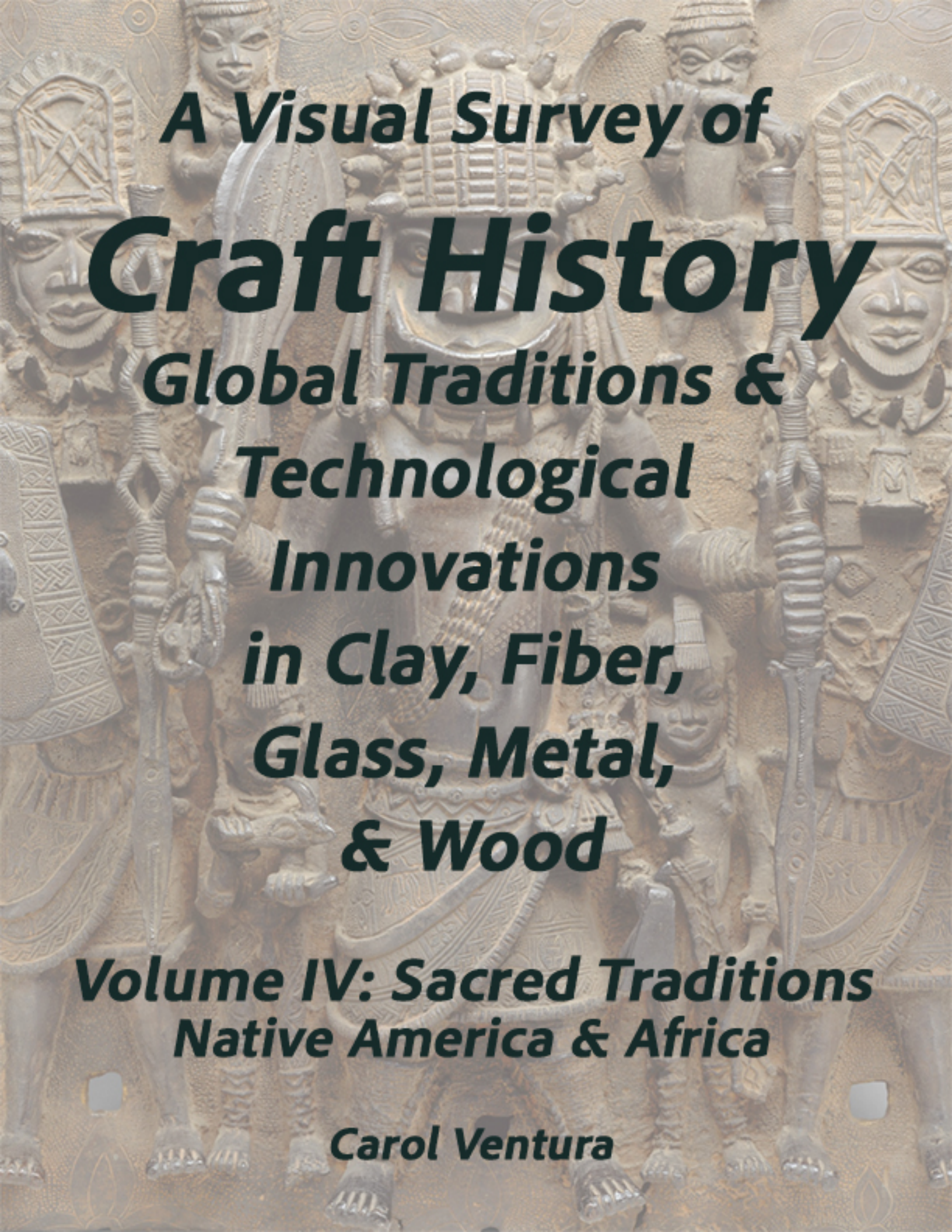

A Visual Survey of Craft History

Global Traditions & Technological Innovations in Clay, Fiber, Glass, Metal, & Wood

Volume IV: Sacred Traditions
Native America & Africa

Carol Ventura

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Preface

Crafts have played an important role in world history. Over millennia, the search for raw materials, merchandise, and markets has sparked military campaigns, alliances, conquests, and trade networks that built and destroyed empires. For example, the great expense of importing silk and porcelain from Asia enticed Europeans to find better trade routes, resulting in the "discovery" and colonization of the Americas and elsewhere.

We stand on the shoulders of the men and women who appropriated, adapted, and developed the products that changed lives and fortunes over the centuries. The Renaissance was financed in large part by the luxury fabrics woven in Florence. The Industrial Revolution had a tremendous impact on society since all furnishings, clothing, and accessories had been laboriously made by hand before mechanized production. Some types of manufacture are still time consuming and expensive, though, so sweatshops and child labor persist. Machines decreased hand labor, but thanks to increased factory production, many craftspeople may now choose to make utilitarian ware or one-of-a-kind non-functional pieces or both!

This visual overview will introduce and deepen your appreciation of clay, fiber, glass, metal, and wood crafts through time with a focus on who, what, where, when, and how. Hundreds of iconic and innovative examples from around the world demonstrate how craft media evolved in the Americas, Europe, Asia, Africa, and Oceania. References in the bibliography, museum websites, and other internet resources lead to more in-depth knowledge about the cultures and media presented.

The book was divided into volumes because the photographs made the digital files too large to convert into an eBook. As a survey, much was excluded, but great effort was made to present a variety of the most innovative and influential masterpieces from around the world. Numerous sidebars in each chapter focus on craft techniques associated with the examples. The words in the glossary are highlighted with bold text the first time they appear in each volume.

The five media are not represented in every chapter nor in consistent order, but the progression is logical because many styles build on tradition or are inspired by another medium or technical innovation. Several figures

represent more than one medium. For instance, ceramic figurines that depict clothed people illustrate both clothing and ceramics. Paintings and sculptures that depict clothing, jewelry, and/or furniture establish context and show examples when few survive.

How did I become interested in this topic? Along with her other talents, my mother sewed, knitted, crocheted, and made slip-cast pottery. In addition to his military career, my father tinkered with electronics, automobiles, plumbing, and carpentry. Between them, my parents could do just about anything. The Navy relocated our family every few years around the United States and Europe, and we traveled every summer to museums and factories to discover new things and see how they were made. My love of travel and manufacturing continues to this day. Most of the photographs in the sidebars were taken on my journeys to Africa, Europe, Asia, and the Americas. The best way to learn is to teach, but this project has taught me that to really understand relationships, influences, and the evolution of ideas, write a book!

I would like to acknowledge and thank Fulbright, Fulbright-Hays, the National Endowment for the Humanities, the Program for Cultural Cooperation between Spain's Ministry of Culture and United States Universities, Smithsonian National Museum of American Art, the US Department of State, and Tennessee Technological University for their support. I would especially like to thank the museums who shared their photographs, Linda Pastryk, and the many other friends and craftspeople who made this free eBook possible.

Chapter 7: Native America and Africa

Native America

Mesoamerica and South America



Pre-Hispanic Mesoamerica and South America

The largest societies in pre-Hispanic America were the Aztecs and Maya of **Mesoamerica** (area extending from the North Mexican deserts to Honduras and El Salvador in the south) and the Inka of South America, but there were hundreds of smaller ethnic groups, too.

These talented people utilized animal and plant **fibers**, metal, wood, and earthenware clay to craft exquisite clothing, jewelry, furniture, sculptures, and vessels. The first **ceramics** appear around 2000 BCE. Tombs of the elite often included finely crafted ceramic vessels, incense

burners, urns, bells, whistles, rattles, pipes, **spindle whorls**, jewelry, and figures depicting humans, birds, and animals.

Clay was **handbuilt**, **molded**, **coiled,** and **stamped**. The surface of leather hard clay (slightly damp) was incised, carved, and/or **burnished** and color was added before or after firing. Dry pieces were usually **fired** on the ground (Figure 1.3b) but some pre-Hispanic **potters** used **kilns** (Figure 7.1e). In the 16th century Spaniards introduced lead **glazes**, the kick-wheel, larger kilns, and new styles, but many native potters still use the pre-Hispanic techniques of their ancestors to produce contemporary ceramics.

Black pottery is made using many pre-Hispanic techniques in the Zapotec town of San Bartolo Coyotepec, Oaxaca, Mexico. To make a vessel, clay is **wedged**, then a hole is punched into the middle. The walls are thinned (Figure 7.1a), then the piece is placed on two convex ceramic disks with the curved faces touching (Figure 7.1b). The potter's hands revolve the piece as it is being shaped (Figure 7.1c).



Figure 7.1a Sofia Reyes (Zapotec, 1922-2016) a cylindrical shape is formed by hand in San Bartolo Coyotepec, Oaxaca, Mexico (photograph by Carol Ventura, 1972).



Figure 7.1b Sofia Reyes (Zapotec, 1922-2016) The piece is placed on the flat part of the top disk in San Bartolo Coyotepec, Oaxaca, Mexico (photographs by Carol Ventura, 1972).



Figure 7.1c Sofia Reyes (Zapotec, 1922-2016) rotates the pot with her left hand as she smooths the edge with her right in San Bartolo Coyotepec, Oaxaca, Mexico (photograph by Carol Ventura, 1972).

After drying for a short time, the leather hard surface is burnished to decrease porosity and make the surface smooth and shiny (Figure 7.1d).



Figure 7.1d Rocio Nieto (Zapotec) uses a smooth stone to burnish a partially dampened unfired clay vessel, San Bartolo Coyotepec, Oaxaca, Mexico (photograph by Carol Ventura, 2013).

Cylindrical kilns made of stone or mud brick were thought to be an introduction from Europe until they were recognized at several sites, including in Atzompa, Oaxaca, in Mexico. Kilns burn fuel more efficiently and heat pots more evenly. In nearby San Bartolo Coyotepec, dry pots are carefully stacked one on top of the other into an underground circular stone-lined kiln of pre-Hispanic design (Figure 7.1e). The kiln is loaded through the top then covered with broken pots before firing begins. Wood is the preferred fuel, but other combustible materials, like corn cobs and dung, are also used. A large hole in front of the kiln below ground level allows the fuel to be stoked from the bottom (Figure 7.1e). At the end of the firing, the kiln is sealed, causing the fire to burn up the available oxygen, turning the red iron oxide to black iron oxide, which turns the pots black.



Figure 7.1e Subterranean wood-fired kiln of pre-Hispanic design in San Bartolo Coyotepec, Oaxaca, Mexico (photograph by Carol Ventura, 1972).

Ceramic figurines offer clues to dress, which is especially insightful where **fabrics** have not survived. The vessel in Figure 7.2 in the form of a seated woman with filed teeth, a beaded necklace, and ear spools was found in a Zapotec tomb. Her hair style, **huipil,** and wrap around skirt are similar to those still worn in that area today (Figure 7.20).



Figure 7.2 Vessel in the Form of a Seated Female Figure, earthenware, 14 in / 35.56 cm tall, ca. 250-600 CE, Zapotec, Monte Alban, Oaxaca, Mexico (St. Louis Art Museum, Missouri, Gift of Morton D. May).
https://www.slam.org/collection/objects/8958/

Numerous Maya figurines that depict deities, nobles, warriors, and ball game players have been excavated from graves in Jaina, an island off the Yucatan coast in Mexico. Press-molded (Figure 5.6) fronts were attached to bases and backs made from **slabs** of clay, then details were applied. Only a little of the color survives because the figurines were painted after firing, so it rubbed off. Blue was made by mixing and heating indigo with clay found in the Yucatan. Some small sculptures were filled with balls of clay to make them rattle. Others are whistles, like the clothed standing figure in Figure 7.3 who is holding a shield, is wearing an elaborate headdress, **pectoral**, ear flares, belt, and loincloth. The mouthpiece of the whistle in the back on the bottom helps the figure stand.



Figure 7.3 Costumed Figure, molded earthenware with applied **pigment**, 11 ½ x 3 13/16 x 3 ¾ in / 29.3 x 9.7 x 9.5 cm, 7th-8th century, Maya, Jaina, Mexico (The Metropolitan Museum of Art, The Michael C. Rockefeller Memorial Collection, Bequest of Nelson A. Rockefeller, 1979, CC0). https://www.metmuseum.org/art/collection/search/313151

Zapotec, Mixtec, Aztec and Maya imagery and hieroglyphs recorded histories, astronomical events, genealogies, and calendars in accordion-folded codices made from bark paper and deerskin. Unfortunately, Spanish colonial priests burned most of the codices in the 16th century. Fortunately, though, scribes also painted on pottery so inscriptions and illustrations on ceramics can provide a glimpse of what was lost. Scribes and painters were highly respected members of the nobility and priesthood.

Chocolate originated in southern Mexico and Guatemala and was so highly valued that cacao beans were used as currency The Maya chocolate drinking vessel in Figure 7.4 shows a rabbit scribe painting in a jaguar-skin covered codex. The Princeton Vase includes several glyphs, some of which can be seen on the top left. Much of the imagery survives because it was painted with pigmented **slip** before firing (Figure 7.5).



Figure 7.4 The Princeton Vase, earthenware with red, cream, and black slip, with remnants of painted stucco, 8 7/16 x 6 9/16 in / 21.5 x 16.6 cm, Late Classic Maya ('Codex Style'), ca. 670-750 CE, Peten, Guatemala (Princeton University Art Museum. Museum purchase, gift of the Hans A. Widenmann, Class of 1918, and Dorothy Widenmann Foundation). https://artmuseum.princeton.edu/collections/objects/32221 includes a video about this piece.

When pigmented slip is painted onto clay before firing, the colors are permanent. White slip is made by wetting, mixing, and straining clay until it has the consistency of thick cream. Black iron oxide is added to make black and red iron oxide is added to produce red. To prepare the surface, **greenware** (dry unfired clay) is dampened with a wet cloth, then rubbed with a smooth stone (Figure 7.5a). Several coats of slip are applied to create long lasting colors (Figure 7.5b), burnishing between coats, then it is fired.



Figure 7.5a Patricia Martin burnishes an unfired earthenware pot with a quartz pebble to prepare it for painting. She then paints slip onto the surface to reproduce a pre-Hispanic vessel in Muna, Yucatan, Mexico (photograph by Carol Ventura, 2002).



Figure 7.5b Patricia Martin paints slip onto the surface to reproduce a pre-Hispanic vessel in Muna, Yucatan, Mexico (photograph by Carol Ventura, 2002).



Figure 7.5c Patricia Martin's reproductions of pre-Hispanic vessels in Muna, Yucatan, Mexico (photograph by Carol Ventura, 2002).

The large bird on top of the double chambered vessel in Figure 7.6 whistles when liquid is poured into the other side. The x-ray view (Figure 7.6b) shows the whistle in the bird's head and the opening between the two cylinders that allows the liquid to enter (which pushes the air through the whistle).

Figure 7.6 was burnished to polish the surface, then blackened during firing, the same process used to produce Figures 7.8 and 7.35.



Figure 7.6a Whistling Vessel, polished blackware earthenware, 11 7/8 x 7 ¾ x 5 1/4 in / 30.2 x 19.7 x 13.3 cm, ca. 400-500 CE, Guatemala or Mexico (Metropolitan Museum of Art, The Michael C. Rockefeller Memorial Collection, Gift of Nelson A. Rockefeller, 1963, CC0). https://www.metmuseum.org/art/collection/search/310542

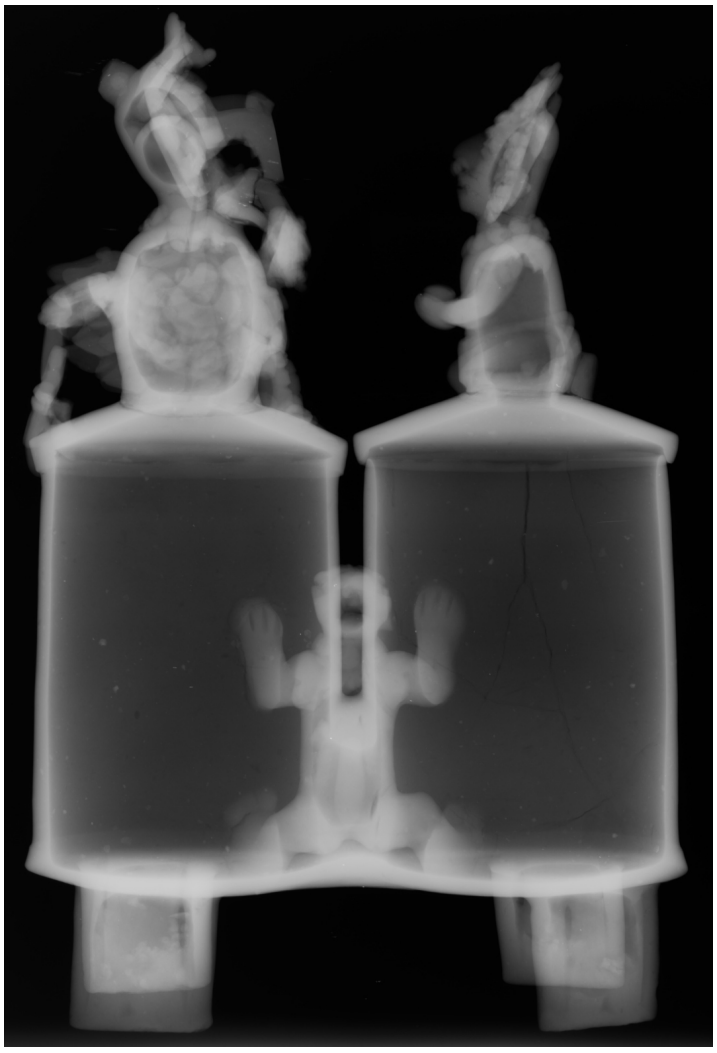


Figure 7.6b X-ray of the Whistling Vessel, polished blackware earthenware, 11 7/8 x 7 ¾ x 5 1/4 in / 30.2 x 19.7 x 13.3 cm, ca. 400-500 CE, Guatemala or Mexico (The Metropolitan Museum of Art, The Michael C. Rockefeller Memorial Collection, Gift of Nelson A. Rockefeller, 1963, CC0). https://www.metmuseum.org/art/collection/search/310542

Stirrup-spout and whistling vessels have been made on Peru's northern coast for thousands of years. They feature a wide range of subjects, including birds (Figures 7.7 and 7.9), humans (Figure 7.8), animals (Figure 7.10), and plants. Many vessels were **press molded.** One and two-piece molds dating to 1000 BCE have been excavated in Peru, though it is possible that molds were used even earlier. While molds with figurative details are easily recognized, plain molds are sometimes misidentified as "heavy, utilitarian ware" since one-piece molds often look like thick,

undecorated pots. After 300 BCE, most Peruvian mortuary pots were press molded. Molds may be reused many times so it is not surprising that numerous duplicate pots have been found in graves (see the author's photograph standing in front of case of Mochica portrait vessels).

The Nazca (100-700 CE) lived on the south coastal region of the Ica Valley by the Nazca River in Peru. They produced lustrous, colorful earthenware by painting leather hard vessels with slips made from mineral pigments, then burnishing them before firing (Figure 7.5). Colors include shades of red, white, cream, yellow, black, purple, green, and brown.

When partially filled with liquid and tipped, the vessels in Figures 7.7 and 7.9 whistle as air is forced out of the mouth of the birds. These sophisticated instruments were crafted by several South American cultures for millennia and are still made in Peru today.



Figure 7.7 Whistling Owl Vessel, molded earthenware, 5 ¼ in / 13.34 cm, Nazca, Peru, ca. 100 BCE-600 CE (© The Trustees of the British Museum, CC BY-NC-SA 4.0 license).
https://www.britishmuseum.org/collection/object/E_Am1938-20

The Chimú (ca. 1000-1400 CE) lived in northern Peru. They pressed soft clay into molds to produce the details on all but their largest storage jars. The whistling jar in Figure 7.8 produces a twittering sound when the vessel is tipped and liquid moves into the chamber with the bird. Other

Chimú pottery features a single person (Figure 7.9) or couples, flora, and fauna that do not whistle.



