

***A Visual Survey of***  
***Craft History***

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

***Volume V: Islamic & Medieval***

***Carol Ventura***

# **A Visual Survey of Craft History:**

## **Global Traditions and Technological Innovations in Clay, Fiber, Glass, Metal, and Wood**

### **Volume V: Islamic and Medieval**

**Carol Ventura**

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ISBN 978-0-9721253-4-5

Web page: <https://www.crafthistory.com>

Cover: *Lindau Gospels* back cover, Abbey of St. Gall, Switzerland, Carolingian Period, ca. 740-800, Pierpont Morgan Library and Museum, Purchased by J. Pierpont Morgan (1837-1913) in 1901, Figure 9.10.

<https://www.themorgan.org/manuscript/76874>

# Contents

## Volume I: The Ancient World

### [Preface](#)

Chapter 1: Stone Age Period and Mesopotamia

Chapter 2: Ancient Egypt

Chapter 3: The Aegean and Greece

Chapter 4: Etruscan and Roman

## Volume II: Continental Asia

Chapter 5: China and India

## Volume III: Island Nations

Chapter 6: Indonesia, Japan, and Oceania

## Volume IV: Sacred Traditions

Chapter 7: Native America and Africa

## **Volume V: Islamic to Medieval**

Chapter 8: [Islamic](#)

Chapter 9: [Byzantine](#) and the [Medieval](#):

Migration, Carolingian, Ottonian, Romanesque, and Gothic

## **Volume VI: Rebirth to Revolution**

Chapter 10: Renaissance

Chapter 11: Baroque, Rococo, and Neoclassical

## **Volume VII: Rise of the Modern World**

Chapter 12: 1800 to 1950

Chapter 13: 1950 to the Present

[Bold Text Glossary](#).

[Bibliography](#)

[Author](#)

## **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.

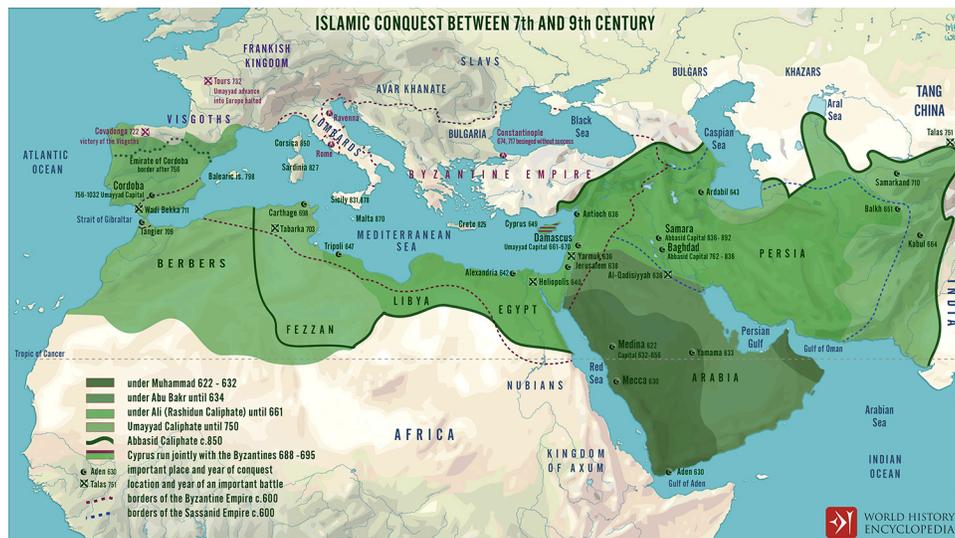
How did I become interested in this topic? Along with her other talents, my mother sewed, knitted, crocheted, and made slip-cast pottery. In addition to his military career, my father tinkered with electronics, automobiles, plumbing, and carpentry. Between them, my parents could do just about anything. 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, Luke Anderson, Noreen Grisolano, and the many other friends and craftspeople who made this free eBook possible.

# Chapter 8: Islamic and Medieval

## Islamic



Islamic Conquests between 7<sup>th</sup> and 9<sup>th</sup> century (map by Simeon Netchev).  
<https://www.worldhistory.org/image/14212/islamic-conquests-in-the-7th-9th-centuries/>

Islam began when Muhammad (570-632) began preaching in his native Mecca in Western Arabia. Muhammad's controversial talks forced him to flee to Medina, but he returned to Mecca after establishing the Islamic religion. Muhammad's teachings were collected into the Qur'an after he died. Unfortunately, his death split the Muslim community into followers of his Companions in Medina, who founded Sunni Islam, and those of the Prophet's son-in-law, who claimed succession through his wife to establish Shia Islam. The competing branches of Islam quickly spread through the Middle East, North Africa, and Europe.

Muslims adopted and adapted something from every culture they met. They learned to make paper from the Chinese, then introduced papermaking to Europe. Muslim scholars translated Western manuscripts into Arabic, conserving knowledge and science while Europeans were burning books. Muslims adopted the "Arabic numerals" that we use today from India and went on to invent algebra. By the thirteenth century, they

were more advanced than Europeans in chemistry, medicine, mathematics, alchemy, cartography, and optics.

Islamic art and architecture follow strict guidelines. Secular art may include human and animal imagery, but Orthodox Islam discourages representations of living creatures. The Qur'an does not forbid it, but later teachings dictate that only Allah (God) has the right to create. This ban was not strictly enforced, but no living thing is portrayed casting a shadow, and Muhammad's face is never shown.

The two main types of Islamic calligraphy are curvilinear Naskhi (Figure 8.1) and angular Kufic (Figure 8.3) scripts. The twenty-eight letters are written from right to left and can be altered to accommodate any surface. Phrases from the Qur'an often decorate Islamic art and architecture, along with geometric motifs and floral patterns.

**Glass** lamps decorated with enamel and **luster** were suspended from the ceilings of mosques in the 14<sup>th</sup> century to illuminate the interiors and symbolize Allah's presence. The *Mosque Lamp* in Figure 8.1 is stylistically similar to many other colorful lamps, including a lamp depicted on the *Ardebil Carpet* (Figure 8.15b), with its high neck, bulbous body, and suspension handles. A bowl of oil with a lit wick floated in water that partially filled the lamp. The water cooled the lamp and directed the flickering light downward. The neck of the glass lamp appropriately contains a verse in Naskhi script from the Qur'an (XXIV: 35) related to the manifestation of divine light in Islam. The donor's epigraphic blazons are shown on the lower part of the lamp.



Figure 8.1 *Mosque Lamp*, enameled and gilded blown glass, 13 ¼ x 12 in / 33.6 x 30.5 cm, Egypt, Mamluk period, ca. 1360 (Smithsonian National Museum of Asian Art, Freer Gallery of Art). [https://asia.si.edu/explore-art-culture/collections/search/edanmdm:fsg\\_F1957.19/](https://asia.si.edu/explore-art-culture/collections/search/edanmdm:fsg_F1957.19/)

Although the Qur'an denounces luxury, Muslim rulers commissioned sumptuous interiors and richly embellished items. Gold and silver vessels were prohibited, so 7<sup>th</sup> century Muslim artisans developed metal-based lusters to help glass (Figure 8.1) and **ceramics** (Figures 8.4 and 8.8) mimic polished metal.

To make the surface look metallic, a solution of **silver** and/or **copper** in a binder was painted onto a finished piece, then **fired** in a reducing atmosphere to bond the metal to the surface. This technique spread elsewhere and is still used today.

Glassblowing developed during the 1<sup>st</sup> century BCE in Syria when that Middle Eastern territory was part of the Roman Empire. Figure 8.2a shows the float of the Ottoman Guild of Glass Blowers in a parade that commemorated the circumcision of Sultan Murad III's son. Workshop members holding finished glass objects walk behind a working furnace that heats the glass. On the left, a finished piece is placed into the upper annealing chamber and below, a vessel is heated on a blowpipe. In the center, two pairs of blow pipes heat in the furnace while four others rest in a container. On the right a worker swings his pipe to elongate the shape while another marvers his vessel. This furnace is similar to the Italian furnace illustrated in Antonio Neri's 17<sup>th</sup> century book, *L'Arte Vetraria /The Art of Glass*. Similar techniques, rectangular wooden paddles, large metal jacks (that look like tweezers), and **molds** (Figure 8.2c) are still used today to blow and shape molten glass (Figure 4.17).



Figure 8.2a Glass blowing on a glass furnace float, Istanbul, Turkey, ca. 1582 (Surname-i Hümayun / Book of the Imperial Circumcision Festival, Topkapı Palace Museum H. 1344).

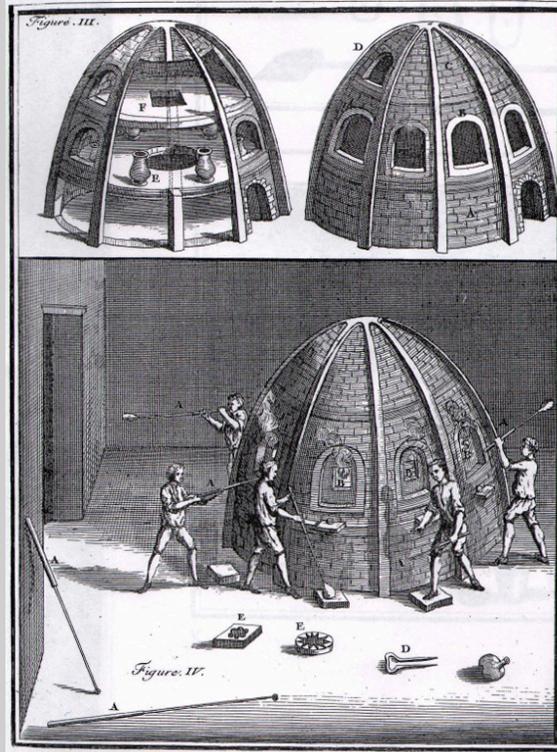


Figure 8.2b Antonio Neri, engraving of an Italian glass furnace in *The Art of Glass*, 1612.



Figure 8.2c Uthman b. Abu Nasr, dip mold used by Muslim glass blowers, brass, 4 ½ x 4 5/8 in / 11.4 x 11.8 cm, probably from Western Asia, 1000-1299 (Corning Museum of Glass).

<https://glasscollection.cmog.org/objects/15551/dip-mold?ctx=04af0f9e3ef9d5ab6ceb89c2ddff7f24452a1472&idx=7>

Imported Chinese blue and white porcelain and three-color earthenware inspired Muslim potters to create their own versions with locally available materials. Lacking kaolin, the essential ingredient of porcelain, 8<sup>th</sup> century Middle Eastern Muslim potters developed an opaque tin-based white **glaze** to cover their cream-colored earthenware clay to make it look like porcelain (Figures 8.3, 8.4, 8.7, and 8.8). Mixtures of copper, manganese, cobalt, and iron oxides were painted over the opaque white glaze to add color, then the pieces were fired. These techniques spread west through Africa and north into Spain, France, and Italy.

The angular Kufic inscription around the inside of the ceramic *Bowl* in Figure 8.3 translates to, "It is said that he is content with his own opinion runs into danger. Blessing to the owner."



Figure 8.3 *Bowl*, tin-based glaze and **underglaze** on earthenware, 4 7/16 x 15 1/2 in / 11.2 x 39.3 cm, Samanid Period, Iran, 10<sup>th</sup> century (National Museum of Asian Art, Freer Gallery of Art). [https://asia.si.edu/explore-art-culture/collections/search/edanmdm:fsg\\_F1957.24/](https://asia.si.edu/explore-art-culture/collections/search/edanmdm:fsg_F1957.24/)

Albarellos (Figure 8.4) were used to store herbs and medicinal ingredients. The top was sealed with a piece of parchment or leather, tied below the lip with a cord. Fingers could easily grasp the top of the jar, which would be placed neck to neck on apothecary shelves. Potters in Italy would later be inspired by the shape and colorful glaze to produce their own versions (Figure 10.4).

A Naskhi inscription in blue and luster on the sloping shoulder translates to “felicity and prosperity,” a typical phrase found on Islamic pottery. Muslim potters in Spain were the first in Europe to use cobalt blue and luster glazes.

Ceramic luster glazes developed in what is now Iraq in the 9<sup>th</sup> century and by the 12<sup>th</sup> century the technique was being used in Spain. Early luster was made by mixing silver and copper metallic salts with a clay binder. Eventually potters found that resin oil binders, like the pine oil still used today, produced a better surface when fired to around 1000°F / 540°C in a smoky, **reduction** atmosphere.



