Tracing the Historical Culture of Spalting in Spain to Its Potential Influence on Peru

Patricia Vega Gutiérrez | ORCID: 0000-0001-8209-7771
Department of Wood Science and Engineering, College of Forestry, Oregon State University, 119 Richardson Hall, Corvallis, OR 97331, USA
patriciavega@mail.com

Seri C. Robinson | ORCID: 0000-0002-4813-6826
Department of Wood Science and Engineering, College of Forestry, Oregon State University, 119 Richardson Hall, Corvallis, OR 97331, USA
seri.robinson@oregonstate.edu

Abstract

In Europe, from the fifteenth to the eighteenth century, intarsia and marquetry woodworks relied heavily on the use of spalted wood (wood colored by fungi) especially the blue-green stained wood from the Chlorociboria species. Although the use of spalted wood is well documented in Italy, Germany, Switzerland, and England, little is known about how guild traditions migrated from Spain during European colonization. This research sought to determine if the techniques or woodworks of the time moved to the viceroyalty of Peru. While numerous examples of spalted marquetry have previously been found in Spain, all were made by German artisans and imported to the country. For this research, only one piece of spalted furniture was found in Peru, and it was of English origin. Noting Spain's lack of production of spalted woodworks and the few pieces found in Peru, it is likely that this niche product did not move to Peru with Spanish colonists and may have instead come over later with English colonists in the 1800s when spalted wood was popular in that region.

Keywords

Chlorociboria – spalted wood – zone lines
1 Introduction

The ancient art style of *intarsia*, and later, marquetry, utilized small pieces of wood (often veneer) to make up larger images. This style of woodcraft became popular around the 1400s in Europe, centering in Italy and Germany, and remained so until the mid-1600s. However, the technique has been documented well into the 1800s in Europe, still centered in Italy and Germany.

Color in *intarsia* was achieved through utilizing different wood species, synthetic dyes, natural dyes, and occasionally, non-wood products such as tortoiseshell and mother of pearl. At the beginning of *intarsia* popularity, some wood dye colors, especially blues, greens, and blue-greens, could not be reliably manufactured. To meet the demand for alternative colors, especially in the blue-green spectrum, wood stained by the fungi *Chlorociboria aeruginascens* and *Chlorociboria aeruginosa* was utilized (Fig. 1).

Wood stained by fungal pigments is defined as spalted wood. In its modern definition, spalting is the process by which wood decay fungi make extracellular pigments in wood (Robinson *et al.* 2007). *Chlorociboria*-stained wood was the most commonly utilized (Blanchette *et al.* 1992; Aguiló Alonso 2010;
Robinson et al. 2016); however, blue stains from Ophiostomatoid fungi and zone lines from a range of fungi were also utilized, albeit sparsely.

The use of spalted wood in *intarsia* is thought to have developed in Italy in the 1400s. The technique was later passed on to Germany, and from there, it spread unevenly throughout Europe. During the 15th and 16th centuries, Augsburg was an important political, commercial, and financial center where trade routes between Italy and Spain crossed. The *intarsia* technique evolved into *gesägte intarsia* (sawn intarsia) in Augsburg (Aguiló Alonso 2010), and spalted wood became a commodity of free trade in the area (Hellwag 1924).

*Gesägte intarsia* was especially preferred by the Hapsburg family. The Hapsburgs, also called “the Austrias,” were founded by King Phillip I in 1496. This dynasty ruled the Holy Roman Empire during almost the entire fifteenth century and ruled Spain until 1700. Under their rule, *intarsia* became a fashion in Europe and was adopted by most of the aristocracy of the Holy Roman Empire (Aguiló-Alonso 2010).

Augsburg craftsmen with links to Spain include Bartholomew Weisshaupt, who made, among other works, the doors of the El Escorial Royal Monastery (Real Monasterio de San Lorenzo de El Escorial (RMSLE)) for King Philip II and his family in 1562. In 1600, Hieronymus Fleischer made furniture for Queen Ana of Spain and her mother, Maria of Austria (Aguiló Alonso 2010).

In Europe, the use of spalted wood was tied to the *intarsiatore* and made since the fourteenth century. Guilds developed inlay techniques in Italy and Germany, producing exquisite objects that reached almost every European country. These techniques were preserved and passed on into the 1900s, primarily in Tunbridge Wells, England, but also sporadically in Germany and Italy.