Figure 7.8 Whistling Jar, molded earthenware, 6 x 3 ¾ x 7 1/2 in / 15.2 x 9.5 x 19.1 cm, Chimú, Peru, ca. 1000-1476 (The Metropolitan Museum of Art, The Crosby Brown Collection of Musical Instruments, 1889, CC0). https://www.metmuseum.org/art/collection/search/501305 includes a recording of the bird-like twittering sound



Figure 7.9 Sleeping Figure Bottle, molded earthenware, 9 x 4 13/16 x 6 1/2 in / 22.9 x 12.2 x 16.5 cm, Chimú Inka, Peru, north coast, 12th-15th century (The Metropolitan Museum of Art, Gift of Judith Riklis, 1983, CC0). https://www.metmuseum.org/art/collection/search/314677

The Moche / Mochica (200-850 CE) lived in the northern coastal valleys of the Chicama River in Peru. They harvested Pacific maritime resources and built canals and aqueducts to irrigate their farms in the coastal deserts. Their immense above-ground adobe tombs included multiple burials that included pottery and jewelry.

Moche potters also decorated leather hard vessels with red, white, and black slip, then burnished the surface before firing to produce smooth, shiny surfaces (Figure 7.5a). The stirrup-spout bottle in Figure 7.10 depicts a fox with warrior face paint wearing a turban decorated with a repeating catfish head motif.



Figure 7.10 Bottle with Fox Head, red and white slipped earthenware, 12 1/2 x 6 1/2 x 8 in / 31.8 x 16.5 x 20.3 cm, Moche, Peru, ca. 500-800 CE (The Metropolitan Museum of Art, Gift of Nathan Cummings, 1963, CC0). https://www.metmuseum.org/art/collection/search/308408

Although plastic and metal containers have been replacing traditional vessels since the mid 20th century, locally produced ceramic pots are still popular household items in many communities. Inexpensive earthenware can take the shock of cooking fires and the round bottoms nestle into the embers and allow for even heating in wood fires. Narrow necks keep food hot and well contained and many believe that food cooked in ceramic pots tastes better. The advantage of storing water in large earthenware jars is that

the sweat that forms on the outer surface keeps the water cool as it evaporates.

Tourism and the art market have created a demand for figurines and sculptures. Traditional forms are produced on a grand scale and talented artists are also creating contemporary ceramics to satisfy the hunger for innovative pieces. Unfortunately, the high price of pre-Hispanic pottery has led to the looting of many archaeological sites. To complicate the issue, some local potters produce authentic looking "fakes" to sell to unsuspecting tourists and collectors. While some fakes are easily spotted, others are so professionally made they can only be authenticated through laboratory testing.

Spinning and **weaving** played an important role in pre-Hispanic society. Fine **textiles** indicated wealth and served as status markers, ritual offerings, payment for services rendered, tribute, and they played a role in diplomatic and military negotiations. Fabrics were produced with many types of fibers, but **agave** (Figure 7.11) and **cotton** (Figure 7.12) were the most popular and in the South American Andes many textiles were woven with **camelid** (alpaca, llama, and vicuña) yarn (Figure 7.13).

Although some men spun and wove, women dominated textile production. For the most part, the life of a woman from birth to death was concerned with motherhood, weaving beautiful textiles, and teaching others to spin and weave. Weaving and spinning were practiced not only by the lower classes, but also by young elite women who received instruction in the temples.

Known as maguey in Spanish, metl in Aztec, and ixtle in Maya, long agave fibers were probably the first to be spun, looped, and woven in the Americas (Figures 7.11a and 7.11b). Archaeological evidence suggests it was used to make textiles as early as 8600 BCE. Its long length (up to 19 5/8 in / 50 cm long) made it easy to handle.

Agave sisalana (sisal) and Agave fourcroydes (henequen) spread to the rest of the world during the Colonial Period (1492-1810). In the nineteenth and twentieth centuries, sisal fiber industries were founded in the Philippines, Indonesia, and East Africa. Although colorful synthetic fiber has taken over

the market, as late as 1982 sisal supplied 70 percent and henequen 15 percent of the world's hard, long fibers, in the form of twine, rope, and bags.



Figure 7.11a Lucas Díaz Cota (Jacaltek Maya) harvests an agave sisalana leaf with his machete, Jacaltenango, Guatemala (photograph by Carol Ventura, 1984).



Figure 7.11b Lucas Díaz Cota (Jacaltek Maya) cuts the sharp spines of an agave sisalana leaf, Jacaltenango, Guatemala (photograph by Carol Ventura, 1984).



Figure 7.11c Miguel Angel Domingo Mendoza (Jacaltek Maya) splits a sisal leaf to harvest the long fiber in Jacaltenango, Guatemala (photograph by Carol Ventura, 1984).



Figure 7.11d Miguel Angel Domingo Mendoza (Jacaltek Maya) pulls the split leaf between 2 parallel canes (seen by his feet in Figure 7.11c) held down with his foot to separate the fiber from the pulp in Jacaltenango, Guatemala (photograph by Carol Ventura, 1984).



Figure 7.11e Miguel Angel Domingo Mendoza (Jacaltek Maya) turns the leaf around to again pull it though the canes to extract the fiber in Jacaltenango, Guatemala (photograph by Carol Ventura, 1984).

To efficiently extract large amounts of fiber, the harvested agave leaves are sliced with a pointed bone tool (Figures 7.11f and 7.11m). The sliced leaves are bundled, stacked, and submerged for three weeks in a ret pond with water channeled into it (see upper right of Figure 7.11g) near a stream to keep the fibers from fermenting. Remaining pulp is pounded off with smooth rocks, then rinsed and hung to dry in the sun. One-pound bundles

(Figure 7.11m) are sold to local artisans and exported to surrounding villages.



Figure 7.11f A Jacaltek Maya slices sisal leaves in preparation for submerging them into the ret pond to remove the pulp in Jacaltenango, Guatemala (photograph by Carol Ventura, 1984).



Figure 7.11g Weighted down sliced sisal leaves submerged in a ret pond with running water to remove the leaf pulp in Jacaltenango, Guatemala (photograph by Carol Ventura, 1984).

Most fibers are commercially spun and **dyed** today, but there are other means to transform loose fibers into thread, including twisting it between the hand and thigh (Figure 7.11h), between the palms of the hands (Figure 7.11i), and with hand-held spinning wheels (Figures 7.11j and 7.11k). Thread is initially spun single **ply**. Two or more strands can be plied together by spinning them with in the opposite direction of the original twist.



Figure 7.11h Miguel Angel Domingo Mendoza (Jacaltek Maya) holds the spun cord with his left hand as he pushes his right hand against his thigh to "Z" twist two groups of long strands of dyed sisal, then immediately pulls his hand towards himself to "S" ply them together (Figure 7.14a). Additional sisal will be added, overlapping the ends, to allow him to spin a longer cord in Jacaltenango, Guatemala (photograph by Carol Ventura, 1986).



Figure 7.11i Juan Jimenez Jimenez (Jacaltek Maya) "S" spins two small groups of sisal at the same time, then quickly reverses the direction to "Z" ply them together with his hands while holding the spun cord with his foot in San Andres, Jacaltenango, Guatemala (photograph by Carol Ventura, 1986).

Where increased production is demanded and lower quality is not a problem, two people can make cord with a wooden-hand-spinning wheel. Dry sisal fibers are separated into a fluffy mass, then fed to a protruding dowel connected to the wheel (Figure 7.11j). One person hand spins the wheel and moves backwards as the fiber is spun while the other adds sisal to the spinning cord.



Figure 7.11j Jacaltec Maya women spinning sisal in in San Andres, Jacaltenango, Guatemala (photograph by Carol Ventura, 1984).

Plying is also done between two people, each holding a different type of wheel. The spun cord is doubled, and the middle is attached to a single hand-held wheel and each end is tied to a pair of doweled wheels (Figure 7.11k). The wheels are then turned in the opposite direction of the original spin.



Figure 7.11k A Jacaltec Maya spinning sisal to make cord in San Andres, Jacaltenango, Guatemala (photograph by Carol Ventura, 1986).

The long sisal fibers run parallel to one another when spun on the thigh (Figure 7.11h) and between the palms (Figure 7.11i), so the resulting cord is

smooth. Because the sisal fibers are pulled from a fluffy mound when wheel spun (Figure 7.11k), the cord is prickly because the ends of the fibers poke out everywhere. After spinning, the cord may be used as rope, looped (Figures 7.11n), netted, **twined**, or woven (Figure 7.11o).



Figure 7.11l Handspun cord (top) and wheel spun cord (bottom) from San Andres, Jacaltenango, Guatemala (Carol Ventura Collection, photograph by Carol Ventura, 1986).



Figure 7.11m Wheel spun cord (top left), a one pound bundle of processed sisal fiber, two bone leaf splitters with rubber tire guards, and seven small packets of dye from San Andres, Jacaltenango, Guatemala (Carol Ventura collection, photograph by Carol Ventura, 1986).



Figure 7.11n Looped 2-ply sisal bag made with smooth cord spun between the hands, with detail from Jacaltenango, Guatemala (Carol Ventura Collection, photograph by Carol Ventura).



Figure 7.11o Locally made sisal rope and straps in Jacaltenango, Guatemala (photograph by Carol Ventura).

A variety of native cottons grow in arid tropical and subtropical regions of the world. Although different cotton species share some similarities, fiber length and color vary, along with the amount of water required to grow them.

White, brown, and yellow cotton have been cultivated in the Americas for over 7000 years. *Gossypium hirsutum* is native to Southern Mexico and Guatemala. Fluffy cotton emerges after the bolls burst open and dry (Figure 7.12). Each seed is covered with masses of 1 – 1 ¼ in / 2.2 -3.2 cm long fibers and fuzzy linters. Hybrids of this variety make up around ninety percent of the world's production, followed by the South American native (*Gossypium barbadense*), and varieties from India (*Gossypium arboreum*) and Africa (*Gossypium herbaceum*).

Cultivation, harvesting, and processing were very labor intensive before machinery was invented in the 18th century to remove seeds and spin the fiber. It wasn't until the mid-20th century that the crop could be mechanically harvested. Irrigated fields, pesticides, and genetically modified seeds are used to commercially grow most white cotton today, but organic white, brown, green, and yellow cotton is still farmed with heirloom seeds by some.



Figure 7.12 Immature (upper left) and mature bolls of light brown cotton from Georgia (photograph by Carol Ventura, 1991).

Spaniards introduced sheep (Figure 1.12) to the Americas during the Colonial Period (1492-1810) so **wool** was not available until after the Spanish invasion. Alpacas and llamas were domesticated in Peru around 3000 years ago, but guanacos and vicuñas (which produce the finest

camelid fiber) were never successfully domesticated. Llamas, alpacas, guanacos, and vicuñas are related to camels, with llamas being the largest of the South American camelids.

Llama's tall, pointy ears easily identify these strong pack animals (Figure 7.13a). Alpacas (Figure 7.13b) are bred for their fiber. They are shorter than llamas, have smaller ears, and are followed in size by guanacos and vicuñas. Alpaca is the most popular camelid fiber because it is soft and abundant. Guanaco and vicuña are finer, but difficult to obtain from the wild animals. Each has three grades of fiber, though, depending on the location; the finest is from the back and sides, followed by the neck, and then the rump and legs. Fiber from young animals is finer than that of older animals. Depending where and when it is sheared, coarse vicuña can equal fine alpaca and fine llama can be indistinguishable from coarse alpaca. Consequently, many pre-Hispanic fabrics are generically labeled as being camelid fiber unless the specific origin can be identified.

Camelid fiber grows in many shades of white, brown, grey, and black (Figure 7.13c) that can be easily dyed with native plants, minerals, and insects. The dry coast of Peru has preserved thousands of colorful camelid fabrics. Seventeenth century chronicles also offer historical references. While most camelid fiber is industrially processed, spun, and chemically dyed today, there is a growing resurgence back to sustainable natural dyeing in the Andes.



Figure 7.13a Llamas at Machu Picchu, Peru (photograph by Carol Ventura, 2017).



Figure 7.13b Alpaca before and after shearing, Cookeville, Tennessee (photograph by Carol Ventura, 2002).



Figure 7.13c Changing colors while knitting a black, white, and brown alpaca cap with five double ended needles in Chinchero, Peru (photograph by Carol Ventura, 2017).

Spinning is the process of twisting loose fibers together to produce a continuous strand. The "twist" is the direction of the spin, which may be counterclockwise to produce an "S" twist or clockwise to produce a "Z" twist (Figure 1.14a).

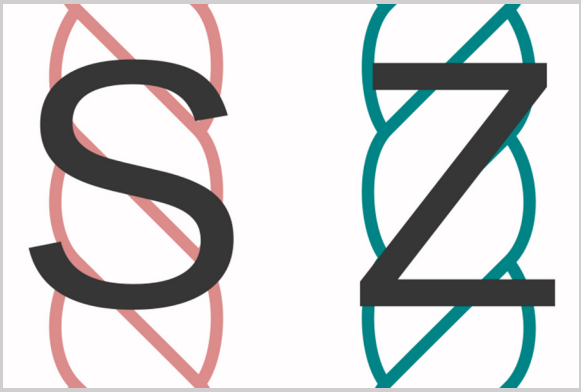


Figure 7.14a "S" twist and "Z" twist thread.

Spindle whorls, consisting of a wooden shaft and a weighted whorl, have been used for millennia to transform fiber into thread. The whorl helps maintain momentum and keeps the spun thread from slipping off the spindle. Wood, bone, stone, and clay whorls vary in shape, form, and style. They have been excavated around the world, often being mistaken for beads because the central wooden shaft rarely survives (Figure 7.14c). Spindle whorls first appear in America around 600 BCE.

While some ceramic whorls were mold-made, others were formed on a stick spun by the fingers to facilitate modeling, then incised and removed for firing. After firing, the incisions were often filled with white lime or other pigments to contrast with the fired clay, which ranged in color from **terracotta** to brown to black. Asphalt or bitumen (a natural tar) decorated spindle whorls from the Gulf Coast of Mexico.

The length of the shaft and size of the whorl depend on the type and thickness of the fiber being spun. Spindles with small whorls can twist thread as thin as the strands of a spider's web. Larger, heavier drop spindles are used to spin stronger fibers (Figures 7.14i and 7.14j). Large spindles, some of which are rotated with two hands, are used to make cordage from agave (Figures 7.11j and 7.11k), corn husks, sedges, reeds, leaves, or rawhide strips.

Thousands of pre-Hispanic mummies have been excavated along the arid coast of Peru. The deceased were placed into the fetal position then wrapped with layer upon layer of woven cotton and camelid textiles and sometimes the tools used to create them, like the spun and unspun cotton, spindles, and basket in Figure 7.14b.



Figure 7.14b Weaver's Workbasket with Hinged Lid, filled with spindles and brown and white cotton, 3 15/16 x 14 3/16 x 7 1/16 in / 10 x 36 x 18 cm, Chillon Valley, Peru, ca. 1000-1476 (Peabody Museum of Archaeology

and Ethnology, Gift of Alexander Agassiz, 1875).
https://collections.peabody.harvard.edu/objects/details/81215?ctx=7ba71aa73d4c7014f5a2d007b2fed0d86b622a05&idx=0



Figure 7.14c Spindle Whorl, **earthenware**, 5/8 in / 1.7 cm, North Coast of Peru (?), ca. 1-500 CE (The Metropolitan Museum of Art, Gift of Mr. and Mrs. Nathan Cummings, 1964, CC0).
https://www.metmuseum.org/art/collection/search/308867

Although most cotton is harvested and processed by machine today, some people still pick, remove the seeds (Figure 7.14d), and beat the cotton by hand to prepare the fiber for spinning (Figures 7.14e and 7.14f).



Figure 7.14d Teresa Garcia AlaVez (Mixtec) removes seeds from several shades of brown and white cotton in San Juan Colorado, Mexico (photograph by Carol Ventura, 2018).



Figure 7.14e After she removed the seeds, this Mam Maya woman beats the cotton with forked sticks on a deer-skin covered bundle in Xaomlaj, Jacaltenango, Guatemala (photograph by Carol Ventura, 1984).



Figure 7.14f Beating marries the short fibers into a fluffy, single mass that is folded, beat, refolded, beat, and then shaped into a cylinder to prepare it to be spun into thread. Her granddaughter is learning the process through observation, the traditional way that crafts have been taught for millennia around the world and in Xaomlaj, Jacaltenango, Guatemala (photograph by Carol Ventura, 1984).

Cotton fibers are short, making them more difficult to spin than animal fibers, so the bottom tip of the slender spindle usually rests on a hard surface. In Guatemala cotton is spun on an upright spindle resting in a small pine pitch-lined gourd bowl (Figure 7.14g). The bowl keeps the spindle from wandering and the pitch is rubbed on the spinner's fingers to keep

them dry, enabling her to spin a fine, strong thread. It is rare to see cotton handspun there today.

A bit of prepared cotton is twisted around a thread tied to the spindle to begin the process. A comfortable amount of cotton is drawn out. While holding prepared cotton in the one hand, the spindle is rotated with the other. Cotton is then pulled upwards with and twisted into a uniform thread in a counter-clockwise or clockwise direction, depending on whether an "S" or "Z" spin is desired (Figure 7.14a). After the thread has been sufficiently spun, it is wound around the shaft, then more fiber is drawn out, spun, wound, repeat. The thread is often left on the spindle to use as weft, transforming the spindle into a **shuttle** (Figure 7.14h).



Figure 7.14g Carefully prepared cotton is spun into thread in Xaomlaj, Jacaltenango, Guatemala (photograph by Carol Ventura, 1984).



Figure 7.14h Manuela Ramirez Cruz occasionally inserts a pass of her handspun thread (on the spindle on the ground) into the cloth she is backstrap weaving with commercially spun and dyed thread in Xaomlaj, Jacaltenango, Guatemala (photograph by Carol Ventura, 1984).

Animal fibers like wool and alpaca are strong enough to spin with large spindles that do not need to be supported on the bottom. The weight of the large spindle combined with friction free rotation in the air allow it to stay in motion much longer, whether seated (Figure 7.14i) or standing (Figure 7.14j).



Figure 7.14i Quechua women spinning alpaca on a drop spindle in Pitumarka, Peru (photograph by Carol Ventura, 2017).



Figure 7.14j Doña Santusa Huaman (Quechua) spinning on a drop spindle in Chinchero, Peru (photograph by Carol Ventura, 2017).

The spinning wheel (Figure 7.14k) was introduced by the Spaniards in the 16th century. It spins yarn much faster but is too heavy to move around, unlike hand spindles that can be used anywhere.



Figure 7.14k Making yarn on a spinning wheel in Oaxaca, Mexico (photograph by Carol Ventura, 2013).

Mineral pigments and dyes obtained from plants, insects, and shellfish were used to color fiber before coal tar dyes were invented during the 1860s. Synthetic dyes are less expensive and easier to use but they are very toxic. Consequently, natural dyes are experiencing a revitalization.

Animal fibers (wool, camelid, and **silk**) accept dye more readily than do plant fibers (cotton and sisal). Fortunately, indigo (for blues), cochineal (for reds), and purpura patula pansa (for purples) not only produce intense colors, but these dyes work well with both animal and plant fibers. Some dyes work at room temperature while others need to be heated.



Figure 7.15a Naturally dyed wool in Teotitlán del Valle, Oaxaca, Mexico (photograph by Carol Ventura, 2017).



Figure 7.15b Francisco Martinez Ruiz (Zapotec) dips white wool into room temperature indigo dye in Teotitlán del Valle, Oaxaca, Mexico (photograph by Carol Ventura, 2017).



Figure 7.15c The wool emerges from the indigo dye green but . . . (photograph by Carol Ventura, 2017).