Figure 8.4 *Tree of Life Albarello*, tin-based glaze, oxides, and luster glaze on earthenware, 3  $\frac{3}{4}$  x 11  $\frac{5}{8}$  in / 9.5 x 29.5 cm, Hispano-Moresque, Spain, late 14<sup>th</sup> century (© The Trustees of the British Museum, CC BY-NC-SA 4.0 license). [https://www.britishmuseum.org/collection/object/H\\_G-585](https://www.britishmuseum.org/collection/object/H_G-585)

Spanish King Ferdinand and Queen Isabella pushed the Muslims out of Southern Spain in 1492, but Islamic legacy can still be seen in the Spanish customs, art, and architecture. Muslims who stayed in Spain after the 15<sup>th</sup> century continued to work in their professions, resulting in the Hispano-Moresque style that combined Spanish and Islamic elements. Several great examples of tin glazed earthenware tiles, woodwork, and **carved** plaster can be seen in palaces in Seville (Figures 8.5a, 8.6a, and 8.6b) and Granada

(Figures 8.5b) that were renovated and enlarged in the Hispano-Moresque style by Christian Spanish monarchs.

Tile wall panels include beautifully cut and installed glazed tiles laid out in mathematical arrangements, topped by elegant Naskhi calligraphy in carved plaster (Figure 8.5a) and colorful tile (Figure 8.5b) praising Allah. Ceramic tile wall panels are still made today in Morocco, where Muslims moved in the 15<sup>th</sup> and 16<sup>th</sup> centuries after the Spanish conquest. Many products, including fountains (Figure 8.5c), are crafted today with the same techniques used to make the wall panels (Figures 8.5d through 8.5i).



Figure 8.5a Detail of tile wall panel, glazed earthenware and carved plaster, Hispano-Moresque, Alcazar, Seville, 1356-1369 (photograph by Carol Ventura, 2005).



Figure 8.5b Detail of tile wall panel, glazed earthenware, Hispano-Moresque, Alhambra, Granada, 1537 (photograph by Carol Ventura, 2005).



Figure 8.5c Tiled fountains for sale at Art Naji, Fes, Morocco (photograph by Carol Ventura, 2005).



Figure 8.5d Glazed rectangular tiles are marked, then skillfully cut to shape with a hammer at Art Naji, Fes, Morocco (photograph by Carol Ventura, 2012).



Figure 8.5e Cutting a glazed ceramic tile into an intricate shape at Art Naji, Fes, Morocco (photograph by Carol Ventura, 2012).



Figure 8.5f Setting tiles face side down (with the front sides touching) on the floor. Finished panels rest against left wall at Art Naji, Fes, Morocco (photograph by Carol Ventura, 2012).



Figure 8.5g Tiles face side down on a fountain mold at Art Naji, Fes, Morocco (photograph by Carol Ventura, 2012).



Figure 8.5h Tiles arranged face down on a fountain mold have been dampened and sprinkled with cement in preparation for the backing. The tile faces touch but the sides angle inwards to embed them in the cement backing at Art Naji, Fes, Morocco (photograph by Carol Ventura, 2012).



Figure 8.5i Cemented back of a tiled fountain at Art Naji, Fes, Morocco (photograph by Carol Ventura, 2012).

The *Ambassadors Hall* in the Alcazar of Seville (Figure 8.6) was built in the 11<sup>th</sup> century by the last Muslim Caliph, Al-Mu'tamid. Three hundred years later, when the Spanish monarchs converted the Alcazar into a residence, Spanish King Peter I (1334-1369) commissioned local Muslim craftsmen to add Hispano-Moresque glazed ceramic tile panels to the lower walls, colorful carved plasterwork to the corners and arch spandrels (Figure 8.6a), and a magnificent, gilded cedar wood domed ceiling (Figure 8.6b).



Figure 8.6a *Ambassadors Hall*, Alcazar, Seville, 11<sup>th</sup>-14<sup>th</sup> centuries, Seville, Spain (photograph by Joaquim Alves Gaspar, Reales Alcázares, Wikimedia Commons, CC BY-SA 4.0).

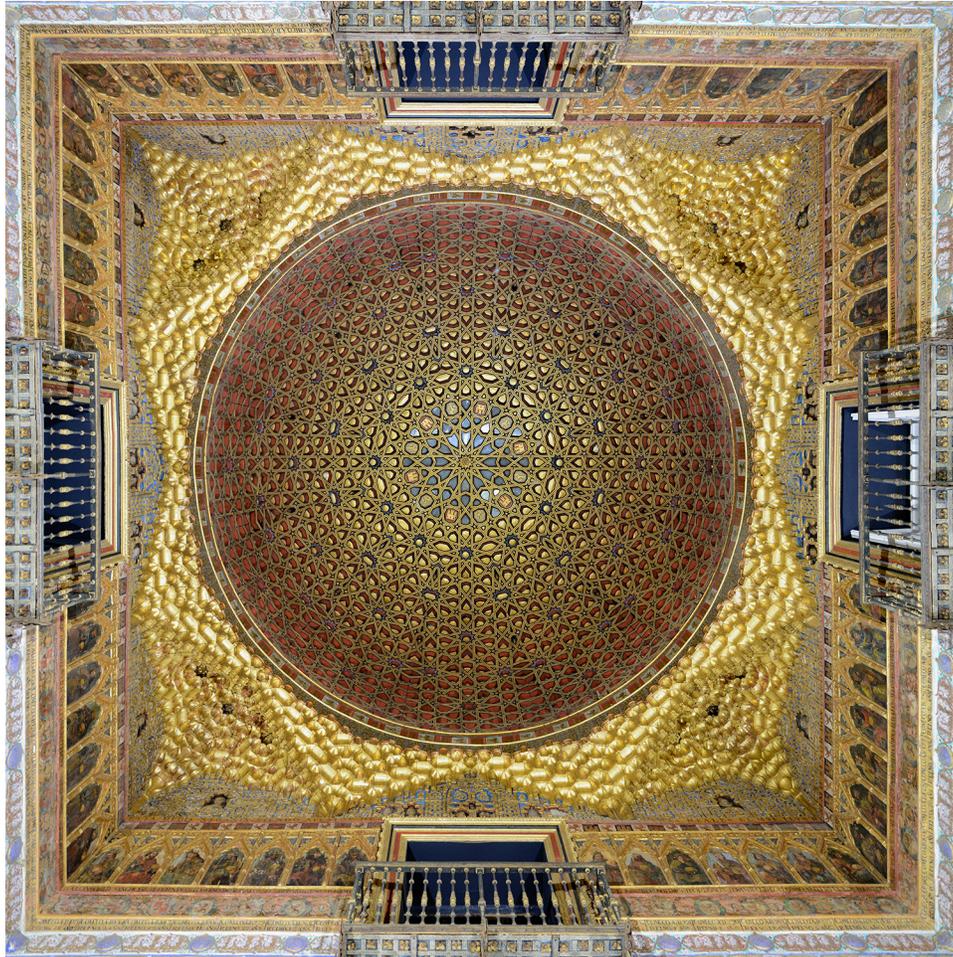


Figure 8.6b Ceiling of the *Ambassadors Hall*, Alcazar, Seville, 11<sup>th</sup>-14<sup>th</sup> centuries, Seville, Spain (photograph by Joaquim Alves Gaspar, Reales Alcázares, CC BY-SA 4.0).

[https://commons.wikimedia.org/wiki/File:Alc%C3%A1zar\\_Seville\\_April\\_2019-11.jpg](https://commons.wikimedia.org/wiki/File:Alc%C3%A1zar_Seville_April_2019-11.jpg)

Fritware was produced in Ottoman Turkey from the late 15<sup>th</sup> through the 17<sup>th</sup> centuries. This technique combines white clay with powdered glass and quartz. It was not easy to work, but could be molded, carved, and glazed to more closely resemble porcelain. The Iznick fritware *Dish* in Figure 8.7 was painted with red, blue, and green floral motifs, covered with

a clear glaze, then fired. Red was added to the Iznik palette shortly before this dish was made.



Figure 8.7 *Dish*, polychrome fritware, 11 in / 27.9 cm diameter, Iznik, Ottoman Turkey, ca. 1575-80 (Victoria and Albert Museum, Bequeathed by George Salting, Esq.). <https://collections.vam.ac.uk/item/O211479/dish-unknown/>

Fritware became more refined over time. Luster was painted onto a fired glazed surface, then the piece was refired at a low temperature. The lobed panels of the exquisite *Bottle* in Figure 8.8 were painted alternately with luster over cobalt blue and opaque white glaze grounds.



Figure 8.8 *Bottle*, molded copper luster fritware ceramic, 3 ½ x 10 in / 9 x 25 cm, Iran, Safavid Dynasty, Iran, late 17<sup>th</sup> century (© The Trustees of the British Museum, CC BY-NC-SA 4.0 license).

[https://www.britishmuseum.org/collection/object/W\\_G-396](https://www.britishmuseum.org/collection/object/W_G-396)

The entrance doors of the Golden Gate of the Royal Palace in Fes (Figure 8.9) are exquisite examples of Islamic metalwork. Stamps of various shapes and sizes were hammered into sheets of brass to create the intricate surface reliefs secured in place with a lattice of decorative brass bars (Figure 8.9b). Many brass items, including decorative trays, are still embellished with stamped designs today (Figure 8.9c).



Figure 8.9a Palace Entrance, brass and ceramic tile, Fes, Morocco, 1969-1971 (photograph by Carol Ventura, 2012).



Figure 8.9b Detail of Palace Entrance door, brass, Fes, Morocco, 1969-1971 (photograph by Carol Ventura, 2012).



Figure 8.9c Stamping brass in Fes, Morocco (photograph by Carol Ventura, 2012).

**Damascene** is a metal inlay technique named for the city where it was perfected, Damascus, Syria, although its roots lie in ancient Egypt. This technique involves forcing colorful soft metals into depressions **engraved** into harder metal. Intricately embellished vessels (Figure 8.10), armor, weapons (Figure 8.11), jewelry, and other items (Figure 8.12) have been damascened in Spain, Japan, and elsewhere for centuries.

Muslim metalworkers crafted many extraordinary objects coveted by European royalty, including the baptismal basin in Figure 8.10. This large inlaid vessel was crafted decades after Louis IX died, so it is not connected with the French King known as St. Louis, but it was used to baptize later French kings. The complex imagery includes groups of people, animals, fish, plants, and Arabic inscriptions.



Figure 8.10 Mohammad Ibn-al-Zahn (Mamluk artist), *Baptistry of St. Louis*, hammered brass inlaid with silver, gold, and niello, 9 1/8 x 19 7/8 in / 23.2 x 50.5 cm, Egypt or Syria, 1325-1340 (Louvre).

<https://collections.louvre.fr/en/ark:/53355/cl010318774>

Muslim **blacksmiths forged** extremely flexible, strong, and sharp **Damascus steel** blades (Figure 8.11a). These legendary weapons were originally crafted in Damascus with imported wootz crucible steel from India. It was difficult to forge the high-carbon metal because if it was too hot it would shatter when struck by the hammer.

The green nephrite grip in Figure 8.11b is carved with a rippling texture similar to the subtle variegated pattern on the steel blade. The Arabic inscriptions on the blade include a verse praising the infinite gentleness and power of Allah and a reference to the sword of the prophet Muhammad, regarded as a symbol of spiritual and political authority.



Figure 8.11a *Saber*, steel, jade (nephrite), gold, copper, and diamond, 38 in / 96.5 cm, 1 lb 15 oz / 889 g, Turkey, grip and guard, late 17<sup>th</sup> century; blade, late 18<sup>th</sup> –19<sup>th</sup> century (The Metropolitan Museum of Art, Bequest of George C. Stone, 1935, CC0).

<https://www.metmuseum.org/art/collection/search/24321>



Figure 8.11b *Saber* detail, steel, jade (nephrite), gold, copper, and diamond, 38 in / 96.5 cm, 1 lb 15 oz / 889 g, Turkey, grip and guard, late 17<sup>th</sup> century; blade, late 18<sup>th</sup>–19<sup>th</sup> century (The Metropolitan Museum of Art, Bequest of George C. Stone, 1935, CC0).

<https://www.metmuseum.org/art/collection/search/24321>

Astrolabes use the position of the sun, stars, and planets to tell time and navigate. The unusually large, ornate instrument in Figure 8.12 is both functional and decorative. The damascened man, flora, fauna, and calligraphy attest to the skill and precision of Muslim metalworkers. The back is engraved with the name of the maker and three royal titles.



