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Welcome

Current Issue

Photo-bank

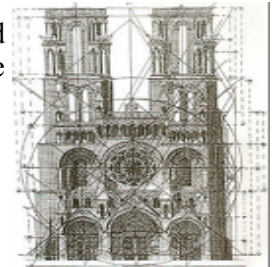
Submission
Guidelines

Organizations

Discoveries



Welcome to the Autumn 2015 issue of *Peregrinations: Journal of Medieval Art & Architecture*. This issue is devoted to a series of thought-provoking and challenging articles. The first portion continues the investigation of the weird and wonderful world of medieval maps by editors Dan Terkla and Asa Mittman. Asa Mittman explores where a map should be and where it isn't, while Arnold Otto investigates the visual and not-so-visual map of the Böddecken Cartulary. Then Chet Van Duzer discusses a graphic representation of a lost world map by the famed Henricus Martellus and why it should be accepted as accurate. The other articles which complete the issue also tackle notions of perception and choice. Rachel Dressler explores alabaster as a means of expressing identity and geographic origin, particularly Englishness in a manner never seen before. Greg Campbell questions how the traditional interpretation of pilgrim ampullae in the shape of scallop shells is an illusion. In fact, the ampullae depict something quite different. Perception, evident and hidden, is explored in Nelly Shafik Ramzy's article on fractal geometry and its role in the design and reception of Gothic architecture.

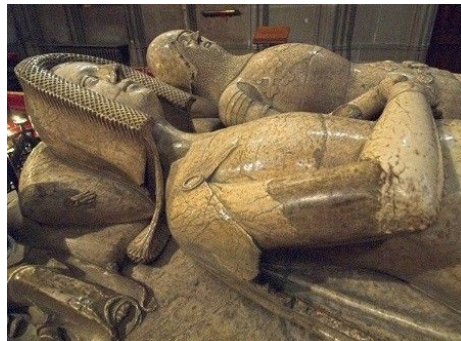


This issue also contains an in-depth book review of Matthew Champion's book *Medieval Graffiti: The Lost Voices of England's Churches* by William Anderson, and the Discoveries section includes accounts of a "flat-pack" Byzantine church being reconstructed in Oxford, re-discovered treasures (such as the remains of an Early-Christian basilica and a 14th-century obsidian ring, both in Bulgaria; a mosaic of Alexander the Great in a medieval temple in Israel; and a vast medieval palace under Old Sarum), and some welcome new technology that is most helpful for medievalists, including the digitization of the Vatican Library holdings and a medieval handwriting app.

Photobank

The Photobank database continues to serve as a resource for scholars and teachers. Recent uploads include details of English parish churches. Please note that our Photobank has undergone considerable renovation and is now part of Digital Kenyon at Kenyon College. You can search by typing in a key word or name in the search box (e.g. Canterbury). The Photobank continues to grow with copyright-free images all downloadable for use in research and teaching.

The Future



For future issues we are actively seeking articles on any aspect of medieval art and architecture, including: long and short scholarly articles, scholarly book reviews, review articles on issues facing the field of medieval art history, interesting notes and announcements, useful website recommendations, new archeological discoveries, and recent museum acquisitions. We are interested in publishing articles that will undergo double-blind review as well as those which are subject

only to regular editing processes, including articles that are the result of preliminary research. We are also looking for images to add to our photobank, to be shared and used by anyone in the classroom and in their research. To round out the scholarly portion of the journal, we are also seeking short, amusing excerpts from medieval sources, comments on the Middle Ages in movies and popular culture, etc.

Again, welcome to *Peregrinations*. Any suggestions or comments you have concerning the journal would be most welcome. Please feel free to e-mail us at: [Sarah Blick \(editor\)](#).

Our grateful appreciation and thanks for partial funding provided by [Kenyon College](#). Assistant editor: [Katherine Werwie](#). Programming and copy-editing: [John Pepple](#). Artistic Advising: [Karen Gerhart](#).

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Vol. 4, Issue 3 (Spring 2014)

Vol. 4, Issue 2 (Autumn 2013)

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Vol. 3, Issue 4 (Autumn 2012)

Vol. 3, Issue 3 (Summer 2012)

Vol. 3, Issue 2 (2011)

Vol. 3, Issue 1 (2010)

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Vol. 2, Issue 3, 4 (2009) **Vol. 2, Issue 2 (2007)**

Vol. 2, Issue 1 (2005) **Vol. 1, Issue 4 (2004)**

Vol. 1, Issue 3 (2003) **Vol. 1, Issue 2 (July 2002)**

Vol. 1, Issue 1 (February 2002)

FABRICATI DIEM, PVNC

-- The motto of the Ankh-Morpork City Watch (Terry Pratchett, *Guards! Guards!*)

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Peregrinations: Journal of Medieval Art & Architecture
Volume V, Number 2 (Autumn 2015)



Introduction to Mappings by Dan Terkla, Illinois Wesleyan University

My co-editor, Asa Mittman, and I welcome you to the second biennial issue of “Mappings” here at *Peregrinations: Journal of Medieval Art and Architecture*. In this issue we offer you Chet Van Duzer’s “Graphic Record of a Lost Wall Map of the World (c. 1490) by Henricus Martellus”; Asa Mittman’s “A Blank Space: Mandeville, Maps, and Possibility”; and Arnold Otto’s “The Map in the Böddeken Cartulary.” All of our contributors focus on unusual cartographical artifacts, one of which no longer exists, one that never existed, and one that seems to present a uniquely innovative way of representing place and possession.

Chet Van Duzer introduces us to a wall map that appears in a miniature from 1497 *Bíblia dos Jerónimos* (Lisbon, Arquivos Nacionais da Torre do Tombo, MS 161/7). This painting, by Attavante degli Attavanti, depicts St. Jerome interacting with Hieronymite monks from the royal Mosteiro dos Jerónimos in Belém, near Lisbon. Van Duzer confidently ascribes the map to Henricus Martellus, one of the fifteenth century’s most important cartographers. Given that the map in the painting no longer exists, the miniature enables Van Duzer to add a map of the world to Martellus’s cartographic catalog.

Moving from one non-existent map to another, Asa Mittman invokes Joseph Conrad’s *Heart of Darkness* to set the stage for his investigation of a fifteenth-century *Book of Sir John Mandeville* (BL Harley MS 3954). This manuscript’s final folio confronts the reader with a blank space, “neatly framed” in black ink. Just below the frame is a reference to “a bok of Latyn that

conteyned al that and myche more, aff wych bok the mappa mundi was mad.” Mittman is tantalized by the rubrication highlighting “mappa mundi” and sets out to discover what the framed map might have looked like and what it might have told us about the ways in which the *Book* portrays Jews.

Arnold Otto introduces us to a curious artifact, the *Böddeker Kopiar*, which is found in the fifteenth-century Böddeken Cartulary (Hs 44 and 45). The cartulary belonged to the Carolingian convent of Böddeken, founded in 836 by the archdeacon St. Meinolf which quickly became an important religious center for the area around Paderborn, in what is now eastern North Rhine-Westphalia. Otto shows us why the *Kopiar* is a map and, further, that it is “an innovation, a new method of describing possessions.” 🐉

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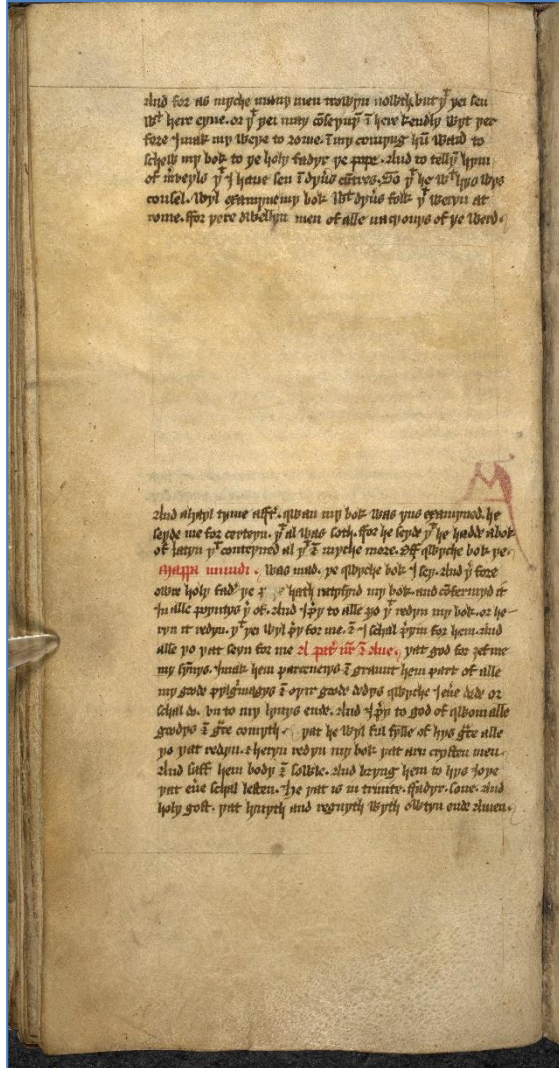


