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Producing Goods, Shaping People: The Materiality of Crafting

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Keywords
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This chapter incorporates materiality into a discussion of craft production and everyday life, asking what new insights result from considering the processes involved in producing needed or desired things from this perspective. I argue that discussing craft production from the perspective of materiality requires a focus on the materials and technologies involved. Differences in the materials themselves, in the techniques developed to work with and take advantage of their properties, and in the training system used to pass on knowledge and inculcate skill in novices inevitably affect the relationships that people develop with these materials and with the craft that these people practice. These differences also contribute to the development of an embodied sense of self. To bring materiality into a discussion of craft production, I consider research on craft production and ancient technology. These two areas of investigation have existed in something

of a state of parallel play, with less cross-fertilization than is desirable. I incorporate relevant research from both areas to discuss how crafting relates to identity, personhood, and daily life, based on two case studies from pre-Columbian Latin America: weaving in Mesoamerica and especially by the Maya, and metal-working in the Andes, with a particular focus on the Moche of the coast of Peru.

Maya Fiber Arts

Spinning and weaving were central to all Mesoamerican cultures for both practical and symbolic reasons (Figure 1). Relatively few textiles or other items made of fibers survive from the pre-Columbian era, but visual imagery, textual references, and some of the tools used, especially when combined with information from the Colonial period up through the present day, attest to the importance of cloth to the Aztecs of central Mexico, the Maya of Mexico and Central America, and other Mesoamerican societies (see Anawalt 2001; Hendon 2006; Mahler 1965; O'Neale 1945; Schevill 1993). [Place Figure 1 here] These sources also underscore the strongly gendered nature of these activities. Spinning and weaving are presented as crafts carried out by girls and women of higher and lower social status (see Hendon 1999b, 2006; Hicks 1994). The cotton and maguey plants were the principal sources of fiber. Feathers and rabbit fur (and perhaps fur from other animals) were also used, but on a smaller scale and often as decoration. Based on those textiles that have been found at Maya sites and on depictions of fabric on stone monuments, pottery, murals, or other images, it seems clear that Maya weavers in the past, like their descendants, created textiles with many different patterns (García Lascuráin V. 1989; Mahler 1965). Norbert Sperlich and Elizabeth Sperlich (1980:45) note that the backstrap looms

used in Precolumbian times and by contemporary Maya women are well suited to weaving plain weave or related weave structures. Plain weave is not plain as in unadorned, but rather creates a textile in which the same number of weft threads pass over the same number of warp threads (e.g., over one, under one). Because we have so few examples of ancient textiles, it would be foolish to declare that Maya weavers always did things in a particular way, but Joy Mahler's discussion of fragments from the Cenote of Sacrifice at Chichén Itzá and Mayapán mentions twill weaves and double weave even while noting that plain weaves are most common (Mahler 1965). Even working with small, burned bits of cloth, Mahler was able to distinguish a wide range of weave structures or embellishments. Among the techniques available to weavers to change the appearance of the finished product, brocading was a way to insert new threads to the weft at specific places in the weaving. These supplementary wefts may be inserted with a needle or a brocade pick at any point in the weaving, making possible complex designs and many color changes (Asturias de Barrios 1997).

The tools associated with the use of the loom are the more usual signal of spinning or weaving activity in archaeological contexts (see Beaudry-Corbett and McCafferty 2002; Coggins 1984; Hendon 1999b; Inomata 2001; Moholy-Nagy 2003). Although the most frequent signs of textile production, such tools are not usually found in large quantities. They are rare in Maya burials, which Hatulla Moholy-Nagy (2003:83) suggests can be explained by their being passed on from one generation of weavers to the next. Several wooden tools from the Cenote of Sacrifice have been tentatively identified as battens (used to pull or beat the warp thread down after it has been inserted in an open shed) and shuttles (used to carry the thread) (Coggins 1984:144-145). The most common artifacts in archaeological contexts are the spindle whorls or weights attached to the shaft of the spindle when spinning (Figure 2).

[Place Figure 2 here]

The Copan Valley

Considered the southeastern-most major Maya polity, the ancient city of Copán was built in the Copán Valley in western Honduras (Figure 3). The river of the same name that formed the valley eventually drains into the Motagua River in Guatemala. The center of the city, called the Main Group by archaeologists, is made up of massive religious, administrative, and domestic buildings plus a wealth of elaborate free-standing and architectural sculpture. Prehistoric settlement radiates out from the Main Group to cover most of the fertile valley floor and enclosing foothills. Larger and more elaborate residences tend to be concentrated immediately around the Main Group, although there are some sizable residential compounds among the smaller settlements further away. These smaller settlements are also mostly residential and were home to non-elite members of society, most of whom were farmers and craft producers for their own use or for exchange. Archaeological investigations carried out since the late 19th-century up to the present-day have established the broad function and chronology of these sites, as well as shed much light on activities of daily life, political organization, social relations, and other aspects of the society and how it developed over time. The beginnings of occupation in the valley have been traced back to at least 1400 B.C. The Maya kingdom that reached its peak in the Late Classic period broke down in the 9th century C.E., although some kind of occupation continued in the valley for some time afterwards (see Fash 2001; Gonlin 2012; Hendon 2010; Webster 1999 for more details).