Figure 7.15d . . . but the wool turns blue as it absorbs oxygen from the air in Teotitlán del Valle, Oaxaca, Mexico (photograph by Carol Ventura, 2017).



Figure 7.15e Antonia Callanaupa (Quechua) lifts wool out of a hot pot of cochineal (Figure 7.16) dye so that Alina Cusihuaman (Quechua) can examine it in Chinchero, Peru (photograph by Carol Ventura, 2017).

Demand was high for light-fast crimson, scarlet, purple, and pink cochineal dyes during the Colonial Period. The strong colors produced from the dry insects were better than anything available at the time in Europe, so it was an important trade item until less expensive synthetic dyes were developed in the 19th century. In fact, cochineal was the second most important export during the Colonial Period (1492-1810), just behind silver.

The source of this dye was initially a trade secret and a crime to divulge. The carminic acid dye is produced by a female cochineal insect that feeds on prickly pear cactus. After mating, the fertilized female increases in size and gives birth to tiny nymphs that scatter. In the wild they produce long

filaments and move to the edge of the cactus pad so the wind can carry them to a new host. They cluster on the new nopal cactus pads and secrete a waxy white substance over their bodies to protect them from water loss and excessive sun (Figure 7.16a). Cochineal is still produced in Mexico and Peru today.



Figure 7.16a Cochineal insects on prickly pear cactus, Tlapanochestli, Rancho La Nopalera, Oaxaca, Mexico (photograph by Carol Ventura, 2013).



Figure 7.16b Red color from mature dried cochineal insects, Tlapanochestli, Rancho La Nopalera, Oaxaca, Mexico (photograph by Carol Ventura, 2013).

Colorfast purple dye has been harvested sustainably for thousands of years from the carnivorous purpura patula pansa that live along the Pacific Coast of Mexico and Central America. Mediterranean Sea snails are killed and dried in Europe to produce purple dye (Tyrian purple), but the secretion of the American species of muricidae can be collected without hurting the creatures.

American purpura patula pansa cling to rocky outcrops in the intertidal zone, moving up and down with the rising and lowering tides because they can't survive underwater, but would dry out if not continually moistened by waves. During low tide the snail is pried from a rock, then gently pressed to stimulate formation of a defensive liquid. The cloudy discharge is immediately poured from the shell onto dry cotton or silk thread (Figure 7.17a). The mollusk is then carefully placed back into a moist, shady rock crevice. Hundreds of purpuras need to be milked to completely color one hank of cotton. As the dyed fiber is exposed to the sun, it turns from yellow, to green, to blue, to purple (Figure 7.17b). If it has not completed the process and turned purple, weeks later the hank can be dampened with tap water and placed in the sun to reactivate the dye.



Figure 7.17a Rafael Avenlop (Mixtec, 1980-) milks yellow extract from the Purpura mollusk (photograph by Carol Ventura, 2018).



Figure 7.17b The clear discharge from the mollusk dyes white cotton thread yellow, then green, then blue and then purple as it is exposed to the air and sun (photograph by Carol Ventura, 2018).

The **backstrap loom** is the earliest known weaving device in the Americas. To provide the necessary tension, the warp end rod is tied to a support and the cloth end rod is attached to a strap that wraps around the weaver's back (Figure 7.18b). Cloth is usually woven to the exact size needed and can be woven with selvedges (finished edges) on all four sides. The width of the fabric is usually not more than 30 in / 76 cm wide (the reach of a weaver). Two other types of looms were also used in South America; one that was pegged to the ground at the four corners, and a vertical loom. All three looms are still used in the Andes today.

There are several ways to measure warp for a loom; around vertical stakes in the floor (Figures 7.18a) or ground, around pegs on a wall (Figure 2.36), or on a rotating warping wheel, but something they all have in common is the formation of a figure 8 on one end to keep them in "one up one down" order (Figure 7.72c).



Figure 7.18a Damian Huaman (Quechua), and Eudes Guerra and his daughter measure warp on stakes set onto the floor for a backstrap loom, Chahuaytiri, Peru (photograph by Carol Ventura, 2017).

A heddle is tied to every other warp for **plain weave**. When the heddle is lifted (Figure 7.18b), a **shed** is formed, allowing weft to pass through. Heddles were first used around 2000 BCE. The other shed is formed by putting tension on the warp (by leaning back), which causes the warp yarns to pop up between the looped heddles and rest on the thick shed rod. A beater beats down the wefts.



Figure 7.18b Antonia (Amuzgo) leans forward and lifts a heddle to open a shed on a backstrap loom in Xochistlahuaca, Mexico. (photograph by Carol Ventura, 2017).



Figure 7.18c Antonia (Amuzgo) **brocades** an open gauze weave on a backstrap loom with cotton thread in Xochistlahuaca, Mexico. Brocade is a **supplementary** weft; if removed, the fabric is still structurally sound (photograph by Carol Ventura, 2017).

Aztec and Maya elite dressed in finely woven cotton clothing embellished with intricate decorations. Although only a few of their textiles survived the damp climate, images on murals, pottery, and sculpture provide insight. Men's clothing included turban-like headdresses, loose fitting tunics, loincloths, sashes, and capes and during battles quilted cotton armor helped fend off the enemy. As they still do in the 21st century, women adorned their hair with woven sashes (Figure 7.2) and dressed in loosely fitting huipils and skirts, sometimes secured with sashes.

The glyphs on the stone relief in Figure 7.19 identify Maya King Shield Jaguar II and his wife and the date of the ceremony depicted. The king wears a cape, a narrow belt with a herringbone design wrapped around his mid-section, and a sash decorated with mat designs, royal symbols. Kneeling Lady K'ab'al Xook's huipil is embellished with a complex diamond pattern that is still brocaded onto Tzotzil huipiles in Chiapas, Mexico (Figure 7.20a), today. Traces of pigment that remain on the carving suggest their handspun cotton garments were brocaded with cochineal and indigo dyed threads.



Figure 7.19 Lintel 24, **carved** limestone, 43 x 30 ¾ x 2 3/8 in / 109 x 78 x 6 cm, Maya, Yaxchilán, Chiapas, Mexico, 709 CE (© The Trustees of the British Museum, CC BY-NC-SA 4.0 license). https://www.britishmuseum.org/collection/object/E_Am1923-Maud-4

The Tzotzil huipil in Figure 7.20 is composed of three backstrap woven panels sewn together. The cross-shaped brocade that is formed before the sides are sewn together symbolizes the four cardinal directions. The neck opening in the middle of the cross places the woman wearing the huipil in the center of the universe.

Each of the large, brocaded diamonds on the middle panel represents the three-layered cosmos with a central sun. Red, black, yellow, and white corn seeds mark the cardinal points and both solstice paths are depicted in between (Figure 7.20b). Thirteen rows of diamonds symbolize the 13 steps

that connect earth and heaven. Other motifs include praying figures, bats, vultures, snakes, worms, bees, toads, corn, and beans.



Figure 7.20 Huipil, backstrap woven wool brocade on cotton, Tzotzil, Chiapas, Mexico, 1985 (The Textile Museum, Walter F. Morris, Jr.). https://collections-gwu.zetcom.net/en/collection/item/12330/

Fortunately, thousands of South American pre-Hispanic textiles have been preserved in the cemeteries located along the dry coast of Peru. Many cultures buried their dead there. We will begin with the Huari (500-1000 CE), who lived in the central and southern highlands of Peru. Like other pre-Hispanic cultures, their clothing was not tailored, but consisted of rectangular cloths draped, wrapped, and/or tied around the body, a style that is still popular today among their descendants.

The colorful Huari-style tunic in Figure 7.21 is composed of 120 separate pieces of step-shaped cloth, probably woven in strips over scaffold yarns (Figures 7.22a, 7.22b and 7.22c). The scaffold yarns were removed to separate the pieces for tie dying (Figure 5.31) then the pieces were sewn together to form large diamond patterns.



Figure 7.21 Tunic, plain woven camelid, disassembled, tie dyed, and reassembled, 47 7/8 x 33 in / 121.6 x 88.82 cm, ca. 750-950 CE, Huari, Peru (The Textile Museum, acquired by George Hewitt Myers in 1941). https://collections-gwu.zetcom.net/en/collection/item/5688/

Scaffold weave is done in the Andean region of South America to produce shaped fabric (Figures 7.22c) and cloth woven with **discontinuous warp** and weft (Figures 7.21, 7.22d, 7.22e, 7.22f), and 7.23). On most looms, the warp is continuous from one end to the other. With discontinuous warp, two or more different colored warp threads interlock to form the warp. This is accomplished with scaffold cords or rods temporarily placed perpendicular to the warp. A heddles are used for weaving larger areas (Figure 7.22f), but weft threaded in a needle is used for smaller designs (Figure 7.22b).

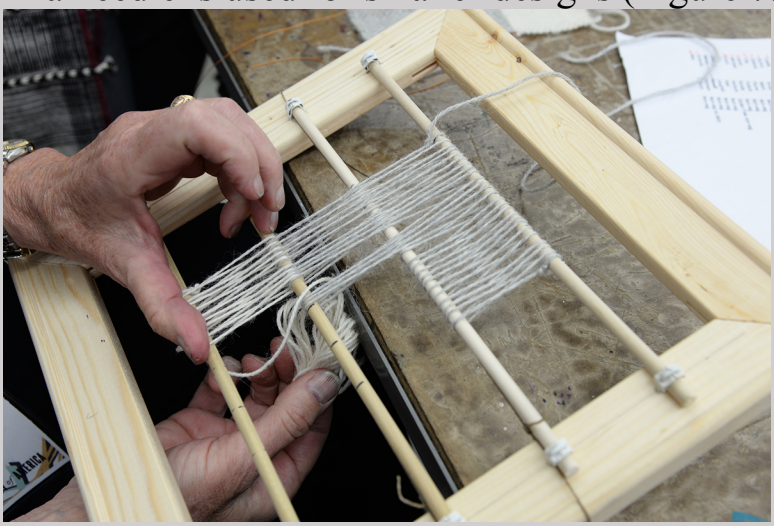


Figure 7.22a Catherine Ellis wraps warp around a scaffold in a figure 8 (photograph by Carol Ventura, 2017).



Figure 7.22b After replacing the rods with yarn, Catherine Ellis inserts weft with a needle (photograph by Carol Ventura, 2017).



Figure 7.22c White wrapped piece ready to dye and two dyed pieces woven on the above scaffold loom (photograph by Carol Ventura, 2017).



Figure 7.22d Quechua women prepare a discontinuous warp (scaffold weave) with white and gray alpaca that will be woven on a backstrap loom in Pitumarka, Peru (photograph by Carol Ventura, 2017).



Figure 7.22e Adding string heddles to the discontinuous warp in Pitumarka, Peru (photograph by Carol Ventura, 2017).



Figure 7.22f In the foreground, Ana Espinoza (Quechua) weaves on a backstrap loom set up with three discontinuous warps in Pitumarka, Peru (photograph by Carol Ventura, 2017).

Many pre-Hispanic backstrap weaving and finishing techniques are still used today. Fabrics continue to be joined together with hidden or decorative stitches (Figure 7.22h). Warp patterning, a pickup technique that involves selecting appropriately colored warps with the fingers or a sharp tool (Figure 7.22g), is particularly popular in the Andes. A distinctly South American detail is the tubular woven embellishment attached to the perimeter of woven fabric (Figure 7.22i) to make the edges more attractive and wear resistant.



Figure 7.22g Picking up warp threads with a bone pick and fingers to create the shed. The warp is close together to create a warp-faced fabric that hides the weft in Pitumarka, Peru (photograph by Carol Ventura, 2017).



Figure 7.22h Sewing two pieces together along the selvedges with a decorative stitch in Pitumarka, Peru (photograph by Carol Ventura, 2017).



Figure 7.22i Weaving a tubular border along the selvedge in Acha Alta, Peru (photograph by Carol Ventura, 2017).

In addition to pottery (Figures 7.8 and 7.9), the Chimú (ca. 1000-1400 CE) also produced amazing textiles. The Hanging in Figure 7.23 is an incredible example of discontinuous warp and weft that was scaffold woven (Figures 7.22e and 7.22f) as one large piece with white, beige, brown, and indigo-dyed blue cotton. The diagonal stylized pelican motif is similar to relief sculpture decorating adobe architecture in Chan Chan, their capital.



Figure 7.23 Hanging, plain woven cotton with discontinuous warps and wefts, 82 x 63 7/8 in / 162.2 x 208.3 cm, Chimú, Peru, ca. 1300–1470 (The Metropolitan Museum of Art, The Michael C. Rockefeller Memorial Collection, Bequest of Nelson A. Rockefeller, 1979, CC0). https://www.metmuseum.org/art/collection/search/312796

The Chancay (1000-1470 CE) lived along the southern coast of Peru. Many of their intricately woven textiles have survived, including the naturally colored cotton double woven bag in Figure 7.24. The patterns were created by interchanging sections of the white and brown layers as it was being woven on a backstrap loom.



Figure 7.24 Bag, plain weave double cloth of natural brown and white cotton, 14 x 10 ¼ in / 35.5 x 26 cm, Chancay, Peru, ca. 1000-1476 CE (Museum of Fine Arts, Boston, Samuel Putnam Avery Fund). https://collections.mfa.org/objects/100220/bag?ctx=cd75dd85-85fc-496f-aed2-83e4635c486d&idx=0

Although gold was considered very important, pre-Hispanic people valued textiles even more highly than the precious metal. Exquisite fabrics were distributed as royal gifts, burned as precious sacrifices, and buried with the dead. Clothing identified a person's age, social status and occupation and special garments were worn during ceremonies.

The Inka (1450-1550) ruled present-day Peru, Ecuador, Bolivia, Argentina, and Chile when Francisco Pizarro (Spanish, 1478-1541) invaded

South America 1526. The Inka Emperor might have worn the fine tunic in Figure 7.25, **tapestry** woven (Figure 2.32c) with approximately 250 threads per inch / 100 threads per centimeter. Each of the rectangular motifs probably represents locations, ethnicities, and social classes within the empire, a statement of the wearer's dominion over the land and its people.



Figure 7.25 All T'oqapu Tunic, backstrap tapestry woven dyed camelid fiber weft and cotton warp, 35 ½ x 30 3/8 in / 90.2 x 77.15 cm, Inka, ca. 1450-1540 (© Dumbarton Oaks Research Library and Collection, photograph by Neil Greentree). http://museum.doaks.org/objects-1/info/23071

Metallic thread was used in many parts of the ancient world, but the use of gold and silver threads in Native American textiles came to an abrupt halt in 1563, when the Spanish Prontuario de cédulas reales ordered "that no person, man or woman, be allowed to wear any textile that was brocaded . . . nor one that had gold or silver in its weaving . . . even if these threads

were false imitation . . . as also it was prohibited that silver or gold should be used for the cloths that were used on horses and mules."

Colonial documents tell us that most Aztec artists were under the patronage of specific deities and inhabited certain areas of the capital city. This was also true elsewhere, where it has been confirmed with archaeological excavations.

Pre-Hispanic jewelers used **gold**, **silver,** tin, **copper**, lead, platinum, and **alloys** of two or more of these metals. Some alloys occurred naturally while others were manmade. One of the advantages of working with alloys is that they melt at lower temperatures than their metallic components.

Gold is the color of the sun and does not tarnish; these properties and its workability and abundance made it very popular with the ruling elite. In fact, the Inka associated gold with the solar deity, Inti, and its use was restricted. In 1533 Francisco Pizarro ransomed the Inka Emperor, Atahualpa, for a room full of gold and silver. He killed him anyway, then melted down 13,000 pounds of 22 karat gold and twice that amount of silver. Montezuma had suffered a similar fate in Mexico. Consequently, very little pre-Hispanic gold and silverwork has survived; most pieces are from tombs and excavations. The earliest preserved South American goldwork dates to 1800 BCE.

Moche / Mochica (200-850 CE) jewelers crafted crowns, diadems, ear ornaments, bracelets, anklets, necklaces, and nose ornaments from gold, silver, copper, stone, bone and shell. Large circular ear ornaments were popular elite adornments. The heavy frontal was counterbalanced by a long tubular shaft that went through a large hole in the earlobe. The bird-headed winged runners in Figure 7.26 hold bags in their outstretched hands.

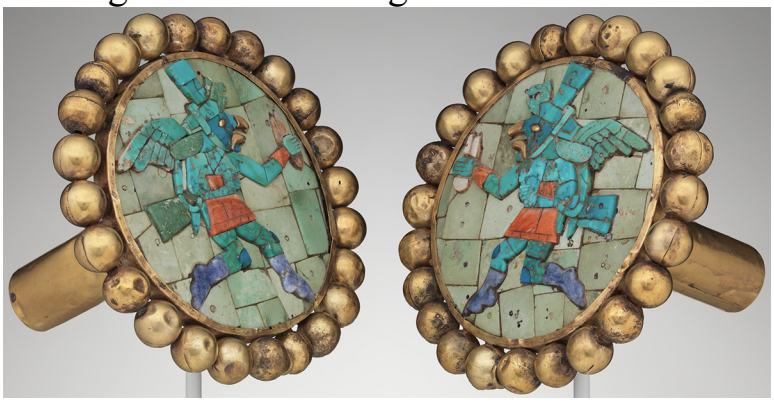


Figure 7.26 Ear Ornaments with Winged Runners, gold, turquoise, sodalite, spondylus shell, 3 3/16 in / 8 cm diameter, Moche / Mochica, Peru, ca. 400–700 CE (The Metropolitan Museum of Art, Gift and Bequest of Alice K. Bache, 1966, 1977, CC0).
https://www.metmuseum.org/art/collection/search/319459

The Sicán (ca. 750-1375) lived in the Lambayeque region of the northern Pacific coast of Peru. The gold drinking vessel in Figure 7.27 is one of over a hundred gold and silver plain and decorated beakers excavated from the pyramidal tombs of their elite. This gold vessel probably would have been **raised** in a similar manner that vessels are formed today over shaped metal **stakes** (Figure 1.9a).



Figure 7.27 Inverse-Face Beaker, gold, 7 7/8 x 7 in / 20 x 17.8 cm, Sicán, Lambayeque, Peru, ca. 900-1100 CE (The Metropolitan Museum of Art, Jan Mitchell and Sons Collection, Gift of Jan Mitchell, 1991, CC0).
https://www.metmuseum.org/art/collection/search/316430

Historians theorize that Mesoamerican gold working methods were imported from South America because technically sophisticated pieces start to appear abruptly in Oaxaca, Mexico, after 600 CE. The necklace in Figure 7.28 was made there using the lost-wax technique. Jaguar molars inspired

the shape of the 34 beads. Rattle bells were joined to the bottom of each "tooth" with **false-filigree** loops. Instead of using wire, the loops were modeled in wax and then cast.



Figure 7.28 Necklace with Beads in the Shape of Jaguar's Teeth, lost wax cast gold, 4 ½ x 1 3/8 x 5 x 15 ¼ in / 11.4 x 3.5 x 12.7 x 38.7 cm, Mixtec, Oaxaca, Central Mexico, 1325-1521 (The Metropolitan Museum of Art, Purchase, Mariana and Ray Herrmann, Jill and Alan Rappaport, and Stephanie Bernheim Gifts, 2017, CC0). https://www.metmuseum.org/art/collection/search/705547

Pre-Hispanic metalworkers in Costa Rica, Panama, and Columbia worked with alloys of copper, gold, and/or silver and other trace metals. They used a depletion technique to make the copper alloys look like pure gold or silver. This was accomplished by heating the alloy, then bathing it in an acid that ate away the outer layer of copper, allowing gold or silver to concentrate on the surface.

The golden pendant in Figure 7.29 is an example of **lost wax casting** (Figure 7.4) and **depletion gilding**. It depicts an anthropomorphic jaguar blowing a conch-shell trumpet. Crocodile heads flank the jaguar's head and thighs, an animal head is depicted on each knee, and serpent heads emerge from the feet.