Figure 1 “A blank space,” London, British Library MS Harley 3954 f 69v. Photo: The British Library Board

A Blank Space: Mandeville, Maps, and Possibility

By Asa Simon Mittman, California State University, Chico

The yarns of seamen have a direct simplicity, the whole meaning of which lies within the shell of a cracked nut. But Marlow was not typical (if his propensity to spin yarns be excepted), and to him the meaning of an episode was not inside like a kernel but outside, enveloping the tale which brought it out only as a glow brings out a haze, in the likeness of one of these misty halos that sometimes are made visible by the spectral illumination of moonshine.¹

(Joseph Conrad, *Heart of Darkness*)

British Library Harley MS 3954's *Book of Sir*

John Mandeville has ninety-nine images, and

another thirty-five blanks, carefully framed by thin

lines of ink as part of the ruling of the

¹ Joseph Conrad, *Heart of Darkness* (Charlottesville: Electronic Text Center, University of Virginia Library, 1999, orig. pub. 1902), 68, available online as Joseph Conrad, “*Heart of Darkness*,” *Electronic Text Center, University of Virginia Library* (April 5, 2014) <<https://msuweb.montclair.edu/~furr/g/i21/hod-uva.pdf>> (accessed May 2015). My thanks to Dan Terkla for his care in editing this essay, for his easygoing style of collaboration, and for his reminding me of this passage from Conrad.

manuscript. As is so often the case, the blanks appear more frequently toward the end.² On the final folio (69v) there appears a neatly framed blank space (**Figure 1**).³ The manuscript's final text block appears just below this space and tells us of "a bok of Latyn that conteyned al that and myche more, aff wych bok the *mappa mundi* was mad." As if to tantalize the reader, "*mappa mundi*" is rubricated and so stands out from the black ink in which the rest of the page (and the book) is written. While I sat there, staring at the blank space, and the red name for an absent image, I caught myself dreaming of finding a new *mappa mundi* hidden within that empty frame, the perfect place for a map of the world according to Mandeville. What would it look like, and what would imagining it tell us about the *Book*'s portrayal of Jews?

Medieval representations of Jews are, to say the least, fraught.⁴ Little work has been done on the role of cartography in the larger Christian projects of anti-Judaism (that is, the definition of Christianity against notions about Jewish beliefs and practices⁵) and anti-Semitism (prejudice against Jewish peoples, involving what Peter Biller has called "proto-racial thought")⁶ though Daniel Birkholz, Kathy Lavezzo, and I have made a start.⁷ We argue that medieval Christian

² There is also one later image added on a previously blank leaf.

³ *The Book of Sir John Mandeville*, BL MS Harley 3954, England (East Anglia), 1425-1450. For the complete record, see "Detailed record for Harley 3954," *British Library Catalogue of Illuminated Manuscripts* (no date) <<http://www.bl.uk/catalogues/illuminatedmanuscripts/record.asp?MSID=4469&CollID=8&NStart=3954>> (accessed May 2015). For excellent introductions to *The Book*, see Iain Macleod Higgins, *The Book of John of Mandeville, with Related Texts* (Cambridge: Hachett Publishing, 2011) and Anthony Bale, trans. and intro., *Sir John Mandeville: The Book of Marvels and Travels* (Oxford: Oxford University Press, 2012).

⁴ See, for example, Debra Higgs Strickland, *Saracens, Demons and Jews: Making Monsters in the Middle Ages* (Princeton: Princeton University Press, 2003).

⁵ See David Nirenberg, *Anti-Judaism: The Western Tradition* (New York: Norton, 2013). Nirenberg, 6, argues that "anti-Judaism should not be understood as some archaic or irrational closet in the vast edifices of Western thought. It was rather one of the basic tools with which that edifice was constructed."

⁶ Peter Biller, "Proto-Racial Thought in Medieval Science," in *The Origins of Racism in the West*, Miriam Eliav-Feldon, Benjamin Isaac and Joseph Ziegler, eds. (Cambridge: Cambridge University Press, 2009), 157-80.

⁷ At the New Chaucer Society Congress in July of 2014, held in Reykjavik, Iceland, Lavezzo organized a thread of sessions on "(Absent) Jews in the Middle" in which Daniel Birkholz delivered a paper on

maps, including the Hereford, Psalter and Ebstorf Maps, as well as Matthew Paris's innovative maps of the "Holy Land," make assertions about Jews and Jewishness through three strategies that are organized along global, eschatological chronologies: the presentation of ancient individuals and events, such as the Wandering of the Israelites; the effacement of medieval Jewish populations who were sometimes living quite near where the maps were created⁸; and the deployment of fear-mongering images of and rhetoric about the purported role Jews, who are often conflated with Gog and Magog, would play during the End-Days. Looking at the blank space in Harley 3954 and imagining it filled provides an opportunity to think through the power and importance of these cartographic conventions.

A few Mandeville manuscripts contain maps, such as BL MS Royal 17 C.xxxxviii (**Figure 2**), which was produced perhaps a decade earlier than Harley 3954.⁹ This makes sense, of course, given that the narrative is so deeply tied to geography.¹⁰

"Coincident Departures: Mapping the Expulsion in the Hereford *Mappamundi* and Harley MS 2253." I spoke on "Jews of the Past, Jews of the Future." For a record of this conference, see "2014 Congress," *The New Chaucer Society Website* (2014) <<http://newchaucersociety.org/pages/entry/2014-congress>> (accessed May 2015). I am currently working on a book on the subject, entitled *Cartographies of Exclusion*.

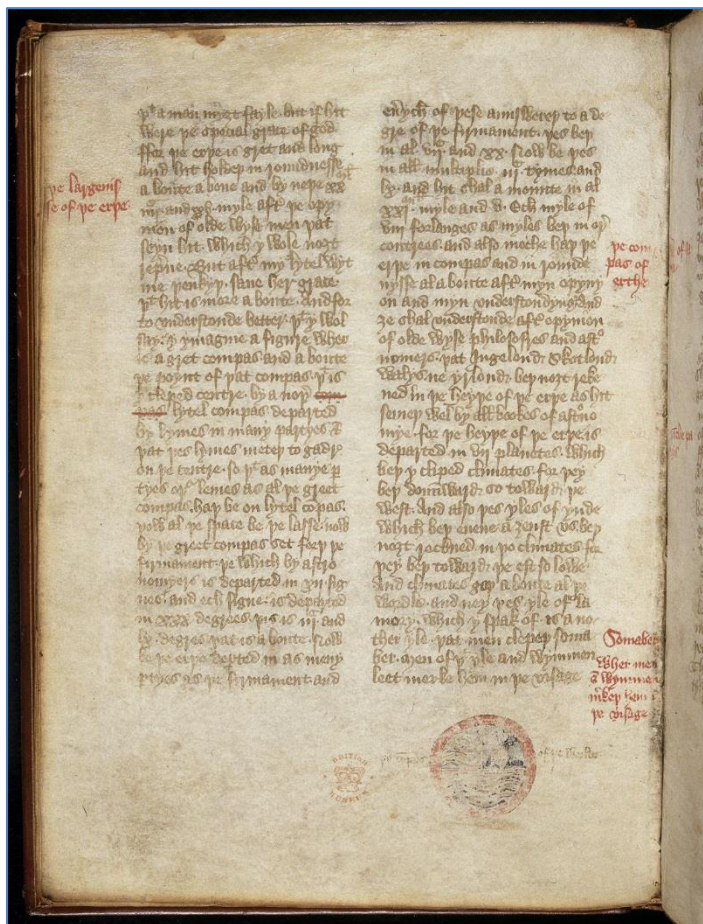
⁸ Matthew Paris, for example, produced his highly defamatory maps while living in St. Albans, a dozen miles from the Jewry of Hertford and two-dozen miles away in main Jewry of London. Joe Hillaby, "Jewish Colonization in the Twelfth Century," *Jews in Medieval Britain: Historical, Literary and Archeological Perspectives*, ed. Patricia Skinner (Woodbridge: Boydell Press, 2003, paperback 2012), 14, Map 1, lists all the English Jewries present in the twelfth century. Robin Mundill, *England's Jewish Solution: Experiment and Expulsion, 1262-1290* (Cambridge: Cambridge University Press, 2002), 286-90, provides a complete list of records of Jewish settlement in England, 1262-1290.

