AnnotationFall2014\_CataldoVisco\_109r

Wax and Tallow: A Material Investigation

**Bnf. Ms. Fr. 640. folio 109r, *“Esbaucher en cire”***

Quand la cire est trop dure, on y mesle de la tourmentine ou un peu de beurre qui rend la cire plus amiable, et est plus propre que le suif que les Italiens y mectent, à cause qu’il fault souvent mectre les houtils en la bouche, qui sont meilleurs de buys ou d’os de cerf.

**Bnf. Ms. Fr. 640. folio 109r, *“Working in rough with wax”***

When the wax is too hard, one mixes in some turpentine or a bit of butter, which renders the wax malleable, and cleaner than tallow, which the *Italians* mix in, because oftentimes, it is necessary to put the tools into the mouth, [tools] which are better when made from box wood or antler.

*“The light is God, the wax is man, Christ is both.”[[1]](#footnote-0)*

*“It is as precious as it is ambiguous in its duality, for wax---poised between a solid and liquid state---fluctuates between presence and absence, strength and weakness, will and obedience, virtue and vice, memory and oblivion, death and resurrection.”[[2]](#footnote-1)*

In the early modern period, wax was a commonly purchased commodity that had a variety of uses in workshops, apothecaries, and ecclesiastical spaces.[[3]](#footnote-2) It could also be used as a device of imitation or trickery, as wax could easily imitate other materials.[[4]](#footnote-3) Tallow, or rendered animal fat, was less expensive, could often be sourced more easily, and shared many of the material advantages of wax---though was considered to be a lower quality material.[[5]](#footnote-4) Both wax and tallow were used regularly by the early modern craftsman; both could be used to carve and model patterns for sculptures,[[6]](#footnote-5) or could be used in other processes like copper etching, bronze casting, and gilding.[[7]](#footnote-6) Both materials were used in candles for illumination---though the expense of wax made it more likely to be used to illuminate sacred spaces. Wax was also a key ingredient for many medicinal remedies, creams, ointments, and cosmetics.[[8]](#footnote-7) These materials, which could readily change from one state to another, from solid to liquid, evoke the trope of transformation and mimic the material properties of metals that could be melted down and reconstituted into new objects. For wax, the duality of the material also had a spiritual dimension, both in alchemical and devotional practices.

Wax and tallow are mentioned in many recipes in Bnf. Ms. Fr. 640, but a few recipes focus on changing the qualities of the material itself, particularly to alter its hardness or softness. On folio 109r, the practitioner-author recounts a recipe for “working rough in wax,” writing, “When the wax is too hard, one mixes in some turpentine or a bit of butter, which renders the wax malleable, and cleaner than tallow, which the *Italians* mix in…” Given the frequency of wax and tallow in the manuscript, how can we understand the material properties of each substance, and how do they work together? How do the suggested additives perform comparatively? How do these mixtures relate more broadly to themes of material transformation in Bnf. Ms. Fr. 640 and other early modern sources?

To begin, wax and tallow share many properties and material characteristics. Both substances ideally undergo a purification process before they can be utilized by a craftsman. In the early modern period, wax was purified and bleached in earthenware pots, boiled in a mixture of “fresh seawater, alum, and saltpetre several times, until no traces of impurities remain[ed].”[[9]](#footnote-8) Tallow also undergoes a purification process before being used; early modern sources on rendering tallow are scarce, perhaps because this process was considered common knowledge and thus unimportant to record, like recipes for baking bread.[[10]](#footnote-9) Modern recipes that describe tallow rendering techniques, however, are plentiful.[[11]](#footnote-10) We rendered our beef fat and pork fat in a modern slow cooker, but this could have also been done over many hours in an oven or on a stove. The important parts of the rendering process are applying heat to the fat for many hours without burning it, then straining the rendered fat through cheesecloth to remove the impurities. This process could be repeated many times to achieve a more purified and perhaps firmer substance.