The migration of spalted wood techniques from Europe to other parts of the world is understudied. Spalted wood is used heavily in North America, primarily in Canada and the USA, more so now than even in Europe. Woodworking techniques involving spalted wood do not appear to have migrated into the Americas, even with European colonization. In North America, the history of spalting is related to Melvin Lindquist and his son Mark, who stumbled upon spalted wood, reinvented its use in woodturning, and coined the term “spalted” (Robinson et al. 2016). The history of spalted wood throughout the rest of the world is unknown.

This research sought to determine if spalted wood use migrated organically with European colonization, specifically to Peru, South America, which was heavily colonized by Spain. In order to give context to any potential Peruvian pieces, research began in Spain to determine if the Spanish themselves manufactured woodworks with spalted wood or if the pieces in Spain were imported and made by German crafters as detailed by Vega Gutierrez and Robinson
As spalted wood was used in Spain, it is possible that guild techniques and/or Spanish pieces migrated with families during the colonization of Peru. This research focused on the apogee of gesägte intarsia in Europe (a period of heavy intarsia manufacturing) to look for a connection between Spain and the Spanish viceroyalties during the sixteenth century thus determining the possible exposure of Peruvian crafters to intarsia and spalted wood.

2 Materials and Methods

Spanish artwork with confirmed spalted wood presence (Vega Gutierrez and Robinson 2017) was surveyed for maker information. Peruvian artwork with potential spalted wood was identified by the presence of intarsia work containing inlaid pieces of blue-green or zone lines (Marmorfäule). The sampling and identification routine for the Peruvian samples was carried out exactly as Vega Gutierrez and Robinson (2017) describe, and spalted wood was classified according to where the pigmentation occurred in the wood's cellular structure.

Maker information for the Spanish pieces was collected via consultation with an expert on Spanish decorative arts from the XV to XVIII centuries, namely Dr. Maria Paz Aguiló Alonso, who identified one piece at the Bilbao Fine Arts Museum (Museo de Bellas Artes de Bilbao (MBAB)) and studied the German doors at the Royal Monastery El Escorial.

The identification of collections that contain possible spalted pieces in Peru was made through direct visits to potential sites. These sites are the Museum of Furniture/Eiffel House (Casa de Fierro), the Cathedral Palace Museum (Museo del Palacio Arzobispal de Lima), and the private collection from Casa Aliaga.

High-resolution photographs were taken at each Peruvian site. Images of the English table were taken with a Panasonic DMC-TZ5, which has a 180 dpi resolution. Images of the Cathedral Museum pianos were taken with a Nikon Coolpix L340, which has a 300 dpi resolution. Data obtained for each piece consisted of date, wood species, technique, original location, and background history. For the Spanish pieces, complete information was available. For the Peruvian sites, information was limited.

3 Results and Discussion

3.1 Spain

Most of the spalted wood pieces identified by Vega Gutierrez and Robinson (2017) were bureaus. They are briefly detailed below to give the reader context.
for the Peruvian artworks. These bureaus or *escritorillos* were important items of furniture characteristic of Spanish homes during the sixteenth century. Their functional role of storage expanded to include a social role that communicated high social status (Perez de Tudela 2009, Aguiló Alonso 2010). King Phillip II had a strong preference for Augsburg furniture. Bartholomew Weisshaupt was in charge of bureau-making and became known as “the bureau master.” Weisshaupt was also in charge of making the doors of the Royal Monastery San Lorenzo de El Escorial between 1562 and 1568 (Aguiló Alonso 1987, 2010).

The bureaus were brought to Spain by the king’s officials and ambassadors (Piera Miquel 2012). These pieces of furniture, made by Augsburg masters, were also given to other members of the Habsburg family, which included the king’s daughter and his sister, Joanne of Austria, Queen of Portugal (Aguiló Alonso 2006, 2010; Perez de Tudela 2009).

### 3.1.1 National Museum of Decorative Arts (MNAD)

Bureau 1 was located in the National Museum of Decorative Arts (Fig. 2) and originated from Southern Germany. It was approximately dated to 1600, measured 18 cm high, 22 cm wide, and 17 cm long, and was primarily made from an unidentified softwood. The drawers were made from *Fagus* sp. and *Fraxinus* sp.