⁹ There is no single "Mandeville" text, but rather, a series of interlocking texts, all in turn based on other sources rather than on the putative travels of its likely fictional narrator, "not a singular thing but a diffuse and volatile concatenation," according to Jeffrey Jerome Cohen, "Pilgrimages, Travel Writing and the Medieval Exotic," *Oxford Handbook of Medieval Literature in English*, Elaine Treharne and Greg Walker, eds., (Oxford: Oxford University Press, 2010), 611-628, 625. See also Iain Macleod Higgins, "Defining the Earth's Center in a Medieval 'Multi-Text': Jerusalem in *The Book of John Mandeville*," in Sealy Gilles and Sylvia Tomasch (eds), *Text and Territory: Geographical Imagination in the European Middle Ages* (Philadelphia: University of Pennsylvania Press, 1998), 29-53.

¹⁰ *The Book of Sir John Mandeville*, BL MS Royal 17 C.xxxxviii, England, 1410-1420. For the complete record, see "Detailed record for Royal 17 C XXXVIII," *British Library Catalogue of Illuminated Manuscripts* (no date) <

Figure 2 “Compass of the World,”
British Library, MS Royal 17
C.xxxviii, f. 41v. Photo: The
British Library Board

A small image in the lower margin labeled “The Compass of the World” is an inverted T-O map, dividing the world with straight lines into three schematic continents.¹¹ This tiny map is badly abraded, but it is clear that east – occupying half the earth – appears at the bottom, in contrast with the norm in medieval western Europe, where it appears on the top (though there are numerous counter-examples, especially those in which the image of the world is held by Christ or kings). Asia (lower half) and Africa (the upper-left quadrant) are filled with wavy lines that suggest water rather than land, creating a further inversion of expectations. The upper-right quadrant, presenting Europe, contains shapes in different colors, but nothing is clearly discernable. And so, sadly, the image provides little more opportunity for speculation about the



<http://www.bl.uk/catalogues/illuminatedmanuscripts/record.asp?MSID=7518&CollID=16&NStart=170338> (accessed May 2015).

¹¹ For a description of the T-O, or tripartite, map type, and numerous examples, see David Woodward, “Medieval Mappaemundi,” *The History of Cartography, Volume 1: Cartography in Prehistoric, Ancient, and Medieval Europe and the Mediterranean*, ed. J. B. Harley and David Woodward (Chicago: University of Chicago Press, 1987): 286-370, esp. 296. For discussions of the role of the eastward orientation of many medieval maps, see Alessandro Scafi, *Mapping Paradise: A History of Heaven on Earth* (Chicago: University of Chicago Press, 2006), 125ff and B. L. Gordon, “Sacred Directions, Orientation, and the Top of the Map,” *History of Religions* 10:3 (February 1971): 211-227.

Mandevillian worldview than the blank space in Harley 3954. More complex maps do survive in a few manuscripts containing *The Book of Mandeville*, such as the elaborate T-O map in BL MS Add. 37049, f. 2v, which appears a few folios before a series of excerpts from Mandeville, and therefore might or might not be associated with it. This map is an unusual variant on the T-O structure, with terrestrial earth somewhat abridged to allow room within the map's circle for the spheres of the elements of fire and air, each of which is labeled. The right branch of the water comprising the "T" of the T-O, the Tanais or Don River, is labeled as the Element of Water, and a forested stretch of northern Asia just above it is labeled as the Element of Earth. The map, then, is rendered into a diagram of the four elements. As Chet Van Duzer and Sandra Sáenz-López Pérez note, the map *may* respond to passages in Mandeville that "emphasize the centrality of Jerusalem," though they admit this is not likely. In any case, it does not otherwise seem to respond to Mandeville, which is only one of the "startling variety of texts and images" in this volume.¹² Even this interesting map, then, provides little guidance about what the "missing" map of Harley 3954 would have looked like.

If not a map, what else might have been intended for this blank space? An image of Mandeville before the pope? After all, as he writes, "I mad my weye to Rome, in my comyng humward to schew my bok to the holy fadyr the pope."¹³ Such an image would work well as part of the larger visual program, which begins with several images of Mandeville, and which contains numerous depictions of him in audiences with various priests and bishops. Indeed, the

¹² Chet Van Duzer and Sandra Sáenz-López Pérez, "Tres filii Noe diviserunt orbem post diluvium: The World Map in British Library Add. MS 37049," *Word & Image* 26:1 (2010): 21-39, 25. For a high-resolution image of this map, as well as the rest of the manuscript, see "Add MS 37049," *British Library Digitized Manuscripts* (no date) <http://www.bl.uk/manuscripts/Viewer.aspx?ref=add_ms_37049_f002v> (accessed July 2015).

¹³ Harley 3954, f. 69.

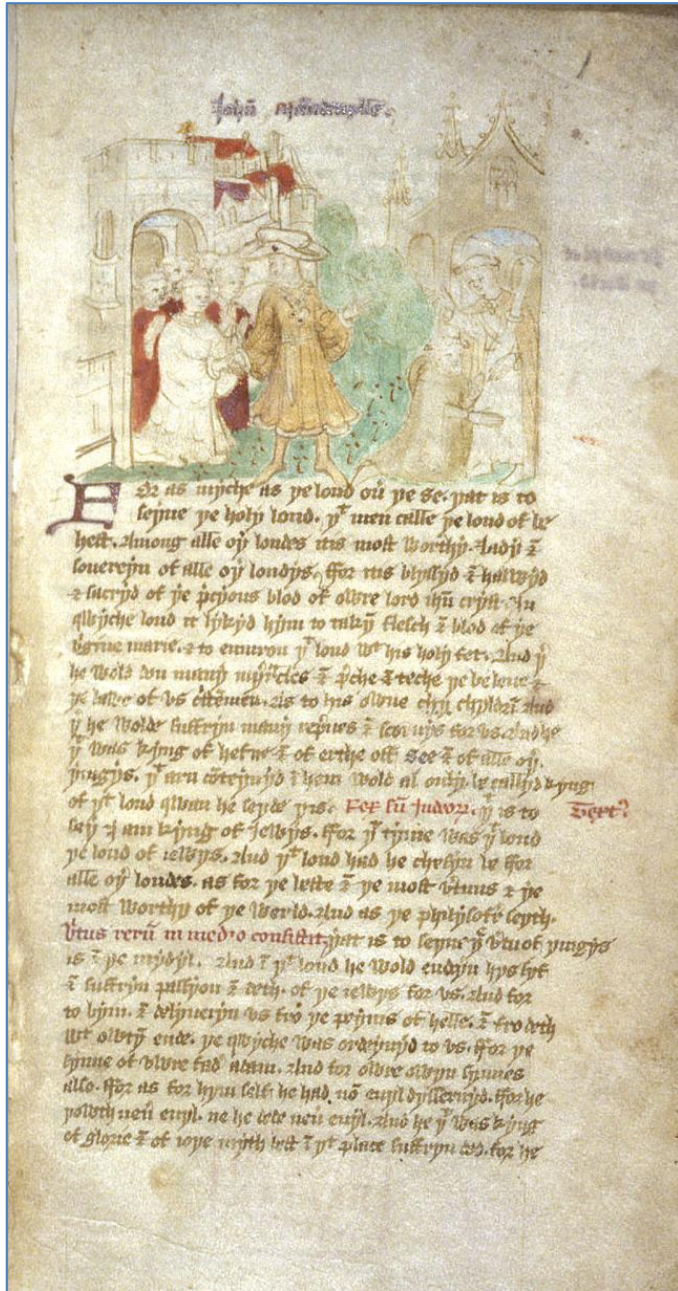


Figure 3 Mandeville Sets Out, London, British Library, MS Harley 3954, f. 1. Photo: The British Library Board.

manuscript's first image is of this type (**Figure 3**). Mandeville appears on the left in sumptuous garments – fur-lined robes, a jeweled necklace, and an elaborate hat – as he takes leave of the apparently adoring people of his native St. Albans, who kneel before him. To the right, Mandeville appears in the simple garb of the humble pilgrim kneeling in the entrance to a church, before a cleric who blesses him. None of the Mandeville texts describe these scenes.¹⁴ It would be fitting to complete this manuscript with an image of Mandeville again kneeling in receipt of a blessing, not from his local vicar, but from the pope, the Vicar of Christ.