Both wax and tallow can be found in different qualities and types. In the manuscript, the author refers to “white wax” in many recipes.[[12]](#footnote-11) In his article on wax, Guerzoni writes that in order to assess the quality of wax, “one must carefully examine the color. The finest is yellow: the lighter it is, the better, and the darker, the worse.”[[13]](#footnote-12) Scent could also play a role in determining the quality of the wax, as a “rotten or mouldy” scent could indicate that tallow had been added to the wax in order to make the expensive material go further.[[14]](#footnote-13) While tallow was much easier and cheaper to procure than beeswax, the fat of different animals could be used, and each of these fats surely had different material properties. Lamb tallow is also mentioned in the manuscript, and Biringuccio mentions goat tallow as an ingredient in a wax mixture.[[15]](#footnote-14) Once cooled, the tallows became soft solids. In our experiments, we rendered both beef and pork tallow, rendering it both once and twice. The pork tallow has a much smoother texture than the beef tallow; the consistency of the once-rendered beef tallow might be compared to mashed potatoes, while the consistency of the once-rendered pork could be likened to thick yogurt. The twice-rendered pork fat was even creamier in texture, but the twice-rendered beef fat had a particulate consistency which could be compared to hard rice pudding. [fig. 1]

On page 109r of Bnf Ms Fr 640, turpentine and butter are listed as softening agents to wax, though it is not clear how much should be added to achieve the desired texture. It is implied that tallow is also a softening agent, though one that, it seems, the author would prefer not to use. [[16]](#footnote-15) In our experiments with wax, a 1:1 mixture of wax and beef tallow yielded a mixture that was soft and released easily from the molds, but was prone to breaking and cracking after it hardened. We, therefore, opted for mixtures that contained less softening agent than wax. We made mixtures of wax and turpentine, wax and butter, wax and beef tallow, and finally, wax and pork tallow. [fig. 2] Adding two teaspoons of turpentine to a quarter cup of wax produced a gummy, sticky result that could be carved easily with a stylus. The butter, however, when mixed with the wax, was difficult to carve; the carving tool got stuck in the material, making it difficult to control.[[17]](#footnote-16) Despite the misgivings of the manuscript author, the tallow mixtures worked particularly well for carving. As mentioned above, a 1:1 mixture was too soft and brittle, but mixtures that included “a little” tallow (in our experiments, two or four teaspoons of tallow to a half cup of wax) had the ideal malleability to carve.[[18]](#footnote-17) The best mixtures were wax and pork tallow; carving tools cut so cleanly through the material, making it easy to manipulate and carve, while the overall structure remained solid enough to endure manual manipulation. [fig. 3]

The author of the manuscript also writes about how wax can be hardened. On page 120r, in a recipe titled “Impress medals made from wax,” the author writes, “You can mold your relief with wax mixed with a bit of resin to make it harder and firmer…”. He goes on to describe a process of striking medals.[[19]](#footnote-18) A resin and wax mixture is also mentioned on page 160v in the recipe for “Moulding a foot or a hand.”[[20]](#footnote-19) Rosin and resin are mentioned in several instances in the manuscript, including the making of imitation coral, purpurine, adhering lead to glass, and using resin candles for smoking molds.[[21]](#footnote-20) In this recipe, the French word *rousine* is used; while other recipes use the more common *résine* or *la gemme*, or gum. In modern usage, rosin, resin, and gum have some interchangeable meanings; the material we used to try the wax-resin mixture was sold as “pine gum rosin.” In our experiment, we were concerned about mixing the two substances due to the higher melting temperature of the pine gum rosin. Would the wax burn or smoke if poured into melted rosin? We melted the wax first and then dropped in pieces of the rosin. The rosin, like an ice cube in cool water, slowly dissolved and became more gelatinous. The resulting mixture was indeed harder to carve.