**FIGURE 2** Bureau at National Museum of Decorative Arts. PHOTO: MNAD
This was a piece of possible Augsburg origin (Aguiló Alonso 1993) as it followed a typical Augsburg composition showing the polyhedral intarsia based on the works of Lorenz Stöer, some of which can be seen in *Geometry and Perspective*, which was published in Augsburg in 1567, and the work of Wentzel Jamnitzer (Aguiló Alonso 1993, 2010).

The inlay work showed on the outside frame and was formed by four panels and the lid with its inlaid panels on the outside and inside as well as the back panel and the inside drawers (Fig. 3) (Museo Nacional de Artes Decorativas 2015). The characteristic blue-green color of *Chlorociboria*-stained wood can be seen in the leaves, grass, and some (but not all) of the trees (Fig. 4).

Bureau 2 also originated in Southern Germany, was dated around 1600 (Fig. 5), and measured 34 cm high, 42.5 cm wide, and 29.2 cm long. The structure was made of *Pinus* sp. and *Juglans* sp. with mahogany (likely *Swietenia* sp.) and *Prunus* sp. marquetry (Museo Nacional de Artes Decorativas 2015).
FIGURE 4  Central drawer showing use of Chlorociboria-stained wood for the trees and grass in the bottom landscape. Trees and grass in the back are painted.
PHOTO: MNAD

FIGURE 5  Bureau 2 showing intarsia work in door panels and drawers.
PHOTO: MNAD
The view of the city ruins through an archway was a characteristic of German marquetry from the Tirol region (Aguiló Alonso 1993). The city ruins was a motif consistent with the works of Lorenz Stöer from Augsburg (Aguiló Alonso 1993). The drawers portray buildings and vegetation, and spalted wood can be clearly seen in the vegetation (Fig. 6).

Bureau 3 was from Southern Germany, dated around 1600, and measures 62 cm high, 104 cm wide, and 39 cm long (Fig. 7). The frame was made of an unidentified softwood, probably *Pinus* sp., and the marquetry was made of *Prunus* sp., *Juglans* sp., and *Faug* sp. (Museo Nacional de Artes Decorativas 2015). The twenty-one panels show birds, vegetation, and ruins according to Aguiló-Alonso (1993). The birds are consistent with the designs published by Lorenz Stöer in 1565 in Augsburg.

The spalted wood is clear on the birds' feathers and in the surrounding vegetation as well as on the tops of some buildings (Fig. 8).

3.1.2 Royal Site of San Lorenzo de El Escorial

The Royal Site of San Lorenzo de El Escorial was founded by King Phillip II in 1795. This building complex consists of the Royal Monastery San Lorenzo de El Escorial, the Royal Library, the Pantheon of the Kings, and the palace
FIGURE 7  Bureau 3 in collection of the National Museum of Decorative Arts.  
PHOTO: MNAD

FIGURE 8  Central right drawer of bureau 3.  
PHOTO: MNAD
of King Phillip II. The building incorporated five doors noted to contain spalted wood (Vega Gutierrez and Robinson 2017). These were located in the Ambassadors Room, the Throne Room and the Portrait Room. All the doors were dated 1567 and were thought to be made by Bartholomew Weisshaupt who was an Augsburg carpenter ordered by Philip II to make the doors and other pieces (Perez de Tudela 2009; Aguiló Alonso 2010). The main wood species used were Quercus sp., Pyrus sp., Prunus sp., Olea europaea L., Acer sp. and Populus sp. (Carreras et al. 2011).

The panels of the doors (Figs 9–12) showed detailed inlay work consistent with the style of Augsburg intarsia. The main motifs found in the design of the
doors were geometric figures based on Lorenz Stöer designs (Aguiló Alonso 2010). These intertwined with designs of vines, buds, floral patterns, and leaves. As with the other Spanish pieces, the *Chlorociboria*-stained wood was used primarily for vegetation with some used for pillars, roofs, and other architectural elements.