Figure 8.12 Abd al-Karim al-Misri, *Astrolabe*, brass, engraved and inlaid with silver and copper, 12  $\frac{3}{4}$  x 18  $\frac{1}{8}$  x 2  $\frac{1}{4}$  in / 32.5 x 46 x 5.8 cm, Ayyubid Dynasty, Turkey or Iraq or Syria, 1241-1242 (© The Trustees of the British Museum, CC BY-NC-SA 4.0 license).

[https://www.britishmuseum.org/collection/object/W\\_1855-0709-1](https://www.britishmuseum.org/collection/object/W_1855-0709-1)

The **silk** fragment in Figure 8.13 may be from the tomb of Bishop San Pedro de Osma (d. 1109), buried in the Cathedral of Burgo de Osma, Spain. Large roundels include pairs of lions and harpies (human-headed birds). Mirrored images and pattern repeats are typical of **fabrics** woven on **drawlooms** (Figure 8.14d) because cords are tied to multiple **warps**. Although each motif is made up of many **shed** changes, mirrored images

greatly reduce the calculations and manipulations. Kufic script in the smaller medallions, translates to "This was made in the town of Baghdad, may God guard it." They repeat both vertically and horizontally.



Figure 8.13 *Wrestling Lions and Harpies*, silk **lampas** woven with red, green, light brown, and **gold brocade**, 19 11/16 x 16 5/16 in / 50 x 43 cm, Almoravid, Spain, early 12<sup>th</sup> century (Museum of Fine Arts, Boston, Ellen Page Hall Fund). <https://collections.mfa.org/objects/66254/fragment-with-wrestling-lions-and-harpies?ctx=9bd10bed-28a1-44db-90e6-9d33eb93acf5&idx=1>

Muslim traders not only transported silk from China, but they also imported sericulture (Figure 5.21) and specialized techniques and tools, including the drawloom (Figure 8.14d), which they modified so that the “draw boy” could sit next to the **loom** instead of over it (Figure 5.37b). Silk weaving eventually became an important industry in Islamic Spain (711-1492), Egypt, Iran, Turkey, and Central Asia, where silk lampas, **velvet** and **ikat** fabrics were produced for homes, palaces, mosques, garments, and

commerce. Europe relied on Islamic and Byzantine silks until silk weaving was established in Italy in the 14<sup>th</sup> century.

Lampas weave, which developed in 11<sup>th</sup> century Iran, is traditionally woven on a drawloom with two sets of warp and **weft**. Each set of warp and weft share the same color. Lampas is essentially a double layered cloth that interchanges to create a reversible patterned fabric.

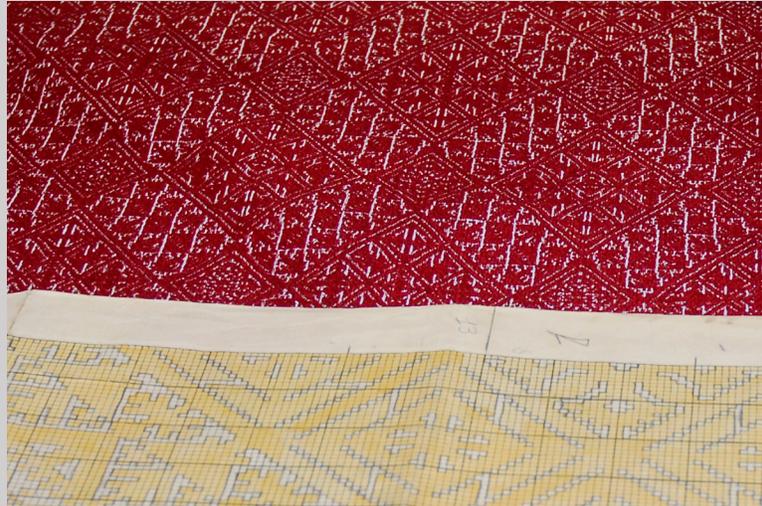


Figure 8.14a Pattern graph and finished lampas cloth at Bencherif, Fes, Morocco (photograph by Carol Ventura, 2012).



Figure 8.14b Arranging the guide cords for the “draw boy.” The vertical cords are attached to the **harnesses** that will produce the pattern. Following the graphed design in Figure 8.14a row by row, a horizontal white cord is placed under each vertical cord that needs to be pulled to

raise the appropriate harnesses for a lampas **weave** at Bencherif, Fes, Morocco (photograph by Carol Ventura, 2012).



Figure 8.14c Each horizontal white cord represents one open shed for a shot of weft. Pulling on a white cord shows the “draw boy” the vertical cords that need to be pulled to raise the harnesses needed to create the next shed. For each shed, the “draw boy” will go to the next cord to see which vertical harness cords need to be pulled at Bencherif, Fes, Morocco (photograph by Carol Ventura, 2012).

The weaver raises the twelve harnesses closest to him with foot treadles and the “draw boy” controls the rest of the harnesses by pulling on the attached cords. A frame above the pattern harnesses with a spindle for each harness cord directs the cords downward to allow the “draw boy” to sit on the side instead of over the loom. This loom has a black and white warps so the weaver inserts black or white weft as needed. With guidance from draw cords, the “draw boy” on the right raises the appropriate warp threads (Figure 8.14e). The weaver passes through the matching color weft

(Figure 8.14f), changes the shed, then beats the weft into place (Figure 8.14g).



Figure 8.14d Drawloom lampas weaver and “draw boy” at Bencherif, Fes, Morocco (photograph by Carol Ventura, 2012).



Figure 8.14e The “draw boy” pulls the cords of a drawloom to raise a group of harnesses for a weaver at Bencherif, Fes, Morocco (photograph by Carol Ventura, 2012).



Figure 8.14f Holding the **shuttle** with the left hand while beating the weft into place with the right on a drawloom at Bencherif, Fes, Morocco (photograph by Carol Ventura, 2012).



Figure 8.14g Inserting the shuttle into the shed on a drawloom at Bencherif, Fes, Morocco (photograph by Carol Ventura, 2012).

The medallion style carpet in Figure 8.15 was woven for the tomb-mosque of Shah Tahmasp at Ardebil, Iran. This carpet has an average of 340 knots per square inch. The blue field is covered with leaves and

flowers, mostly peonies, which show a Chinese influence. A small panel on the right end includes the date of completion and the name of the man in charge of its production, Maqsud Kashani.



Figure 8.15a Maqsud Kashani, *Ardabil Carpet*, 10 color of **asymmetrically** knotted **wool pile** on silk foundation, 17 3/8 x 33 7/8 ft / 5.3 x 10.32 m, Iran, 1539-1540 (Victoria and Albert Museum, London).

<https://collections.vam.ac.uk/item/O54307/the-ardabil-carpet-carpet-unknown/>



Figure 8.15b Maqsd Kashani, Hanging Lamp Motif detail from the *Ardabil Carpet*, Iran, 1539-1540 (Victoria and Albert Museum, London).

<https://collections.vam.ac.uk/item/O54307/the-ardabil-carpet-carpet-unknown/>

Wool must be carded (combed) to remove debris and to help line up the **fibers** (Figure 8.16a). After several passes of the cards, the flattened piece of wool is rolled into a rolag (Figure 8.16b) in preparation for spinning (Figures 8.16c, 8.16d, and 8.16e). Local plants are used to dye the yarn in a rainbow of colors (Figure 8.16f).



Figure 8.16a Carding wool in Ben Smim, Morocco (photograph by Carol Ventura, 2012).



Figure 8.16b Making a rolag in Ben Smim, Morocco (photograph by Carol Ventura, 2012).



Figure 8.16c Spinning wool from the rolag with a **spindle** in Ben Smim, Morocco (photograph by Carol Ventura, 2012).



Figure 8.16d **Spinning** wool with a spindle in Ben Smim, Morocco (photograph by Carol Ventura, 2012).



Figure 8.16e Winding the spun wool on the spindle in Ben Smim, Morocco (photograph by Carol Ventura, 2012).



Figure 8.16f **Dye** plants in Sefrou, Morocco (photograph by Carol Ventura, 2012).

Floor coverings, saddle cloths, bags, and cushion tops have been made with knotted pile fabrics for centuries in the Middle East and Asia. Carpets were especially popular in Iran in both shepherd's tents and royal palaces. Raw materials included wool (sheep, goat, and camel), silk, **cotton**, **linen**, and hemp. Most carpets are woven with wool weft on cotton warp. By the

10<sup>th</sup> century, Islamic carpets were traded as far as China and western Europe.



Figure 8.17a Vertical loom for weaving knotted carpets at the Carpet and **Textile** House in Jaipur, India (photograph by Carol Ventura, 2016).



Figure 8.17b Pattern used for knotting a rug on a vertical loom at the Carpet and Textile House in Jaipur, India (photograph by Carol Ventura, 2016).

The pile is secured to the warp with knots. There are several variations, but the knots are basically either asymmetrical (ends together to the right or left; Figures 8.17c and 8.17d) or symmetrical (ends in the middle; Figure 8.17e).

The weaver starts at one side of the rug and ties a knot on the first 2 warp threads, cuts the yarn and continues across, tying knots on successive warp pairs with colored yarns. After completing a row of knots, one or more passes of weft are inserted and beaten into place with a comb to secure the knots (Figure 8.17f).



Figure 8.17c Adding an asymmetrical knot to a rug at the Carpet and Textile House in Jaipur, India (photograph by Carol Ventura, 2016).



Figure 8.17d Row of asymmetrical knots on a rug being woven at the Carpet and Textile House in Jaipur, India (photograph by Carol Ventura, 2016).



Figure 8.17e Making a symmetrical knot in Sefrou, Morocco (photograph by Carol Ventura, 2012).



Figure 8.17f The author beats down white weft placed over the knots with a rug weaving comb in Sefrou, Morocco (photograph by friend of Carol Ventura, 2012).

The knotted pile is trimmed to the correct length with special angled shears (Figure 8.17g) and then the fringe is knotted (Figure 8.17h).



Figure 8.17g Row of knots on a vertical loom, final leveling of the pile with angled scissors at the Carpet and Textile House in Jaipur, India (photograph by Carol Ventura, 2016).



Figure 8.17h Knotting the fringes of a rug at the Carpet and Textile House in Jaipur India (photograph by Carol Ventura, 2016).

The sadeli **marquetry** technique (Figures 8.19a through 8.19d) was used to cover the surfaces of the *Writing Box* in Figure 8.18 with intricate geometric and floral motifs of brass, **ebony**, and partially stained bone and ivory.



Figure 8.18a *Writing Box*, wood with sadeli marquetry of ebony, ivory, bone, and brass, 13 ½ x 20 7/8 x 5 1/8 in / 34.3 x 53 x 13 cm, India or Pakistan, late 16<sup>th</sup> – early 17<sup>th</sup> century (The Metropolitan Museum of Art, Purchase, Pat and John Rosenwald Gift, 2004, CC0).

<https://www.metmuseum.org/art/collection/search/454768>



Figure 8.18b *Writing Box Lid*, wood with sadeli marquetry of ebony, ivory, bone, and brass, 13 ½ x 20 7/8 in / 34.3 x 53 cm, India or Pakistan, late 16<sup>th</sup> – early 17<sup>th</sup> century (The Metropolitan Museum of Art, Purchase, Pat and John Rosenwald Gift, 2004, CC0).

<https://www.metmuseum.org/art/collection/search/454768>

Sadeli marquetry is still produced in Granada, Spain, where bone (Figure 8.19a), metal, mahogany, ebony, rosewood, and walnut are cut, shaped, then glued together along the grain to create patterned bundles (Figures 8.19b). Thin cross sections are carefully cut off the end (Figure 8.19c). The end grain slices are then arranged into intricate geometric patterns and glued to wooden furniture and accessories (Figure 8.19d).

<https://www.carolventura.com/marquetry.htm>



Figure 8.19a Bone and marquetry strips at Laguna Taracea, Alhambra, Granada, Spain (photograph by Carol Ventura, 2005).



Figure 8.19b Glued bundles of shaped wood, ivory, and bone at Laguna Taracea, Alhambra, Granada, Spain (photograph by Carol Ventura, 2005).