The softness and hardness of wax and its ever-changing properties seem to be a recurring theme for early modern craft writers: Cellini remarks how the seasons affected the conditions of wax, and the temperature of the workshop could determine how the material responded to the craftsman’s hand and tools.[[22]](#footnote-21) Indeed, the remarkable ability of both materials to easily transform and combine with other substances made them useful as well as symbolically important in the culture of early modern craft processes, which stressed material transformation. Several more wax mixtures could be reconstructed. On page 151r, the author recommends mixing coal with white wax to make it strong,[[23]](#footnote-22) and Hugh Platt also mentions this mixture (“Note also that you must first cast all your curious patternes in yellow wax tempered with the fine powder of smale cole”).[[24]](#footnote-23) Plat also mentions red ochre as an additive to color the wax, which makes the pattern more visible.[[25]](#footnote-24) Biringuccio mentions adding Grecian pitch or “ship’s tar” to wax,[[26]](#footnote-25) while both Biringuccio and Cellini write about the benefits of mixing white lead with wax for softening it.[[27]](#footnote-26) More experimenting with these materials and others could be done to further this research.

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List of illustrations

Figure 1: Once-rendered pork tallow is smooth and creamy when it has solidified. When combined in small amounts to pure beeswax, it creates a soft, malleable carving material.

Figure 2: Chart showing the mixtures of beeswax and additives, hardness-to-softness, and comments about the consistencies of the mixtures.

Figure 3: Diagram of consistency of beeswax mixtures.

**Bibliography**

Beretta, Marco. “Usi scientifici della cera nell’antichità,” in *Quaderni Storici*, 2009 XLIV 1, 15-34.

Biringuccio, Vannoccio. *The Pirotechnia of Vannoccio Biringuccio. The Classic Sixteenth-Century Treatise on Metals and Metallurgy*, trans. and ed. by Cyril Stanley Smith and Martha Teach Gnudi (New York: Dover Publications, 1990).

Cellini, Benvenuto. *The Treatises of Benvenuto Cellini On Goldsmithing and Scultpure,* trans. C.R. Ashbee,(New York: Dover Publications, 1967).

Guerzoni, Guido Antonio. “Use and Abuse of Beeswax in the Early Modern Age. Two Apologues and a taste,” in A. Daninos, ed., *Waxing Eloquent: Italian Portraits in Wax* (Milano: Officina Libraria, 2012): 43-59.

“Prices (Posthumus) [database].” in Rudolph M. Bell and Martha Howell, eds., “Medieval and Early Modern Data Bank.” (Rutgers University: Oct. 19, 1998). Accessed 19 December 2014. <http://www2.scc.rutgers.edu/memdb/index.html>.

Plat, Hugh. *The jewel house of art and nature: containing divers rare and profitable inventions, together with sundry new experiments in in [sic] the art of husbandry, with divers chymical conclusions concerning the art of distillation, and the rare practises and uses thereof.* (London: Printed by Elizabeth Alsop, 1653). *The Making Of The Modern World*. Web. 19 Dec. 2014.