But a map. A *mappa mundi*. That is what I wanted to find. This is a text centered on

geography, using geography to make claims about peoples and their proper places. A map could show how the illuminator synthesized this mass of complicated information, which sections were

¹⁴ This manuscript also lacks the preface, which precedes the prologue and provides more background information.

deemed most important, and how the confusing textual geography might be rendered accessible for readers.

The generous British Library staff allowed me to look at the Harley 3954 folio under a black light. I squinted, looked through my magnifying glass, took off my glasses, put them back on, and squinted harder. I saw nothing; no drypoint underdrawings; not even small, incidental scratches that I might have misread as preparatory marks. It is a smooth, clear stretch of velum. The reading room superintendent offered me a “cold light,” a 1960s-looking contraption with a steel box housing a light source that allows one to examine fragile manuscripts without subjecting them to the potentially damaging heat of more conventional lights. I was instructed to shine the light on the blank space on the recto, and through it from the verso. Nothing. No pope, no Mandeville, *no map*. Nothing to be written up, no fame, no glory from having found an unknown map. Just a blank space. Or *maybe a blank space*.

I borrow “a blank space,” from the “Manifesto” of the Material Collective, “a collaborative of art historians and students of visual culture [that] seeks to foster a safe space for alternative ways of thinking about objects.”¹⁵ The manifesto, for which I was one of a dozen co-authors, establishes the Collective’s goals – “to cooperate, encourage, share,” and so on – and lists actions and qualities it values: “experimental processes; risk-taking; transparency, revelation; *a blank space*; joy in faltering.”¹⁶ The fourth value was originally a placeholder, a blank space, but we in the Collective found that we liked it that way. “Blank space” signifies openness and possibility. That is, our blank space, any blank space, is not *merely* a blank space.

¹⁵ “Manifesto,” *The Material Collective Website* (May 2013) <<http://thematerialcollective.org/manifesto/>> (accessed May 2015).

¹⁶ “Manifesto,” emphasis added.

It might stand in for positive prospects, for example, thereby leaving room for discovery, innovation, and creativity.

The narrative and rhetoric of *The Book of Mandeville* is driven by strategies similar to those operative in maps. *Mandeville* is often referred to as a medieval bestseller, having been translated into nine languages, and seems to have had “popularity ... greater than that of any other prose work of the Middle Ages,” as attested by the 300-some extant manuscripts.¹⁷ The popularity of this text may be, at least in part, attributable to its subtle but pervasive anti-Jewish rhetoric. Indeed, this is a work *about* Jews, or, seen another way, about English identity formed in opposition to customary beliefs about Jews and Judaism.¹⁸ It contains a chronological pattern of associations very similar to that found on medieval *mappae mundi* and other medieval maps, such as Matthew Paris’s maps of the “Holy Land.” The text of *Mandeville*, much in concert with notions espoused on maps, claims, for example, that Jerusalem, “*belonged* to the Jews”¹⁹ in the past, and then looks ahead, through conflation, to the time when “the Jews of the Ten Tribes, who are called Gog and Magog,” will escape their enclosure behind the Caspian Mountains in “Antichrist’s time and ... will slaughter a great many Christians.”²⁰ His Jews plot to smuggle

¹⁷ Mary B. Campbell, *The Witness and the Other World: Exotic European Travel Writing, 400–1600* (Ithaca, N.Y.: Cornell University Press, 1988), 122. For a detailed account of surviving manuscripts and manuscript groups of the Continental French version, see Susanne Röhl, *Der livre de Mandeville in 14. und 15. Jahrhundert: Untersuchungen zur handschriftlichen Überlieferung der kontinentalfranzösischen Version* (Munich: Wilhelm Fink, 2004). For a chart of all surviving manuscripts, see Deluz, *Le Livre de Jehan de Mandeville*, 370-382. Further, several early printed versions were published, beginning in 1470, rendering it more popular in incunabula than any other medieval prose text.

¹⁸ See my forthcoming “Mandeville’s ‘East,’ Colonialism, Certainty, and Art History,” *Postcolonising the Medieval Image*, eds. Eva Frojmovic and Catherine Karkov (London: Ashgate).

¹⁹ Higgins, *Mandeville*, 3, emphasis added.

²⁰ Higgins, *Mandeville*, 157-58; 159.



Figure 4 Psalter Map, London, British Library, MS Add. 28681, f. 9. Photo: The British Library Board.

arms to their compatriots, as part of a global conspiracy to overthrow and enslave the Christian rulers of Europe, to “oppress them in our turn ... to bring the whole world to subjection.” A customs collector on a bridge, though, uncovers the concealed arms and, with them, “the hidden treachery and extraordinary deceit of the Jews, who chose rather to assist these open enemies of the world in general” – that is, the so-called “Tartars,” whom Matthew takes to be Jews – “than to aid the Christians, who allowed them to live amongst them.”²¹ Matthew did not illustrate this episode on any of his surviving maps, though it would not seem out of place on several of them, amidst other strange tales and accusations of Jewish colonial aggression.

The passages condemning Jews in *Mandeville*, Matthew Paris’s *Chronica*, and a great many other medieval English texts, form part of the intellectual context in which Harley 3954 was produced. So what would a map on its final folio look like? The space is small, only three inches high, but the circle of the world on the richly detailed Psalter Map is only half an inch larger (**Figure 4**).²² Given how much material that tiny map contains, the non-existent Mandeville map *could have contained* over 125 inscriptions and dozens of images. It could have shown the wandering of the Israelites and Moses’s parting of the Red Sea; it could have shown Gog and Magog behind their wall. It could have shown cannibalistic Jews, murderous Jews, violent Jews, monstrous Jews.

Figure 5 Alexander Encloses Gog and Magog, London, British Library, MS Harley 3954, f. 53. Photo: The British Library Board.

²¹ J.A. Giles, *Matthew Paris’s English History: From the Year 1235 to 1273* (London: G. Bell, 1889), 357-8, available online through the Hathi Trust Digital Library at <http://hdl.handle.net/2027/inu.3200000637670> (accessed March 2014)

²² BL MS Add. 28681, fol. 9r, c. 1265. See Konrad Miller, *Mappaemundi: Die ältesten Weltkarten* (Stuttgart: J. Roth, 1895–98), vol. 3, pp. 37–43; Peter Barber, “Medieval Maps of the World,” in P.D.A. Harvey, ed., *The Hereford World Map: Medieval World Maps and their Context* (London: The British Library, 2006), pp. 15–19 and Chet Van Duzer, “*Hic sunt dracones*: The Geography and Cartography of Monsters,” *Research Companion to Monsters and the Monstrous*, Asa Simon Mittman and Peter Dendle, eds., (London: Ashgate, 2012).



Figure 5 Alexander Encloses Gog and Magog, London, British Library, MS Harley 3954, f. 53. Photo: The British Library Board.

Harley 3954 does have a grand image of Alexander walling in Gog and Magog (**Figure 5**).

The text directly above it innocuously informs the reader that the trees that bear cloves and nutmeg. The passage describing Gog and Magog does not start until the next page, so we first confront their image, with only its caption to identify them. We might gaze at this complicated, murky image for a while, before moving to the text that labels them as “the Jews.” In the half-page illumination, we see a great mass of figures, some in armor and helms and others wearing crowns, suggesting that these



Figure 6 Flat-Faced People, London, British Library, MS Harley 3954, f. 42v. Photo: The British Library Board.

are some of the twenty-two Jewish kings imprisoned with their followers. The image bristles with swords and spears and is splashed with bright red like so much blood. The background is a dusky maroon that seems to wave and sway, looking like flames of Hell – an impression furthered by the sharp, flame-like rocks that seem to press the Jews toward the water on the right. This implies that their temporal imprisonment foreshadows the eternal imprisonment awaiting these “enemies of Christ.” Above them, the Caspian Gate looms, visually confirming the text’s assertion that they have no way out; more to the point, though: the map designer and the tradition within which he worked excluded Jews from the otherwise ecumenical world of the ecumene. Therefore, text and image assure the viewer that, although the many heavily armed Jews here are securely enclosed, their containment is eschatologically temporary. They are

conflated with Gog and Magog and thus will eventually overrun their walls, and all of the Christian world beyond. The map that is *not* in this manuscript could have had any of these elements, or all of them. Although these are *standard* features of medieval cartography, they have received little commentary from modern historians.