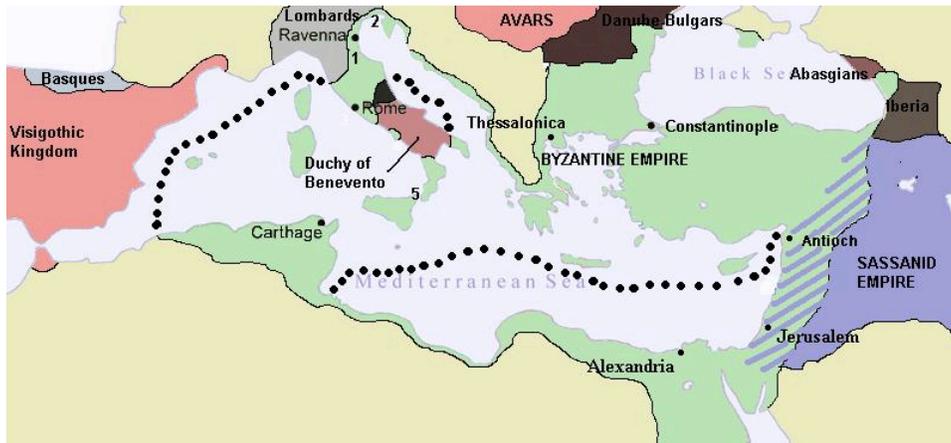
Figure 8.19c Slices of marquetry waiting to be used at Laguna Taracea, Alhambra, Granada, Spain (photograph by Carol Ventura, 2005).



Figure 8.19d Filling holes between the slices with putty before sanding and sealing, Granada, Spain (photograph by Carol Ventura, 2005).

# Chapter 9: Byzantine and Medieval

## Byzantine (330-1453 CE)



Byzantine Empire, ca. 626.

<https://www.worldhistory.org/image/7696/byzantine-empire-c-626-ce/>

The city of Byzantium was founded in 657 BCE at the entrance of the Black Sea. The Byzantine Empire began when Emperor Constantine (ruled 306 - 337) moved the capital of the Roman Empire to Byzantium, which he renamed Constantinople. Constantine made Christianity the official religion of the Roman Empire.

Byzantine lands extended across Egypt and Asia Minor during the 6<sup>th</sup> century, almost encircling the Mediterranean. The Western Roman Empire fell in 476, but the Byzantine empire continued until it was conquered by the Ottoman Turks in 1453.

Constantinople remained a major artistic and ecclesiastical center for over a thousand years. The city's central location made it a major trade center between the East and West. Silk, ivory, precious stones and pearls were imported from China, Persia and the Persian Gulf. Gold was sourced from the western Balkans, Asia Minor and Greece.

Roman-styled necklaces, rings, earrings, and **brooches** were still popular during the fourth and fifth centuries and Christian symbols began to appear in the fifth century. The finest materials were available to palace workshops, where skilled craftsmen produced jewelry for the emperor, his

family and the court in Constantinople. Presentation pieces were produced for important individuals, foreign leaders, and the military to celebrate victories, reward bravery, and reinforce loyalty.

Sumptuary laws kept the social classes in place by restricting the types of clothing and accessories available to the public. Everyone could wear a gold ring, but only the imperial court and the Church could own large gold pieces and precious stones. The sixth century Codex of Justinian decreed that pearls, emeralds and sapphires were reserved for the emperor.

Large gold earrings and pendants that incorporated pearls and colorful stones continued to be popular during the Byzantine period. Most precious stones were polished into smooth irregular beads, drilled, then secured with gold wire. Emeralds, pearls, and sapphires decorate the bottoms of the hinged pendants that dangle from the gold earrings and the open-work pendant in Figure 9.1.



Figure 9.1 *Necklace and Earrings*, gold, sapphire, pearl, and emerald, pendant is 3 in / 7.5 cm, earrings are 4 7/8 in / 12.3 cm, Asyut, Egypt, Early Byzantine Period, ca. 600 (© The Trustees of the British Museum, CC BY-NC-SA 4.0 license).

[https://www.britishmuseum.org/collection/object/H\\_1916-0704-2](https://www.britishmuseum.org/collection/object/H_1916-0704-2) and [https://www.britishmuseum.org/collection/object/H\\_1916-0704-3](https://www.britishmuseum.org/collection/object/H_1916-0704-3)

The cross-shaped plate, tongue, and loop of the gold *Buckle* in Figure 9.2 are connected at the hinge. A gold pin joins the hinge together. The top edge of the loop is incised with crescent shapes. The head and arms of the cross are **stamped** with concentric motifs.



Figure 9.2a *Buckle*, cast, stamped, engraved, and soldered gold, 3 7/8 x 1 1/2 in / 9.85 x 3.91 cm, Constantinople (Istanbul), Turkey, Byzantine Period, 7<sup>th</sup> century (© The Trustees of the British Museum, CC BY-NC-SA 4.0 license). [https://www.britishmuseum.org/collection/object/H\\_1980-0708-](https://www.britishmuseum.org/collection/object/H_1980-0708-1)

1



Figure 9.2b *Buckle back*, cast, stamped, engraved, and soldered gold, 3 7/8 x 1 1/2 in / 9.85 x 3.91 cm, Constantinople (Istanbul), Turkey, Byzantine Period, 7<sup>th</sup> century (© The Trustees of the British Museum, CC BY-NC-SA 4.0 license). [https://www.britishmuseum.org/collection/object/H\\_1980-0708-1](https://www.britishmuseum.org/collection/object/H_1980-0708-1)

Byzantine silk represented status, power, and wealth. Silk fabrics were given for military assistance, as diplomatic gifts, and to negotiate trade agreements and marriage alliances. Silk was only available from China until the 4<sup>th</sup> century, when sericulture was established in Syria, Constantinople, and Egypt. Silk was dyed yellow, green, blue, red, and purple, but only the royal family could wear Tyrian purple, which was harvested from Mediterranean murex shellfish (8000 were needed to make .035 oz / 1 gram of dye).

Imperial and non-Imperial silk-weaving workshops produced magnificent fabrics for clothing and interiors. Some cloth was plain, while

others incorporated a variety of images, including eagles, griffins, bulls, plants and the quadriga (chariot drawn by 4 horses abreast) shown in Figure 9.3. This shroud is the oldest surviving piece of Byzantine silk that includes a woven picture. The quadriga image was repeated across the cloth.



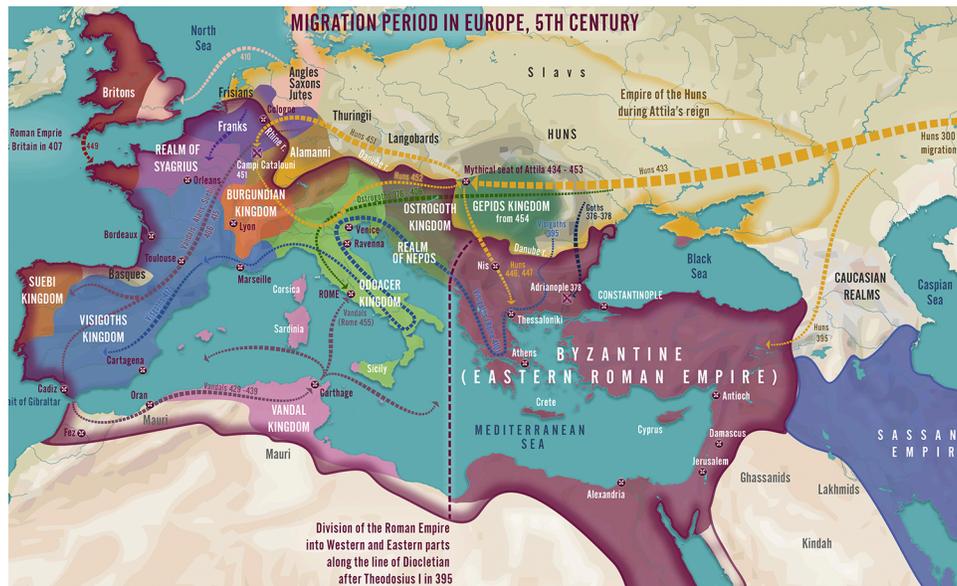
Figure 9.3 *Shroud of Charlemagne with Quadriga* fragment, gold and murex Tyrian purple silk cloth, 30 x 29 ½ in / 76 x 75 cm, 814, Byzantine Period, Constantinople (Aachen Cathedral Treasury, Germany).

[https://commons.wikimedia.org/wiki/File:Aachen\\_Cathedral\\_Treasury\\_cloth\\_with\\_quadriga\\_from\\_Karlsschrein.jpg#:~:text=English%3A%20So%2Dcalled%20%22Shroud,Cathedral%20Treasury%2C%20Aachen%2C%20German](https://commons.wikimedia.org/wiki/File:Aachen_Cathedral_Treasury_cloth_with_quadriga_from_Karlsschrein.jpg#:~:text=English%3A%20So%2Dcalled%20%22Shroud,Cathedral%20Treasury%2C%20Aachen%2C%20Germany.)

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## The Medieval Period (ca. 476 – 1450)

# Migration Period (ca. 375-700 CE)



Migration in Europe, ca. 450 (map by Simeon Netchev).

<https://www.worldhistory.org/user/simeonnetchev/>

The Medieval Period, also known as the Middle Ages and the Dark Ages, is the time between the fall of the Western Roman Empire and the Renaissance. Migrations were set in motion when Eastern European Huns and Scandinavian Germanic Goths began migrating along the frontiers of the declining Roman Empire. The nomadic Visigoths, Lombards, Anglo-Saxons, Celts, and other ethnic groups prized portable weapons, jewelry, buckles, brooches, clasps, and horse gear decorated with abstract and geometric Christian and pagan motifs. They eventually settled down, intermarried with locals and adopted some of the beliefs and customs.

Visigoth Kings donated decorative crowns and crosses to the Roman Catholic Church as a sign of their devotion, including the *Votive Crown* in Figure 9.4. This crown was not worn but suspended above an altar. Although influenced by the opulent Byzantine style, the gem setting techniques and lettering are Germanic. The pierced gold bands are decorated with **bezel**-set sapphires, emeralds, and pearls. Pendants hanging from the lower edge spell out the king's name, "RECCESVINTHUS REX OFFERET." This sophisticated piece demonstrates Visigoth wealth and east Mediterranean connections.



Figure 9.4 *Votive Crown of King Recceswinth* from the *Guarrazar Treasure*, gold, sapphires, emeralds, and pearls, 31 ½ x 8 1/16 in / 80 x 20.6 cm, Visigoth, Toledo, Spain, 621-672 (Museo Arqueológico Nacional, Madrid, photograph by Ángel M. Felicísimo from Mérida, España, CC BY 2.0).

[https://en.wikipedia.org/wiki/Votive\\_crown\\_of\\_Recceswinth#/media/File:Corona\\_de\\_\(29049230050\).jpg](https://en.wikipedia.org/wiki/Votive_crown_of_Recceswinth#/media/File:Corona_de_(29049230050).jpg)

Decorative **bronze**, silver, and gold brooches were used to fasten garments. The cast silver brooch in Figure 9.5 was topped with eleven radiating animal masks. The central area is decorated with profiled bird heads, animal masks, and **interlace**. Some of the surface is gilded, while other areas are inlaid with niello. Niello is a mixture of silver, lead, copper, and sulfur that is applied to cold metal, heated, cooled, then polished to create a black metallic inlay.



Figure 9.5 *Radiate-Headed Brooch*, gold, copper **alloy**, silver, niello, 6 ½ x 3 ¾ in / 16.3 x 9.6 cm, Lombardic, Italy, early 7<sup>th</sup> century (© The Trustees of the British Museum, CC BY-NC-SA 4.0 license).

[https://www.britishmuseum.org/collection/object/H\\_1851-0806-10](https://www.britishmuseum.org/collection/object/H_1851-0806-10)

The seafaring Anglo-Saxons began to settle in Britain around 450 CE. Many exquisite artifacts have been found in their "ship burials." Anglo-Saxon King Raedwald was surrounded by grave goods and buried in his ship Sutton Hoo, England around 624 CE. Unfortunately, the organic items decomposed in the damp soil, but coins, weapons, armor, and jewelry were preserved, including the exquisite pair of gold clasps in Figure 9.6 that were probably sewn to a garment through the back loops.

These clasps are the finest examples of the Migration Period style that feature abstract animal and geometric motifs, **cloisonné enamel**, and garnet. A loop and chain attach a gold pin (topped with a **filigree** animal head) that passes through the hinge to join the two halves. Millefiori alternates with red garnet inlay over textured foil in the rectangular center. Millefiori, which means "a thousand flowers," were cut from colorful glass canes (Figure 11.8), a technique inspired by the **mosaic glass** of the Egyptians (Figures 2.13 and 2.14) and Romans (Figure 4.14). The interlaced animals with serpentine hindquarters and jaws are similar to those found in Anglo-Saxon illuminated manuscripts. The inlaid curved ends feature the mirrored heads, forelegs, hindquarters, and twisted tails of two overlapping razorback boars.