[Place Figure 3 here]

The Sepulturas zone northeast of the Main Group is notable for its dense concentration of high status residences during the Late Classic and Terminal Classic periods, spanning the seventh to ninth centuries C.E. A raised walkway (*sacbeob*) runs through the settlement from the Main Group, ending in one of the most elaborate compounds that seems, based on our current knowledge derived from mapping and excavation, to mark the eastern edge of the Sepulturas zone (Hendon 2012). The people living in this zone built compounds made up of houses raised on foundation platforms and arranged around an interior courtyard or patio. These courtyards were usually paved with cobbles that were covered with white limestone plaster. Many compounds also contain a temple or religious shrine, storage or cooking structures, and work areas.

Houses vary in size and building material. Some are quite large and built out of carefully shaped blocks of stone, often covered with plaster and sometimes painted. A few of these large houses have been decorated with stone sculpture attached to the exterior walls. Other houses are smaller and used a combination of river cobbles and perishable materials, such as wood and clay (wattle and daub) for their walls. Despite these differences, the area as a whole was occupied by families of high status within Copan society, some with ties to the royal family, as shown by the overall quality of building construction and the presence of locally made and imported objects and resources, such as decorated pottery serving and eating vessels, marine shell and jade jewelry, and other markers of social importance and wealth commonly found in Mesoamerican societies of this time period. Daily life in the Sepulturas zone included crafting, as well as carrying out rituals and hosting feasts, some connected to the individual and group life-cycle and some connected to the ballgame (Hendon 2010). Figure 4 shows the distribution of weaving tools in one of the largest of the residential compounds, labeled Group 9N-8.

[Place Figure 4 here]

Spindle whorls made of clay and flat pottery disks with a central perforation have been found in residential areas near the Main Group, including the Sepulturas zone, and further away, in the more rural part of the settlement (Gonlin 2012; Hendon 1997, 1999b). They are more prevalent in the Sepulturas excavated compounds than in those studied by Nancy Gonlin although, as she notes, perishable materials might have been used as well. Based on a study of the ones from Sepulturas, I found that most spindle whorls were round, elliptical, or hemispherical, with a truncated cone shape also found. The rounder ones have a diameter that ranges from 2.8 cm to 3.7 cm. The half-circles are similar, with diameters from 2.5 cm to 3.8 cm. Thickness is also comparable: 1.0 to 2.0 cm for the round ones and 0.9 to 2.0 cm for the hemispheres. The one example of a truncated cone-shaped whorl was a bit larger, with a diameter of 2.2 cm (Hendon 1987:table 5.25). Many of the whorls were decorated on one side with curved lines, crosses, triangles, circles, pentagons, and birds incised in the clay (Hendon 1999b, 2006gig. 1).

A second type of weight for the spindle was created from the walls of pottery vessels, no doubt after the vessel had broken. Flat to slightly concave disks with a central hole, they were larger and thinner than the spindle whorls just described. Their diameters ranged from 1.8 cm to 6.0 cm and their thickness from 0.1 cm to 0.9 cm (Hendon 1987:table 5.26, 1999b). Based on the work of Mary Parsons (1972) that showed that differences in the size and weight of spindle weights can reflect differences in the type of material being spun and the fineness of the thread one wants to produce, I have argued that the spindle whorls were used to spin cotton, but that the pottery disks may have been used for spinning other materials such as maguey fibers (Hendon 1999b).

Bone tools that were part of the weaver's toolkit have been found in domestic refuse associated with Sepulturas residences, but not in the rural ones (Gonlin 2012:90; Hendon 1999b). These tools include needles and pins, the latter identical to the needles but lacking an eye through which the thread would pass. Needle lengths, based on a small sample of complete ones, varied from 4.8 cm to 10.8 cm, suggesting that they were used in different ways. While sewing is the obvious inference from needles, contemporary Maya weavers also use needles to insert supplementary warps into their weaving. Pins have many uses, including as a way to attach the woven cloth to the tenter sticks of the backstrap loom (O'Neale 1945:32; Sperlich and Sperlich 1980:33). A second kind of bone tool serves as another indicator that the high status weavers in the Sepulturas area elaborated their textiles with brocading. This tool, often made from deer bone, is twice as long as it is wide. Most taper to quite a sharp point, while the rest have a rounded tip. While this shape is often classified as an awl, or a tool to pierce tough material such as leather, it can also serve as a warp lifter when inserting supplementary warps, as well as for basketry (Hendon 1987:363; O'Neale 1945:34, fig. 75h).