1. “Il lume è Iddio, la cera è l’huomo, Christo è l’uno & l’altro.” C. Musso, *Il quarto libro delle prediche del reverndissimo mons. Cornelio Musso, vescovo di Bitonto.* (Venice: Giovanni e Gio, 1579), p. 138. Qtd. in Guerzoni, “Use and Abuse,” p. 49. [↑](#footnote-ref-0)
2. Guido Antonio Guerzoni, “Use and Abuse of Beeswax in the Early Modern Age. Two Apologues and a taste,” in A. Daninos, ed., *Waxing Eloquent: Italian Portraits in Wax* (Milano: Officina Libraria, 2012), 49. [↑](#footnote-ref-1)
3. For more on various uses of wax, see Marco Beretta, “Usi scientifici della cera nell’antichità,” in *Quaderni Storici*, 2009 XLIV 1, 15-34. [↑](#footnote-ref-2)
4. Guerzoni, “Use and Abuse of Beeswax,” 54-55. [↑](#footnote-ref-3)
5. For the economic considerations of wax and tallow, see Guido Antonio Guerzoni, “Use and Abuse,” 47. In 1619, 100 pounds of Native Wax cost 79 guilders; 100 pounds of Baltic Tallow, on the other hand, cost 22.5 guilders. Early modern Dutch price data for three different kinds of wax (Baltic Dry Wax, Native Wax, and Riga Wax) and five tallow products (Baltic Tallow, Waits Tallow, and three categories of Native Tallow) can be found in the Prices (Posthumus) database, Medieval and Early Modern Data Bank, <http://www2.scc.rutgers.edu/memdb/index.html>. [↑](#footnote-ref-4)
6. Vannoccio Biringuccio, *The Pirotechnia of Vannoccio Biringuccio. The Classic Sixteenth-Century Treatise on Metals and Metallurgy*, trans. and ed. by Cyril Stanley Smith and Martha Teach Gnudi (New York: Dover Publications, 1990), 221. [↑](#footnote-ref-5)
7. For gilding and etching processes, see Benvenuto Cellini, *The Treatises of Benvenuto Cellini On Goldsmithing and Scultpure,* trans. C.R. Ashbee,(New York: Dover Publications, 1967), 100-101 and 105. [↑](#footnote-ref-6)
8. Guerzoni, “Use and Abuse of Beeswax,” 45. [↑](#footnote-ref-7)
9. Guerzoni, “Use and Abuse of Beeswax,” 46. [↑](#footnote-ref-8)
10. Bread is mentioned as a molding material in Bnf. Ms. Fr. 640, but a recipe is not provided. On folio 156r in the recipe “Quickly moulding hollow mould and relief,” the author instructs the reader to use a bread loaf, “prepared as you know [preparée co{mm}e tu sçais].” [↑](#footnote-ref-9)
11. Here, we use the word “render” to describe the purification process of applying heat to animal fat over a long period of time. This process is not described in Bnf. Ms. Fr. 640, and the French word “rendre” used in the manuscript carries a more distinctive meaning related to making and transformation. [↑](#footnote-ref-10)
12. For more recipes that mention “white wax,” see Bnf. Ms. Fr. 640, 59v “To mend holes [in] painting,” 131r “Molded Wax,” 133r “Hard wax to imprinting seals,” 139v “Casting wax to mold an animal that one has not got,” 151r “Moulding hollow,” 153r “Molding hollow seals or other things,” 155v “Rose,” 156v “Moulding a fly,” and 159r “Wax paintings.” [↑](#footnote-ref-11)
13. Guerzoni, “Use and Abuse of Beeswax,” 47. [↑](#footnote-ref-12)
14. Guerzoni, “Use and Abuse of Beeswax,” 47. [↑](#footnote-ref-13)
15. See Bnf. Ms. Fr. 640, 6r, and Biringuccio, *Pyrotechnia*, 330. [↑](#footnote-ref-14)
16. The author does mention the mixing of wax and tallow on page 122v, “Molding hollow”: “But tallow alone is not good and that is why you have to mix wax and tallow together.” [↑](#footnote-ref-15)
17. We used all-natural, organic butter, but might have had a different result had we made our own butter or clarified the store-bought butter. See Cataldo and Visco Field Notes, 16 November 2014, “Wax and tallow and elm infusion.” [↑](#footnote-ref-16)
18. Biringuccio says to mix “a little” tallow into the wax. See Biringuccio, *Pyrotechnia*, 330. [↑](#footnote-ref-17)
19. Rosin-wax mixtures are also mentioned in Hugh Plat, *The Jewell House of Art and Nature*, on p. 60. [↑](#footnote-ref-18)
20. Bnf. Ms. Fr. 640, 160v, “Moulding a foot or a hand.” [↑](#footnote-ref-19)
21. Bnf Ms Fr 640, 3r “Imitation coral,” 43r “Purpurine,” 49r “Lead Casting” and “Pewterers.” [↑](#footnote-ref-20)
22. Benvenuto Cellini*, Treatises,* 118. [↑](#footnote-ref-21)
23. Bnf Ms Fr 640, 151r, “Very strong wax.” [↑](#footnote-ref-22)
24. Plat, *The Jewell House*, 59. [↑](#footnote-ref-23)
25. Plat, *The Jewell House*, 59. [↑](#footnote-ref-24)
26. Biringuccio, *Pyrotechnia,* 330. [↑](#footnote-ref-25)
27. Cellini, *Treatises*, 100-101 and Biringuccio, *Pyrotechnia*, 330. [↑](#footnote-ref-26)