Just above the dramatic image of Gog and Magog in Harley 3954 is an image of people eating giant grapes. The rubric beside them reads “*merveyl*,” and so is redundant, given that nearly every image in this manuscript depicts a “*merveyl*.” There is really nothing more *merveylous* about these giant grapes than about the astonishing Flat-Faced People (**Figure 6**) or great-lipped Amyctrae, for example. Therefore, I find myself reading the inscription against its intended nominative, and instead in the imperative mood: “Marvel!” That is, “Reader, *merveyl* at this.” The giant grapes get a rubric, and several of the blank spaces are labeled “*merueyllys*.” But the final blank has no label, unless the rubricated “*mappa mundi*” within the text block qualifies. Latin is rubricated throughout the manuscript, and that is likely all the coloration signifies, of course. And so *a blank space*. Nothing on the page, nothing, that is, but space for readerly flights of fancy, opportunities for medieval readers to draw in the final image – or, to turn to their mental images of illustrated *mappae mundi* or of other anti-Semitic Christian images in other media.

Other images have been added – a lovely city on 44v (**Figure 7**), and a few odd, amusing doodles, like the bald, bearded man with a long nose on 33v (**Figure 8**). At some point, a reader scribbled and wrote in a few of the blanks, but someone scrupulously scratched these out, following the lines carefully and leaving blurred scratches in place of the texts and images that were once there. Folio 69r, which backs the not-*mappa mundi*, had some text written on it, also scratched carefully away. Though I cannot read these erased words, the hand is clearly larger and

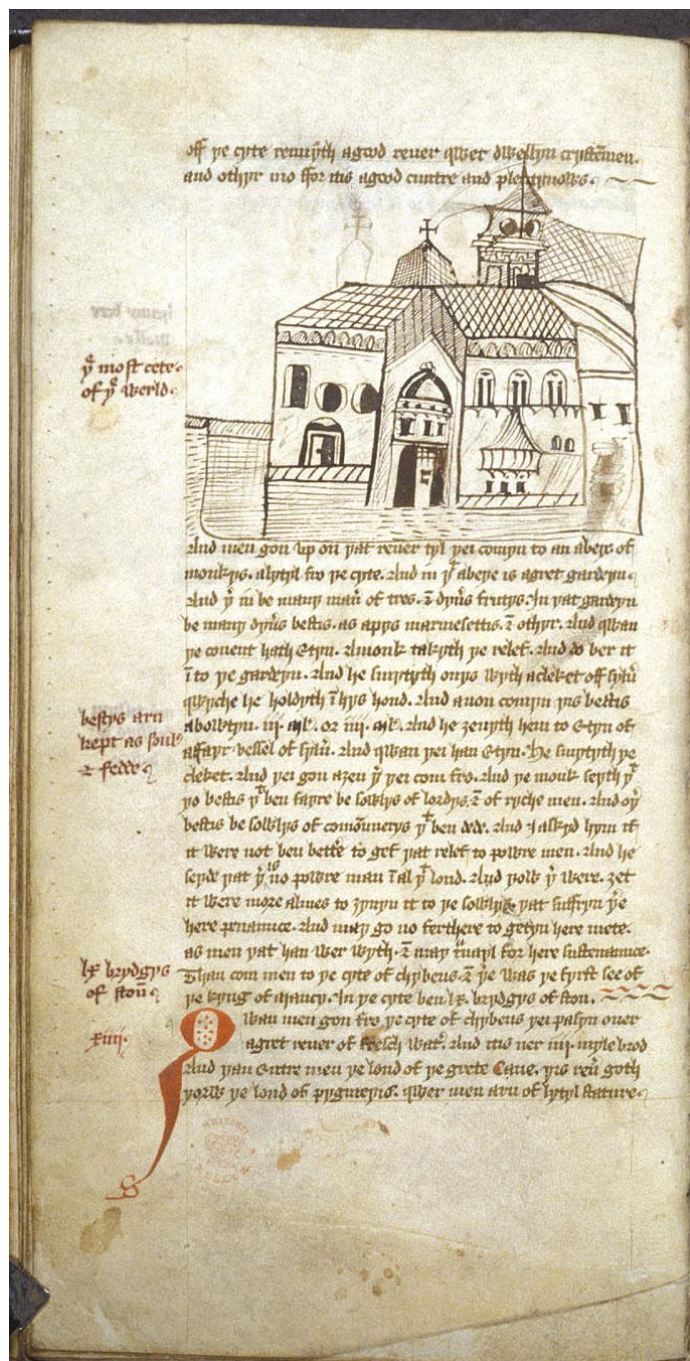


Figure 7 City of Cassay, later addition, London, British Library, MS Harley 3954, f. 44v. Photo: The British Library Board.

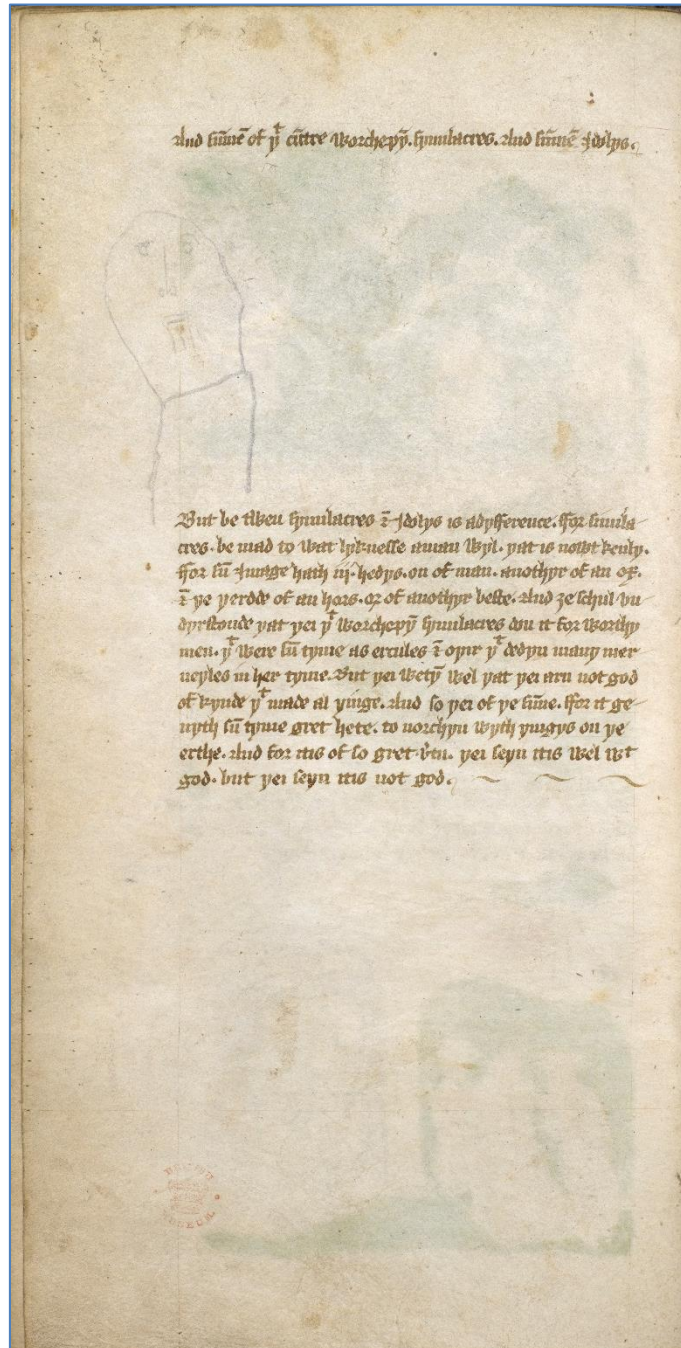
much later than that of the manuscript's scribe. This text was added later and removed later still, resulting, as it presumably was at the time of the manuscript's "completion," in a blank space. Such later additions of text and image are so common in medieval manuscripts that they almost seem to be natural accretions of time, building up like stalactites. Often, when modern historians mention them, they do so with a note of scorn, as in C. R. Dodwell's commentary about the later hand in the *Old English Illustrated Hexateuch*, BL MS Cotton Claudius B.v:

Then, after the end of the Middle Ages, the manuscript fell into the hands of a person, more meddlesome than artistic, who decided to touch up a number of the pictures with his pen. What he succeeded in doing by his childish efforts was simply to bodge up the pictures concerned and he has left his unhappy mark on almost all the folios between 70v and 128r.²³

²³ C. R. Dodwell and Peter Clemoes, *The Old English Illustrated Hexateuch (British Museum Cotton Tiberius B. IV)*. Early English Manuscripts in Facsimile 18 (Copenhagen: Rosenkilde and Bagger, 1974), 61.

Figure 8 Marginal Face, later addition, London, British Library, MS Harley 3954, f. 44v. Photo: The British Library Board.