Figure 9.6 *Hinged Clasps*, gold, cloisonné enamel, millefiori glass, and garnet, 5 x 2 in / 12.7 x 5.1 cm, Anglo-Saxon, Sutton Hoo, England, late 6<sup>th</sup>-early 7<sup>th</sup> century (© The Trustees of the British Museum, CC BY-NC-SA 4.0 license). [https://www.britishmuseum.org/collection/object/H\\_1939-1010-4-a](https://www.britishmuseum.org/collection/object/H_1939-1010-4-a)

Enameling is the craft of fusing glass to metal with heat. Several techniques of have evolved over millennia, including cloisonné, which is accented with

metal strips. Cloison is the French word for “partitions,” which perfectly describes this technique that developed in Egypt (Figure 2.21), Persia (Figure 1.24), and Greece (Figure 3.33).

Cloisonné enamel was probably introduced to China from Central Asia during the Yuan Dynasty (ca. 1279-1368). The labor-intensive techniques used to produce such fine work require talent, skill, and patience, beginning with carefully tracing a paper pattern pinned to carbon paper (Figure 9.7a) onto the metal. The pattern also guides the shaping of the flat copper wire with fingers (Figure 9.7b) and pliers. Cloisons are dipped into a specially formulated nontoxic glue (Figure 9.7c) and set in place over the traced design with tweezers. The piece is heated to secure the wires then the cells are filled with colorful **vitreous** enamel and fired again to melt and fuse the glass.



Figure 9.7a A pattern is carefully traced to transfer the design to the metal at the Beijing Enamel Factory, China (photograph by Carol Ventura, 2004).



Figure 9.7b Cloisons are prepared following a paper pattern at the Beijing Enamel Factory, China (photograph by Carol Ventura, 2004).



Figure 9.7c A cloison is dipped in a special glue then applied to the vessel at the Beijing Enamel Factory, China (photograph by Carol Ventura, 2004).

Enamel shrinks as it liquefies when heated, so the cells are refilled and refired three or four times until the cloisons are completely full. After firing, the resulting bumpy surface is smoothed with grinding stones (Figure 9.7e) and charcoal (Figure 9.7f), refired to bring back the glossy glass surface, then the exposed cloison wires are electroplated with gold or silver. <https://www.carolventura.com/Cloisonne.htm>



Figure 9.7d Enamel is applied with a dropper over fired enamel at the Beijing Enamel Factory, China (photograph by Carol Ventura, 2004).



Figure 9.7e The uneven enameled surface is ground smooth on an electric lathe with water and emery stones at the Beijing Enamel Factory, China (photograph by Carol Ventura, 2004).



Figure 9.7f The ground surface is polished on an electric lathe with charcoal at the Beijing Enamel Factory, China (photograph by Carol Ventura, 2004).



Figure 9.7g Vessels waiting to be refired; the green and dark blue vases covered with second coats of enamel and others with ground surfaces at the Beijing Enamel Factory, China (photograph by Carol Ventura, 2004).

Seventh century Celtic craftsmen cast silver and copper alloy (sometimes coated with tin to make it look like silver) in clay molds to make ring brooches and pins. The shape of the Irish ring brooch gradually developed into a circle with an attached pin, like the *Tara Brooch* in Figure 9.8. Large brooches were worn pointed upwards by men on the shoulder and women on the breast.

The *Tara Brooch* is decorated on both faces. The front (Figures 9.8a and 9.8b) includes fine gold filigree panels (Figure 9.9) depicting interlaced animal and abstract motifs separated by glass studs, enamel, and amber. The back of the *Tara Brooch* (Figure 9.8c) is almost as ornate. **Plaited** silver wire is attached with an animal head swivel framed with small cast glass human heads. The panels are chip carved, tooled, engraved, and inlaid with copper, silver, and gold. Dublin jewelers, Waterhouse and Company, made this brooch famous by producing replicas during the 19<sup>th</sup> century Celtic Revival.



Figure 9.8a *Tara Brooch* front, cast and gilt silver, gold filigree, amber, and glass, 3 3/8 in / 8.7 cm diameter, Celtic, Ireland, ca. 700 (National Museum of Ireland). <https://www.museum.ie/en-IE/Collections->

[Research/Collection/The-Treasury/Artefact/The-Tara-Brooch/4e7de8cc-9cf5-4352-a20a-34caf1bf4d95](https://www.nm.ie/en/research/collection/the-treasury/artefact/the-tara-brooch/4e7de8cc-9cf5-4352-a20a-34caf1bf4d95)



Figure 9.8b *Tara Brooch* front detail, cast and gilt silver, gold filigree, amber, and glass, Celtic, Ireland, ca. 700 (National Museum of Ireland, photograph by Sailko, CC BY 3.0)

[https://en.wikipedia.org/wiki/Tara\\_Brooch#/media/File:Spillone\\_di\\_tara,\\_da\\_bettystown,\\_contea\\_di\\_meath,\\_viii\\_secolo\\_02.jpg](https://en.wikipedia.org/wiki/Tara_Brooch#/media/File:Spillone_di_tara,_da_bettystown,_contea_di_meath,_viii_secolo_02.jpg)



Figure 9.8c *Tara Brooch* back detail, cast and gilt silver, gold filigree, amber, and glass, Celtic, Ireland, ca. 700 (National Museum of Ireland, photograph by Sailko, CC BY 3.0)

[https://en.wikipedia.org/wiki/Tara\\_Brooch#/media/File:Spillone\\_di\\_tara,\\_da\\_bettystown,\\_contea\\_di\\_meath,\\_viii\\_secolo\\_03.jpg](https://en.wikipedia.org/wiki/Tara_Brooch#/media/File:Spillone_di_tara,_da_bettystown,_contea_di_meath,_viii_secolo_03.jpg)

Filigree features delicate open or backed patterns crafted with fine metal wires. This ancient technique is still practiced in places like Yogyakarta, Indonesia, where sterling silver is cast into bars, then formed into fine wire by pulling it through drawplates (Figures 10.16c and 10.16d). The wires are then flattened in a rolling mill (Figure 10.16h) or twisted together and flattened. The fine silver wire is then shaped with tweezers (Figure 9.9a).

Components are filled with even finer hand-formed wires (Figure 9.9b). Paper backing keeps everything in place before soldering. **Flux** is applied (Figure 9.9c), solder is sprinkled on (Figure 9.9d), then it is placed on a metal screen resting on an **earthenware** tile and heated to melt the solder and burn off the paper (Figure 9.9e). Complex pieces are soldered together in several steps.

After cleaning the pieces with lerak fruit juice and a toothbrush, the edges are **burnished** to a high gloss with a graver (Figure 9.9f). The result is amazing (Figure 9.9g)!

Although most filigree is soldered today with gas torches, some jewelers prefer to use the ancient method of blowing into a flame through an angled **blowpipe** (Figure 9.9h) because it is less expensive, and the wire can easily melt if the flame gets too hot.

<https://www.carolventura.com/Filigree.htm>



Figure 9.9a Wire components are formed with tweezers at HS Silver in Yogya, Java, Indonesia (photograph by Carol Ventura, 2007).



Figure 9.9b Tweezers move a wire component to sticky paper at HS Silver in Yogya, Java, Indonesia (photograph by Carol Ventura, 2007).



Figure 9.9c Flux is applied in preparation for soldering at HS Silver in Yogya, Java, Indonesia (photograph by Carol Ventura, 2007).



Figure 9.9d Solder is sprinkled onto the fluxed pieces at HS Silver in Yogya, Java, Indonesia (photograph by Carol Ventura, 2007).



Figure 9.9e Pieces being soldered with the flame of a torch at HS Silver in Yogya, Java, Indonesia (photograph by Carol Ventura, 2007).



Figure 9.9f After being cleaned, the edges are burnished at HS Silver in Yogya, Java, Indonesia (photograph by Carol Ventura, 2007).



Figure 9.9g Filigree Peacock at HS Silver, Yogyakarta, Java, Indonesia (photograph by Carol Ventura, 2007).

The soldering method seen in Figure 9.9h was used during the Medieval Period and is still utilized by some jewelers to solder fine filigree. Circular breathing is required to keep the air flow steady while soldering with a blowpipe.



Figure 9.9h Augusto Cano solders a delicate silver filigree earring supported on a slab of charcoal while blowing through a flame with an angled blowpipe. The flame is fueled by a wick stuck into the spout of a can shaped like a teapot filled with kerosene in Jacaltenango, Guatemala (photograph by Carol Ventura, 1986).

Towards the end of the Migration period, artists began making chalices, **reliquaries**, and book covers for the Church. These objects were often made with gold and silver and studded with precious or semiprecious stones. **Casting** and **repoussé** techniques were used with gold, silver, and various metal alloys.

# Carolingian Period (768-936 CE)



The Carolingian Empire, ca. 814 (map by Simeon Netchev).

<https://www.worldhistory.org/user/simeonnetchev/>

Carolingian comes from the word, “Carolus,” Latin for Charles. This period takes its name from the political Dynasty established by Charles Martel (688-741), his son, Pepin the Short (714-768), and his grandson, Charlemagne (Charles the Great; 742-814). Carolingians were Frankish-Germanic people from Belgium. In Charlemagne’s time, Carolingian territory extended to the Netherlands, France, Germany, and Italy. Charlemagne successfully stabilized the lands under his control, transplanted classical learning to Northern Europe, and strengthened religious ties to Italy and the Pope. The Pope crowned him the first Holy Roman Emperor in Old Saint Peter’s Cathedral in Rome in 800.

Centuries before paper and the printing press, monks in Ireland and England hand copied old gospel books to preserve the Bible. The precious manuscripts consisted of illustrated texts on vellum (veal skin) or parchment (sheep, calf, or goat skin) bound into books. Book covers were made of leather, wood, ivory, enamel, gems, and / or gold.

Unfortunately, difficult to read passages of the Bible were incorrectly transcribed over the centuries so Charlemagne set out to recover the true text. To that end, he established artistic workshops in his palace in Aachen

in northwest Germany, as well as other centers of the Empire. Latin script was standardized to make books more legible. Charlemagne imported libraries and invited scholars and artists to Aachen, which encouraged a variety of artistic styles.

The composition of the back cover of the *Lindau Gospels* in Figure 9.10 was inspired by the Hiberno-Saxon animal style. A bezel set topaz and four abbreviations: IHS XPS DNS NOS (Jesus Christus Dominus Noster / Jesus Christ Our Lord) flanked by four enameled busts framed by garnets form the center of a large cross. More jewels are set in the arms of the cross, in the interlace panels between the arms and in the enameled borders. The figurative evangelists at the corners were added in 1584.



Figure 9.10 *Lindau Gospels* back cover, gilded silver, enamel, topaz, garnet, and other stones, 13 3/4 x 10 7/8 in / 35 x 27.5 cm, Abbey of St. Gall, Switzerland, Carolingian Period, ca. 740-800 (Pierpont Morgan Library)

and Museum, Purchased by J. Pierpont Morgan (1837-1913) in 1901).

<https://www.themorgan.org/manuscript/76874>

video at [https://www.youtube.com/watch?v=oTR\\_8cTJkBO](https://www.youtube.com/watch?v=oTR_8cTJkBO)

The front cover of the *Lindau Gospel* (Figure 9.11) was crafted in a figurative style by the court artists of Charles the Bald, the grandson of Charlemagne. A large Triumphant Crucified Christ and ten small grieving figures (that include four angels, the Virgin, Mary Magdalene, and John) are expressively repousséd (Figure 1.9b) and chased (Figure 1.9d) in high relief. Ornate filigree (Figure 9.9) and hundreds of bezel-set jewels and pearls outline the cross, fill the spaces between the mourning figures, and decorate the wide border.



Figure 9.11 *Crucifixion, Lindau Gospels* front cover, gold, precious stones, and pearls, 13 3/4 x 10 7/8 in / 35 x 27.5 cm, Carolingian, Court School of Charles the Bold, Abbey of Lindau, Germany, Carolingian Period, ca. 880

(Pierpont Morgan Library and Museum, Purchased by J. Pierpont Morgan (1837-1913) in 1901). <https://www.themorgan.org/manuscript/76874> video at [https://www.youtube.com/watch?v=oTR\\_8cTjkBO](https://www.youtube.com/watch?v=oTR_8cTjkBO)

## Ottonian Period (ca. 936-1024 CE)



The Ottonian and Holy Roman Empire, ca. 972 (map by Simeon Netchev). <https://www.worldhistory.org/user/simeonnetchev/>

The Ottonian Dynasty began around 936 when Otto I (912-973) established Germany as the political and cultural center of Europe. He was succeeded by Otto II (955-983) and Otto III (980-1002). Few pieces of Ottonian jewelry survive, but legal codes and wills record the gold and precious stones worn by the nobility.

