder people in the village and in turn they shared their knowledge. As with other cultures, there can be mystique and limited access to knowledge and skills surrounding the process of hunting (see also Szuter 2000). Boys would gather in the men's house to listen to elders and learn by doing. However, some could be blocked from knowledge of the full range of hunting techniques and expertise. For instance, a Chevak elder I spoke with was told by his father that orphaned boys crept through village tunnels to listen clandestinely to the teachings of the men.

Beginning in the early 1830s and throughout the nineteenth-century Russian and later Anglo-American goods and materials circulated along the coast. More efficient weapons increasingly entered the system after 1867 when the United States legalized firearms sales to Native people (Mishler and Simeone 2004). Though illegal to sell to Native people, the first guns to enter the area were Russian muzzle-loaders which were “extremely clumsy” (Nelson 1983, p. 163; Redding-Gubitosa 1992). According to ANCSA reports, Russian guns arrived in the delta “before the gasaqs came” (Henry 1984). A Yup'ik elder recounted the story that “many people gathered to see how the gun worked” and the shot was so big “people saw the bullet as it traveled in the air and as it hit the target it fell on the ground and started rolling on the ground” (Henry 1984).

Nelson, the first documented non-Native to travel the coast (1878/79), noted that firearms were “common everywhere among the Eskimo” even in remote regions like the delta (Nelson 1983, p. 163). At one of the villages he collected both an older forked support used with the Russian muzzle-loaders and typical wooden cap boxes found with newer rifle models in other areas such as St. Michael (Nelson 1983, pp. 163–164, Plate LXIII). Though there have been signs of “conservatism” at some coastal sites, whether from lack of access or other reasons (Staley 1992), excavations on Nunivak Island support that coastal men had access to muskets during the nineteenth century (Griffin 2004, p. 103). And according to Griffin (2004, p. 104) there was “access and variety of arms available” to the early twentieth-century hunters along the coast.

The very early firearms may have served more as markers of differentiation, conflict, and prestige among men rather than hunting tools (see Reedy-Maschner and Maschner 1999). Reedy-Maschner and Maschner (1999, p. 732) report that among Subarctic groups firearms “gave some males [especially young men] an advantage not previously present.” One of the most “popular” of trade items during the early

missionary period in the delta (early 1900s) were Army muskets (Oswalt 1963, pp. 110–111; Oswalt and VanStone 1967, p. 74). In the delta region as technology and availability increased, guns became the backbone of hunting and a new indigenous industry of production surrounded the firearms (Nelson 1983, p. 164). For instance, archaeological evidence shows that in the later part of the nineteenth century people were making molds for musket balls (Redding-Gubitosa 1992; Oswalt and VanStone 1967). Over time, coastal hunters effectively integrated the tool into their hunting regime while continuing to use complementary traditional hunting implements (Nelson 1983, p. 166). This tandem approach is evidenced today when a coastal man shoots a seal with his .22 rifle, he will employ a traditional style harpoon to secure the seal before it sinks (Frink 2005; Oswalt 1952).

The gun is the centerpiece of the Eskimo hunting tool kit and several are commonly used in Yup'ik households (Fig. 2). I have been told by coastal men that a gun may not make a bad hunter a good hunter—but a gun can make a good hunter a great hunter. As a component of the hunting assemblage, the gun did not completely displace men's tool making or hunting expertise. Rather, the gun supplemented an existing suite of mixed technology that even today remains specialized and a baseline for authority building. Since the gun had the potential to increase a man's harvest, the use of the gun in hunting could streamline a man's access to communal and household influence. This is particularly important in that the increase in access to guns, steel traps, and other goods mirrors the demand for terrestrial furs in the colonial market (Michael 1967; Ray 1966, 1975). Some of the incentive for men to harvest fur was likely driven by desires for firearms. This connection is symbolized by the way Anglo traders bargained for a man's fur harvest. A man could buy a firearm when a stack of furs matched the length of the gun for sale. I have been told this fur-stacking practice pertained to other goods as well.