Figure 7.29 Masked Figure Blowing Conch Pendant, tumbaga depletion gilded lost wax cast alloy, 3 3/4 x 3 1/2 x 1 3/4 in / 9.53 x 8.89 x 4.45 cm, Diquís-Chiriquí, Southern Costa Rica / Western Panama, ca. 700-1550 CE (Dumbarton Oaks Museum). https://museum.doaks.org/objects-1/info/22642

Wood is very perishable. Consequently, only a few old pieces have survived, but from colonial documents we know that dye was extracted from trees, wood was used to weave baskets and traps, and this versatile medium was carved to craft beads, drums, statues, masks, dishes, spoons, mortars, canoes, bows and arrows. Wood was also burned as fuel, and it was used for house construction.

The expressive Aztec teponaztli drum in Figure 7.30 was carved from a hollow log. The long and short rectangular tongues cut into the top emit different tones when struck.



Figure 7.30 Teponaztli, carved wood, 9 1/8 x 10 1/8 x 34 ½ in / 23.2 x 25.8 x 87.8 cm, ca. 1250-1521, Aztec, Malinalco, Mexico (© Archivo Digital MNA, Mexico). https://mna.inah.gob.mx/colecciones_detalle.php?id=2664

Drinks were served in large vessels during festivals in the Andes. The wooden Inka kero in Figure 7.31 was embellished with animated people and creatures around the sides and bottom. Gold and silver face beakers (Figure 7.27) have a long history in the region.



Figure 7.31a Kero Ceremonial Drinking Cup, painted wood, wood pitch / gum, 19 x 21.2 x 16.3 cm, Colonial Inka, ca. 1550-1800 (Smithsonian

National Museum of the American Indian).
https://www.si.edu/object/ceremonial-drinking-cup:NMAI_114417



Figure 7.31b Kero Ceremonial Drinking Cup, painted wood, wood pitch / gum, 19 x 21.2 x 16.3 cm, Colonial Inka, ca. 1550-1800 (Smithsonian National Museum of the American Indian).
https://www.si.edu/object/ceremonial-drinking-cup:NMAI_114417

Native Americans North of the Rio Grande



Native North America
https://www.pinterest.com/pin/657947826781334491/

Local climate, flora, and fauna helped determine the lifestyles and traditions of the hundreds of diverse Native Americans that lived in North America before the European invasion. The introduction of new diseases, cows, horses, sheep, guns, and capitalism dramatically changed their lives. Fortunately, despite the efforts of missionaries and governments to eradicate native beliefs and culture, all has not been lost.

The dry Southwest is blessed with earthenware clay that potters have been shaping, decorating, and firing for thousands of years in recognizable styles that changed from place to place over time. The Mimbres people lived in apartment like-dwellings along rivers in the mountainous regions of New Mexico between 1000 and 1150 CE. Mimbres potters painted abstract figurative and geometric images onto unfired pots with hematite slip, which turned red in an oxygen rich atmosphere and black when it was reduced.

The bowl in Figure 7.32 is both red and black because some parts of the vessel received more and others less oxygen during firing.

The Mimbres farmed, hunted, foraged, and buried their dead under the floors of their houses. The deceased were placed in the fetal position with a bowl placed over their head. Other bowls, like the example in Figure 7.32, were arranged face down in the grave.



Figure 7.32 Mountain Sheep Bowl, earthenware, 4 1/8 x 9 ¼ in / 10.5 x 23.5 cm, black on white Mimbres, Mattocks Site, NM, ca. 1000-1130 CE (Maxwell Museum of Anthropology, The University of New Mexico).

The Anasazi (450-1300 CE) built their homes in the cliffs of northern New Mexico and the "Four Corners" region where Utah, Colorado, Arizona, and New Mexico meet. Anasazi decorated their baskets and pottery with geometric motifs inspired by nature. They crafted both black on white and black on red pieces, like the jar in Figure 7.33 that was decorated with abstract birds and stepped spirals.



Figure 7.33 Storage Jar, black on red earthenware, 12 ¼ x 13 in / 31.1 x 33 cm, Anasazi, Arizona, ca. 1125-1200 (Image Courtesy Dallas Museum of Art). https://dma.org/art/collection/object/4204013

The Zuni have lived in the western part of New Mexico by the Zuni River since around 700 CE. The animals depicted on their pottery and jewelry usually include a lifeline from the mouth to the heart, like the slip painted deer on the earthenware water jar in Figure 7.34.



Figure 7.34 Water Jar / Olla, Zuni, earthenware with slip, 10 3/8 x 7 x 13 in / 26.2 x 17.6 x 33 cm, New Mexico, n.d. (©The Trustees of the British Museum, CC BY-NC-SA 4.0 license). https://www.britishmuseum.org/collection/object/E_Am1938-1017-16

Locally excavated ancestral ceramics inspired Maria Martinez (San Ildefonso Pueblo, 1887-1980) and her husband, Julian Martinez (San Ildefonso Pueblo, 1885-1943), to reintroduce black on black pottery to San Ildefonso Pueblo. She coil-built, slipped, and stone-burnished the vessel in Figure 7.35 and then Julian painted a matt slip in the negative space around the feathers and Avanyu water serpents.

They fired the pots on a windless day to assure even temperatures. After carefully positioning the pieces face down over a raised metal grate that had dry cedar wood underneath, they covered the mound with pieces of scrap metal and dry cow dung patties, then lit the fire. When the temperature reached around 1200°F to 1400° F / 649°C to 760° C, the fire was covered with dry, powdered horse manure and ashes to smother the flames and create the oxygen reduced atmosphere that blackened the clay. Hot pots were removed from the mound when the smoke stopped. Their family continues to produce black pottery today in the same manner.



Figure 7.35 Maria Martinez (San Ildefonso Pueblo, 1887-1980) and Julian Martinez (San Ildefonso Pueblo, 1885-1943), Water Jar / Olla with Feathers and Avanyu, earthenware with slip, 14 1/4 x 18 5/8 in / 36.2 x 47.3 cm, San Ildefonso Pueblo, New Mexico, 1930-1943 (Museum of Fine Arts, Houston, Gift of Miss Ima Hogg). https://emuseum.mfah.org/objects/45825/jar-olla-with-feathers-and-avanyu?ctx=4282ab7c318ffc1ad84406135b8ab7fb465cfa63&idx=7

Mississippian Period Native Americans (800-1600 CE) in the Midwest and Southeast mixed crushed shells with their clay and decorated the damp earthenware vessels with pointed tools and textured wooden paddles to produce elaborate ceremonial vessels and less ornate bottles, jars, and shallow bowls for everyday use. The vessel in Figure 7.36 is one of many effigy head pots that have been excavated in the Southeast.



Figure 7.36 Vessel in the shape of a human head, coiled, modeled, incised earthenware, 6 1/4 in / 15.9 cm high, Mississippian Period, Arkansas, ca. 1350-1550 (245 The Nelson-Atkins Museum of Art, Kansas City, Missouri, the Donald D. Jones Fund for American Indian Art, photograph by Daderot, CC0, via Wikimedia Commons).

Baskets have been coiled, twined, **plaited**, and woven for over 9,000 years in the Americas. Unfortunately, only a few examples have survived because the perishable raw materials used to create them succumbed to environmental conditions. Basket textures on clay pottery provide the earliest clues of their existence, predating actual basket remains.

Basketmaking predates the development of ceramics. Vegetables, meat, herbs, liquid, and hot rocks were put into tightly coiled baskets to cook stews. Some baskets were coated with resin for carrying water. They were also used ceremonially.

Local raw materials varied. In the southwest, roots and grasses were used to make coiled baskets (Figures 7.37 and 7.38), the oldest

basketmaking structure. The Yokuts and Pomo of California still **coil build** baskets today.



Figure 7.37 Basket, coiled grass stems, sedge root, dyed bracken fern root, redbud shoots, Yokuts, ca. 1910 (National Museum of the American Indian). https://americanindian.si.edu/collections-search/object/NMAI_229629



Figure 7.38 Andra Susie Santiago Billy, (Hopland Band Pomo/Kashaya Pomo, ca. 1885–1968), Basket Bowl, coiled and stitched willow, mallard duck feathers, woodpecker feathers, meadowlark feathers, quail feathers, shell beads, abalone/haliotis shell, cotton twine/string, 3 x 6 1/8 in / 7.8 x 15.6 cm, 1952, Pomo, Hopland Reservation, Mendocino County, California

(National Museum of the American Indian).
https://americanindian.si.edu/collections-search/object/NMAI_276092

Southeastern Native Americans wove and still weave large rivercane (*Arundinaria tecta*) floormats (Figure 7.39a), sifters, storage baskets (Figure 7.39c), winnowing baskets, burden baskets, and single walled (Figures 7.39e and 7.39f) and double walled baskets (Figures 7.39h through 7.39l and 7.40). Organic materials rarely survive, but a few fragments have been excavated from dry archeological sites in the Southeastern United States. Rectangular, lidded river-cane baskets found in Spiro (850-1450 CE), Oklahoma, held disarticulated human remains. In Louisiana the Chitimacha used lidded baskets to hold human bones and ashes into the 19th century.

The chroniclers who traveled through the Southeast with Hernando DeSoto (1500-1542) described baskets and mats woven with angular and curvilinear geometric designs that included zigzag snake designs, bird motifs (Figure 7.39a), diamonds, and diagonals.

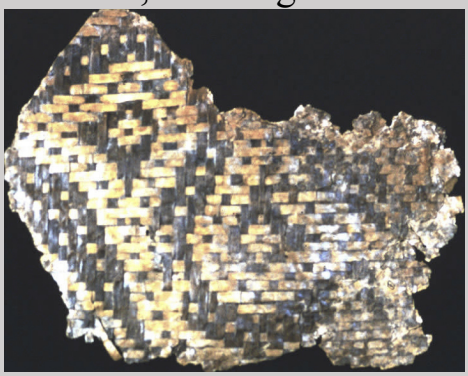


Figure 7.39a Mat Fragment, natural and dyed rivercane, Caddo, Mounds Plantation Site, Louisiana, ca. 800-1200 CE.
https://www.texasbeyondhistory.net/tejas/fundamentals/graves.html#:~:text=Woven%20mat%20fragment%20with%20bird,famous%20for%20their%20woven%20mats.

Rivercane has a glossy outer surface and a matt inner surface, so most baskets have a shiny side and a dull side. The woven patterns in Figure 7.39b were made by interlacing shiny side up weft with contrasting shiny side down warp.



Figure 7.39b Basket Fragment, rivercane with flipped warp and weft splits, mirrored triangle design, Cobb Cave, Arkansas, Mississippian Period, ca. 1000-1500 (University of Arkansas Museum 68-733-8, ARAS photo and inset drawing by Elizabeth Horton).
https://archeology.uark.edu/artifacts/cobbcavebasketry/



Figure 7.39c Basket Fragment, rivercane with flipped warp and weft splits, spider motif design, Cobb Cave, Arkansas, Mississippian Period, ca. 1000-1500 (University of Arkansas Museum 68-733-6, ARAS photo and inset drawing by Elizabeth Horton).
https://archeology.uark.edu/artifacts/cobbcavebasketry/

Rivercane is light green when fresh but yellows as it ages. Some splits were dyed red orange with blood root, brown with black walnut, and yellow with

curly dock. Red dye was made by adding muscle shells to curly dock. Splits were soaked in sulfured mud, black walnut dye, or gently scorched with live coals to turn them black.

Claude Medford (Choctaw, 1941-1989) was introduced to basketry by his Choctaw grandfather. Choctaws weave relatively wide cane splits with the smooth side on the outside of the basket, while Catawbas and Chitimachas weave narrower cane splits with the shiny side facing the inside. Claude taught workshops to native and non-native people to preserve the traditions he learned from his own nation and others. He was a walking encyclopedia, so much was lost when he passed away!

Figures 7.39d, 7.39e, and 7.39f are from one of Claude's workshops. After harvesting the cane, he splits it in half, quarters it, then divides it one more time before slicing off a split (Figure 7.39d). The inside of the split is scraped (Figure 7.39g) with a knife until it is thin enough to easily wrap around his finger.



Photo 7.39d Claude Medford (Choctaw, 1941-1989) slices off the outer layer of a river cane that was split into eight long pieces (photograph by Carol Ventura, 1988).



Photo 7.39e Claude Medford (Choctaw, 1941-1989) weaves a Chitimacha style basket with the shiny side facing the inside of the basket (photograph by Carol Ventura, 1988).



Photo 7.39f Claude Medford (Choctaw, 1941-1989) pushes together the cane splits to weave a tight Chitimacha style basket (photograph by Carol Ventura, 1988).

Eva Bigwitch (Eastern Cherokee, 1928-2005) was another generous teacher. The photos below were taken during one of her double wall cane basket workshops. The double walls make this style of basket very strong and this structure allows the glossy side of the cane to show on both the inside and the outside of the basket.

Eva scrapes the tough fibers off the back of the splits (Figure 7.39g) to make them more flexible. It may be stored for future use but needs to be soaked in water to make it pliable again. First, the bottom of the inner basket (Figure 7.39h) is woven with wet naturally colored green, bloodroot dyed red orange, and black walnut dyed rivercane splits. With the shiny side

of the cane facing upwards, the corners of the bottom are folded on the diagonal to plait the sides, the top is tied to secure the splits (Figure 7.39i), they are folded outwards at the rim (Figure 7.39j), then plaited on the diagonal down to the bottom. After the splits are overlapped on the bottom, the tips are cut off (Figure 7.39k). The green splits turn yellow over time, producing a yellow, red, and black colored basket.



Figure 7.39g With the cane resting shiny side down against her leg, Eva Bigwitch (Eastern Cherokee, 1928-2005) scrapes off the back of the split to make it thinner and more flexible (photograph by Carol Ventura, 1991).

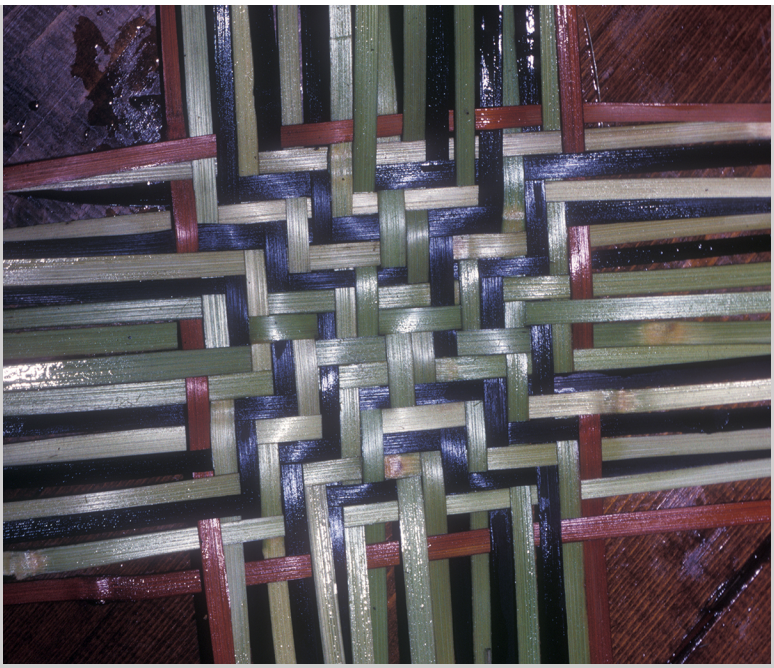


Figure 7.39h A double woven basket begins at the bottom, shown here with wet natural green and dyed red orange and black rivercane splits (photograph by Carol Ventura, 1991).



Figure 7.39i Eva Bigwitch (Eastern Cherokee, 1928-2005) ties a string around the rim to hold the cane splits in place when they are bent down to weave the outside layer of the basket (photograph by Carol Ventura, 1991).



Figure 7.39j Eva Bigwitch (Eastern Cherokee, 1928-2005) folds and forces the splits downwards to weave the outside of the basket (photograph by Carol Ventura, 1991).



Figure 7.39k Eva Bigwitch (Eastern Cherokee, 1928-2005) finishes the basket by cutting off the ends of the overlapping cane splits with a knife (photograph by Carol Ventura, 1991).



Figure 7.39l Author's 4 ¾ in / 12 cm high basket made in Eva's 1991 workshop and a double walled covered basket made by a Cherokee ca. 2003 (Carol Ventura Collection, photograph by Carol Ventura, 2025).

Clara Darden (Chitimacha, 1829-1910) lived on the Chitimacha Reservation in southern Louisiana. Her finely plaited lidded baskets in Figures 7.40 are double walled, so the glossy side of the rivercane is seen on both the inside and outside of the sturdy baskets and lids.



Figure 7.40 Clara Darden (Chitimacha, 1829-1910), back from left to right: Alligator Guts, Worm Tracks, Grape Skins; middle left to right: Cross Marks; Worm Tracks, Up Across and Down, Eyes of Cattle, Something Around; front left to right: Bottom of Basket, Square Blocks, Cross Marks, Worm Track going Stout, double weave and diagonally plaited covered rivercane baskets, Charenton, Louisiana, ca. 1900 (Peabody Museum of Archaeology and Ethnology). https://collections.peabody.harvard.edu/advancedsearch/Objects/objectRelatedPeople%3Adarden and https://collections.peabody.harvard.edu/objects/details/26540?ctx=cbde540b700eae641170b4954decf93421b2799d&idx=0

Shan Goshorn's (Eastern Band of Cherokee, 1957-2018) narrative baskets confront many of the atrocities her ancestors endured. Between 1878-1918, ten to twelve thousand Native American children from all over

the United States attended a facility aimed to eradicate their traditional culture. Photographs were taken when they arrived and after they had been westernized. Goshorn's seven pairs of Cherokee style single woven baskets in Figure 7.41 were made from sliced "before and after" images and contemporary comments.



Figure 7.41 Shan Goshorn (Eastern Band of Cherokee, 1957-2018), Resisting the Mission; Filling the Silence, seven sets of two (14 baskets total) each is 21 1/4 x 6 ¾ in / 54 x 17.3 cm, woven sliced Arches watercolor paper, ink, acrylic paint, imitation sinew, 2017 (National Museum of the American Indian).
https://americanindian.si.edu/collections-search/object/NMAI_415695

Split ash and sweet grass baskets with decorative curls have been made for centuries in the Northeast. Mary Kawennatakie Adams (Akwesasne Mohawk, 1917-1999) raised the technique to a new level, though, with her amazing basket in Figure 7.42. The large size of this masterpiece, numerous decorative curls, and tiny basket inclusions are amazing!



Figure 7.42 Mary Kawennatakie Adams (Akwesasne Mohawk, 1917-1999), Pope Basket, ash and sweetgrass, 11 x 11 1/2 in / 27.9 x 29.2 cm, New York State, 1985 (Smithsonian American Art Museum).
https://americanart.si.edu/artwork/basket-31571

Kelly Church's (Odawa and Pottawatomi, Gun Lake Band, 1967-) basket in Figure 7.43 addresses the damage being done by the emerald ash borer, which is killing black ash trees in her home state of Michigan and the rest of North America. Like a Fabergé Egg (Figure 12.23), the basket holds treasures within – an adult emerald ash borer and a flash drive that Church says has "all the teachings you would need to bring back black ash basket making if they were ever lost." She weaves together traditions of the past with realities of the present by combining new and traditional materials in hope that black ash basket weaving will survive.



Figure 7.43 Kelly Church (Odawa and Pottawatomi, Gun Lake Band, 1967-), Sustaining Traditions – Digital Teachings, black ash, Rit dye, copper, velvet, flash drive, and a vial containing emerald ash borer, 9 ½ x 4 ½ in / 24.13 x 11.43 cm, 2018 (Smithsonian American Art Museum). https://americanart.si.edu/blog/kelly-church-native-artist-traditions

Fingerweaving is done without a loom. One end of the warp is tied to a support, then interlaced with one another diagonally. Before Europeans introduced sheep, northeastern Native Americans used plant fibers to

fingerweave belts, straps, and sashes. Common motifs included arrowheads and chevrons, as seen in the fingerwoven wool and glass bead sash in Figure 7.44.