3.1.3 Bilbao Fine Arts Museum

Both the spalted bureau and the table from the Bilbao Fine Arts Museum showed characteristic elements of Augsburg-style *intarsia*. Polyhedral figures, vegetation in the form of leaves, and floral patterns as well as the depiction of birds and minor details such as books were done in *Chlorociboria*-stained wood.
Bureau 4 was dated to 1560 and was made with *Acer* sp., *Quercus* sp., *Pyrus* sp., *Prunus* sp., *Fraxinus* sp. (noted as Hungarian ash), and *Buxus* sp. Toasted coconut was used for friezes and entablatures, and *Populus* sp. was used for the spalted pieces (Aguiló Alonso 2010).
Aguiló-Alonso (2010), in her detailed study of the piece, indicated that the technique gesägte intarsia, mostly used in Augsburg during the sixteenth century, was employed for the outside panels, interior drawer, and the four surfaces of the inner central niche. The interior drawer can be completely removed, revealing exquisite marquetry work. These details were designed to add to the wealth effect of the piece (Aguiló Alonso 2010), which was a fashion of the 16th century (Piera Miquel 2012). Aguiló-Alonso (2010) indicated that the pattern followed the Fontainebleau school, also known as Beschlagwerk (strapwork) in Germany or labor de cueros recortados in Spain. This technique consists of polyhedrons, green leaves, branches, and large floral patterns.

In this piece, blue-green Chlorociboria-stained wood is used profusely to depict leaves of different shapes (Aguiló-Alonso 2010) (Figs 13 and 14).

The table, as with other sixteenth-century German pieces found in Spain, showed characteristic elements from the Augsburg style, including polyhedral figures on the right and left sides that create an exercise of perspective (Figs 15 and 16). A composition of weapons – arrows, axes and a shield – was the central piece, surrounded by rolled cylinders intertwined with vines and
FIGURE 14  Panel of inside drawer.
PHOTO: BILBAO MUSEUM OF FINE ARTS

FIGURE 15  Bufete in the Bilbao Museum of Fine Arts Museum.
PHOTO: BILBAO MUSEUM OF FINE ARTS
floral patterns. On the upper left and right sides, birds flank the composition; in the middle, the weapons are also flanked by birds. Again, spalted wood was primarily used for vegetation, but it was also utilized for the fletching of the arrows.
All the spalted Spanish pieces dated to the 1500s and showed clear Augsburg elements. Among the themes that identified this particular style are the rolling cylinders ("rollwerk") or scroll (Aguiló Alonso 1987a); the exercise of perspective through polyhedral instarsia inspired by the work of Lorenzo Stöer and Wenceslao Jamnitzer; the recurrent theme of ruins seen through archways; Fontainebleu themes with leaves, floral patterns, and vines; and the presence of birds and musical instruments (Aguiló Alonso 1987a, 1993, 2010). None of the spalted pieces found in Spain came from Spanish crafters, which may help explain why results for spalted furniture in Peru were so poor.

3.2 Peru
Unfortunately, in Peru, no objects using blue-green wood were found. Most of the pieces inspected were from the sixteenth century and followed the Spanish style of the period, consisting of strong and simple pieces of furniture. Inlay tradition does exist in Spain, but is known as taracea, an inlay technique of Arab origin, which used wood, stones, mother of pearl, and bones to create exceptional pieces. This type of furniture was exported to the viceroyalties and can be found in the Peruvian museum and private collections, but it does not have the added Italian/Germanic element of spalted wood.

Identification of spalted wood in Spanish-style furniture was made more difficult due to stains. Furniture of the era was usually varnished and consumer preference leaned towards an absence of “defects.” Among the available unvarnished pieces, no staining or zone lines were found on the pieces of Spanish origin.

One piece of furniture was found that might contain spalting, although its origin was, surprisingly, English (Fig. 17). It measured approximately 1.40 cm wide, 75 cm deep, and 85 cm high and featured decorated supports. It bears the stamp “A. Blain Liverpool,” which was characteristic of the William IV and early Victorian periods given that A. Blain was a renowned bureau maker commissioned by the royal family (The Furniture Gazette 1882).

The table was found in the private collection of the Aliaga House and dated to 1790. It had a tabletop with a dense pattern of black lines that may have been zone lines or tree host response lines since many trees can make their own “zone lines” in response to wounding or stress (Robinson et al. 2016). Host response lines are often made around areas of wounding in a tree, which is a key identification difference; however, some trees, such as olives, make these kinds of black and brown streaks as part of their growth. Definitive determination would require a detailed chemical analysis of the zone line content wherein melanin would be consistent with zone line presence. Due to the table’s age, however, taking samples was not allowed.
Noting the date of the table, it is unlikely that the piece was made from spalted wood. Spalted wood had mostly fallen out of favor by the early 1700s in Europe as synthetic dyes expanded their color range and became cheaper (Robinson et al. 2016). The only recorded instance of spalted wood from the late 1700s on was from Tunbridge Wells, England where boxes with geometric inlay were manufactured using spalted wood.