But, although the gun eventually boosted production for hunters able to access firearms, elder men would have lost some authority based in the hunting apprenticeship system. Research elsewhere demonstrates that the colonial market was a boon to younger men's trade and status building activities (Reedy-Maschner



Fig. 2 Firearms in Yup'ik household (L. Frink)

and Maschner 1999). Given the debt system of authority, elder men were negatively affected by the transformed power relationships (see Sharp 1952). However, young men would have remained reliant upon older men (and remain so today) to train them in the overall skills of hunting such as tracking, seasonal behavioral patterns, and other ecological mastery which would have remained relevant to hunters whether wielding traditional or firearm technology. It is possible that to counteract some of the erosion of influence and identity of older men these skills of animal behavior, pursuit techniques, and survival skills would have been even more emphasized in ritual and practice. And older men may have been able to translate their skills to not only the use but maintenance and repair of firearms.

Nonetheless, the system of apprenticeship and status built from hunting proficiency and access to the market would have been *relatively undermined* given the new technology. Young men would have a continued reliance on older men to learn a suite of skills—however the gun would have subtly yet powerfully changed a key definition and practice of hunting and thus the characterization of an accomplished hunter. Once the gun was fully embraced by Eskimo hunters, no longer was the expert crafting or technical use of the bow and arrow necessary for the accomplished hunter, a likely blow to elder men's expertise and power. This disjunction of dependence is indicative of a typical sentiment among elder men I have interviewed that youth “don't work anymore.” And to a man, older men miss the men's house environment especially for the training of young men. Elder men would have had less long-term mastery of the technology and maintenance of the gun and hence young men's reliance on their knowledge was relatively diminished. In addition because of the gun and their access to it through the market, young men were better able to strike out on their own in search of furs, goods, wages, and competitive status.

Women and the Ceramic Cook Pot

Evidence for ceramic manufacture of cooking vessels in Arctic archaeological sites is copious (de Laguna 1940; Lucier and VanStone 1992; Redding-Gubitosa 1992) and for at least 2,500 years and into the late 1800s people along the coast manufactured ceramic cook pots (Okada et al., 1982; Oswalt 1952, 1955; VanStone 1954, 1957; Fig. 3).

However numerous, Native ceramics contradict most archaeological models since they were made in the Arctic climate. Recent work demonstrates that these wares were an ingenious combination of complying with environmental demands, cultural constraints, and nutritional requirements (Frink and Harry 2008; Harry and Frink 2009).

Ceramic cook pots began to be supplanted in the early nineteenth century by Russian cast iron kettles and sheet iron pots and may have persisted into the mid/late 1800s at which time they were completely replaced by metal wares (Oswalt and VanStone 1967, p. 74; see also Nelson 1983, p. 317; Oswalt 1955, p. 39; Oswalt and VanStone 1967; Ray 1975). (Unlike some areas of the Arctic [Cabak and Loring 2000; Jackson 1991] few colonial ceramic serving vessel remains are found in early historic coastal sites (Oswalt 1952; Shaw 1983). For example, at the site of Kwigumpainukamiut in southeast Alaska there is a significant rise in metal objects and a dramatic drop in the



Fig. 3 Replica ceramic Thule-style cook pot

number of sherds found in a fur-trade era residence occupied after 1867 compared to earlier house assemblages (Redding-Gubitosa 1992, p. 135; see also Shepard 1997, p. 52). So too in the delta region, unlike other “traditional” technologies acquired by Nelson he collected no ceramic cooking pots (Nelson 1983, p. 56).

Cross-cultural data suggests that the makers of domestic ceramic wares are women, and generally older women (Nassaney 2004a; Nassaney and Volmar 2003; Skibo and Schiffer 1995). So too among Arctic Alaskans where Nelson observed “women are the only potters” in this once wide spread practice (Lantis 1946, p. 245; Lucier and VanStone 1992, p. 6; Nelson 1983, pp. 201–202). According to Spencer (1959, p. 471) women were the ceramic specialists, and the finished product was considered their property and the full production sequence of gathering clays, potting, and control of the vessels’ use was the provenience of women. There was symbolic weight to some of these ceramics in defining ritual activities and signaling the meaning of significant cultural events (Spencer 1959, p. 471).