Figure 7.44 Sash, fingerwoven wool with glass beads, 4 3/8 x 113 3/8 in / 11 x 288 cm, Iroquois, ca. 1800 (M8486 McCord Museum). https://collections.musee-mccord-stewart.ca/en/objects/16209/no-title?ctx=b2205af1c64c3294a0b37806f6a6f60ce05e9058&idx=50

It is easy to understand why First Nations people of the Northwest Coast are called "People of the Cedar." Not only were their houses, canoes, paddles, poles, masks, bowls, and spoons made from red and yellow cedar, but the inner bark and roots were used to fabricate rope, mats, clothing, baskets, and hats and the wood is lightweight, relatively easy to carve, and contains an oil preservative.

Red cedar (*Thuja plicata*) and yellow cedar (*Chamaecyparis nootkatensis*) belong to the cypress family, but were named before accurate botanical information had developed. Inner bark is harvested when the sap is running, from May through July, without damaging the tree when only a few 6-inch-wide strips are removed. After cutting the base of the tree with an ax or adze, the bark can be pulled off from the bottom of the trunk to the top, then snapped off where it tapers or hits a branch. The inner and outer bark layers

are immediately split apart then the inner bark is rolled up, brought home, dried outside in rolls, and saved for future use.

Gladys Vandal (Haida) looks in dark groves for trees that are twenty to thirty years old with trunk diameters of around fifteen inches. The perfect tree should not have any low side branches, and the bark should run straight up the tree, not spiral around it. Gladys gives thanks before removing the bark and when working with cedar bark to assure it will continue to grow on Haida Gwaii, her beautiful home off the coast of British Columbia in Canada. https://www.carolventura.com/gladys.htm

Inner bark must be processed to make it soft and pliable before it can be woven. To transform the stiff, wide piece into numerous narrow, flexible strands, it is soaked in water, beat with a bark shredder (made of stone, bone, or wood), and then split.

Twining (Figure 7.45a) is one of the oldest fiber techniques, predating weaving by thousands of years. A twined or woven hat is crafted a little at a time with damp inner bark. Gladys works from the top of the hat down, as did her ancestors, but her working method has evolved; she rests the hat on a rotating wooden mold (Figure 7.45b) to create a perfectly shaped, symmetrical hat.

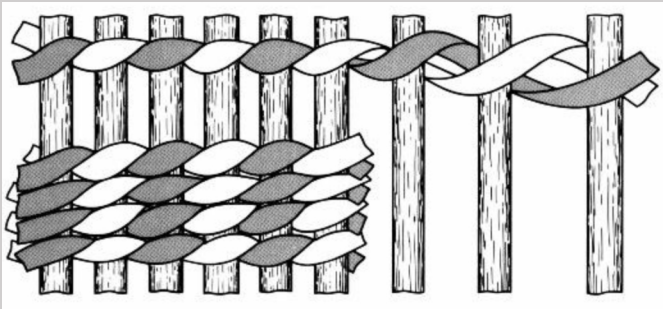


Figure 7.45a. Twining technique.



Figure 7.45b Gladys Vandal (Haida), hats with the wood hat molds she uses in Skidegate, Haida Gwaii, Canada (photograph by Carol Ventura, 2001).

Overlapping warps are separated and woven individually and more warps are slid in to increase their number as the hat diameter expands (Figure 7.45c).



Figure 7.45c Gladys Vandal (Haida) twines a hat on a wood mold in Skidegate, Haida Gwaii, Canada, 2001(photographs by Carol Ventura, 2001).

Although ancient hats have not survived the damp coastal climate, they were mentioned in traditional stories and hats were depicted on the

heads of some of the figures that top totem poles. The shape and abstract formline design (Figure 7.57) on the twined cedar bark hat in Figure 7.46 communicate that the owner was a member of the Raven Clan.



Figure 7.46 Isabella Edenshaw / Kwii.aang (Haida, 1858-1926) (twining) and Charles Edenshaw / Tahaygen/Da.axiigang (Haida, 1839-1920) (painting), Basket Hat with Raven Design, twined cedar bark and spruce root, paint, 17 3/8 x 7 in / 44 x 18 cm, ca. 1890-1920, Haida (Smithsonian National Museum of the American Indian). https://americanindian.si.edu/collections-search/object/NMAI_209490

Preston Singletary (Tlingit, 1963-) is a musician and artist who grew up in the Seattle area. After participating in a workshop at Pilchuck Glass School 1984, he went on to study and teach glass around the world. Singletary is known for blending traditional native forms and concepts with non-native techniques to redefine Native American art. He explains, "Our art has always been a declaration of who we are. Using a modern art approach—with a new medium—gives us a new way of looking at Native American art. It moves us into the future while allowing us to reclaim what has always been ours."

His early work, like Tlingit Crest Hat in Figure 7.47, was inspired by traditional Tlingit cedar hats (Figure 7.46). Singletary's glass hat is placed upside down, under a light, to cast a shadow of the crest below.



Figure 7.47 Preston Singletary (Tlingit, 1963-), Tlingit Crest Hat, etched blue glass, 7 x 19 in / 17.8 x 48.3 cm, 2006 (2007.12 Hood Museum of Art, Dartmouth). https://hoodmuseum.dartmouth.edu/objects/2007.12

Several Northwest Coast First Nations and Alaska Native people twine ceremonial dance robes / blankets with thigh-spun mountain goat wool on gravity hung natural white warp; Ravenstail (Figure 7.48) with black geometric motifs on a white ground and Chilkat (Figure 7.49), with colorful curvilinear imagery. Ravenstail blankets are rectangular, while Chilkat robes are five sided, but both have fur trim and long dance fringes. High-ranking leaders wear them wrapped around their shoulders during ceremonies and while dancing.

The magnificent Tlingit Ravenstail robe in Figure 7.48 was decorated with two distinct designs to communicate more than one message.

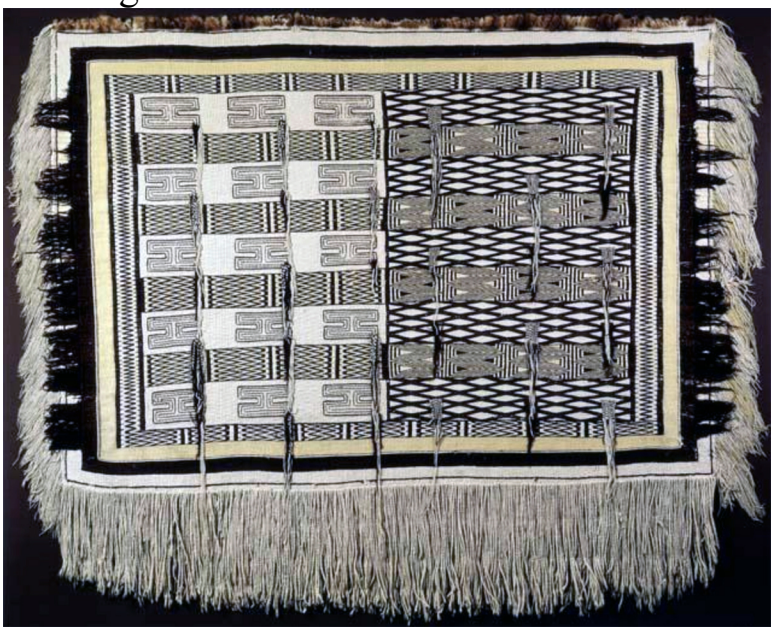


Figure 7.48 “Swift Blanket” Ravenstail Robe, wool, mountain goat wool, cedar bark, fur, and leather, 3 15/16 x 70 1/2 x 50 3/8 in / 10 x 179 x 128 cm, Tlingit, British Columbia, Canada, 1740-1760 (Peabody Museum of Archaeology and Ethnology, Harvard University). https://collections.peabody.harvard.edu/objects/details/12561?ctx=8530c70ea88e3a6c35dc00a747e07f9d7f060335&idx=0



Figure 7.49 Chilkat Dancing Blanket, mountain goat wool and yellow cedar bark warp; white, black, yellow, and blue dyed mountain goat wool weft, 66 in / 167.64 cm wide, Tsimshian, Gitksan, Kitwanga, Alaska, ca. 1800 (Royal British Columbia Museum). https://search-collections.royalbcmuseum.bc.ca/Ethnology/ViewItem/135060

Chilkat robes evolved from Ravenstail. Both styles are worked from the top down. In the past, men designed the robes by painting crest imagery onto wooden planks and then women created them. Warp was thigh-spun (Figure 7.11h) white mountain goat wool mixed with the inner bark of yellow cedar trees. Weft was more finely spun mountain goat wool, some of which was dyed black, yellow, and green. Wefts were twined (Figure 7.45a) around warps suspended from a horizontal wooden support attached to a frame (Figure 7.50a).

Today both men and women design and produce robes and accessories on the same type of frame but sheep’s wool has replaced mountain goat wool.

As in the past, cedar is still thigh spun into the warp and finer wool is twined across.



Figure 7.50a Clarissa Rizal (Tlingit 1956-2016) and her daughter, Lily Hope (Tlingit 1980-), at their looms, Juneau, Alaska (photograph by Sealaska Heritage Institute, 2020).



Figure 7.50b Lily Hope (Tlingit 1980-) models the Double Raven Robe woven by her and Ricky Tagaban (Tlingit), Juneau, Alaska (photograph by @sydneyakagiphoto, 2020). https://www.lilyhope.com/lily-hope-worksamples

Jaad Kuujus / Meghann O'Brien's (1982-) wove both Ravenstail and Chilkat styles before designing and weaving Sky Blanket (Figure 7.51), which includes elements of both. The imagery represents past, present and future generations. The black and white areas symbolize duality.



Figure 7.51 Jaad Kuujus / Meghann O'Brien (Kwakwaka'wakw / Haida / Irish-Canadian, 1982-), Sky Blanket, merino wool, cashmere, and mountain goat wool, 2014 (collection of the artist). https://meghannobrien.com/2015/08/29/sky-blanket-design/

Barbara Teller Ornelas (1954-) in Figure 7.52 is a fifth-generation Navajo weaver. She and her sisters learned from their mother how to hand-card and spin black, brown, beige, and white sheep wool, sometimes mixing black with white to make gray, and how to tapestry weave (Figure 2.32c) on a frame loom. Barbara's weavings feature symmetrical geometric motifs, woven with naturally colored wool.

Notice how the warp winds around the top and bottom bars of Barbara's vertical loom. This technique produces **selvedges** on all four sides, a stylistic characteristic of Navajo tapestries.



Figure 7.52a Barbara Teller Ornelas (Navajo, 1954-) beginning a Two Gray Hills style tapestry weaving (photograph by Carol Ventura, 2017).



Figure 7.52b Barbara Teller Ornelas (Navajo, 1954-), Two Gray Hills Textile, handspun wool, 71 x 47 ¼ in / 1.8 x 1.2 m, 1995 (Heard Museum 4650-31). https://heard.org/collection/textiles/

Copper nuggets found in Tennessee were pounded flat with a stone, then ground and polished with sand and sandstone to make ear plugs, rings, beads, reliefs, knives, awls, arrow tips, needles, and hooks that were widely traded. Silver and **brass** replaced copper as a raw material after the Europeans arrived.

Plain and repoussé (Figure 1.9b) copper reliefs have been excavated from Mississippian Period tombs in Florida, Georgia, Illinois, Mississippi,

Oklahoma, Tennessee, and Wisconsin. Some feature bird-men dancers (Figure 7.53) and men wearing feather ornaments. Figure 7.54 was found in a tomb with seven more copper repoussé feather ornaments.



Figure 7.53 Human Figure, copper relief, Etowah Mounds Archaeological Site, Georgia, Mississippian, ca. 1300 - 1350 CE (Smithsonian National Museum of Natural History).
https://www.si.edu/object/nmnhanthropology_8319024



Figure 7.54 Falcon-Eye Warrior Wearing a Feather Ornament, copper relief, 11 in / 28 cm, Craig Mound, Spiro Archaeological Site, Oklahoma, Mississippian, ca. 1200 - 1450 CE (Ohio History Connection). https://www.spiromounds.com/collection/objects/human-head-effigy-plate-a1393000001a

Before Europeans arrived, jewelry in the Southwest consisted mostly of carved shell and stone, including red argillite and turquoise. These materials are still popular today but are now often combined with gold and silver.

Barbara Teller Ornelas (Figure 7.52a) is wearing shell beads, a silver and turquoise brooch, bracelet, and belt and a silver squash blossom necklace and earrings. The squash blossom necklace was first made in the late 1870s or early 1880s after the arrival of Spanish Mexicans. Native jewelers adopted and adapted the form, which is how styles evolve.

Charles Loloma (Hopi, 1921-1991), was an innovative teacher, painter, ceramist, and jeweler from Arizona. His jewelry fused Hopi and

non-native ideas, inspired by his heritage, formal education and world-wide travel. In addition to traditional turquoise and silver jewelry, he often incorporated other materials into his work. The inlay in the bracelet in Figure 7.55 follows the curve, but projects outward dramatically.



Figure 7.55 Charles Loloma (Hopi, 1921-1991), Bracelet, **forged** gold with mosaic of desert ironwood, lapis lazuli, turquoise, coral, elephant ivory and walrus ivory, 3 1/8 x 2 3/8 x 1 in / 8 x 6 x 2.4 cm, 1982 (National Museum of the American Indian) https://americanindian.si.edu/collections-search/object/NMAI_272185

Native Americans of the Northwest coast are known for the formline style that consists of curvilinear, ovoid, and rectangular shapes that represent anatomical features depicted with tapered black outlines. James Sawyer / Gam Nan K'ihl Nuens (Haida, 1969-) traced a formline pattern (Figure 7.56a) onto a paddle, then filled in the outlines free hand (Figures 7.56b). https://www.carolventura.com/james.htm



Figure 7.56a James Sawyer / Gam Nan K'ihl Nuens (Haida, 1969-), eagle formline pattern and paddle, Masset, Haida Gwaii, Canada, 2001 (photograph by Carol Ventura, 2001).



Figure 7.56b James Sawyer / Gam Nan K'ihl Nuens (Haida, 1969-) traces the eagle formline pattern onto a paddle with a pencil, then paints in the details free hand in Masset, Haida Gwaii, Canada (photograph by Carol Ventura, 2001).

Red and yellow cedar trees can live for more than a thousand years, and red cedar can grow to over 145 feet high with a trunk diameter of three feet or more. Now it is difficult to find large trees for carving dugout canoes and totem poles, though, because they are usually harvested before reaching full maturity.

Reg Davidson (Haida, 1954-) is a printmaker, jeweler, weaver, painter, singer, and dancer, but is best known for the cedar totem poles, sculptures, and masks that he carves and paints.

Carving a moon-faced mask in Figure 5.57d requires talent and skill. To steady the wood, Reg screws it to a rotating vise. Careful measurements are necessary to give the mask a symmetrical face. He spends as much time measuring with calipers (Figure 7.57a) and marking (Figure 7.57b) as he does carving (Figure 7.57c). The inside of the mask will be hollowed out after the face has been carved. https://www.carolventura.com/reg.htm



Figure 7.57a Reg Davidson (Haida, 1954-) measures the moon mask in Figure 7.57d in his studio in Masset, Haida Gwaii, Canada (photograph by Carol Ventura, 2001).



Figure 7.57b Reg Davidson (Haida, 1954-) marks the moon mask in Figure 7.57d in his studio in Masset, Haida Gwaii, Canada (photograph by Carol Ventura, 2001).



Figure 7.57c Reg Davidson (Haida, 1954-) carves the moon mask in Figure 7.57d in his studio in Masset, Haida Gwaii, Canada (photograph by Carol Ventura, 2001).



Figure 7.57d Reg Davidson (Haida, 1954-), Moon Mask, cedar, Masset, Haida Gwaii, Canada, 2001 (photograph by Reg Davidson).

Northwest Coast people crafted bentwood boxes to use for cooking and serving food, for storing possessions, and as coffins. The sides were made from one piece of seasoned cedar. The short ends were rabbeted to fit together after the three grooved corners were bent. To allow the wood to bend ninety degrees without cracking, the plank was put into a pit filled with hot rocks then covered with seaweed and sand. The ends of the board were sewn or pegged together, then the base (rabbeted along the edges) was attached.

The crest of the owner decorated the outside. Green paint was made from celadonite (iron silicate; also called green earth), blue from an iron phosphate mineral called vivianite, and red ochre was used to make red before commercial paint was available.

Charles Edenshaw was one of the most accomplished Haida sculptors, jewelers, and painters (Figure 7.46) of his generation. He crafted the bentwood box in Figure 7.58 with traditional techniques, but the craftsmanship and design make it an exceptional example. To make the box, Charles carved grooves into a cedar board for the corners, heated the wood to make it pliable, bent the wood 90 degrees at the corners, sewed the seams

together with cedar bark, then carved and painted the exterior in Northwest Coast formline style.



Figure 7.58 Charles Edenshaw (Haida, 1839-1920), Bentwood Box, cedar wood and bark, abalone shell, paint, 4 ¼ x 9 3/8 x 8 in / 10.8 x 24 x 20.3 cm, Haida Gwaii, Canada, ca. 1880 (© University of British Columbia Museum of Anthropology). http://collection-online.moa.ubc.ca/search/item?keywords=A8928&row=0

Bill Reid's (1920-1998) Haida mother and Scottish German American father raised him in Victoria, Canada. Reid began his career as a radio personality but followed another path as he became more interested in his Haida heritage, eventually becoming an accomplished goldsmith, sculptor (Figure 7.60), and author, but when suppression eased, Reid helped lead a movement to resurrect many native arts.

The Haida used ocean-going dugout canoes for fishing, hunting, trading, transportation, and fighting. The prows were carved or painted with family crests to identify their affiliations. Then as now, these vessels were a group effort to build and navigate. Much was lost in the nineteenth and early twentieth centuries when the Canadian and United States governments tried to erase native culture by outlawing their traditions. Canoes stopped being made at that time. Reid interviewed elders and studied smaller canoes in museums to figure out how to craft a large canoe from a single tree. Then

he and his assistants carved and painted Loo Taas / Wave Eater (Figure 7.59) almost 80 years after the last large canoe had been made.

The final shape was steam bent by partially filling it with water, brush, and hot stones and then covering the canoe with a tarp. Spreaders were inserted across the top to make it 10 inches wider, which simultaneously curved the back and front upwards. The steaming process strengthened and transformed it into a more seaworthy shape.

In 1987 Loo Taas traveled 19 days from Vancouver to Haida Gwaii, stopping at many communities along the way. The paddlers were welcomed with traditional songs and dances that bolstered efforts to resurrect their cultural practices.

Two years later a team of Haida in full regalia paddled Loo Taas up the Seine River and made a dramatic entrance into Paris where the canoe was part of an exhibition. Today Loo Taas can be found in Haida Gwaii where it continues to inspire others to craft their own vessels. Around a hundred hand-hewn canoes now participate in the annual Pacific Northwest Coast Tribal Canoe Journey, established in 1989.



Figure 7.59 Bill Reid (Haida, 1920-1998), Loo Taas / Wave Eater, carved and painted cedar, 50 ft / 15.2 m long, Haida Gwaii, Canada, 1986 (Haida canoe photograph by Susan Clarke, CC BY 2.0, 2008).

Traditional Haida stories and wood carvings inspired many of Bill Reid's pieces, including the gold box in Figure 7.60. Charles Edenshaw, who made the box in Figure 7.58, was Reid's great-great-grandfather.

In addition to **engraving** imagery onto metal, Reid used repoussé, casting, and **soldering** techniques to give his metalwork a more three-dimensional quality.