The distribution of tools related to spinning and weaving in the Sepulturas zone indicates that these activities took place more frequently in the largest residential compound that I studied (Group 9N-8) than in the smaller ones. The spatial patterning thus suggests that some of the highest-ranking women in this elite residential area incorporated textile production, with special emphasis on brocade work, into their daily lives. The contextual associations do not support the existence of separate workshops for textile production or even that women were somehow segregated from others when engaged in these activities. Finds of raw materials and tools for the working of shell into ornaments and bone or obsidian into tools attest to the occurrence of other kinds of craft production in these same locations, as well as food preparation and the celebration

of rituals (Hendon 1997, 2010). Thus, crafting was intimately connected to the experience of daily life in these compounds.

Moche Metal-Working

Just as elaborate textiles were one important marker of status for the Classic period Maya, objects made of copper alloyed with gold or silver were important elements of the dress, body adornment, and burial furniture of the Moche, especially the elite. The increase in long-term, in-depth archaeological research at Moche sites has given new life to the study of Moche era metal-working by providing information on spatial and social contexts that complements approaches based on materials science techniques or art historical analysis, which focus on properties of the objects themselves (Lechtman 1979; Lechtman and Steinberg 1979; Schorsch 1998). The ever increasing number of royal or elite tombs richly furnished with grave goods that have been excavated in recent years has given scholars impressive examples of Moche crafting that are more securely dated and have excellent archaeological context (Chapdelaine 2011). Recent excavations at Moche settlements have further added to the understanding of craft production in Moche society through research on workshops in and around people's houses.

Huacas de Moche

Located in the Moche Valley, the Huacas de Moche site is the largest in the valley and in fact was "the largest site of its time" (Chapdelaine 2011:206) during the Moche Phase IV, ca. C.E. 450–600/700 (Figure 5). It experienced a slow decline after C.E. 700 and was abandoned sometime in the 9th century. The ancient city is delimited by two massive buildings: the Huaca

del Sol to the west, paralleling the course of the Moche River, and the Huaca de la Luna to the east, on the slopes of a large hill called Cerro Blanco. A smaller hill defines the northern limit of the settlement. Much of the Huaca del Sol has been destroyed by looting and erosion (Shimada 1994:3). Better preserved, the Huaca de la Luna has revealed a great deal about the ruling elite and their religious and political roles. Most of the city's residents lived in the area between the two monumental structures (Chapdelaine 2009). Large, multi-roomed compounds facing onto streets have been excavated here. The streets appear to have served to separate the living areas of different social classes, as well as providing a way to move around the city. Some of the compounds contain patios, unroofed areas enclosed by the walls of the compound. They vary greatly in terms of size, number of rooms, and layout. People lived in many of these compounds, carrying out various tasks of daily life such as cooking and burying their dead at home. They also used the compounds as a place to craft a range of things and for storage. Some compounds seem to have been used as production areas without anyone living there (Figure 6).

[Place Figure 5 here]

[Place Figure 6 here]

Craft production activities identified so far include making objects out of metal, stone (such as beads), and clay (such as pottery vessels, figurines, and adobe bricks). In addition, areas devoted to brewing *chicha* (corn beer) and herding llamas have been found. Evidence of spinning and weaving or sewing has turned up in several compounds. Multiple ceramic workshops existed and several for metal working (Compounds 7, 27, and possibly 35) (Bernier 2008; Chapdelaine 1998, 2008, 2009; Chapdelaine et al. 2004; Rengifo Chunga and Rojas Vega 2008; Tello et al. 2008; Uceda 2010; Uceda Castillo and Rengifo Chunga 2006). Overall, the impression one gets is that more than one craft was often practiced in the same compound,

although probably not by the same people. In addition to evidence of craft production, the excavated materials from many compounds also demonstrate the importance of the items produced to the residents of the city. Decorative and useful items made of copper or copper alloys, such as beads, masks, fish hooks, decorative plates, nose pendants, and others, were found not only in tombs in the urban residential area, but also in the living areas or associated trash deposits (Chapdelaine et al. 2001:tables 1 and 2). Clay nozzles (*tuyères*) that would have been attached to the blowpipes used to send air into the small smelting crucibles are reported as well and suggest that other workshops for metal crafting existed (Chapdelaine 2008).