And yet, we often value these additions, embedded in “complex relationships to scholarly disciplines, cultural values, and material practices,” because they teach us about the history of the manuscript, and the periods through which it has passed.²⁴ We should be cautious about rendering such judgments, especially in the context of a discussion of medieval maps, part of what Richard Gough referred to in a letter to the Reverend Michael Tyson in 1770 as the “barbarous Monkish System of Geography.”²⁵ We view medieval maps, and later markings on maps and manuscripts, as valuable,



²⁴ William Sherman, *Used Books: Marking Readers in Renaissance England* (Philadelphia: University of Pennsylvania Press, 2008), 24.

²⁵ Richard Gough, letter of November 13, 1770, printed in full in John Nichols, *Literary Anecdotes of the Eighteenth Century; Comprizing Biographical Memoirs of William Bowyer and Many of his Learned Friends; an Incidental View of the Progress and Advancement of Literature in this Kingdom During the Last Century; and Biographical Anecdotes of a Considerable Number of Eminent Writers and Ingenious Artists; with a Very Copious Index*. Vol. 8 (London: Nichols, Son, and Bentley, 1814), 668.

regardless of their status as “meddlesome.” Indeed, Renaissance readers were actively taught to mark up their books – some of which were medieval manuscripts – and they did so with great vigor.²⁶ As William Sherman argues, the consideration of marginalia “takes us back, finally, to that crucial *space* from which ‘marginalia’ itself takes its name.”²⁷ That is, the predicate for all of this energetic addition – one reader added 59,600 words to a 68-page volume of Aristotle’s *Posterior Analytics!*²⁸ – is the *blank space* of the margin. For the “meddlesome” post-medieval artist who added small drawings to almost fifty folios of the Hexateuch, sometimes the blank spaces were large, as was the case with the then-empty lower frames on f. 87v and f. 149v;²⁹ in other cases, though, they were smaller, like the blank faces of the Israelites who spy on the giant Sons of Anak on f. 118r (**Figure 9**).³⁰ The vacant faces of the rightmost Israelite and of the giants beneath their arch to the right remain only lightly sketched in with drypoint, but the rest of the figures’ faces have been “bodged up” by the later hand (to me, rather amusingly). How much more “meddlesome” are these than the very extensive twelfth-century commentary that at times overwhelms the images, as on f. 99v?³¹ Really, the efforts of the “bodger” are rather weak in comparison to those of the commentator. For that matter, are either of these more meddlesome than the red “MUSEUM BRITANICUM” stamps that appear as vigorous marks of ownership on

²⁶ Sherman, *Used Books*, 3.

²⁷ Sherman, *Used Books*, 24.

²⁸ Sherman, *Used Books*, xii.

²⁹ These images are online at:

http://www.bl.uk/manuscripts/Viewer.aspx?ref=cotton_ms_claudius_b_iv_f087v and

http://www.bl.uk/manuscripts/Viewer.aspx?ref=cotton_ms_claudius_b_iv_f149v (accessed July 2015).

³⁰ For a similar example, here with a rather skeptical-looking Moses, see f. 112r, online at:

http://www.bl.uk/manuscripts/Viewer.aspx?ref=cotton_ms_claudius_b_iv_f112r (accessed July 2015).

³¹ This image is online at:

http://www.bl.uk/manuscripts/Viewer.aspx?ref=cotton_ms_claudius_b_iv_f099v (accessed July 2015).

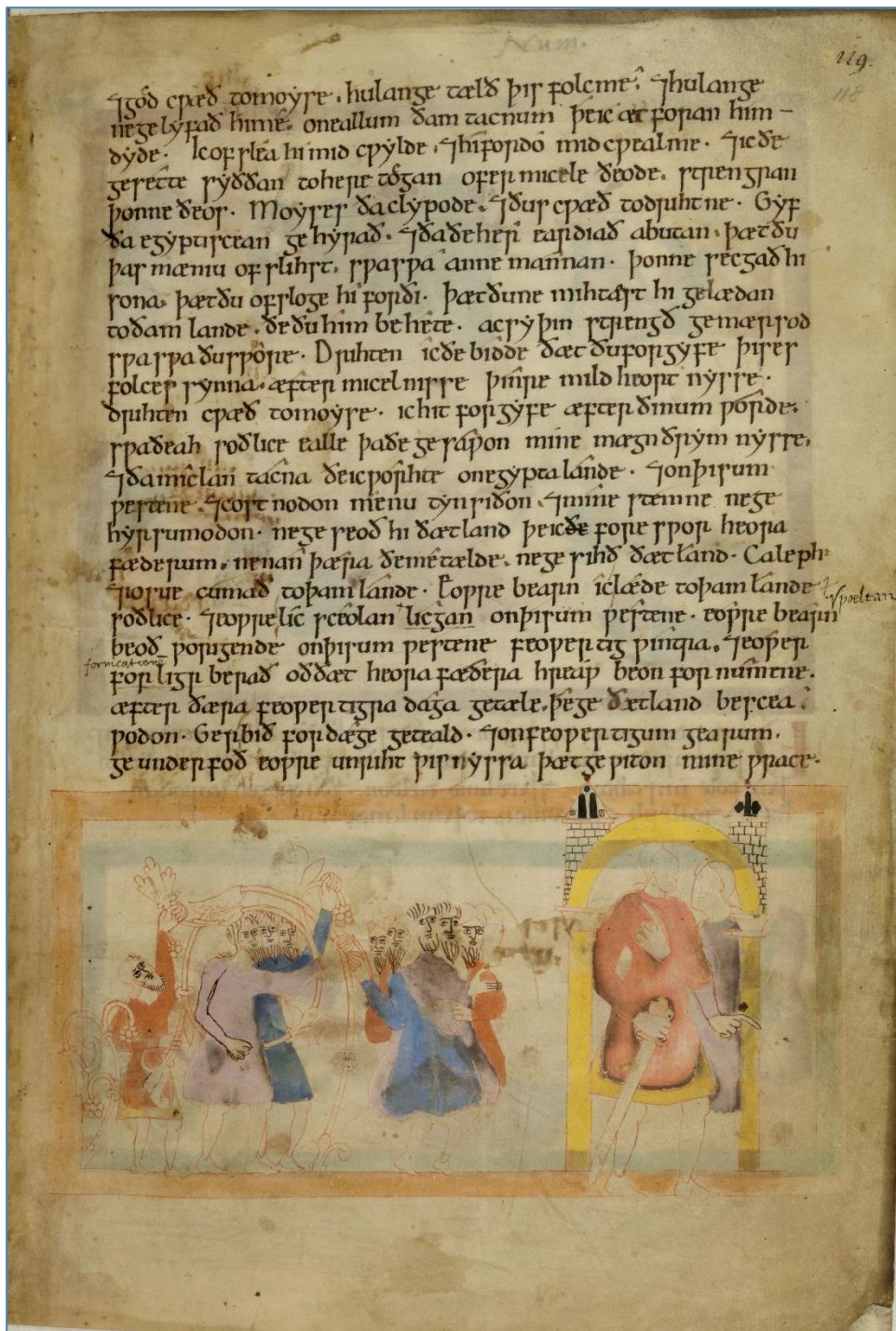


Figure 9 Sons of Anak, London, British Library, MS Cotton Tiberius B.iv, f. 118r. Photo: The British Library Board.

a few folios of this manuscript, and many others?³² These, too, step into the breaches left by the manuscript's original creators, and by many generations of its users.

Indeed, it is not just the creators of a manuscript who have the opportunity to mark it up; all users do (though modern library practices *strongly* forbid this, and with good reason³³).

Benjamin C. Tilghman, also a founding member of the Material Collective, inherited a small fifteenth-century Book of Hours from his grandfather and muses on the Collective's blog about his ability to leave his traces in its blank spaces:

It suddenly occurred to me that the book bears no traces of its years in my grandfather's care, and I have been very careful so far not to leave any of my own. After all, I'm a historian entrusted with the care and maintenance of our cultural heritage: of course I'm not going to write in it, or mark it up, or erase anything.

But really, why shouldn't I? The marks of readers, the traces of the past lives of artworks are some of my favorite things about works of art. I love imagining all the people who have come into contact with a work of art, who have touched it and been touched back by it.³⁴

As in the Material Collective's manifesto, every empty space is an invitation. Open spaces in manuscripts call for personal inscription by owners, scholars, students, children, and vandals.³⁵

As poet Kay Ryan implores,

³² For example, f. 2v and 85v, online at:

<http://www.bl.uk/manuscripts/Viewer.aspx?ref=cotton_ms_claudius_b_iv_f002v> and <http://www.bl.uk/manuscripts/Viewer.aspx?ref=cotton_ms_claudius_b_iv_f085v> (accessed July 2015).