Jeweled head ornaments were worn by noble men and women throughout the Medieval Period. Women inherited chains, brooches, necklaces, earrings and bracelets, while men passed down their jeweled sword fittings, spurs, belts and brooches. Royal regalia included a Crown, Imperial Cross, Imperial Sword, Holy Lance, Holy Scepter, and Orb (Figure 9.12), many of which are illustrated in the *Gospel Book of Otto III*. The large size (that symbolizes his importance) and posture of Emperor Otto III who is seated on a lion-headed throne with his feet on a footstool, wearing a

crown and voluminous royal purple and gold clothing, contrasts with that of his subservient clergy and military.



Figure 9.12 *Otto III Enthroned, Gospel Book of Otto III*, tempera on vellum illuminated manuscript, 13 x 9 3/8 in / 33.02 x 23.81 cm, Reichenau Abbey, Germany, Ottonian Period, ca. 1000 (Munich, Bavarian State Library Clm. 4453). [https://www.digitale-sammlungen.de/en/view/bsb00096593?](https://www.digitale-sammlungen.de/en/view/bsb00096593?page=20,21)

[page=20,21](https://www.digitale-sammlungen.de/en/view/bsb00096593?page=20,21)

and

[https://en.wikipedia.org/wiki/Gospels\\_of\\_Otto\\_III#/media/File:Clm\\_4453\\_fol\\_24r\\_Detail\\_Herrscherbild.jpg](https://en.wikipedia.org/wiki/Gospels_of_Otto_III#/media/File:Clm_4453_fol_24r_Detail_Herrscherbild.jpg)

The Ottonian *Crown of the Holy Roman Emperor* in Figure 9.13 was constructed from eight 22 carat gold hinged plates that were later riveted to strips of **iron**. An arch connects the front and back.

The precious translucent stones are rounded rather than faceted because cutting techniques did not develop until the 13<sup>th</sup> century. Hundreds of pearls, sapphires, emeralds and amethysts were fastened

with thin wires over holes cut into the gold to allow light to penetrate. The twelve stones on the front and back probably reference the twelve stones of the Jewish high priest's breastplate (cf. Exodus 39:9-14) and the foundation stones of the New Jerusalem in the Revelation to John (Cf. Revelation 21: 19-21).

Four of the plaques are decorated with precious stones and pearls and the other four feature cloisonné (Figure 9.7) bible scenes and inscriptions. On the front, King Solomon holds a scroll with the words, "Fear the Lord and flee from evil" (Proverbs 3:7).

The cross and arch were added in 1027 during the reign of Conrad II, whose name and title are inscribed in seed pearls across the top. The red velvet cap dates to the 18<sup>th</sup> century.



Figure 9.13 *Crown of the Holy Roman Emperor*, 6 1/8 x 8 1/4 x 8 3/4 in / 15.56 x 20.96 x 22.23 cm, gold, enamel, 116 gemstones, pearls, cloisonné, Germany, Ottonian Period, ca. 962 and 1027 (Imperial Treasure, Hofburg Palace, Vienna SK Inv. No. XIII). <https://www.projekt-reichskrone.at/en/>

## Romanesque Period (ca. 1024-1200 CE)

Europe consisted of numerous feudal states, powerful monasteries, and independently chartered cities during the eleventh and twelfth centuries when capitalism, banking, and commerce were beginning to change the structure of society. The term Romanesque was invented in the 19<sup>th</sup> century and simply means “between Roman and Gothic with Roman elements.” This Period began around 1024 and continued through 1200 in most of Europe but only lasted until 1140 in France, where Gothic began.

The *Bayeux Tapestry* (Figure 9.14) is the most famous surviving Romanesque **textile**. It should be called the Bayeux **Embroidery**, though, because it is not a woven tapestry, but an amazing 20 in / 50 cm high by 230 ft / 7 m piece of **plain woven** (Figure 2.32a) linen embroidered (Figure 9.15) with colorful wool. Like a graphic novel, a continuous frieze tells the story of the events leading up to the Norman conquest of England by William the Conqueror (Norman, ca. 1028-1087) at the Battle of Hastings in 1066. It was commissioned by William’s half-brother, Bishop Odo (Norman, ca. 1030-1097).

The upper and lower margins include fanciful beasts and birds in heraldic arrangements. Stylized men, horses, and architecture depict preparations, feasts, battles, weapons, armor and more with accompanying inscriptions. It is not only an important work of art, but also an insightful historical document.



Figure 9.14a *Cutting a Tree, Preparing a Board, and Building Ships for Crossing the English Channel* details of the *Bayeux Tapestry*, France,

Romanesque Period, 1070-1080 (Musée de la Tapisserie de Bayeux).

<https://www.bayeuxmuseum.com/en/the-bayeux-tapestry/>



Figure 9.14b *The Battle of Hastings* detail of the *Bayeux Tapestry*, France, Romanesque Period, 1070-1080 (Musée de la Tapisserie de Bayeux).

<https://www.bayeuxmuseum.com/la-tapisserie-de-bayeux/decouvrir-la-tapisserie-de-bayeux/>

Many types of embroidery stitches are used to embellish surfaces with a threaded needle or hook. Two stitches were used to embroider the *Bayeux Tapestry*; the stem stitch (Figure 9.15a) for lines, and couching (Figure 9.15b) for filling in shapes.

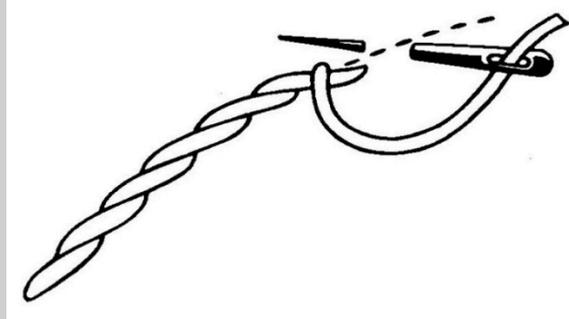


Figure 9.15a Stem stitch used to embroider linear parts of the images on the *Bayeux Tapestry*. <https://stitchwitchcottage.com/tutorials/stem-stitch-tutorial/>

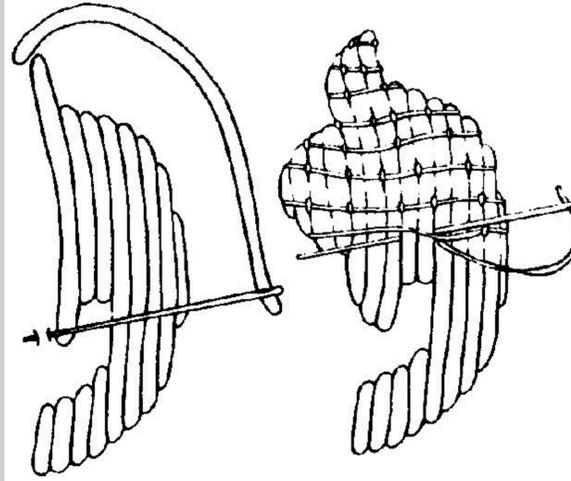


Figure 9.15b Couching stitch used to embroider solid areas of images on the *Bayeux Tapestry*.

Tight embroidery stitches can wrinkle fabric, so a hoop (Figure 9.15c and Figure 9.15d) or frame (Figure 9.15e) are often used to keep the cloth taut and flat while stitching.



Figure 9.15c A threaded needle is inserted into the cloth to cross stitch embroider, Chinantec, Rancho Grande, Oaxaca, Mexico (photograph by Carol Ventura, 2018).



Figure 9.15d The thread is pulled taut, in preparation for the next cross embroidered stitch, Chinantec, Rancho Grande, Oaxaca, Mexico (photograph by Carol Ventura, 2018).



Figure 9.15e Embroidering fabric stretched on a frame in Agra, India (photograph by Carol Ventura, 2016).

Skills are often passed down from parent to child, as seen in Figure 9.15f. The mother and her daughters are not pulling the thread too tight after each stitch, so their cloth does not need to be stretched on a frame as it is being embroidered.



Figure 9.15f A mother stitches together the layers of a **quilt** while her daughters embroider in Kutch, Gujarat, India (photograph by Carol Ventura, 2016).

Tambour embroidery is done with a tambour or crochet hook. The hook is pushed through tightly stretched fabric to create chain-like stitches (Figures 9.15g and 9.15h).



Figure 9.15g Inserting the tambour embroidery hook into fabric stretched on a frame in Juchitan, Oaxaca, Mexico (photograph by Carol Ventura,

2016).



Figure 9.15h Pulling a loop of embroidery thread through stretched fabric with a tambour hook in Juchitan, Oaxaca, Mexico (photograph by Carol Ventura, 2016).

# Gothic Period (ca. 1140-1450 CE)



Gothic Europe, 14<sup>th</sup> Century.

<https://mrcolwellhistory.weebly.com/medieval-map-of-europe.html>

The Gothic Period began in northern France in the mid 12th century when the Church was the main sponsor of the arts. The rising fortunes of kings, bankers, and merchants gradually provided more support. Schools and newly formed universities began to replace monasteries as centers of learning. France, England, and Spain developed into independent kingdoms during the Gothic Period. As cities began to thrive, a middle class of craftsmen, merchants, and professionals developed.

“Craft” comes from the old English word that means “skill.” Craft guilds composed of apprentices, journeymen, and masters sprung up to teach and protect artisans. Guilds received commissions, assigned jobs,

inspected finished work, and handled payments. Once apprentices mastered the basics, they would spend several years working as journeymen, observing and learning from many masters. Social and moral constraints didn't allow women to travel and apprentice under male masters. Some wealthy women were tutored at home, though, or learned by assisting their fathers and husbands.

Monumental church construction required the coordination of numerous craft guilds. Heavy stone vaulted ceilings were supported by thick walls with small windows until the French invented flying buttresses. This Gothic innovation transferred stress and weight away from the walls, allowing them to be filled with enormous windows.

Small stained glass windows were installed in churches as early as the 4<sup>th</sup> century. For medieval people, light symbolized the Divine light of the Immaculate Conception. Just as Mary was impregnated without violating her virginity, sunlight passes through colorful stained glass without breaking it and projects beautiful colors onto the floors and walls. The religious images and stories depicted also enlightened the faithful.

Chartres Cathedral in France has the largest original collection of stained glass windows; 172 windows populated by 8,000 figures. The windows survive because they were removed and stored during both World Wars. Vertical and horizontal metal iron bands reinforced stained glass windows until the 13th century, when the bands began to follow the outlines of the imagery. They appear as dark lines around the medallions in the detail in Figure 9.16, in a window commissioned by the Chartres guild of wood workers. Forty-two craft guilds donated windows, twenty-five of which include artisans engaged in their jobs, providing a lively record of daily life in Medieval Chartres.

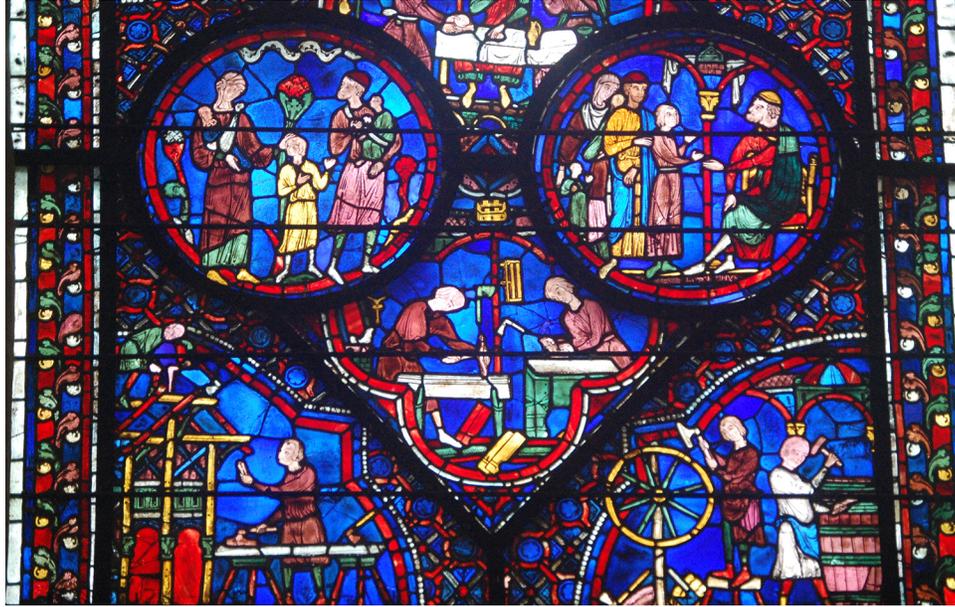


Figure 9.16 *Carpenters, Wheelwrights, and Coopers*, stained glass window detail, Chartres Cathedral, France, Gothic Period, ca. 1210.