Figure 7.60 Bill Reid (Haida, 1920-1998), Beaver and Human Box with Killer Whale Cover, cast and engraved gold, 3 3/4 x 3 ¼ x 4 in / 9.4 x 8.2 x 10 cm, Victoria, Canada, 1971 (Royal British Columbia Museum). https://search-collections.royalbcmuseum.bc.ca/Ethnology/ViewItem/133922

Metal must be well secured to be engraved so Dave Hunter (Haida) attaches his sterling silver to wood clamped into a rotating vice. After drawing the design onto the silver with a pencil (Figure 7.60a), he pushes a sharp tool (burin) into the lines to remove slivers of silver (Figure 7.60b), slowly transforming them into grooves. He repeats the process until the engraving

is complete, then removes the silver from the wood, forms it into a bracelet with a leather mallet (Figure 7.60c), soaks it in a hot blackening solution, then buffs the black off the surface, to produce a silver bracelet (Figure 7.70d). https://www.carolventura.com/dave.htm



Figure 7.61a Dave Hunter (Haida) pencils lines onto sterling silver in Haida Gwaii, Canada (photograph by Carol Ventura, 2001).

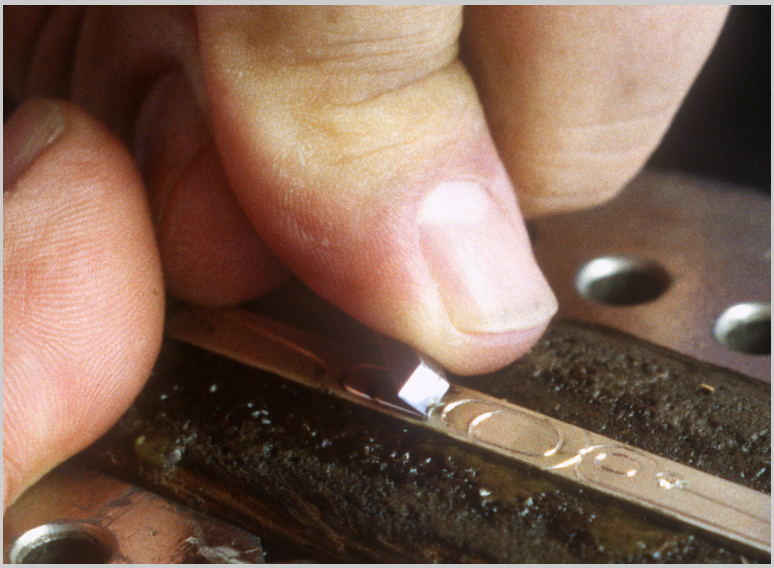


Figure 7.61b Dave Hunter (Haida) cuts into the pencil lines with a sharp steel burin to engrave a hummingbird design into the surface (photograph by Carol Ventura, 2001).



Figure 7.61c Dave Hunter (Haida) hammers the silver against a secured trailer hitch to shape it into a bracelet (photograph by Carol Ventura, 2001).



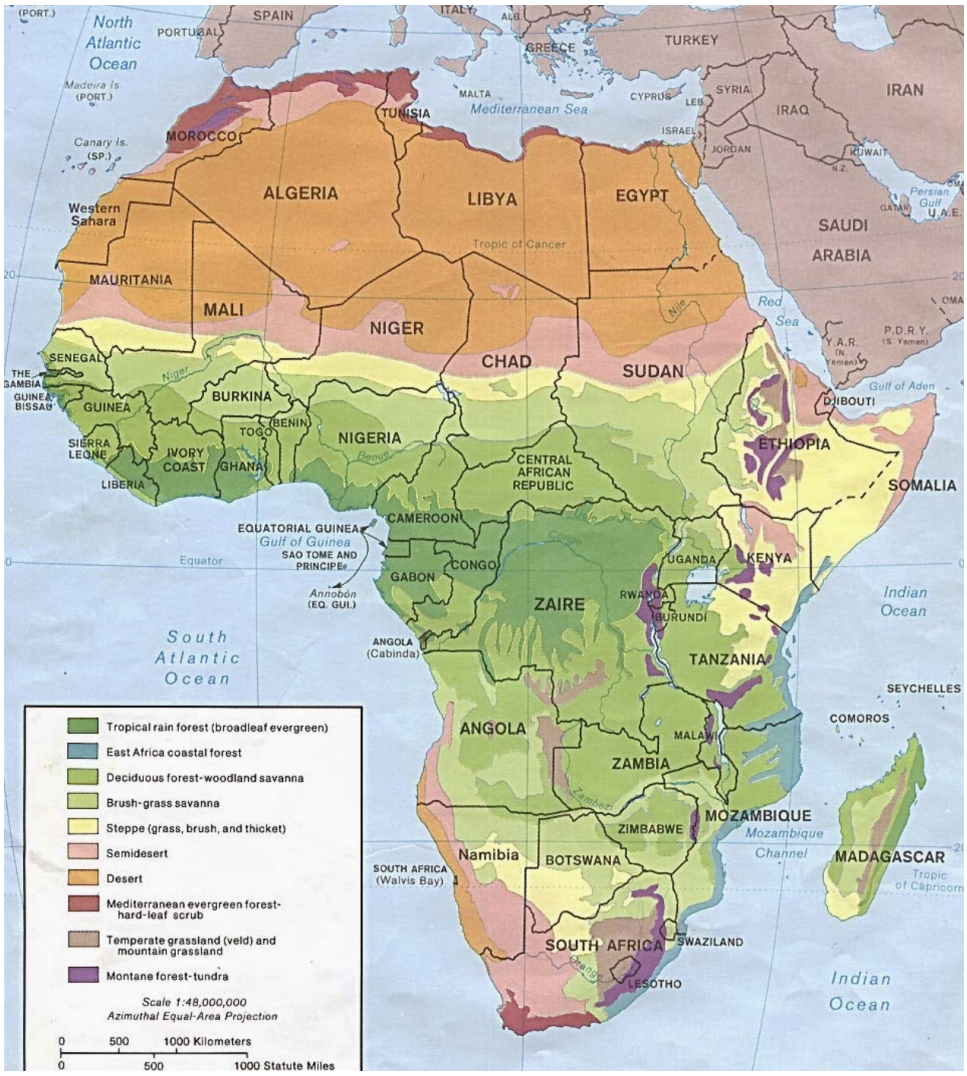
Figure 7.61d Dave Hunter (Haida), Hummingbird Bracelet, engraved sterling silver, 2 ¼ x 2 x ¼ in / 5.72 x 5.08 x .64 cm, 2001 (Carol Ventura Collection, photograph by Carol Ventura, 2024).

Phil Janze (1950-2016) traveled to the United Kingdom to train at Goldsmith's Hall in the late 1970s to refine his techniques and develop new skills. He also produced work in ivory, bone, and mountain goat horn, as well as silkscreen prints and wood carvings. The repousséd, chased, and engraved gold bracelet in Figure 7.62 depicts a right-facing raven in profile.



Figure 7.62 Phil Janze (Gitksan, 1950-2016), Raven Bracelet Ts'ixsna'axs, repousséd, chased, and engraved gold, 1 ¼ x 6 in / 3.1 x 15.2 cm, 1979 (University of British Columbia Museum of Anthropology). http://collection-online.moa.ubc.ca/search/item?keywords=2594%2F2&row=0

Africa



African Vegetation https://printable-maps.blogspot.com/2008/08/africa-physical-map.html

Africa is composed of many diverse ecosystems and groups of people with unique artistic styles. Chapter 2 introduced the oldest surviving African crafts, that of ancient Egypt. This chapter will look at traditional crafts that have survived into the present in western Africa.

Benin was the capital of the powerful Edo Kingdom in Nigeria that was ruled by Obas (Rulers) for over 600 years, reaching the height of its power in the mid-16th century. Craft guilds supported by the Oba produced sculptures, furniture, and jewelry for the court with metal, wood, ivory, leather, and coral.

In 1897 the British invaded the Kingdom and confiscated numerous items from the Oba's royal palace, including hundreds of plaques and are now scattered around the world in various collections. Fortunately, some museums are coming to terms with the how their holdings from Benin and elsewhere were acquired and are repatriating questionably obtained items to their rightful owners.

The plaques documented historical events. Figure 7.63 depicts a powerful warrior chief and his attendants. As with many other cultures, personal adornment was a mark of status and rank. The chief is depicted with a leopard-tooth necklace and leopard-spot scarification, to give him the stealth, speed, and ferocity of the leopard. He also wears a coral-studded helmet and collar, a wrap, and a brass ornament on his hip. He carries a ceremonial sword in his left hand and a spear in his other hand. Attendants hold a fan to cool the chief, a trumpet to announce his presence, and a box of kola nuts as a gift for the Oba.



Figure 7.63a Warriors and Attendants, front of plaque, lost wax cast brass, 18 3/4 x 15 x 4 1/4 in / 47.6 x 38.1 x 10.8 cm, Edo, Benin, Nigeria, 16-17th

century (The Metropolitan Museum of Art, Gift of Mr. and Mrs. Klaus G. Perls, 1990, CC0).
https://www.metmuseum.org/art/collection/search/316393



Figure 7.63b Warriors and Attendants, back of plaque, lost wax cast brass, 18 3/4 x 15 x 4 1/4 in / 47.6 x 38.1 x 10.8 cm, Edo, Benin, Nigeria, 16-17th century (The Metropolitan Museum of Art, Gift of Mr. and Mrs. Klaus G. Perls, 1990, CC0).
https://www.metmuseum.org/art/collection/search/316393

The Akan people began trading gold dust with the Portuguese and Spanish along the west coast of Africa in the 14th century. They became very powerful between 1700 and 1900. Only the king, major chiefs, and special servants could wear gold jewelry. All goldsmithing was done by professional smiths, some of whom were descendants of gold workers captured from defeated states in the early days of expansion.

The Akans used **chasing**, **repoussé**, and lost wax casting to craft jewelry. The lost wax cast brass weight in Figure 7.64 was used to weigh gold. It depicts Sankofa, a bird with its head turned back to its tail. This image is derived from the Akan proverb, "There is nothing wrong with learning from hindsight."



Figure 7.64 Sankofa Gold Weight, brass, 1 ¾ in / 4.45 cm high, Akan, Ghana, 18–19th century (Metropolitan Museum of Art, Gift of Ernst Anspach, 1994, CC0).
https://www.metmuseum.org/art/collection/search/317688

The gold necklace in Figure 7.65 is a very fine example of lost wax casting. The gold amulets include a stool in the lower right, perhaps referring to the revered golden stool of the Asante, the largest ethnic group of the Akan people. The actual golden stool in the palace of the Asante in Ghana symbolizes unity and is believed to hold the souls of the people.



Figure 7.65 Necklace, lost wax cast gold, 13 x 1 3/8 in / 33 x 3.5 cm, Akan, Ghana, ca. 1900-1915 (Museum of Fine Arts Houston). https://emuseum.mfah.org/objects/133484/necklace-with-multiple-beads-and-amulet-in-the-form-of-a-sto?ctx=3735e6bee87354e0b4b4ca7dfa986aea7d16e2c3&idx=49

Metallurgy was traditionally attributed to shaman craftsmen. The ability to transform raw metal into beautiful jewelry and effective weapons is truly magical.

Traditional and modern techniques are used to lost wax cast brass jewelry and sculptures in the Asante village of Krofofrom in Ghana.

A hollow bead is made by covering a core with extruded wax threads (Figure 7.66a). Cores are a mixture of fresh cow dung, powdered charcoal, clay, and water (Figure 7.66b).



Figure 7.66a Asante wax over core and cast brass in Krofofrom, Ghana (photograph by Carol Ventura, 2008).



Figure 7.66b Wax covered cores in Krofofrom, Ghana (photograph by Carol Ventura, 2009).

The wax model is dipped into a slurry of pulverized charcoal, clay, and water to preserve fine details. Several slurry-covered wax models are bundled together with a stronger charcoal mixture, then a wax rod is attached to each model to serve as a channel for the molten metal (Figure 7.66c). The bundle is covered with a mixture of clay, sand and banana stalk fiber. The wax is melted out of the mold, then the cavity is filled with

molten metal. Molds either incorporate a crucible of metal (Figure 7.66d) or molten metal is poured into hot molds (Figure 7.66f).



Figure 7.66c Wax covered with slurry in Krofofrom, Ghana (photographs by Carol Ventura, 2008).



Figure 7.66d Adding a crucible of metal to the mold in Krofofrom, Ghana (photograph by Carol Ventura, 2008).

The dry molds that include a crucible are placed (with the metal side down) into a kiln and covered charcoal. The wax burns out and the metal is heated to a liquid. After a few hours, the molds are removed, then turned over to so that the molten metal can flow into the cavity (Figure 7.66e).



Figure 7.66e Removing hot molds from the kiln in Krofofrom, Ghana (photograph by Carol Ventura, 2008).



Figure 7.66f Brass is poured into molds in Krofofrom, Ghana (photograph by Carol Ventura, 2008).

The mold is broken after it cools to reveal the metal casting (Figure 7.66h). Since metal takes the place of the wax in the mold, the finished casting duplicates the wax original. For more about Asanti casting, please look at https://www.carolventura.com/LostWaxCasting.htm .



Figure 7.66g Warm molds broken apart to reveal the casts in Krofofrom, Ghana (photograph by Carol Ventura, 2008).

Wood carving was originally a religious art in Cameroon. Carvers were held in high esteem and worked mostly for chiefs. Today both tourists and chiefs support woodcarvers.

In addition to traditional items like drums, masks, statues, house posts, doors, door frames, vessels, mortars, royal beds, thrones, and games, today carvers also produce figurines, wall plaques, and contemporary furniture. Items destined for tourists are usually not as fine as items crafted for a chief or his court. Many chiefs, however, to earn money for their people, are replacing old carvings with new ones. These Bamiléké, Tikar, and Bamoun antiquities can be found in museums and collections around the world. Some carvings, however, have been stolen and sold to collectors, which has caused quite a hardship on the people, since these special objects possess great power.



Figure 7.67…Fon's Palace, Tikar, Cameroon (photograph by Carol Ventura, 2001).

Traditional carvings are often covered with symbolic motifs that represent the strength, power, authority, wisdom, and leadership of the chief. Royal animals and insects include the powerful elephant, buffalo, leopard, lion, python, scorpion and large earth spider. This spider is also associated with divination because it is the mediator between the living and the dead, linking the spiritual world with the material world. Other animals associated with the chief are the peaceful donkey, the fertile and clever rabbit, the steadfast dove, the supernatural bat, the fertile and astute frog, the witch-defying lizard, the god-like chameleon, and the wise tortoise. Objects associated with the chief include wealth-related cowry shells (traditional money), victorious spearheads, and the unifying hunting net.

There are 3 types of masks in Africa: face masks, helmet masks, and masks that go on top of the head. Masks were often made for a special ceremony for a specific person that was a member of a specific group. Masks are sometimes used only one time, then discarded.

Division of labor is quite common in Western Cameroon; one person harvests the wood, another roughs out the form, a carver refines the details, a sander smooths the surface, a painter decorates it, then a merchant sells

the finished item. Sometimes one person may complete more than one of the steps.

The wood is usually carved while still green, although in some cases, it is dried before being worked. Soft, light-weight wood is preferred for masks, while hardwood is the material of choice for carved furniture.

Wood tones range from white to dark brown. Carvings were traditionally smoked and / or colored with red camwood or white chalk. Today paint and shoe-wax are used along with traditional colorants and soot.



Figure 7.68a Carving a wood panel with mallet and chisels in Foumban, Cameroon (photograph by Andrzej Gutek, 2001).



Figure 7.68b Sanding a carved wooden mask in Cameroon (photograph by Carol Ventura, 2001).

The Ga people in the seaside town of Teshie, near Ghana's capital of Accra, are known for their wooden coffins in shapes that relate to the deceased's status or profession; a camera for a photographer, a hen for a mother of many children, a book for a teacher, a truck for a driver, a hammer for a carpenter, etc. Some are specially commissioned by the family and others are prepared ahead of time and placed in a showroom to be purchased as needed (Figure 7.69a). Apprentices learn the craft as they help fill the orders.

The deceased is viewed in the open coffin during the wake, then the lid is closed and the coffin is carried on the shoulders of pallbearers to the cemetery for burial. https://www.carolventura.com/Coffins.htm



Figure 7.69a Coffins for sale at Daniel Oblie's (Ga) Hello Design Coffins in Teshie, Ghana (photograph by Carol Ventura, 2008).



Figure 7.69b Aojer Dani Klur (Ga) cuts soft Wawa (Obeche) wood by hand at the Kane Kwei workshop in Teshie, Ghana (photograph by Carol

Ventura, 2008).



Figure 7.69c Aojer Dani Klur (Ga) planes each piece of wood to fit the coffin he is making at the Kane Kwei workshop in Teshie, Ghana (photograph by Carol Ventura, 2008).



Figure 7.69d Aojer Dani Klur (Ga) checks the fit of the piece on the neck of a bottle-shaped coffin at the Kane Kwei workshop in Teshie, Ghana (photograph by Carol Ventura, 2008).



Figure 7.69e Aojer Dani Klur (Ga) applies glue before he nails the wood in place. A fish coffin in the background is almost finished at the Kane Kwei workshop in Teshie, Ghana (photograph by Carol Ventura, 2008).



Figure 7.69f While Aojer Dani Klur (Ga) nails the last piece in place, another apprentice smooths the surface with a plane at the Kane Kwei workshop in Teshie, Ghana (photograph by Carol Ventura, 2008).



Figure 7.69g After all the joints between the pieces of wood have been filled, the coffin is sprayed with several colors of oil-based paint at the Kane Kwei workshop in Teshie, Ghana (photograph by Carol Ventura, 2008).



Figure 7.69h This cocoa pod coffin is beautifully lined with cloth in at the Kane Kwei workshop in Teshie, Ghana (photograph by Carol Ventura, 2008).

The coffin in Figure 7.70 from the Kane Kwei workshop (Figures 7.69b – 7.69h) was not buried but lives in the de Young Museum in

California.



Figure 7.70 Seth Kane Kwei (Ga, 1922-1992), Cocoa Pod Coffin, painted wood and cloth, 34 x 102 x 29 in / 86.4 x 259.1 x 73.7 cm, ca. 1970 (de Young Museum, Gift of Vivian Burns, Inc.). https://www.famsf.org/artworks/coffin-in-the-shape-of-a-cocoa-pod

Kente cloth is worn by men and women in Ghana. Men wrap one large cloth around their body (Figure 7.71). Women wear 3 smaller matching cloths; one around the lower torso, another around the upper body, and a head wrap.



Figure 7.71 Kente Coth, cotton and silk, Asante, Ghana, 19th century (The Metropolitan Museum of Art, Purchase, Irene Lewisohn Bequest, 1972, CC0). https://www.metmuseum.org/art/collection/search/85576

Kente cloth (Figure 7.71) is handwoven with symbolic geometric motifs by Asanti and Ewe weavers in Ghana. Cloth strips are sewn together along the selvedges to form a large, rectangular fabric that is traditionally worn wrapped around the body. The length of the warp is determined by the size of the Kente cloth being constructed since the woven strip must be long enough to make the entire garment. The motifs are carefully planned and

measured to perfectly line up when the fabric is cut apart and sewn together to create the magnificent cloth.



Figure 7.72a Otumfuo Osei Tutu II, the Asantehene since 1999, wears gold jewelry and colorful kente during the Akwasidae at his palace in Kumasi (photograph by Carol Ventura, 2009).



Figure 7.72b Black and white kente worn by an Asanti chief at the Akwasidae Festival in Kumasi (photograph by Carol Ventura, 2009).

To measure the long warp, spools of thread are slipped onto a rack that enables multiple threads to be measured at the same time, then the warp is wound around metal stakes in the ground (Figure 7.72c). The crossed threads on the end aid in dressing the loom.