Compound 7, located on the eastern side of the urban area, near the Huaca de la Luna, is a multi-room compound that revealed evidence for domestic activities, including a kitchen, storage areas, and some areas that are more private than others. Several burials were found as well. Production related activities include metal working and brewing, and possibly potting (Chapdelaine 2008, 2009; Chapdelaine et al. 1997). The evidence for crafting metals includes an adobe chimney and associated kiln/furnace. Although its cylindrical shape differs from that of the small furnaces known from other sites and illustrated on pottery, Chapdelaine (1998, 2008) indicates that it was used for smelting based on several pieces of evidence. Slag and charcoal, as well as the discoloration of the clay walls of the chimney, argue for the heating of metal ores. A crucible made of clay contained copper oxide. Copper objects were abundant as well. The heat-reddened clay coating of the adobe chimney was found to contain much more gold than is usual for clays, leading Chapdelaine (2009) to suggest that the Moche were smelting gold. Analysis of copper objects from tombs and compounds revealed the presence of gold and silver in varying amounts, demonstrating that gold would have been added to the copper (the silver may be naturally occurring or added) (Chapdelaine et al. 2001).

Compound 27 is part of a large complex of adjoining rooms (Rengifo Chunga and Rojas Vega 2008; Uceda Castillo and Rengifo Chunga 2006). Despite sharing many walls, not all the rooms connect to one another, and a short alley separates some of the rooms. The complex contained living quarters, an area for brewing chicha, and craft production workshops. The metalsmiths' workshop is located in the southwestern part of Compound 27. A second, later, workshop was also found, indicating that crafting metal objects had a history in this particular residential complex. The evidence for this kind of craft production includes slag; prills (small drops of copper ore extracted from the slag by reheating it); pieces of pottery vessels with copper stuck to the surface which may have been the crucibles in which the metal was heated or reheated; tuyères; and an object identified as an anvil (*yunque*). Hammers of varying sizes and shapes, some suitable for repoussé work, as well as polishers made of stone, turned up in the fill excavated from this area. Also found were small sheets of metal as well as wire and needles, either in the process of manufacture or displaying some kind of production problem or defect. Other objects found there (some finished and some not) included darts, hooks, knives, clubs or batons, beads, and zoomorphic objects. Small adjoining or nearby rooms may have been used for storing the finished products. Unfortunately, the chemical analyses reported in Chapdelaine et al. (2001) do not include any from the workshops in Compound 27, so the composition of the metal objects and waste found here remain undetermined beyond the identification of copper as their main material based on visual assessment.

Pampa Grande

Pampa Grande was a Late Moche city, important during the seventh and eighth centuries and located in the Lambayeque Valley in the far north of the Moche region (Shimada 2005:178) (see

Figure 5). Pampa Grande contains a mix of large monumental structures with many residential compounds. The city sits on a flat area at the base of a steep hill. The massive platform mound, Huaca Fortaleza, enclosed in turn by a wall, serves as the heart of the city spatially and socio-politically (Shimada 1994:147). People of higher social status lived closer to this central area in compounds with their own impressive, but smaller, monumental structures. The positioning of Huaca Fortaleza and those other monumental structures closest to it creates an axis that separates the city into a northern and southern areas (Shimada 2005:181). The southern area was more densely populated with people living in smaller houses closely packed together. Based on the architectural differences between the two areas, as well as in the style and function of ceramics and in the distribution of other artifacts, Shimada (2005:183) argues that Pampa Grande's residents belonged to different ethnic groups as well as social classes.

The craft workshops identified by Shimada (1994:191–206, 2005) are concentrated in the part of the northern area closest to Huaca Fortaleza's compound. As with Huacas de Moche, Pampa Grande's workshops include a variety of crafts and materials: turning *Spondylus* (spiny oyster) shells into ornaments; preparing, spinning, and weaving cotton; making pottery; and working metal. In most cases, the workshops were found in or near platform mounds in large compounds, near to but not part of places where people lived, although food and drink were provided to the workers in some workshops.

Although no evidence of smelting of copper ore was found, evidence for copper or copper alloy working was abundant in the areas known as Sectors H and D, located on either side of the Huaca Fortaleza compound. The presence of stone tools for working metal and many small copper tools suggests metalworking in more than one location. The one workshop excavated at the site, Structure 52 in Sector H, had four separate spaces that were dedicated to

distinct aspects of the crafting process (Figure 7). In one area, ingots or prills of copper were melted over large braziers lined with clay and stone. Blowtubes tipped with clay nozzles (*tuyères*) raised the heat inside the braziers. The molten metal was poured into molds to make blanks. A mold found in association with the braziers was small and rectangular.