³³ Perhaps most famously, the Bodleian Library at Oxford still has its readers sign a pledge, originally written in Latin, declaring, "I hereby undertake not to remove from the Library, or to mark, deface, or injure in any way, any volume, document, or other object belonging to it or in its custody; not to bring into the Library or kindle therein any fire or flame, and not to smoke in the Library; and I promise to obey all rules of the Library." See "Library Regulations," *Bodleian Libraries, University of Oxford* website (2015) <<http://www.bodleian.ox.ac.uk/about-us/policies/regulations>> (accessed July 2015).

³⁴ Benjamin C. Tilghman, "Marking Time," *The Material Collective Blog* (April 2, 2013) <<http://thematerialcollective.org/marking-time/>> (accessed July 2015)

³⁵ This is also true of empty spaces in churches, as evidenced by Matthew Champion, "The Medium is the Message: Votive Devotional Imagery and Gift Giving amongst the Commonality in the Late Medieval Parish," *Peregrinations* 3:4 (Autumn 2012): 103-123.

Why isn't it all
 more marked,
 why isn't every wall
 graffitied, every park tree
 stripped like the stark limbs
 in the house of
 the chimpanzees?³⁶

Dario Gamboni argues of *all* artifacts that “it is their normal fate to disappear.”³⁷ Similarly, since it is not only nature but also culture that abhors a vacuum, it is the normal fate of blank spaces to be filled.

In a way, I have been trying to virtually fill in that blank space on the final folio of Harley 3954, to use my words to occupy the gap left behind, creating my own version of the epigraphic text inserted “between square brackets in a fragmentary text,” and then generating from it an example of that “peculiar brand of historical fiction created by those (most often primarily historians, not epigraphists) who build far-ranging historical theories on words or phrases [or, here, images] which their epigraphist predecessors have inserted – meaning no harm” into the “text.”³⁸ It is difficult, as the “bodger” of the Hexateuch seems to have felt, to let emptiness *be*.³⁹

³⁶ Kay Ryan, “Why Isn’t It All More Marked,” *Odd Blocks: Selected and New Poems* (Manchester: Carcanet Press, 2011), unpaginated. My thanks to Kerr Houston, whose comment on Tilghman’s post (April 2, 2013 at 3:27 pm: <<http://thematerialcollective.org/markings-time/#comment-1412>>) drew my attention to this beautiful poem.

³⁷ Dario Gamboni, *The Destruction of Art: Iconoclasm and Vandalism since the French Revolution* (New Haven: Yale University Press, 1997), 25.

³⁸ Ernst Badian, “History from ‘Square Brackets,’” *Zeitschrift für Papyrologie und Epigraphik* 79 (1989): 59–70, 59.

³⁹ Elina Gertsman has been producing excellent work on emptiness in medieval art, including “The Gap of Death: Passive Violence and Visual Void in the Encounter of the Three Dead and the Three Living,” in *Beholding Violence in Medieval and Early Modern Culture*, eds. Erin Labbie and Allie Terry, 85-104. Burlington, VT; Aldershot, UK: Ashgate, 2012), and a book in progress on *Figuring Absence: Empty Spaces in Late Medieval Art*. Anne Harris, Alexa Sand, and Jacqueline Jung have also begun working on emptiness and absence, and spoke in a session at the 49th International Congress On Medieval Studies (2014) called “No/Thing: Medieval Art and Apophasis,” Sponsored by the International Center of Medieval Art: <scholarworks.wmich.edu/medieval_icms/2014/Schedule/487/> (accessed July 2015).

In Joseph Conrad's *Heart of Darkness*, the protagonist, Charlie Marlow, reminisces about the role of blank spaces in his childhood fascination with maps:

When I was a little chap I had a passion for maps. I would look for hours at South America, or Africa, or Australia, and lose myself in all the glories of exploration. At that time there were many blank spaces on the earth, and when I saw one that looked particularly inviting on a map (but they all look that) I would put my finger on it and say, "When I grow up I will go there."⁴⁰

The "blank spaces" enticed Marlow, because blank spaces are openings, invitations, calls to viewers (or travelers, from Mandeville to Marlow) to fill them. In my epigraph, the narrator introduces Marlow by cryptically claiming that the meanings of his stories lie "not inside like a kernel but outside, enveloping the tale which brought it out only as a glow brings out a haze, in the likeness of one of these misty halos that sometimes are made visible by the spectral illumination of moonshine."⁴¹ The "blank spaces" of Marlow's earth, the places not yet colonized by white Europeans and their cartographic representations, are rendered visible, are given meaning, by those who literally or figuratively inhabit them. Put another way, Harley 3954's blank space and the blank spaces around and within other medieval maps, do not present readers with epistemological kernels. Rather, the contexts in which readers find them, the contexts that envelop them like "a haze," prompt readers to supply meaning, visual information pulled from memory that complements *The Book's* text.

Were there a simple T-O map on Harley 3954's final folio, like the one in Royal 17 C.xxxviii (**Figure 2**), or even a simpler one, like the oft-reproduced map in an eleventh-century copy of Isidore's *Etymologies*⁴² (**Figure 10**), its meaning, its Conradian "kernel," would not be

⁴⁰ Conrad, *Heart of Darkness*, 70-71, emphasis added.

⁴¹ Conrad, *Heart of Darkness*, 68.

⁴² BL MS Royal 6 C.i, f. 108v. For the complete record, see "Detailed record for Royal 6 C I," *British Library Catalogue of Illuminated Manuscripts* (no date) <<http://www.bl.uk/catalogues/illuminatedmanuscripts/record.asp?MSID=7436>> (accessed May 2015).



Figure 10 T-O Map, Isidore's *Etymologies*, British Library, MS Royal 6 C.i, f. 108v. Photo: The British Library Board.

contained within its boundaries.

Here, three thin, brown pen lines, drawn with a compass, delineate the universe, then the encircling world ocean, and finally the boundary of the ecumene. And yet, despite their comprehensive reach, despite their resemblance to “the shell of a cracked nut,” opened to reveal its contents, “the whole meaning” is determined, controlled and corralled

by the text, which crowds around this universe, encircling it yet again. So, were there a map at the end of the Harley 3954 Mandeville, it would not have been an independent work, any more than any medieval map. All maps from this time, including wall maps like the Hereford and Ebstorf maps, enabled their readers to produce meanings with reference to the texts and the contexts in which they – the maps and their readers – were embedded. Put another way, their meanings resonate through and are derived from their architectural situations, their relationships to their exegetical sources, and their buildings' liturgical, processional, or educational uses.⁴³

⁴³ On “resonance,” see Stephen Greenblatt, “Resonance and Wonder,” *Bulletin of the American Academy of Arts and Sciences* 43:4 (January 1990): 11-34, 19-20: “By ‘resonance’ I mean the power of the object displayed to reach out beyond its formal boundaries to a larger world, to evoke in the viewer the complex, dynamic cultural forces from which it has emerged and for which—as metaphor or, more simply, as

The “missing” Mandeville map would surely have been another brick in the cultural and legal wall that imprisoned real Jewish people during the Middle Ages. Like most of its cartographical contemporaries, it would have presented and reinforced *difference* and *separation*, *otherness* and *exclusion*. It would *not* have been one of the rare medieval displays of interreligious affection and appreciation of humane feeling like we see in some of the writings of Robert Grosseteste, Bishop of Lincoln.⁴⁴ Not on a map, and not in a Mandeville manuscript. *The Book of Mandeville* is all about certitude.⁴⁵ It ends on a particularly strong note of certitude in some of the Middle English versions, including the one in Harley 3954, which informs us in the lines beneath the “*mappa mundi*” rubric that “owre holy fadyr the pope hath ratyfyed my bok and confermyd it in alle poyntys.”⁴⁶ This leaves little room for the reader to object, resist, press back, contradict, struggle, or invent. So, perhaps we are better off having found within this frustrating and insistent text not a map, but *a blank space*. 🙄

metonymy-it may be taken by a viewer to stand.” For relations of maps to contexts, see, for example, Dan Terkla, “The Original Placement of the Hereford *Mappa Mundi*,” *Imago Mundi* 56:2 (2004): 131-151, 142: “Knowing where the map was originally displayed would allow us to more confidently on how it was used . . . purpose helps determine placement, and placement enables purpose.” Merton College, Oxford, had a map (or maps) hung on the college library’s wall, which is where lectures were delivered. See Rodney M. Thomson, “Medieval maps at Merton College, Oxford.” *Imago Mundi* 61:1 (2009): 84–90, especially 87–89.