Figure 7.72c Steven Akwah (Ashanti) holds a creel in his left hand while crossing the threads around the end of a metal stake with his right hand to measure a kente warp in Adawomase, Ghana (photograph by Carol Ventura, 2009).

Harnesses with string **heddles** are made in Adawomase by wrapping nylon cord around a frame (Figure 7.72d). After wrapping, the tops and bottoms of the heddles are transferred to dowels.



Figure 7.72d Making string heddles in Adawomase, Ghana (photograph by Carol Ventura, 2009).

The warp is divided into groups; the crossed threads at the end of the warp keeps them in order. The warp is then threaded through the heddles (Figure 7.72e). Four threads are passed one at a time through the reed (Figure 7.72f), following the order of the heddles. The warp is then grouped and tied to a metal rod (Figure 7.72f) that will be tied to the cloth beam of the loom. https://www.carolventura.com/KenteAdawomase.htm



Figure 7.72e Kofi Eric (Asanti) sits on a curb while he threads heddles with warp in Adawomase, Ghana (photograph by Carol Ventura, 2009).



Figure 7.72f After threading the warp through the reed, Ofori A. Isaac (Asanti) ties bundles of warp around the metal rod that will be tied to the warp beam of the loom (under his feet) in Adawomase, Ghana (photograph by Carol Ventura, 2009).

Carved wood pulleys support two sets of heddles; one pair for plain weaving, the other for weaving the weft-faced pattern. The weaver's toes pull down the suspended heddles to change the sheds (Figure 7.72g). Red, green and yellow wefts rest on the left side of the loom, waiting to become part of a warp of the same hues that features Asanti and the Ghanaian flag colors. The bundled end of the warp is tied to a weighted sled (out of the picture).



Figure 7.72g Kyere Bado (Asanti) inserts weft in Bonwire, Ghana (photograph by Carol Ventura, 2009).



Figure 7.72h Kyere Bado (Asanti) adjusts the weft in Bonwire, Ghana (photograph by Carol Ventura, 2009).

Ewe weavers in Denu, Ghana, dip their cotton warp and weft in cassava starch to make them stronger so that they do not break while weaving. https://www.carolventura.com/KenteEwe.htm



Figure 7.72i Kwami Hgbemehia's (Ewe) weaves a kente strip with an umbrella motif (Figure 7.74g) in Denu, Ghana (photograph by Carol Ventura, 2008).



Figure 7.72j Kwami Hgbemehia's (Ewe) inserts the **supplementary** weft of the motif while holding the ground cloth weft shuttle in Denu, Ghana (photograph by Carol Ventura, 2008).

For the motifs to line up correctly on the finished cloth, they need to be the correct size, so the motifs are measured as the weaving progresses (Figure 7.72k).



Figure 7.72k Kwami Hgbemehia's (Ewe) measures the chicken motif with a notched stick in Denu, Ghana (photographs by Carol Ventura, 2008).

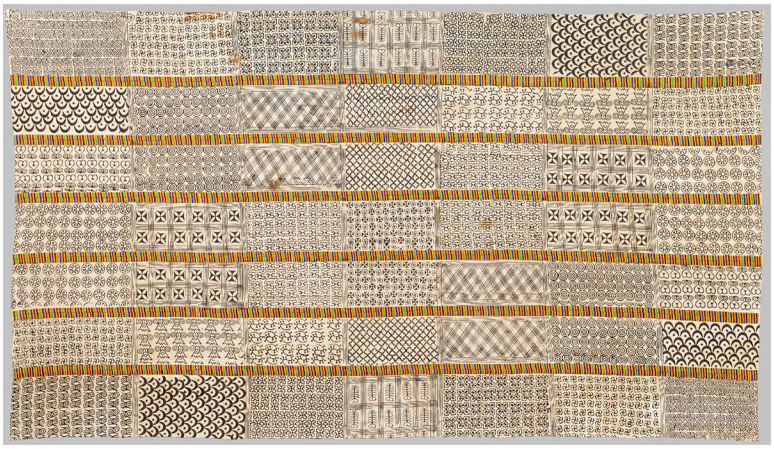


Figure 7.73 Man's **Adinkra** Cloth Wrapper, cotton and rayon, 152 x 85 in / 386.1 x 215.9 cm, Asante, mid to late 20th century (St. Louis Art Museum, Missouri, Funds given by the Honorable Carol E. Jackson, The Honorable and Mrs. Charles A. Shaw, and Donald M. Suggs).
https://www.slam.org/collection/objects/29199/

Adinkra means “good bye” and at one time the black cloth was just worn during funeral ceremonies. Handwoven cloth and printed has now been replaced by colorful manufactured fabric joined together either by hand (Figure 7.74a) or machine to form large rectangular fabrics that are worn wrapped around the body on more festive occasions.



Figure 7.74a Sewing together pieces of cloth with decorative stitches in Ntonso, Ghana (photograph by Carol Ventura, 2009).

Carved gourd stamps (Figures 7.74b and 7.74c) are still used to transfer symbolic geometric designs onto adinkra cloth, but screen printing is gaining in popularity (Figure 7.74e). Stamps are made with thick-skinned calabash softened with shea butter. The outer skin is scraped with a knife, the pattern is drawn with a pencil, then the background is gouged out (Figure 7.74b). More than seventy different symbols are used, each of which represents a proverb, belief, or philosophy.
https://www.carolventura.com/Adinkra.htm



Figure 7.74b Paul Nyamaah Boakye (Asanti) carves adinkra stamps in Ntonso, Ghana (photograph by Carol Ventura, 2008).



Figure 7.74c Paul Nyamaah Boakye (Asanti), adinkra stamps, Ntonso, Ghana (photograph by Carol Ventura, 2008).

To make adinkra aduro medium (colorant), the bark and roots of the Badie (Adansonia digitata) tree are harvested, the outer layer is cut away, then the inner bark is broken into pieces and soaked overnight in water. It is then pounded with a wooden mortar, boiled in water for several hours, strained, then boiled again.

The cloth is laid onto foam rubber resting on boards. A comb dipped into adinkra duro is pulled across stretch cloth delineate the sections to be printed with specially selected stamps (Figure 7.74d). Each section is printed with the same design.



Figure 7.74d Nana Yaw Boakye (Asanti) and his son, Gabriel, print a cloth with adinkra aduro as Gabriel's son observes. This is how many people learn their craft. They are exposed to it at an early age, carefully observing every step until they are allowed to help, in Ntonso, Ghana (photograph by Carol Ventura, 2008).



Figure 7.74e Opanin Yaw Boakye Junior screen prints adinkra inspired designs onto cloth with water based fabric paint in Ntonso, Ghana (photograph by Carol Ventura, 2008).



Figure 7.74f Dignitaries wearing yellow screen printed Adinkra and manufactured fabrics wait to pay respect to Asantehene Otumfuo Osei Tutu II during the Akwasidae in Kumasi (photograph by Carol Ventura, 2009).

The beaded stool in Figure 7.75 was owned by the king of Bandjoun, in Cameroon, West Africa. This type of portable stool was carried to ceremonies and meetings for personal use. It was carved from one piece of wood, then covered with cloth and beaded. Many people owned stools, but only high-ranking individuals could own a beaded stool that included such a powerful animal. Symbols on clothing, furniture, and other items often indicate the purpose of the object and the status of the owner.



Figure 7.75 Leopard Travel Stool, wood, cotton, plant fiber, **glass** beads, indigo, 20 1/16 x 14 15/16 x 16 15/16 in / 51 x 38 x 43 cm, Bamileke, Bandjoun Kingdom, Cameroon, 19th century (Cleveland Museum of Art). https://www.clevelandart.org/art/2006.138

Gourds, jewelry, wooden stools (Figures 7.75), sculptures, flywhisks, toys, baskets, and sculptures are some of the items covered with beads in Western Cameroon. Cloth is sewn to the surface of the object to be beaded, then beads are sewn onto the cloth, several at a time (Figure 7.76).



Figure 7.76 In Foumban, Cameroon, a Bamileke beadworker coaxes six to eight glass beads onto a heavy thread with the tip of a circular needle. The beads are then attached to the burlap that covers a wooden stool with one long stitch (photograph by Carol Ventura, 2001).

Bold Text Glossary

Adinkra – Cloth from Ghana hand-printed with symbolic motifs.
Adire – Yoruba cloth that is resist-dyed in indigo from Nigeria.
Agave / Maguey / Sisal – Bast fiber extracted from the pointed leaves of large succulents native to the Americas.
Albarello – Cylindrical ceramic jar used to store drugs and medicinal ingredients.
Alloy – Two or more metals mixed together while molten.
Amate / Bark "Paper" – Paper-like material made in Mexico by macerating, cooking, then beating the inner bark of certain trees.
Amphora – Double-handled ceramic vessel used to store wine and oil.
Annealer – A kiln used to slowly cool glass.
Anneal (glass) – To cool finished hot-worked glass slowly in a kiln so that the thick and thin parts cool at the same rate to prevent stresses within the glass.
Anneal (metal) – Metal is heated, then cooled to make it more pliable.
Anvil / Stake – A tool used to support metal during raising. Usually made of hard steel, stakes come in a variety of shapes and sizes.
Art Glass – Glass that is decorative and often functional.
Asymmetrical / Persian Knot – Used to create pile in rugs. The right and left sides of the knot are not the same.
Attica / Attic – The region around Athens, Greece.
Backstrap Loom –Warp is tensioned between a stationary object and the weaver's body on this loom.
Barkcloth / Tapa – Fabric made by pounding the inner bark of suitable vines, shrubs, and trees to the desired width and length.
Basse-Taille Enamel – French for "shallow cut." Low relief on metal covered with translucent glass enamel.
Bast – Fiber extracted from the stem of a plant or the inner bark of a tree.
Batik – Wax resist is applied to select areas, then removed after the fabric has been dyed.
Bentwood Lamination – Thin strips of wood are glued, joined together, then clamped to a curved form to produce a strong, curvilinear piece.
Bezel – Rim that holds a cabochon or other media in place.

Bisque / Biscuit – Fired unglazed ceramic that is durable, but absorbent enough for glaze application.
Bit Work – Molten glass sculpted and/or added to other hot glass.
Black Figure – Greek Archaic and Classical terracotta ware that features large black figures on a red background.
Blacksmith – A metalsmith who forges and shapes hot iron and steel.
Blowpipe – Hollow metal tube used for blowing air.
Bobbin Lace – Threads wound around bobbins are moved back and forth around pins (stuck into a pattern mounted on a pillow) to form an open fabric.
Bombé – The "blown out" shape of 17th century French Louis XIV Rococo style furniture.
Bone China – A type of white, translucent porcelain containing a high percentage of bone ash.
Boulle Work – Sixteenth, seventeenth, and eighteenth-century marquetry technique using metal (often brass or pewter), wood veneer, and/or tortoise shell; perfected by André-Charles Boulle (1642-1732), the French cabinetmaker of Louis XIV.
Box Joint – Two pieces joined together with interlocking "fingers" cut at right angles.
Bow Drill – A drilling tool consisting of a bow and string.
Brass – An alloy of copper and zinc, sometimes with other trace elements.
Brooch – A woman's ornament worn pinned to clothing at or near her neck.
Brocade – Cloth with decorative discontinuous supplementary weft. The extra weft is inserted into part of the textile as it is woven.
Bronze – An alloy of around 9 parts copper and 1 part tin, sometimes with other trace elements. Bronze is harder than copper and melts at 1742°F / 950°C, a lower temperature than copper.
Burnish – To rub the surface with a hard, smooth object.
Butt Joint – Two pieces joined together along their edges either on the same plane or at a right angle.
Cabochon – Semiprecious stone with a curved, convex face and flat back.
Cage Cup – Roman glass vessel that incorporates an intricately carved free-standing outer layer of glass.
Camelid – Fiber from alpaca, llama, and vicuña used to produce fabrics.

Cameo – Stone, shell, glass, or ceramic with multicolored layers whose top has been selectively removed to create a relief that contrasts in color with the background.

Canting – Batik tool used to draw lines and dots of molten wax resist onto fabric.

Cap – Copper block batik tool used to apply patterns of molten wax resist onto fabric.

Carcass – The framework of a piece of furniture.

Card Weaving / Tablet Weaving – Individual warp threads are inserted into holes punched into the corners of sturdy cards. The warp is tensioned, then one or more cards are turned to produce the various sheds for the weft to pass through to weave narrow bands of patterned warp faced fabric.

Carnelian – A brownish-red semi-precious stone.

Cartoon – A full-scale preparatory drawing.

Carve – Cutting into a surface to create a pattern.

Cased glass – Glass composed of differently colored glass layers fused together with heat.

Cassapanca – Long wooden Italian bench with a back, sides, and hinged seat that opens for storage, popular during the Renaissance.

Cassone – Carved wooden Italian marriage chest with a hinged lid, popular during the Renaissance.

Casting – The process of filling a hollow mold with molten or flexible media. Once the medium solidifies, the mold is removed to produce the product, called a cast.

Celadon – Greenish high fired stoneware and porcelain glaze of Chinese origin.

Ceramic / Pottery – Clay that has been fired to maturity.

Ceramist / Potter – A person who makes functional and/or non-functional objects with clay.

Champlevé Enamel –French for “to gouge out,” recesses in metal filled with opaque or translucent glass enamel.

Chasing – Hammering metal punches into the front side of metal to create or refine textured decorations. Often used in conjunction with repoussé to create a relief.

Chasuble – An ornate sleeveless outer vestment worn by some Christian priests when celebrating Mass.

China Clay / Kaolin – White firing clay that is the essential ingredient of hard paste porcelain.

China Paint / Enamel – A colorful low fired overglaze.

Chiton – A loosely fitting rectangular linen garment worn in ancient times by Greek men and women.

Chintz – Cotton cloth printed or painted with floral patterns in India.

Cloisonné Enamel – Cloison is French for "cell." Compartments formed by thin metal bands on a metal base filled with opaque or translucent glass enamel. The exposed tops of the bands add a linear element to the design.

Coil Building (clay) – Clay is squeezed and rolled into long, slender cylinders that are joined together in a spiral, then the joints are smoothed over.

Coil Building (basketry) – A flexible material is wrapped around a core and connected to its neighbor to form a spiraling structure.

Colloidal Fusion Welding / Colloidal Hard Soldering – A mixture of an organic binder (like tragacanth gum) and copper salts is painted where two pieces of metal meet. The piece is then heated to 1634°F / 890°C in a reducing atmosphere, which allows the copper to diffuse into both pieces at the point of contact. No solder is used, so "Colloidal Fusion Welding" is the correct term.

Combing – Manipulating bands of color on the surface of clay or glass with a pointed tool.

Compound Weave – Has more than one set of warp and weft elements, manipulated individually for weaving a patterned textile.

Copper – A reddish-brown colored metal that melts at (1984°F / 1085°C).

Core-Formed Glass – A mixture of clay, sand, and dung was shaped and attached to the end of a metal rod. The dry core was heated, coated with glass, then shaped by rolling on a smooth hard surface. After reheating, it was wrapped with strands of different colored hot glass, the rod and core were removed, then the glass was slowly cooled to produce a small striped vessel.

Cotton – Seed fiber of several *Gossypium* plants grown in shades of white, brown, and green.

Coverlet – Bedcover woven with a loom-controlled pattern.

Crochet – French for "hook." Interlooped fabric made with a hand-held hook.

Damascene – Soft metal inlaid with pressure into hard metal – usually gold, silver, brass, or copper forced into engraved depressions in steel, bronze, or nickel.

Damascus Steel / Wootz – Flattened iron is heated, folded, and forge-welded many times until hundreds of layers are formed. Carbon absorbed while heating converts the metal to wrought iron.

Damask – A monochrome reversible patterned textile made by weaving a single warp and weft together, using warp face and weft face satin weaves to create the figure and ground.

Depletion Gilding and Silvering – An alloy of copper and gold or silver is bathed in acid to dissolve the copper on the surface, leaving an almost pure layer of gold or silver.

Diamond Point Engraving – Diamond tipped tool used to scratch decorations on the surface of glass.

Die – A mold made of metal, wood, or stone.

Die Forming – Method of shaping metal, plastic or other material into a relief by pressing it into a concave die or between a pair of convex and concave dies.

Ding - Container for cooking, serving and storing food items. When made of clay, they were used for daily cooking, serving, and storing food. Cast bronze dings (Figure 5.1) were used during elite feasting and ceremonies.

Discontinuous Weft – Does not extend across the textile from selvage to selvage.

Dovetail Joint – Two pieces joined together with interlocking "fingers" cut at slight angles.

Drawloom – A loom with harnesses to weave the ground and individual heddles that are raised by draw boy (assistant) to produce a textile with complex imagery.

Dye – Soluble natural or synthetic colorant that soaks into fiber.

Earthenware – Clay that matures at temperatures below 2100°F / 1150°C. This low fired porous ceramic is often glazed to make it more watertight.

Ebony – Very hard, black or extremely dark colored fine-grained wood.

Egyptian Paste / Egyptian Faience – Mixture of ground quartz or sand and natron (a naturally occurring mixture of sodium carbonate and sodium bicarbonate found on dried-out salt lakes in the Nile Delta) that is mixed, molded, dried, and fired. At around 1600°F / 870°C, some of the carbonate migrates to the surface and forms a glaze. Copper, manganese, or iron oxides are added to produce blue or black. It is sometimes used to glaze stone.

Electroforming – Electrodes are attached to source metal and an object (coated with a metallic surface) in the same electrolytic bath, then a low-voltage current dissolves the source metal to deposit a thick layer on the other piece.

Electroplating – Electrodes are attached to source metal and an object (coated with a metallic surface) in the same electrolytic bath, then a low-voltage current dissolves the source metal to deposit a thin layer on the other piece.

Electrum – Naturally occurring alloy of gold and silver.

Embossing – A soft sheet of metal is placed onto leather (or another yielding surface) or over a mold, then the metal is rubbed with a tool to create a raised line or shape on the other side.

Embroidery – Decorative stitches usually applied to fabric with a threaded needle.

Enamel – Glass fused to the surface of glass or metal with heat.

Enamel / China Paint – In ceramics, it is a colorful overglaze that matures at a relatively low temperature.

Engobe – A clay slip that may be applied before or after bisque firing.

Engrave – To remove part of a surface with a sharp tool or rotating abrasive disk.

Etch – To remove part of a surface with acid.

Ewer - A vessel to hold and pour a liquid, like water or wine.

Fabric – From the Latin word, “fabricare”, to fabricate. Many construction techniques can produce fabric, including bobbin lace, crochet, knitting, needle lace, weaving, etc.

False-Filigree - Thin wax threads are used to create a piece that is transformed into metal through the lost-wax process. These cast

pieces are often confused with the fine soldered wirework of true filigree.

Faience (vitreous) – Crushed quartz core covered with ceramic glaze.

Fiber – Plant, animal, or synthetic material capable of being spun into thread or yarn.

Fibula / Fibulae – A decorative Roman or Medieval pin (like a large safety pin) used to fasten clothing.

Filigree – Open or backed delicate pattern made with fine metal wires.

Firing / Fire – Heating clay until it matures and transforms into a hard ceramic.

Fire Gilding / Mercury Gilding – Technique used to deposit a thin layer of gold or silver on the surface of another metal. A mixture of mercury and gold or silver was applied then heated until the mercury evaporated, leaving only the precious metal.

Flamework / Lampwork – Glass worked with a torch.

Flashed Glass – A clear or tinted piece of glass fused to one or more thin layers of colored glass.

Flax – The stem of this plant is processed to produce fiber to make linen.

Float – A warp or weft thread that passes unbound over or under two or more of the opposite elements.

Flux (clay and glass) – Ingredient that lowers the melting temperature.

Flux (metal) – Applied to metal components to be joined together to prevent oxidation during fusing, soldering, and welding. Clean surfaces are essential during these processes. Different fluxes are used with different metals.