[Place Figure 7 here]

The blanks were in turn made into sheets through annealing and hammering. The same braziers as provided heat for the initial melting of ingots or prills would have been used to anneal the objects. The hammering and subsequent shaping of the sheets took place in separate rooms next to the heating area. Excavators found a large anvil and hammerstones with differently shaped working faces that would have been used to flatten, bend, cut, and shape the sheets of metal (Figure 8). The metalworkers would have had to move between these two spaces while working the sheet copper or copper alloys, since one can only hammer or shape for so long before it becomes necessary to apply heat again. Shimada (2005:188) notes that this arrangement may seem inefficient but he attributes it to the need to keep the room where sheets were hammered and shaped free of grit, ash, and other detritus that would have marred the surface of the sheet metal. The Structure 52 workshop is a space dedicated to crafting metal objects at least partway through the production process. These stages seem to fall into the middle part of the process. There is no evidence of smelting, which begins the process, and not much evidence of final assembly and finishing of finer objects, although the workers could have been completing useful objects, such as tools (Shimada 1994:204–206). The crafters did not live in Structure 52, but they did have food provided. Excavations found some evidence of food preparation as well as storage vessels and serving dishes nearby, including vessels favored by those of high status.

[Place Figure 8 here]

Crafting with Fibers and Metals

Studies of craft production often focus on issues of organization and the relations between producers and the receivers of the finished products. Shimada (1994, 2005), Chapdelaine (2009), Bernier (2008), Rengifo Chunga and Rojas Vega (2008), and Uceda Castillo and Rengifo Chunga (2006) see the metalworkers at Huacas del Moche and Pampa Grande as attached or affiliated crafters, intimately connected through economic and social ties to the elite who consumed most or all of the fancy metalwork, such as costume elements and body ornaments. Since coppersmiths also produced objects with a more practical or useful purpose, such as fishhooks, they probably also interacted with less exalted residents of the city in which they lived or with residents of the smaller settlements in the valley. I have argued that the craftspersons at Copán and other Maya sites were drawn from the ranks of women of differing social status who worked within a social framework that made weaving and spinning part of daily life, but which also served as a source of prestige and economic gain. Elite Copán women devoted time to brocade work to produce textiles of the sort most desired by their elite relations and political allies (Hendon 1999a, 2006, 2010). The spatial context of Moche production differs in that the metal-workers (and other craft specialists) worked in designated workshops. For these artisans, the workshop became one focus of everyday life as they engaged with the materials of their craft, their fellow workers, and their clients. Given that the Huacas de Moche and Pampa Grande workshops were located close to living quarters and spaces where other activities took place, everyday life in these cities for all residents would have included an awareness of crafting.

In order to think more about the materiality of crafting, however, we need to shift focus to the crafters themselves and the processes through which they create their crafts. Charles Keller (2001) notes that crafting requires both a plan and the ability to adjust as the process plays out. Thus, successful crafting is not only dependent on planning and designing before the work begins. Nor is it an accurate description of the crafting process to view designing as separate from and antecedent to production. Artisans certainly decide ahead of time what they want to make, but there are also a series of decisions and adjustments that have to be made as part of the execution of the piece. These changes are not always consciously taken, since much of the crafter's skill and knowledge is tacit, embodied in the interaction between material, tools, and the person. This process reflects the fact that conditions are never stable, nor easily reproduced.

A second lens through which we can view crafters such as Maya weavers or Moche metalsmiths is that of communities of practice (Lave and Wenger 1991). Craft specialization lends itself well to this framework (see Hendon 2010; Hendon et al. 2014; Joyce et al. 2014). While the practitioner's perspective provides a way to consider the interaction between individual crafter and what is being crafted, a community of practice perspective reminds us that crafters were not working in isolation either from one another or from people who did not engage in the particular craft. Communities of practice are made up of people who, drawn together through their involvement in a shared purpose or task, share a sense of identity. This identity stems from the task itself, the ways that the task is accomplished, and the relationships and attitudes that develop as part of the process. Keller's practitioner's perspective, in fact, can be seen as developing in part because the crafter is part of a community of practice. Membership in a community of practice is not necessarily voluntary or egalitarian. The weavers and metalsmiths discussed here began their learning process as children based on decisions made by the adults in

their lives. The engagement with a particular set of embodied practices, whether those required to spin and weave or to smelt and anneal, requires intensive, on-going interaction between novices, experts, and those in between these two positions on the continuum of being knowledgeable about a particular craft.