Royal themes dominate the imagery in the *Rose and Lancet Windows* in Figure 9.17 that were donated by Queen Blanch of Castile (1188-1252) and her son Louis IX (1214-1270). The Queen of Heaven, Mary, holds Jesus in the center, surrounded by four doves on top and eight angels on the sides and bottom. Twelve Old Testament kings occupy the squares of the next ring. Twelve prophets inhabit the lunettes along the outside border. Twelve quatrefoils with golden fleur-de-lis between the kings and the prophets identify the royal French donors.

The five lancet windows below the rose window represent the triumph of divine law. From left to right, the priest king, Melchizedek, towers over idolatrous Nebuchadnezzar; Saul kills himself with a sword beneath King David; Saint Anne holds her child, the Virgin Mary, above the arms of France; Solomon stands above Jeroboam, who worships calves; and on the far right, Aaron stands over the pharaoh whose armies drowned in the Red Sea.

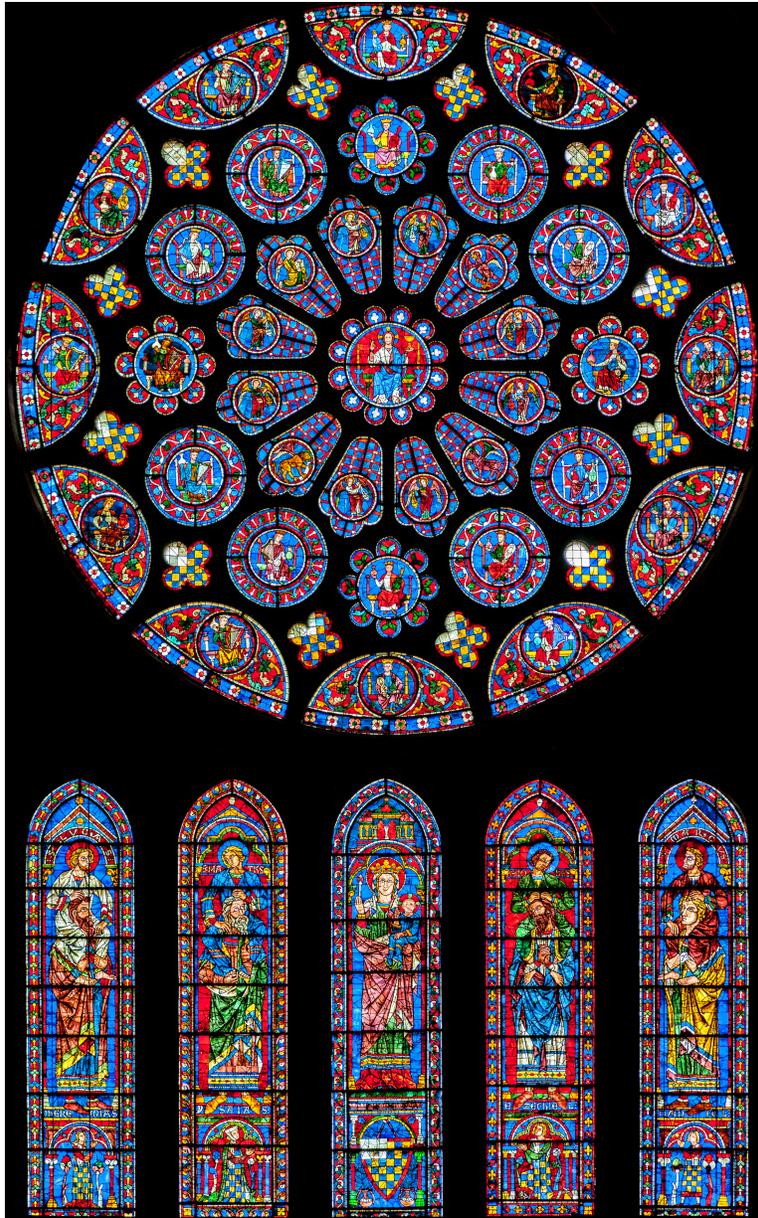


Figure 9.17 *Rose and Lancets Windows*, stained glass, Chartres Cathedral, France, Gothic Period, 1235 (photograph by PtrQs, CC BY-SA 3.0).

[https://en.wikipedia.org/wiki/Stained\\_glass\\_windows\\_of\\_Chartres\\_Cathedral#/media/File:Chartres\\_RosetteSued\\_122\\_DSC08269.jpg](https://en.wikipedia.org/wiki/Stained_glass_windows_of_Chartres_Cathedral#/media/File:Chartres_RosetteSued_122_DSC08269.jpg)

Silica, wood ash, and lime were combined and heated to make glass cullet, then it was either used locally or shipped to glass workshops. Glass was produced in forested areas because wood was needed to heat the **furnaces**. Figure 9.18 (clockwise) illustrates sand being dug in a wooded landscape then carried to a nearby glass furnace. A worker stokes the fire

while another dips his blowpipe into a vessel of molten glass in the furnace. A craftsman blows and shapes a vessel while finished items are removed from the **annealing** chamber. Lastly, a well-dressed gentleman inspects a finished vessel.



Figure 9.18a Sir John Mandeville, Glass Workshop, Mandeville manuscript illustration, Bohemia, ca. 1410-1420 (photograph from the British Library Archive). <https://imagesonline.bl.uk/asset/4802>

Flat glass was made by either spinning molten glass into a flat disk or by blowing and shaping a glass cylinder that was cut, opened, and rolled flat while still molten (Figure 9.18b). Since it was difficult to make large pieces of flat glass, windows were often assembled from numerous small pieces.



Figure 9.18b Flat glass disk and cylinder used to make flat glass at the Corning Museum of Glass (photograph by Carol Ventura, 2013).

**Leaded stained glass** window techniques have not changed much since the Gothic Period. A **cartoon** was drawn on a whitewashed board, then a piece of glass was placed over it. The outline was marked with white lime wash, then the glass was cut with a hot dividing iron (Figure 9.18c). Permanent markers and glass cutters are used today to perform the same tasks. The shape was refined by chipping off small pieces with a slotted iron bar called a grozier (Figure 9.18d). Grozier pliers and grinders are used today.



Figure 9.18c Lime-marked glass is cut with a hot dividing iron.

<https://www.khanacademy.org/humanities/medieval-world/gothic-art/beginners-guide-gothic-art/a/how-stained-glass-is-made>



Figure 9.18d Excess glass is trimmed away with a grozier.

<https://www.khanacademy.org/humanities/medieval-world/gothic-art/beginners-guide-gothic-art/a/how-stained-glass-is-made>

The shaped glass was set onto the cartoon, then imagery was painted onto it with a mixture of iron oxide, ground copper, and powdered glass, mixed with either wine, urine, or vinegar (Figure 9.18e). It was then heated in a

wood-fired **kiln** to **fuse** the **enamel** to the glass. The piece was again placed on the cartoon, then secured with flexible lead came (narrow strips of grooved lead). Nails temporarily held everything in place (figure 9.18f).



Figure 9.18e Glass is placed on the cartoon and painted.

<https://www.khanacademy.org/humanities/medieval-world/gothic-art/beginners-guide-gothic-art/a/how-stained-glass-is-made>

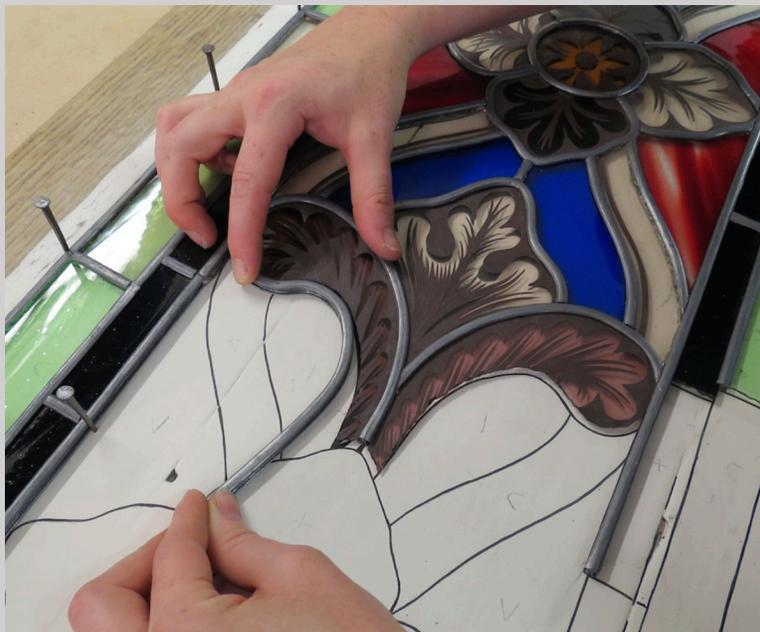


Figure 9.18f Glass is secured with lead came.

<https://www.khanacademy.org/humanities/medieval-world/gothic-art/beginners-guide-gothic-art/a/how-stained-glass-is-made>

The lead came joints were soldered with an alloy of lead and tin (Figure 9.18g), then thin cement was applied to the joints to fill in the gaps and make the panel waterproof (Figure 9.18h). Excess cement was removed with a dry brush (Figure 9.18i).



Figure 9.18g Joints are soldered.

<https://www.khanacademy.org/humanities/medieval-world/gothic-art/beginners-guide-gothic-art/a/how-stained-glass-is-made>.



Figure 9.18h Cement is applied between the lead came and glass.

<https://www.khanacademy.org/humanities/medieval-world/gothic-art/beginners-guide-gothic-art/a/how-stained-glass-is-made>

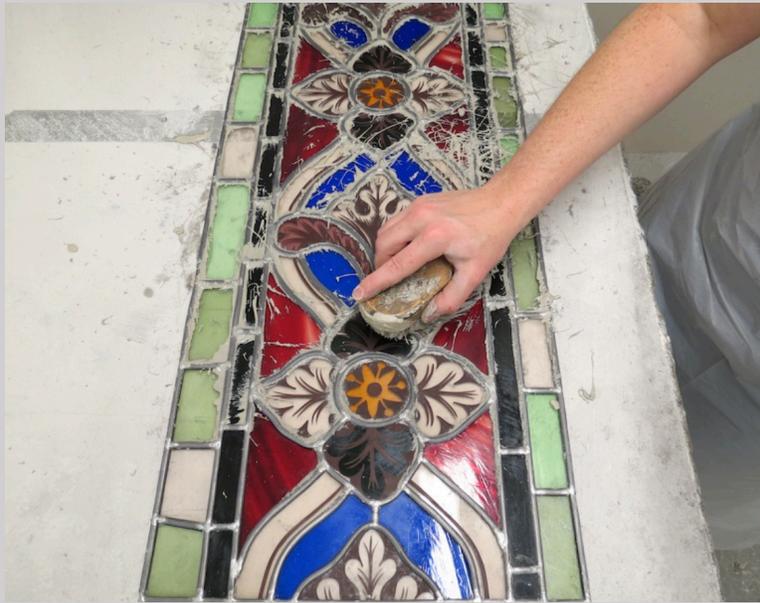


Figure 9.18i Excess cement is removed with a brush.

<https://www.khanacademy.org/humanities/medieval-world/gothic-art/beginners-guide-gothic-art/a/how-stained-glass-is-made>

Gothic Period jewelers used gemstones and Indian pearls (that were transported to Constantinople, Egypt, and Syria on camels), Persian Gulf pearls, and Scottish freshwater pearls. Members of the Fourth Crusade that sacked Constantinople in 1204 on their way to the Holy Land returned home with precious stones, jewelry, church ornaments, relics, and new designs.

Sapphires, emeralds, and rubies were rounded **cabochon** shaped (Figures 9.4, 9.10 and 9.11) until the Gothic Period when European **lapidaries** began to refine Indian and Persian faceting techniques to produce translucent stones with multiple angled planes. Diamond cutting also improved during the Gothic period. Earlier they were only available in their natural octahedron crystalline form that resembled two pyramids joined at the base. Lapidaries sliced them in half to make two points and then set into rings (Figure 9.19a). The points could be sliced a second time to produce a square flat-topped stone, the table-cut (Figure 10.15). Diamond cutting skills spread through Europe and by 1465 Bruges became a major center.

Gemstones were selected for their color and their healing and spiritual properties. Fakes were a problem, so legislation and guild regulations tried to protect the public from counterfeit stones and pearls made of glass, ceramics, ground stones, and other materials.