The indigenous assessment of the worth of the cook vessels is apparent in the value that Yup’ik people gave to them. Several Tununak elders I interviewed remembered seeing ceramic vessels on top of women’s internments on Nelson Island (see also Nelson 1983). There is archaeological, historic, and Native experience evidence that ceramic cook pots were mended and curated (Lucier and VanStone 1992; Oswalt 1955; Oswalt and VanStone 1967). Lucier and VanStone (1992, p. 4) report that pots were carefully used while cooking and stored “safely out of the way” when not in use. And so too a Yup’ik elder (ANCSA interview) recalled that in his house kids were “hollered at” if they came near the cook pot for fear it would break (Friday 1983). This same elder man recalled that he preferred the taste of food cooked in the ceramic pot more than in a metal one. And according to this elder not all households had a ceramic cook vessel, and kinswomen would share among themselves (Friday 1983).

Because of the mastery of skill required to make ceramic vessels not all women had the specialized skills to make pots. Or, like other Eskimo technologies, many women may have known how to make a pot, but some elder women may have excelled at creating a ritually appropriate and functionally superior product. For instance, Lucier and VanStone (1992, p. 15) remark that Kotzebue Sound women “who made higher quality cooking pots were probably always few, and they were doubtless known to all who traded for these superior wares.” Similarly, over the years of observation and interaction with people on the coast, I have learned that even the most seemingly straightforward and mundane subsistence task can take a lifetime to master, and certain Yup’ik elders are well-known for their particular expertise (Frink 2009; see also Szuter 2000). There likely was a mystique or “myth of unusual power” (Pfaffenberger 1992, p. 505) and concomitant status accorded those women particularly adept at making vessels in this most challenging of environments.

Because of the early replacement of cook pot manufacture the sequence and process of the replacement of the ceramic cook vessel is still little understood (Lucier and VanStone 1992, p. 14). The expediency and durability of metal pots may have driven ceramic production of cooking vessels to extinction, since cook pots were one of the first Native technologies to be replaced (Ray 1975). According to Oswalt and VanStone (1967, p. 74) during the early 1900s missionary period one of the most “popular” of trade items were sheet iron kettles (see also Oswalt 1963, pp. 110–111). Additionally, the increase in extralocal production born from the colonial market may have shifted the demands of intensified domestic production to women. Therefore, time spent on making pots had to be shifted to other production efforts. But, there is strong indication that the processing of fox fur, the primary nineteenth- and early twentieth-century market item, unlike any other subsistence harvest, was controlled by men (Frink 2005; Lantis 1946). However, time demands may have been a factor in the processing of other resources such as seal (including skins and oil) which harvest and indigenous trade may have increased with the use of firearms (Lantis 1984, pp. 213–215).

The knowledge of the productive sequence of making and using a ceramic cook pot was personal “intellectual property” of “mature and older women” (Lucier and VanStone 1992, p. 15; see also Fienup-Riordan 1975). Potters practical and esoteric skills were valued among Yup’ik women and the community. Like other knowledge, the elder woman potters’ recipes and attendant techniques of cooking with the ceramic vessels were “the exclusive property of the originators and their heirs” (Lucier and VanStone 1992, p. 15). Therefore an elder woman’s knowledge of ceramic production was a significant element in the indigenous apprenticeship system which could help her build and maintain authority, security, and provide an edge in social brokering. But, the knowledge set of ceramic technology and technique was displaced by the imported metal cook pot.

Discussion

The integration of imported guns and metal pots would have destabilized the generations of practiced technological erudition and skill sets of both Yup’ik women and men. Elder position and authority, though not completely displaced, was

relatively undermined because their knowledge and skills were displaced by the introduction of these two objects. For instance, men's political and practical relationships and power built on mastery and apprenticeship of hunting technology and technique would have been transformed. No longer were young men as beholden for knowledge of traditional techniques. Instead, in the burgeoning market young men were still linked to elder men but could bypass some previously significant stages of apprenticeship.

Elder women as well were adversely affected by the undercutting of control of the full production sequence, specialized skills, and concomitant authority. The metal cook pot supplanted women's expertise in ceramic manufacture and thus added to an erosion of potential authority-building based in the control of an entire production sequence from processing to product. And unlike other regions, such as the American Southwest, wherein women's ceramic production became artistic and an important commodity, this did not happen for Native Arctic pottery production. Interestingly in the 1970s, several agencies promoted ceramic manufacture of non-traditional items on Nelson Island given their access to raw clays (Fienup-Riordan 1975). However, those involved in the short-lived industry were primarily Yup'ik men (Frink and Harry 2008).