Moche Metalworkers' Technological Style

In the case of Andean metallurgy, technical analyses of the objects themselves have shed light on the kinds of metals and other materials used, as well as the techniques employed and the ways that the materials were treated to produce the desired result (Lechtman 1979, 1984, 1993). These technical analyses, according to Heather Lechtman (1979, 1984; Lechtman and Steinberg 1979), provide one way to get at the kinds of choices that Keller writes about. Keller calls this kind of insight the practitioner's perspective. There are at least three things at work in this decision making process: the physical properties of the materials used; the techniques and knowledge available to the crafters; and the cultural values that make certain choices more desirable and meaningful. For metal-workers, the mix of materials in the ore may vary. The amount of heat generated in the furnace may fluctuate depending on fuel, weather conditions, or how much air is introduced by the assistants. The precision of working the metal may be affected by many factors, as well (see Shimada and Griffin 1994). Lechtman and Steinberg (1979) call these decisions and outcomes, the preferences they reflect, and the means employed to achieve them the technological style.

Moche metal-workers demonstrated remarkable control over the properties of their materials and used a variety of techniques (Figure 9). One of the most salient aspects of Moche technological style is their preference for working with strikingly thin sheets of metal made from

ingots through hammering and annealing. In a study of seven jaguars made of gold alloyed with copper and silver from the Lambayeque Valley, Lechtman notes that even three-dimensional figures like these were made from separate pieces of sheet metal shaped into the desired form before being joined together to make the finished object (Lechtman et al. 1975). Shimada (1994:200) has revised the original dating of the jaguars to the Moche V period and believes that they were looted from the Huaca Fortaleza area of Pampa Grande.

[Place Figure 9 here]

Lechtman (1979) has argued that Andean smiths worked with alloys of copper with gold or silver (*tumbaga*) because they and their patrons or clients valued the combination of these different ores and the surface colors that could be produced. She suggests that the emphasis on alloys may have started from the fact that most copper ores in the Andean region are rich in silver. Sheets of argentiferous copper, when exposed to force (hammering) and heating and cooling (annealing), would have lost copper at the surface through oxidation. The resulting enrichment of silver would change the color and appearance of the metal. Since gold is not found naturally mixed with copper, those alloys that include gold reflect a desire to produce "gold surfaces on hammered objects" in the same way as silver surfaces were created (Lechtman 1979:30). She concludes that the inclusion of copper in such alloys or of silver or gold does not reflect an effort to adulterate the finished product or make the gold "go farther," but rather reflects the cultural value placed on the mixes themselves and the colors produced. In fact, as she notes, "in alloys of tumbaga all the gold inside the alloy is 'wasted'" (Lechtman 1979:31). To conserve gold, she suggests, one could apply gold leaf or use an external plating technique.

Additional aspects of the Moche technological style emerge from Schorsch's study of artifacts in the Metropolitan Museum of Art that came from the site of Loma Negra in the Piura

Valley, part of the Vicús culture (Schorsch 1998; see also Shimada 1994:75–77). Many of the metal objects recovered from tombs there are considered to be Moche in style and manufacture, although the Vicús culture's relationship to the Moche remains uncertain (Chapdelaine 2011). Schorsch's analysis supports Lechtman's observations about the values associated with alloying and surface color. In addition, Schorsch found that when Moche metal-workers often made composite objects, they combined pieces of more silvery appearance with those with a more golden color. Mechanical joins were the preferred technique for joining different pieces together (see also Fraresso 2008; Lechtman et al. 1975; Shimada and Griffin 1994). Tabs and slots, or wire inserted into holes, allowed one piece to be fastened to another. Sometimes they added inlays of stone or shell. Many pieces were designed to move or were removable. "In general movement—be it tongues dangling from the jaws of foxes or the rotating owl head and flapping wings..., combined with the liberal use of dangles of every description—played an integral role in Moche metalwork" (Schorsch 1998:117). Several different techniques were used to produce the same visual effect. She identified three different ways of mechanically joining pieces together from Loma Negra. This variation may represent a metal-smith's virtuosity or different technological styles preferred by different artisans.

Maya Weavers' Expert Practice

The relative lack of Prehispanic textiles from Mesoamerica has hampered the application of a similar kind of analysis to the fiber arts. Considering how contemporary weavers work with some of the same materials and equipment provides an alternative source of information. This approach works not because of any claim that present-day weavers are "just like" their many times grandmothers, but rather because these contemporary weavers are part of a tradition of

expert practice (Jones and Yarrow 2013). Expert practice develops from the intersection of the materiality of what one works with, the techniques used, the methods of instruction, and a commitment to a tradition of the craft itself. For the masons restoring Glasgow Cathedral studied by Siân Jones and Thomas Yarrow, expert practice is embodied in an adherence to the enduring principles of stonemasonry and the skill they have developed over time through practice. A similar sense of expertise can be discerned in Maya weavers who engage in a long-term process of learning beginning in childhood that allows them to feel that they are maintaining a tradition through continuity of practices, even if some of the materials or designs have changed (Asturias de Barrios 1997; Greenfield 2004; Komes Peres et al. 1990).