It is often difficult to determine the country of origin of medieval jewelry, since designs were similar throughout Europe. Inscriptions are in French or Latin, regardless of where it was made. Many styles of rings were worn on all the fingers and on more than one joint. The same ring served for engagement and marriage; given during a formal betrothal and then blessed and placed on the third finger of the bride's right hand during the wedding. The *Fede-Ring* (from the Italian "mani in fede" or "hands clasped in trust") in Figure 9.19 originally symbolized an alliance. During the Medieval Period, clasped hands with poetic inscriptions were found on some love and marriage rings. The inscription, "IO:SVI.ICI.EN / LIV:DE AMI / ODCEST:PRE / SENT:AVVS," translates to "I am here in the stead of a lover, yours with this gift."



Figure 9.19a *Fede-Ring*, engraved gold and bezel set diamond crystal, 1 in / 2.47 cm front to back, England, 14<sup>th</sup> century (© The Trustees of the British Museum, CC BY-NC-SA 4.0 license).

[https://www.britishmuseum.org/collection/object/H\\_1857-0928-1](https://www.britishmuseum.org/collection/object/H_1857-0928-1)



Figure 9.19b *Fede-Ring*, engraved gold and bezel set diamond crystal, 1 in / 2.47 cm front to back, England, 14<sup>th</sup> century (© The Trustees of the British Museum, CC BY-NC-SA 4.0 license).

[https://www.britishmuseum.org/collection/object/H\\_1857-0928-1](https://www.britishmuseum.org/collection/object/H_1857-0928-1)

Signet rings were used to witness and seal letters and documents. Most were made of metal, but some incorporated engraved gems. The engraved profile of a lady's face wearing a veil in Figure 9.20 was probably carved by a Greek craftsman around the first century BCE. Ancient Roman and Greek gems were often reset and reinterpreted.

The Latin engraving around the oval bezel, TECTA LEGE, LECTA TEGE, translates to "Read what is written, hide what is read." Sapphires were believed to promote peace and reconciliation, heal various ailments, cure stammers, ensure chastity, enable one to detect fraud, avoid envy, and prevent witchcraft so the setting is open under the stone to allow it to touch the skin.



Figure 9.20 *Signet Ring*, engraved gold and sapphire, 1 in / 2.5 cm high, ring made in Europe (perhaps England) 1275-1325 / sapphire engraved in Hellenistic Alexandria, 1<sup>st</sup> century BCE (Victoria and Albert Museum).  
<https://collections.vam.ac.uk/item/O121099/signet-ring-unknown/>

Sumptuary laws continued to restrict clothing and jewelry to certain classes. In France, townspeople could not wear precious metal and gemstone coronals. Edward III of England restricted jewelry made of gold or silver to the court. Knights, squires and their ladies, and brides could wear crowns. Parish churches lent simpler coronels to poor brides for their weddings.

The crown in Figure 9.21 is the oldest surviving English crown, believed to have been worn by Princess Blanche (1392-1409; daughter of Henry IV) when she married Ludwig II of Bavaria in 1402. The base has twelve hexagonal rosettes with jeweled gold stems topped with lilies that alternate in size and height. The middle of each hexagon features **enameled** white flowers over a translucent blue or red background, and a pale blue sapphire. The points are decorated with sapphires and emeralds and alternating rubies and pearls around a small diamond.



Figure 9.21 *Crown of an English Queen*, gold, enamel, sapphires, rubies, emeralds, real and imitation diamonds, pearls, 7.1 x 7.1 in / 18 x 18 cm, western Europe, ca. 1370-80 (Munich Residence Treasury).

<https://www.residenz-muenchen.de/englisch/treasury/pic11.htm>

Reliquaries are often shaped like the relics they hold. The wooden core (now removed) of the reliquary in Figure 9.22 held the skull of Saint Yrieix (510-591), who founded a monastery in France. This reliquary was carried through the streets in an annual procession, then placed on an altar.



Figure 9.22 *Reliquary Bust of Saint Yrieix* and wooden core, silver, **gilded** silver, rock crystal, gems, **glass**, and wood, outer layer is 15 x 9 3/16 x 10 1/4 in / 38.1 x 23.4 x 26.1 cm, Limoges, France, ca. 1220-1240 (The Metropolitan Museum, Gift of J. Pierpont Morgan, 1917, CC0).  
<https://www.metmuseum.org/art/collection/search/464333>

The colorful *Chalice* with portraits of the apostles in Figure 9.23 was signed by two artists, Paulo di Giovanni and Jacomo of Siena. It is an exquisite example of **basse-taille enamel**, which developed in Italy around 1290. With this technique, chased and engraved low reliefs are covered with translucent enamels to produce shimmering, shaded imagery.



Figure 9.23a Workshop of Paolo di Giovanni Fei (Italian, ca. 1345-1411) and Giacomo of Siena (Italian, 14<sup>th</sup> century), *Chalice*, silver, gilded copper, basse-taille enamel, 8 13/16 x 5 5/16 x 5 5/16 in / 22.4 x 13.5 x 13.5 cm, Italian, 14<sup>th</sup> century (The Walters Art Museum, Acquired by Henry Walters, 1913). <https://art.thewalters.org/detail/26370/chalice-2/>



Figure 9.23b Workshop of Paolo di Giovanni Fei (Italian, ca. 1345-1411) and Giacomo of Siena (Italian, 14<sup>th</sup> century), *Chalice* detail, silver, gilded copper, basse-taille enamel, Italian, 14<sup>th</sup> century (The Walters Art Museum, Acquired by Henry Walters, 1913).

<https://art.thewalters.org/detail/26370/chalice-2/>



Figure 9.23c Workshop of Paolo di Giovanni Fei (Italian, ca. 1345-ca. 1411) and Giacomo of Siena (Italian, 14<sup>th</sup> century artist), *Chalice* detail, silver, gilded copper, basse-taille enamel, Italian, 14<sup>th</sup> century (The Walters Art Museum, Acquired by Henry Walters, 1913).

<https://art.thewalters.org/detail/26370/chalice-2/>

The devotional medallion in Figure 9.24 is an inspirational example of *ronde bosse* encrusted enamel, a technique the French developed around 1360 to colorize three-dimensional gold and silver pieces. The composition was influenced by contemporary paintings that showed Mary with John holding the dead Christ. The angel above Christ's head holds the crown of thorns while two more angels support a curtain.



Figure 9.24 *Dead Christ with the Virgin, Saint John, and Angels*, ronde-bosse enamel on gold, 2 7/16 x 2 5/16 x 3/8 in / 6.2 x 5.8 x 1 cm, Paris, France, ca. 1390-1405 (The Metropolitan Museum of Art, Gift of J. Pierpont Morgan, 1917, CC0).

<https://www.metmuseum.org/art/collection/search/464709>

The Merode Cup (Figure 9.25) is decorated with birds, fruit, plants, and panels of the earliest known plique-a-jour enamel. With this delicate technique, enamel is applied onto a temporary backing placed behind an opening, the piece is fired, then the backing is removed to create the appearance of stained glass.



Figure 9.25 Merode Cup, 4 x 6 7/8 in / 10 x 17.5 cm high, silver, silver gilt, gold, plique-a-jour enamel, France, ca. 1400 (Victoria and Albert Museum). <https://collections.vam.ac.uk/item/O93263/the-mérode--cup-cup-and-cover-unknown/>

The rich upper class owned several homes and moved between them seasonally. Little of the furniture survives but many examples are depicted in paintings and are frequently described in inventories. These sources document two types, lightweight pieces that were easily transported and built-in or heavy furniture (too difficult to steal) that were left in place.

Common seating consisted of stools and benches. Cushions added comfort as upholstery was in its infancy. Thrones were constructed from elaborately decorated planks. The most celebrated example is the *Coronation Chair of King Edward I* (Figure 9.26) upon which the kings and queens of England are still crowned. It is the oldest dated piece of English furniture carved by a known artist, Walter of Durham. Figure 9.26b shows the chair with the Stone of Scone (on which Scottish kings had been crowned for over 300 years) that King Edward brought to England after defeating the Scots in battle. The Stone was returned to Scotland in 1996. The chair was originally gilded, painted and inlaid with glass mosaic. The four gilded lions that support the base were added later.



Figure 9.26a Walter of Durham (English, died ca.1305), *Coronation Chair of King Edward I*, carved oak, ca. 1296 (Westminster Abbey).  
<https://www.westminster-abbey.org/history/explore-our-history/the-coronation-chair>



Figure 9.26b Walter of Durham (English, died ca.1305), *Coronation Chair of King Edward I with the Stone of Scone*, carved oak, ca. 1296 (Westminster Abbey). <https://www.westminster-abbey.org/history/explore-our-history/the-coronation-chair>

The chair in Figure 9.27 is believed to have been used by English King Stephen in 1138. The groove in the lowest front rail probably linked the chair to a missing footboard. A loose seat cushion would have made the flat board seat more comfortable.



Figure 9.27 *Bishop's Chair*, turned wood with board seat, Hereford Cathedral, England, 1138.

The turned components of the chair in Figure 9.27 were made on a lathe similar to the one depicted in Figure 9.28. A rope was tied to a springy piece of wood (or a bent over sapling if turned in the woods), wrapped around the work piece, then tied to a foot-pedal. The turner pushed a sharp cutting tool against the workpiece as it rotated toward him when the foot pedal was pressed, and the tool was pulled away when the springy wood pulled up the rope. The process would be repeated until the piece was shaped, then it was smoothed and finished as it rotated on the lathe.



Figure 9.28 Turning Wood on a Pole Lathe, from *Das Hauscomponents buch der Mendelschen Zwolfbruderstiftung*, ca. 1425. Mendel I, Amb. 317b.2°, Folio 18 verso (Stadtbibliothek im Bildungscampus Nürnberg). [https://online-service.nuernberg.de/viewer/image/5d64f831-7a9d-47b4-9a01-d6a28f29ad99/39/LOG\\_0039/](https://online-service.nuernberg.de/viewer/image/5d64f831-7a9d-47b4-9a01-d6a28f29ad99/39/LOG_0039/)

The Annunciation in Figure 9.29 is taking place in the home of a prosperous Southern Netherlandish family. The central room has leaded clear and stained glass windows, shutters, an elegant carved wooden bench, a hanging **brass** kettle, a pierced wooden fire screen, and wrought iron andirons and candle holders. A ceramic pitcher, brass candleholder, and illuminated manuscript sit on the circular table. A blue and white prayer shawl hangs on a decorative rack in the background. All the figures wear voluminous loosely fitting garments. Gabriel's flowing robe includes a

decorative sash and cuffs, and Mary's silky red dress is decorated with gold trim.

On the right Joseph is in his carpenter shop drilling holes in a board with a brace and bit. On his workbench are an auger, mouse trap, nails, hammer, chisel, nipper, and knife. A saw, ax, and rod are at his feet. On the left the humble kneeling donor and his wife witness the scene through an open door, while a townsman stands at the courtyard open door.



Figure 9.29 Workshop of Robert Campin (Flemish, ca. 1378-1444), *Annunciation Triptych / Merode Altarpiece*, oil on oak, 25 3/8 x 46 3/8 in / 64.5 x 117.8 cm, Netherlands, ca. 1427-1432 (The Metropolitan Museum of Art, The Cloisters Collection, 1956, CC0).

<https://www.metmuseum.org/art/collection/search/470304>

Beds were status symbols and heirlooms specifically mentioned in wills. Few survive, but some have been depicted in paintings. Figure 9.30 depicts a couple next to a richly draped and canopied bed with a carved wooden frame. The curtains could be closed for additional warmth and privacy. Textiles were vehicles of extravagant display, often costing much more than the wood furniture they accompanied.



Figure 9.30 Jan Van Eyck (Flemish, 1390-1441), *Giovanni Arnolfini and His Bride*, oil on oak, 32 ½ x 23 5/8 in / 82.6 x 60 cm, Netherlands, 1434 (The National Gallery, London).

<https://www.nationalgallery.org.uk/paintings/jan-van-eyck-the-arnolfini-portrait>

## 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 17<sup>th</sup> century French Louis XIV Rococo style furniture.

Bone China – A type of white, translucent porcelain containing a high percentage of bone ash.

Boule 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 16<sup>th</sup> 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 5<sup>th</sup> 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 11<sup>th</sup> 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 dyeing to prevent absorption in the covered area.

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

Sagger – 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 embellish 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 8<sup>th</sup> century BCE through the 3<sup>rd</sup> 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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# Author

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 the web pages linked to her home page at <https://www.carolventura.com/>. She has presented papers at international conferences, including the 47<sup>th</sup> International Congress of Americanists, The 6<sup>th</sup> 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*,

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