Foot Loom / Treadle Loom – Foot-operated harnesses control the warp while weaving a textile.

Forge – A blacksmith's workshop. A furnace used to heat metal with solid or gas fuel.

Forge Welding – Hammering together two or more fluxed pieces of metal heated to just below the melting temperature.

Forging / Forged – Forming or shaping cold or hot metal by placing it against a hard surface, then stretching or compressing it with a hammer or press.

Furnace – An oven / kiln that can achieve the high temperatures needed to melt glass or metal.

Fuse / Fusing (glass and metal) – Two or more materials joined together or melted together with heat.

Gaffer – The glassblower who does the most critical steps when working glass on a blowpipe or pontil.

Gather – In glassblowing, the blob of molten glass on the end of the pipe.

Ghiordes / Turkish / Symmetrical Knot– Used to create pile in rugs; the right and left sides of the knot are the same.

Gilding / Gilded – Applying a very thin layer of gold or silver to the surface of an object. Techniques vary, according to the medium (see Depletion Gilding, Leaf, Luster, and Mercury Gilding).

Glass – Made by melting together silica (sand or crushed quartz), flux (soda ash), and a stabilizer (lime) at temperatures around 2400°F / 1316°C. It is worked cold (room temperature), warm (around 1251°F / 677°C), and hot (2000°F / 1093°C).

Glassblowing – Air is blown through the mouthpiece of a hollow metal blowpipe to inflate a bubble of molten glass on the other end.

Glass Cane – A slender rod of glass.

Glaze – A glassy mixture applied to the surface of clay, then fired. Various ingredients determine the color and melting temperature and whether it will be glossy, matte, or clear.

Gold – A lustrous yellow metal that does not easily corrode. Pure gold is expensive and soft, so it is often mixed with another metal to make it less expensive and more durable. The final color of the alloy depends on the type and quantity of metal added; the most popular being yellow, white, pink, and green.

Granulation – A small piece of gold or silver is heated until it melts and forms a ball, then it is cooled. Multiple balls are arranged in a decorative pattern on another piece of metal, then heated to fuse them to the surface without solder.

Greenware – Dry clay object before it has been fired.

Handbuilding – Forming clay by hand without the use of a potter's wheel.

Hard-Paste – European term for true porcelain.

Harness / Shaft – A frame that holds a group of heddles on a loom.

Heddle – A warp thread is held by a heddle on a loom. Heddles are moved up and down to weave cloth.

High Fired – Kiln temperatures between 2192°F / 1200°C and 2552°F / 1400°C used to mature stoneware and porcelain.

Huipil – A traditional blouse worn by Indigenous women in Guatemala and Mexico made with one or more pieces of fabric joined together into a rectangular shape then folded in half with a head opening in the center. The sides are usually sewn together, leaving openings for the arms.

Hydria – A three-handled Greek vessel used to hold water.

Ikat / Kasuri / Jaspe – Sections of warp and/or weft are wrapped to resist dye. The wrapping is removed after the thread has been dyed, then the threads are woven to produce a patterned cloth.

Interlace – Decorative, intertwined linear elements.

Intarsia / Inlay – From Italian for inlay, "intarsiare", some of the surface is removed, then filled with decorative stone, wood, ivory, metal, shell, etc.

Iron – A gray hard metal that turns melts at 2800°F / 1538°C.

"Istoriato" – The Italian word for "history", features colorful figurative scenes painted with glaze onto 16th century Italian ceramics.

Ivory – From animal teeth and tusks; elephant ivory being the most common.

Jacquard Loom – Invented by Jacquard in 1804, a mechanized loom with ground cloth harnesses and punched cards that control individual warp heddles for producing textiles with complex imagery.

Kaolin / China Clay – Essential high fire clay ingredient of porcelain.

Kente – Strip cloth woven in Ghana.

Kilim / Kelim – A sturdy weft faced slit tapestry woven from Eastern Europe.

Kiln – An insulated chamber that is heated to fire clay or to fuse, slump, or cast glass.

Kline – Greek and Roman reclining couch or bed.

Klismos – A curvy wooden chair that developed in 5th century Greece; the back and front legs curve in the opposite direction.

Knit – Interlooped fabric made with a pair of hand-held knitting needles or a knitting machine.

Krater / Crater – Large Greek and Roman ceramic bowl, often with a tall foot.

Lamination – Several thin layers joined together.

Lampas – A double layered cloth with a reversible pattern that was first woven in 11th century Iran on a drawloom with two sets of warp and weft; each set of warp and weft of the same color.

Lampwork / Flamework – Glass worked with a torch.

Lapidary – Cutting and polishing precious and semi-precious stones.

Lapis Lazuli – A blue semi-precious stone mined in Afghanistan for more than eight thousand years.

Lathe – Machine that rotates a workpiece on a horizontal axis.

Leaded Glass – Clear pieces of flat glass held together with strips of lead.

Leaf – A very thin piece of metal.

Leather Hard – Clay that is dry enough to be stiff, but damp enough to work.

Lekythos – Slender Greek ceramic vessel used to hold oils and perfumes.

Linen – Fiber and fabric made from flax.

Loom – Weaving device that holds warp in sequence and under tension so that weft may be inserted to produce a textile.

Looping – A strand is crossed over itself, leaving an opening for the free end and full length to pass through.

Lost-Wax Casting – A wax model is covered with plaster or clay to create a mold. The mold is heated to melt out the wax, molten metal or glass is poured or melted into the cavity, then the mold is removed to reveal the casting.

Low Fired – Kiln temperature below 2100°F / 1150°C used to mature earthenware and overglaze.

Luster – Metal oxides painted onto the surface of cold glass or clay, then fired to create a metallic appearance.

Maiolica / Majolica / Faience – Earthenware with bright colors over a white tin-based opaque glaze; originally made to imitate porcelain.

Marquetry – Geometric patterns or pictorial compositions created with contrasting colors of veneer or other thin media fitted together and glued to the surface of a support.

Medium / Media (plural) – Raw material.

Mercury Gilding / Fire Gilding – Mercury is mixed with gold, then applied to the surface of a piece to be gilded. The object is heated to evaporate the mercury, leaving a thin layer of gold.

Mesoamerica – Geographical area bounded by Central Mexico in the north and Honduras and El Salvador in the south that was home to many Pre-Columbian people (including the Maya and Aztec) that shared cultural traits.

Mesopotamia – The valley between the Tigris and Euphrates rivers corresponding to modern-day Iraq, southwestern Iran, Kuwait, northeast Syria and southeastern Turkey.

Miter / Mitre – Joint formed by abutting two 45 degree-angled surfaces at right angles.

Mokumé Gane – Japanese metalworking technique; alternating layers of non-ferrous metals are forge-welded, then manipulated to create patterns.

Mold – Negative impression that is used to replicate a positive three-dimensional form.

Mold-Blown Glass – Molten glass on a blowpipe is inserted into a mold, then inflated.

Mordant – French for "to bite," it is used to fix dye to fabric. Mordants help dyes "bite" into cloth to keep the colors from washing out.

Mortise and Tenon Joint – Formed with a tongue (tenon) inserted into a hole of the same shape (mortise).

Mosaic Glass / Millefiori – Italian for "thousand flowers," murrini or slices of a multicolored bundle of fused glass are placed closely together, then fused with heat to form a single piece.

Murrini – Small colorful glass cylinders and cubes made by cutting cross-sections of cane.

Needle Lace – Made by stitching with a needle and thread over a pattern.

Niello – Black inlay on metal made by filling depressions on metal with a mixture of ground silver, lead, copper, and sulphur. It is fused to the surface with heat, cooled, then polished.

Overglaze / Enamel – A colorful glaze that cannot be high fired is applied to the surface of a ceramic piece that has already been glazed and fired. The piece is then fired at a low temperature.

Oxidation – Firing with an oxygen-rich atmosphere.

Paper – Made with macerated pulp mixed with water, strained, and dried.
Papyrus – Laminated fabric made by slicing papyrus reed into strips, then aligning, layering, and pounding them together.
Parquetry / Parquet – Pieces of wood arranged in repeating geometric patterns on furniture or floors.
Pâte de Verre – French for "glass paste," it is produced by pressing a mixture of glass granules, a binder and flux into a mold. The filled mold is left to dry, fused with heat, cooled, then cleaned.
Patina – Coloration that forms on a surface as it reacts to environmental elements.
Pectoral – A large ornament worn on the chest.
Penannular Brooch – Used to fasten clothing, it consists of a long sliding pin attached to a C-shaped metal ring.
Peplos – A long, rectangular woolen garment folded at the top and gathered at the waist, worn by Greek women.
Pigment – Insoluble coloring agent that adheres to the surface.
Pile – Decorative loops or tufts formed by hand-knotting or with supplementary warp that protrude above the surface of a textile.
Pithos / Pithoi (plural) – Large Minoan ceramic storage vessel(s).
Plain Weave / Tabby – A balanced weave made by passing a single weft over one then under one warp, reversing the sequence in each row. Both the warp and weft are visible on the finished cloth.
Plaiting – Diagonal interlacing of two or more elements, often used to produce baskets and fabrics.
Ply – Number of spun fibers twisted together.
Porcelain / Hard Paste – Ceramic developed in China that becomes vitreous, nonporous, white, and translucent when fired to between 2192°F / 1200°C and 2552°F / 1400°C.
Potter's Wheel – A disk on a vertical rotating shaft that enables a potter to form a cylindrical clay object with both hands.
Potter / Ceramist – A person who uses clay to make functional or non-functional objects.
Pottery / Ceramic – Clay that has been fired to maturity.
Press Molding Clay – Soft clay is pressed into a decorative mold.
Press Molding / Pressed Glass – Molten glass is poured into a patterned metal mold, followed by a plunger, to quickly forms a decorative

glass object.

Punty / Pontil – Solid metal rod that supports the bottom of a molten glass piece after it has been removed from the blowpipe.

Quilt – A top fabric composed of many pieces is sewn to a backing fabric, usually with a layer of batting in between. Decorative stitches secure the layers.

Raising – A technique that transforms a flat sheet of metal into a three-dimensional form by hammering the surface into a hollow form or against an anvil or stake.

Raku – Originally a Japanese firing method; red-hot glazed ceramics are removed from the kiln and cooled quickly.

Red Figure Ware – Greek Classical Period terracotta that features large red figures on a black background.

Reduction – Firing with an oxygen-starved atmosphere.

Reliquary – Container for a relic.

Repoussé – Hammering or pressing into the reverse side of metal to shape the form or to raise the surface on the front. Often followed by chasing to refine the details. From the French word, "repousser", which means, "to push back."

Resist – Applied to a surface before glazing, printing, or dying to prevent absorption in the covered area.

Rhyton – Cylindrical drinking vessel that usually includes a sculpted head on the bottom.

Saggar – Ceramic container used to protect delicate clays and glazes in a kiln during firing.

Sagging / Slumping – Glass is placed over a mold in a kiln, then heated until the glass is flexible enough to collapse into / onto the mold.

Salt Glaze – Sodium chloride introduced into the kiln at its maximum temperature vaporizes and combines with silica on the surface of high fired clay to form a textured glaze.

Sandblasting – Sand is forcibly sprayed onto a surface to remove the outer layer.

Sarong – Traditional cloth worn wrapped around the lower body of Malay men and women.

Satin – Smooth, glossy textile with intermittent warp floats on one side and weft floats on the other side.

Sgraffito / Scraffito – From Italian “graffiare” (to scratch); a sharp tool cuts through an unfired layer of slip or glaze to reveal the contrasting clay below.

Selvedge / Selvage –Finished edge of a textile where the warp or weft turns around.

Shard / Sherd – A broken piece of fired clay.

Shed – Temporary opening created by raising or lowering select portions of warp for passage of the weft while weaving on a loom.

Shibori – Japanese resist dye technique for cloth using stitches, gathering, folding, binding, and/or twisting.

Shuttle – Holds the weft and passes it through the shed during weaving.

Silk – Strong protein filament produced by a silkworm while making its cocoon used to produce fabrics.

Silver – A lustrous white metal that tarnishes to black. Fine silver is 99.9% silver, but too soft for most applications. Sterling silver is alloyed with 7.5% copper to make it stronger.

Slab Building – Clay is rolled into a flat slab, cut, then joined together while still soft or leather hard.

Slag – A glass-like by-product of smelting.

Slip – Fine clay suspended in water, sometimes colored, used for mold casting, for joining together pieces of clay, or for decorating damp clay surfaces.

Slow Wheel – Base with a moveable disk on top that is rotated by hand; used by a potter to produce symmetrical clay vessels. A stone example from Mesopotamia (dating to 3500 BCE) has a central shaft on the bottom that fits into a hole in the base. Another type, consisting of two convex ceramic disks placed curve to curve, is utilized in Coyotepec, Mexico, to make earthenware vessels.

Slumping / Sagging – Glass is placed over a mold in a kiln, then heated until the glass is flexible enough to collapse into / onto the mold.

Smelting – Extracting metal from ore in a furnace.

Soda Glaze – Sodium carbonate and water mixture sprayed into the hot kiln at the end of the firing vaporizes and combines with silica on the clay surface to form a glaze.

Soft Paste Porcelain – Low fired European white translucent ware made to imitate porcelain.

Solder – An alloy used to join hot metal together. Solder melts at a lower temperature than the metals it is uniting.

Songket –**Brocade fabric hand woven in Indonesia (and some neighboring countries) with real or synthetic gold and silver threads on a silk, rayon, or cotton base cloth**.

Spindle (fiber)– A notched shaft with a weight towards one end that is rotated to twist loose fiber, transforming it into yarn or thread. A drop spindle spins freely in the air.

Spindle Whorl – The circular weight placed towards the bottom of a spindle to help maintain momentum and keep the spun yarn from sliding off the bottom.

Spinning (fiber) – The process of twisting loose fibers together to produce a continuous strand.

Sprang – Warp is fixed at both ends and crossed over one another, twisting the top and bottom elements then securing the central part.

Sprig Mold – Mold made of fired clay, plaster, or other material, with a decorative concave surface. Damp clay is pressed into the mold then removed and attached to leather hard clay.

Stained Glass – Colored and painted window glass held together with strips of metal.

Stake / Anvil – A tool used to support metal during raising. Usually made of hard steel, stakes come in a variety of shapes and sizes.

Stamping – A patterned punch or stamp is hammered into a surface to impress or print a decoration.

Steel – A gray-colored alloy of iron, carbon, and other elements.

Stippling – A pattern of dots that forms a picture.

Stoneware – Ceramic that developed in China that becomes vitreous, nonporous, and stone-like when fired between 2192°F / 1200°C and 2372°F / 1300°C in a kiln.

Supplementary Warp / Supplementary Weft – Non-structural warp or weft used to embellishment a textile during the weaving process. If this extra warp / weft is removed, the ground cloth is still intact.

Symmetrical / Ghiordes / Turkish Knot – Used to create pile in rugs; the right and left sides of the knot are the same.

Tabby / Plain Weave – Textile with a single weft passing over a single warp then under a single warp, reversing the sequence with each pass of the

weft.

Tablet Weaving / Card Weaving – Individual warp threads are inserted into holes punched into the corners of sturdy cards. The warp is tensioned, then one or more cards are turned to produce the various sheds for the weft to pass through to create warp faced fabric.

Tapestry – Patterned textile of weft faced tabby or twill weave with multiple colors of discontinuous wefts.

Tapa / Barkcloth – Fabric made by pounding the inner bark of suitable vines, shrubs, and trees to the desired width and length.

Terracotta – Latin for "baked earth" so it is both the raw clay and fired clay. A type of porous earthenware that matures around 1000°F / 538°C. The high iron content lowers the melting temperature and colors the body red orange to brown.

Terra Sigillata – Glossy terracotta ceramic made by applying highly refined slip, then burnishing and polishing the slipped surface before firing.

Textile – From the Latin word, "texere", to weave, it specifically refers to cloth that has been woven on a loom. Although all textiles are fabrics, the reverse is not true.

Throwing – Clay is centered on the head of a spinning potter's wheel, then formed by hand.

Torc – A metal neck ring with a front opening worn by high ranking tribal men in Europe from the 8th century BCE through the 3rd century CE.

Treadle Loom / Foot Loom – Foot-operated harnesses / shafts control the warp while weaving a textile.

Turkish / Ghiordes / Symmetrical Knot– Used to create pile in rugs; the right and left sides of the knot are the same.

Twill Weave – Textile with diagonally aligned floats, formed by passing the weft over two or more warp elements, then under one or more warp elements in sequence, moving over one or more warp elements with each pass.

Twining – Two or more wefts pass in front and behind warp and then twist together between the warp to produce a basket or fabric.

Underglaze – Colorful oxides applied to clay, then covered with a transparent glaze.

Velvet – As it is being woven, wires are inserted into the open shed to form loops of supplementary warp over all or part of the surface of a fabric. Cut velvet is produced by cutting the loops before removing the wire.

Veneer – Thin slices of decorative wood glued to the surface of less expensive, more stable wood.

Vitrify – Transform into glass.

Vitreous – Glass like and not porous.

Volute – A spiral or "S" curved ornament.

Wabi-Sabi – Japanese aesthetic of imperfection.

Warp – Lengthwise elements held in tension on a loom.

Warp Faced – Warp placed close together to mostly or completely cover the weft of the textile.

Washi – Hand-made Japanese paper.

Wax resist –a protective layer of wax is applied to protect a cloth, ceramic, or other material, from being dyed, glazed, or painted. The original surface is revealed when the wax is removed.

Weaving – Interlacing warp and weft elements at right angles to each other to produce a textile.

Wedging Clay – Kneading or pounding clay until it has a uniform consistency and air pockets have been removed.

Weft – Crosswise elements inserted over and under the warp to produce a textile.

Weft Faced – Weft placed close together to mostly or completely cover the warp of the textile.

Woodturning – Cutting wood on a horizontal axis while it is spinning on a lathe.

Wool – Protein fiber shorn from sheep used to produce fabrics.

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Professor Carol Ventura taught the Paleolithic through twenty-first century art surveys, Mesoamerican art, and craft history at Tennessee Technological University until her retirement in 2021.

In addition to a PhD in Art, she has an MA in Ceramics and an MFA in Printmaking, Papermaking and Book Arts. Her award-winning ceramics, fiber art, glass, jewelry, and photographs have been included in more than a hundred invitational and juried exhibitions. Carol has also taught batik, ceramics, photography, printmaking, silversmithing, cloisonné enameling and weaving on the college level. Her studio background adds an extra dimension to her teaching and writing because she understands how crafts and art are made and includes that information in her classes and publications.

Carol worked with a weaving cooperative in Guatemala as a Peace Corps volunteer from 1976-80. She later wrote *Maya Hair Sashes Backstrap Woven in Jacaltenango/Cintas mayas tejidas con el telar de cintura en Jacaltenango*, Guatemala, a bilingual book based on her dissertation. Carol also authored three books about tapestry crochet, a craft she learned while in Guatemala.

Carol has interviewed and photographed craftspeople around the world – some of which are included in this book. More may be found on web pages linked to her home page at https://www.carolventura.com/. She has presented papers at international conferences, including the 47th International Congress of Americanists, The 6th Annual Conference on Textiles, The Handweavers Guild of America International Conference, and the College Art Association.

Her numerous scholarly papers and articles have been included in both refereed journals and the popular press, including the *Berg Encyclopedia of World Dress and Fashion*, *Bloomsbury Encyclopedia of World Textiles, Testimony of Images: Pre-Columbian Art* books and *American Lutherie, Anvil's Ring, Ars Textrina, Ceramics Monthly, Ceramic Review, Crochet Traditions, FiberArts, Handwoven*, *Interweave Crochet, Ornament, Piecework, Shuttle Spindle and Dyepot, Vogue Knitting Crochet, Whispering Wind,* and *Woodcarving* magazines.



Carol Ventura surrounded by first millennium Mochica portrait vessels at the Larco Museum in Lima, Peru, 2017.