For people working with fibers, the raw material (in this case cotton or maguey) varies in terms of color and quality depending on the conditions under which it is grown, the way it is harvested, and how well it has been cleaned and processed. Since color was an important part of Mesoamerican textile arts, dyeing the spun fiber was also an important step about which we know much too little (but see Roquero 1999; Turok 1996). Spinning produces thread of various weights and plies, suitable for a range of finished products. Mahler (1965:592) notes “a great variety in the quality of spinning” of the thread used in the Cenote textiles. Weaving requires an understanding of multiple techniques, color, and the ability to invent or follow patterns.

The backstrap loom is often celebrated for its portability and lack of fixity. Yet, setup and dismantling the loom takes time, and the more intermittent one’s weaving, the longer it takes to get started again. The loom has been described as simple or “primitive,” yet anyone who has tried to use one will find that it is neither intuitive nor easily managed. Like any loom, it imposes certain conditions on the weaver, such as the length and width of the finished cloth. Such a limitation, if it is such, is balanced by other features of the loom. Backstrap looms lend

themselves more easily to improvisation and are well suited to brocading (inserting supplemental warps). Schevill (1993:55) describes the backstrap loom as "a complex device, more responsive to the weaver's creative impulses than the modern treadle loom." Learning to weave on such a loom starts early for Maya girls and it takes much practice to become a good weaver (Greenfield 2004). Contemporary and ethnohistoric information indicates that girls begin learning to weave at a young age, often around ages seven to nine (Greenfield 2004:58; Hendon 2006; Sperlich and Sperlich 1980:xvi). Even younger Maya play on smaller looms created by them for their older sisters (Greenfield 2004; Sperlich and Sperlich 1980), a style of learning that children in other cultures also find appealing (Church 2012).

Skilled Crafting

Skilled crafting is thus a combination of training, one's abilities, and one's ability to adjust as needed. As practices embedded in the context of everyday life, weaving and metalsmithing contributed to the ongoing and recursive actions and relations that comprise the everyday. Archaeological discussions of craft production do not always take into account how the kinds of materials and techniques that crafters work with affects their experiences and sense of self. The process of become part of a tradition of expert practice and absorbing a technological style to the degree that any individual crafter is capable of also must be taken into account for a full understanding of craft production. Materiality provides a useful way of thinking about these issues, especially when combined with information on the social and spatial contexts in which training and work takes place.

Maya weavers, mostly or entirely women based on the sources available to us, worked at home. They were not concentrated in workshops or separated from the rest of their household. Many other activities of daily life took place in these same places, activities that involved these women on a daily or periodic basis. The Sepulturas evidence indicates that both spinning and weaving took place there. It is possible that weavers also spun, although it is also likely that spinning involved more people, perhaps girls, not yet proficient weavers, and older women who were less able to continue weaving (Asturias de Barrios 1997; Stephen 1993). Still undetermined is who processed the raw fibers and dyed the thread, both time consuming and important sets of tasks. Weavers had the responsibility of training new weavers, many of whom would have been their relatives. The women weaving in the Sepulturas zone at Copán were also producing some of the most valued kinds of textiles. The receivers of these goods would have been for the most part people with whom the weavers had a close connection and to whom they were tied by social relations.

Moche metal-smiths may have been men—there is Moche pottery vessel in the collection of the Museo Nacional de Arqueología, Antropología e Historia del Perú showing four men seated around a dome-shaped furnace (Figure 10). Three of them are blowing through blowpipes; the fourth may be annealing a metal sheet (Donnan 1973). Based on the research at Huacas de Moche and Pampa Grande, metalworkers carried out their craft in specially defined places. Shimada (1994:204–206) argues that the Pampa Grande workshop Structure 52 was under the supervision or the control of someone, perhaps the head craftsman or administrative elites. He believes that it was manned by “a few skilled specialists and a handful of assistants or apprentices” (Shimada 2005:189) who attended to the braziers and moved the metal being worked between the heating area and the working area. These workshops were near to and

sometimes in the same large architectural complex as residences, but the metalworkers do not seem to have lived where they worked, although they were supplied with food and drink. A range of tasks related to smithing occurred in the Pampa Grande and Huacas de Moche workshops, but not all steps of the production process are represented in any of them. Like the Maya weavers of Copán, the Moche metalsmiths had to train the next generation but they did so in a different setting and while being supervised themselves. The metalsmiths may also have had contact with the receivers of the finished products at least in some cases, but that contact may have been more structured by the administrative system in place in both Moche cities.