Partially because of male-centered practices of colonial mercantilism, wherein traders were men, lines of communication and exchange followed gendered lines (see Fiske 1991) and the shift to metal pots introduced a new dependence in the production sequence for Eskimo women since men had primary access to market goods. Some Native women may have had relatively better access to trade items prior to Anglo-American practices (Frink 2007). However, men were the backbone of interregional indigenous and imported trade connections including that of metal pots (Oswalt and VanStone 1967, p. 4). And as wages increasingly entered the Eskimo system in the early 1900s, men controlled the processing and selling of furs and were more often employed as hunters, linguists, guides, traders, and cannery labor and thus had relatively better access to wages (Frink 2005, 2006; Menager 1962; see also Simeone 1995; Lightfoot et al. 1991). Several Chevak elders remember that it was their fathers who went to the store for household supplies like sugar or flour. According to an elder man, the man as "the head of the house" did the bulk of the trading and women "hardly ever" went to the store (see also Redding-Gubitoso 1992). At least by the early and into the mid-1900s, Eskimo men were the primary face of market exchange. Access to the centerpiece of a woman's domestic tool kit, the cook pot, was no longer solely hers because men had access to metal kettles in the market place as a result of their greater engagement in trade networks and wages in a discretionary system of economics (see also Hensel 1996).

This nuanced yet profound shift in access and attribution had implications for the balance of Yup'ik economic and social interactions and contributed to fluid and historically contingent power relationships between women and men over time (see Fiske 1991; Gonzalez 1981). For instance this oscillation of gendered opportunity or disadvantage (Lepowsky 1993) continues even today since many women believe that "men have it harder" given their decreased status due to the steady diminishment of the value of hunting (see also Hensel 1996). Several Yup'ik women have also commented to me that they no longer control food as their mothers once did. These comments support the suggestion by Nassaney and Volmar (2003, p. 79) that gender sets can "lose ground."

Women's autonomy and authority was not built solely on the shoulders of making ceramic cook vessels and cooking but rather centered on their overall productive output and opportunities for social mobility based on a range of expert skill sets. Nevertheless, control of the production of ceramics was one of a series of technologies and productive contributions that were relatively detached and/or replaced from women's direct control during the colonial historic period (Frink 2005, 2006, 2007).

A redirection of access and authority may also have reframed women's relationships (and especially the hold of older women on younger women) and as such had implications for identity collective cohesion and action. The metal pot may have triggered an emergent independence of young women from older women since they could have gotten a metal pot through different channels. Household networks would have shifted or been splintered given the alternative routes for attainment of metal pots versus the women's networks of sharing ceramic cook pots. For instance, even though they may have attained pots from men, women may have had an exchange system for the pots among themselves. Also, the metal from pots could have been recycled into a variety of tools and implements such as women's semi-lunar knives (see for instance Redding-Gubitosa 1992).

Moreover, the addition of firearms emancipated some Native women to use them since they would not have had to learn the complexities of how to wield traditional hunting technologies. For instance there is a story of an eighteenth-century entrepreneur on Nunivak Island named Arnaracungar. Though it is unclear whether she used a firearm, Arnaracungar was a noted fur hunter and secured imports before other people on the island (U.S. BIA 1995, vol. 2, 80). There is also the example of Native women who became sisters for the Jesuit church in the coastal village of Hooper Bay in the 1930s. On their weekly day off they would collect firewood and take their guns and hunt—and some could “hunt as well as any Eskimo in the village” (Frink *in press*).

However the new social and economic relations played out, elder women's influence based on their mastery of not only ceramic production but attendant techniques of cooking in a ceramic vessel would have been disengaged or reinterpreted in village “gastropolitics” (Crown 2000, p. 266). Given these historical shifts in access, use, and meaning, elder women's ceramic manufacture, at one time a pertinent intellectual set with significant social, economic, and political clout, has been redefined as an obsolete technology today of heritage interest—no longer of everyday practiced significance but a distant and somewhat extraneous memory.

The importation of colonial technology and relocation or dislocation of the control of production and social valuation of expertise has weighty implications for understanding status and social group relations and transitions in descendent subsistence-based communities. And the multiple dimensions of this process are complex and in many ways beyond the scope of this article. But, depicting the historical processes and lasting repercussions of the effects of technology and transformed gendered and aged roles, security, and authority is an imperative and fruitful path for archaeologists to model and test the social role of technology in cultural change.

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