Particular to this piece, A. Blain or Arthur (Arbuthnot) Blain was born in Donegal, Ireland around 1796. Blain was an active bureau maker in Liverpool in 1835 (Oxford University 1879). His business was started by his father in 1796 and continued on by his son William until 1909 (Beard and Gilbert 1986). He made most of his pieces with hardwoods with a preference for mahogany and walnut, which are two woods that do not readily spalt (Kendall 2014).

With regard to the table’s immigration to Peru, British immigration concurred with the end of the Spanish viceroyalty at the beginning of the Republican period in the nineteenth century. British citizens played an important role during the Peruvian independence war, and since then, occupied important political and economic positions in the new republic. At mid-century, Peru’s economy grew exponentially because of the exploitation of guano. In this period and during the second half of the nineteenth century, British companies controlled broad trade sectors, such as oil, railroads, furniture, and textiles, among others, thereby intensifying the economic relationship between the United Kingdom and Peru.

During this period, pieces of furniture, such as those made by Irish bureau maker Arthur Blain, arrived in the newly-born Peruvian Republic. The table found in Casa Aliaga is an example of the furniture trade between Peru and the United Kingdom. Access to this type of furniture was reserved for economic and social elites such as the Aliaga family. Owning a high-quality British piece of furniture was a sign of high social status in the Republican period.

Most of the Peruvian wooden pieces from the sixteenth century (the heyday of spalted wood) were inspired by the sobriety that characterized the reigns of King Charles V and King Phillip regardless of both monarchs’ preference for Augsburg furniture. Most of the pieces found were bargueños, which are furniture pieces that preceded the bureaus. These were solid wood and all decoration was based on taracea, the Spanish word for intarsia. Taracea used mother of pearl, wood pieces, bone, and precious rocks to create elaborated marquetry designs, and these more exquisite designs were more made for elites from the south of Spain, especially Granada (Whishaw & Whishaw 1912; Burr 1941). Peruvian decoration and furniture of the time was made mostly of Nicaraguan cedar (Cedrela sp.), was free of defects, and is well represented in the Cathedral Palace Museum.
FIGURE 17  Detail of dark line pattern on the English table.
PHOTO: PATRICIA VEGA
4 Conclusions

No spalted woodwork was found in Peru either apart from an English tabletop from the late 1700s that may contain zone-line type spalting, although this is unlikely given the time period of the table’s manufacture.

The presence of gësagte intarsia pieces is closely linked to the Habsburg family (Perez de Tudela 2009; Aguiló Alonso 2010; Piera Miquel 2012). All the collection pieces that feature the intarsia technique using spalted wood coincided with the ruling period of the family. The profusion of this type of material decreased when the Bourbons replaced the Habsburgs in Spain in 1700, changing the decoration and architectonic style of the time.

Based on the findings of this study, there is no evidence of the presence of gësagte intarsia pieces in Peru during the Habsburgs’ rule.

A more common practice was to have the intarsiatore, like Bartholomew Weisshaupt, build the intarsia pieces in Ausburg and then send them to Spain for installation, as is the case of the doors in the Royal Monastery El Escorial (Aguiló Alonso 1987b, 2010). This method meant that the technique was not shared with local wood artists, which is in line with the protective nature of the guilds at that time. This is likely the reason why intarsia techniques using spalted wood were not utilized by local Spanish and viceregal craftsmen and also why the technique did not move into Peru even during its apogee in Europe.

More studies are needed to explore the Republican period in Peru and other South American countries in order to confirm or deny the presence of more spalled wood pieces that could have been commercialized during this period. It would also be interesting to explore the techniques brought by German, English, and Italian craftsmen that migrated to South America during the second half of the nineteenth century. In addition, the use of spalled wood by local native communities should be studied as there is the possibility of yet unidentified local use. Finally, the breadth of spalted wood use might be widened through consultation with the National Archives of the studied countries.

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