[Place Figure 10 here]

Both examples present crafts that are, based on available evidence, concentrated in the hands of a particular gender: women in the case of Mesoamerican fiber arts and men in the case of Moche metalworking. There is also good reason to infer that the long training of new members of the craft was organized through existing social structures such as families, social houses, and possibly rank or ethnicity. The Colonial period documents from Mexico, such as the *Codex Mendoza*, present a home-based method of instruction that parallels what we know of Maya practices. While the argument of the Moche is based more on analogy, the household based location of most craft activity from Huacas de Moche provides support as well. Rather than assume some kind of essential or natural association between craft and gender, these cases suggest how the education and training of novice crafters effectively makes use of existing relationships and lines of authority. At the same time, I would emphasize that it is almost inevitable that crafting in these kinds of social and spatial settings would lead to the involvement of a broader range of people, including those not considered to be the crafters and individuals of different genders and ages.

Such a long term apprenticeship process indicates an equally long term engagement with the material properties of raw materials, tools, and associated resources. People became enmeshed in a web of relations that connected them to the materials themselves, the things produced, their fellow crafters, and those who acquired the finished products. It is this relational engagement that shapes their practitioner's perspective and, more deeply, their sense of personhood (Hendon 2006; Ingold 2000; Keller 2001). While archaeologists have thought much about the significance of these objects to this last set of people, commenting on the ways that finely crafted objects made from cloth, metal, or other materials serve as material markers of status or identity, researchers have devoted less time to the corresponding set of significances for the crafters. As Tim Ingold (2001) has noted, the Western intellectual dichotomy between art and craft inhibits our ability to understand the intersection of modes of learning, materials used, and personhood for those involved in those arts (or crafts).

Craft production is a social process that results in the creation of needed or desired things, while also shaping people through their engagement with the material properties of what they make, with the technologies employed in the production process, and with the people with whom they interact, whether as teachers, apprentices, patrons, or family members. Crafting things is necessarily a part of daily life, regardless of whether it is done intermittently or on a regular basis, at home or in a workshop, with more or less supervision. The materiality of metal and fiber, the cultural values with which these materials are saturated, and the relationships that make crafting possible are integral to the ways that Maya weavers and Moche metalsmiths experienced their world and defined their personhood.

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Figures Captions

Figure 1. Both the royal man and woman on Yaxchilan Lintel 24 wear elaborately decorated clothing suggesting the skill of ancient Maya weavers.Drawing by John Montgomery, © Foundation for the Advancement of Mesoamerican Studies, Inc., www.famsi.org.

Figure 2. Clay spindle whorls from the Sepulturas zone of Copán. (Scale in centimeters, 1 square = 1 cm). Photo by Julia A. Hendon.

Figure 3. The Maya Lowlands showing the location of Copán. Map by Julia A. Hendon.

Figure 4. Distribution of spinning and weaving tools in Group 9N-8 in the Sepulturas zone of Copán. Credit: Map by Julia A. Hendon.

Figure 5. Map of the Moche region showing the location of Huacas de Moche, Pampa Grande, and Loma Negra (Chapdelaine 2009:182, fig. 9.1). © 2009 Regents of the University of Michigan.

Figure 6. Huacas de Moche urban area showing the location of Compounds 7 and 27 where metal-working workshops were located (Chapdelaine 2009:186, fig. 9.4). © 2009 Regents of the University of Michigan.

Figure 7. Structure 52, the metal-working workshop, in Sector H at Pampa Grande (Shimada 1994:204, fig. 8.20). © 1994 University of Texas Press.

Figure 8. Hammerstones and other tools used to pound, shape, and cut metal sheets in the Structure 52 workshop at Pampa Grande (Shimada 1994:205, fig. 8.21). © 1994 University of Texas Press.

Figure 9. Pair of earflares with condors (Right: 1979.206.1245, front; Left: 1979.206.1246, 3/4 left.) from Loma Negra, Peru made from silver, gold, gilded copper, and shell. Credit: The Metropolitan Museum of Art, The Michael C. Rockefeller Memorial Collection, Bequest of Nelson A. Rockefeller, 1979 (1979.206.1245-.1246) (1979.209.1245, 1979.206.1246). © The Metropolitan Museum of Art.

Figure 10. Moche pot depicting men working at a furnace blowing air through tuyères. Photo by Nathan Benn/Alamy.