⁴⁴ In a letter to Margaret de Quincy, countess of Winchester, regarding the Jews of Leicester (c. August 1231–November 1232), Robert asks her to “consider carefully how Christian princes should welcome and protect Jews,” and therefore to have her agents cease to harass them, because “[t]his people is vagrant because of the dispersal, and an exile from its own home, that is, Jerusalem.” *The Letters of Robert Grosseteste, Bishop of Lincoln*, trans. F.A.C. Mantello and Joseph Goering (Toronto: University of Toronto Press, 2010), 68.

⁴⁵ Mittman, “Mandeville’s ‘East,’” forthcoming.

⁴⁶ Harley 3954, f. 69v.



The Map in the Böddeken Cartulary

By Arnold Otto, Erzbistum Paderborn (Archdiocese of Paderborn)

What does an object need to feature to be called a map? Throughout the history of cartography, there has been a range of different responses to this question.¹ In the western world, world maps developed from Roman through medieval to Early Modern times, but some mapping conventions have been invented more than once: portolan maps from the Mediterranean, for instance, use lines between points of reference to facilitate navigation.² The Marshall Islands stick charts employ lines, too, using them for a quite different purpose that rooted them in a predominantly oral culture.³ These two regions are far away from each other, but since the speed of communication was slower in medieval times, simultaneous inventions also came up closer to each other. The document dealt with here likewise can be considered a reinvention of cartography undertaken by individuals who were certainly not experts and might not even have come into contact with other examples of cartography by the time they produced the object in question here. For simplicity's sake, this object shall be called a "map" here, until its character is

¹ To provide a survey over the literature on this subject published worldwide would justify a publication of its own. Therefore, only two works should be mentioned here. A commonly known work in Germany has been recently reedited: Ute Schneider, *Die Macht der Karten: Eine Geschichte der Kartographie vom Mittelalter bis heute*. Darmstadt, Primus-Verlag 3rd ed. 2012. Still widely used is the *Lexikon zur Geschichte der Kartographie*, ed. Ingrid Kretschmer, Wien: Deuticke 1986.

² Richard L. Pfloderer, *Finding their way at the sea. The portolan charts, the cartographers who drew them and the mariners who sailed by them*. Houten: Hes & de Graaf, 2012.

³ A. Hops, "Über die Einmaligkeit der Marshall-Stabkarten im Stillen Ozean," *Zeitschrift für Ethnologie*, Vol. 81 (1956), pp. 104-110; J. Genz, et al., "Wave Navigation in the Marshall Islands," *Oceanography*, Vol. 22 No. 2 (2009), pp. 234-245.

discussed in the closing section. This map (**Figure 1**) is situated in a Cartulary of the fifteenth century called *Böddeker Kopiar*, and appears on a leaf between other medieval documents. The map covers one folio page, showing the borderline of an estate with various landmarks placed in relation to it. The borderline itself and crossing paths and roads along it are depicted by lines of words and Roman numerals telling the length of the single sections. Likewise, a river is depicted by a line of words. Some forests are shown by hatchings, whereas the Wewelsburg, a local castle, is depicted as a double house.⁴

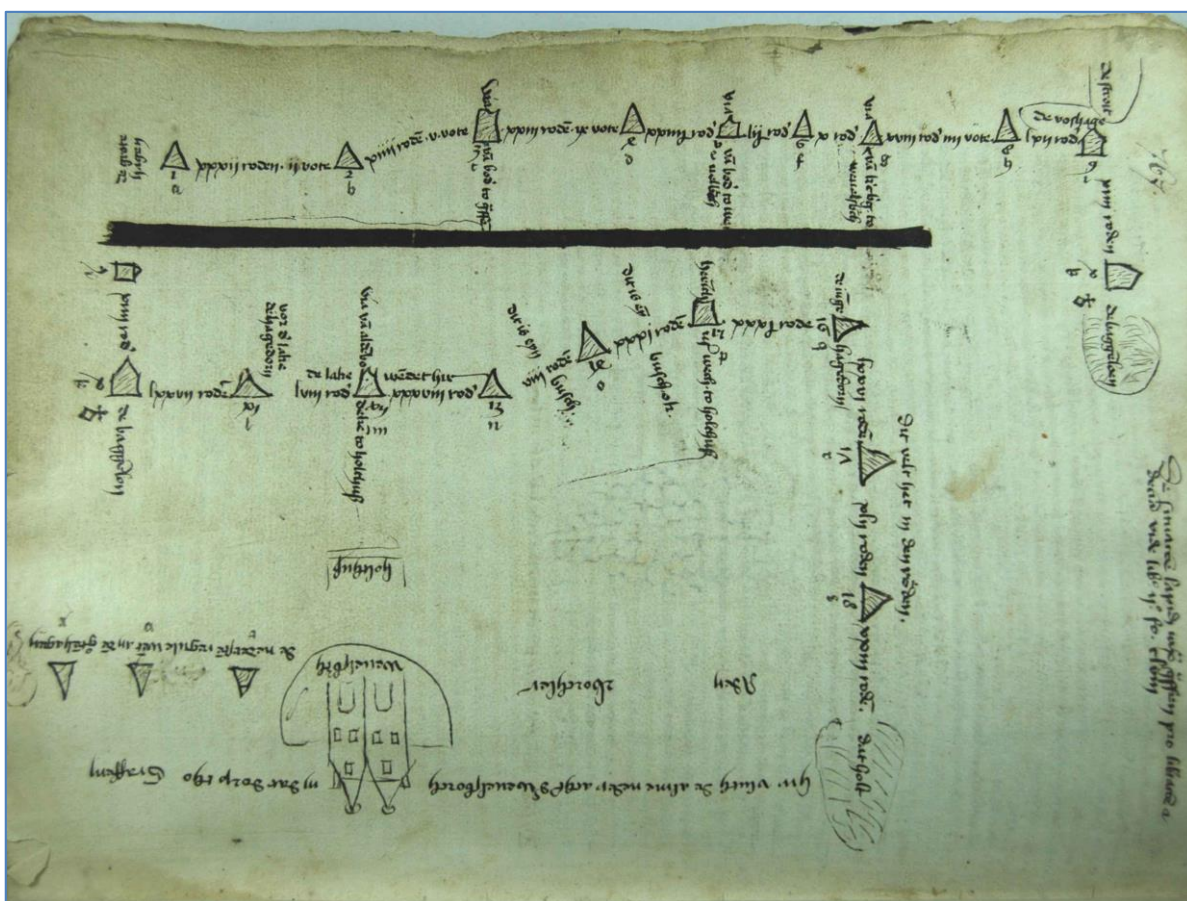


Figure 1 Böddeken Cartulary fol. 382v. Photo: Erzbistumsarchiv Paderborn Handschriften Nr. XLIV "Böddeker Kopiar."

⁴ In German, *Kopiar* and *Kartular* or *Cartular* may be used synonymously, and, although the book is commonly known as *Böddeker Kopiar*, it will be described as a *cartulary* throughout this article.

I. Where does the Map come from?

The Convent of Böddeken was a Carolingian foundation, originally designed as a house for canonesses. Founded in 836 by the archdeacon St. Meinolf, it soon became an important center of religious life in the immediate environment of Paderborn. The reception of numerous women from the landed gentry and nobility in the region, who often made considerable donations and left legacies to the house, enabled the convent to flourish very quickly. However, monastic discipline declined over the centuries and, together with the economic impact of the Black Death, the convent was subject to general decay. Requests to enter the convent dropped, and, as the need for agricultural products decreased, many peasants gave up their farms. Those retaining their farms could easily demand tax deductions to maintain their estates, as the fines paid in grain were reduced in weight and also brought lower prices at the market.⁵

Therefore, in 1409 the estate was transformed, and canons regular from Zwolle took over the house and led it into a second flowering as one of the convents of the Augustinian congregation of Windesheim. The canons brought in an important economic factor to the monastery: if necessary they worked themselves. As they could show that, for many of the jobs to be done, there would be a member of the monastic house (not necessarily a canon) doing it if a tenant would not, they were able to re-establish discipline and also – maybe not voluntarily – a level of prices and wages amenable to both producers and the convent. Part of the work of the monastery's consolidation was a careful revision of the vast gifts of the past, which led to the composition of a cartulary denoting all the gifts, benefits, and privileges the monastery had received. This book brought a double benefit: the originals of the charters could be spared from use and their content became more easily accessible, as they were contained in one volume.

⁵ Cf. Heinrich Rüthing, "Zur Wirtschaftsgeschichte des Klosters Böddeken," *Westfälische Zeitschrift* 130 (1980), pp. 150-166, here p. 153.

Some of the documents were rather lengthy and complicated, so the reason the canons created one of the oldest maps or at least an essay of a map might have grown from their desire to have a graphically supported explanation of one of the cartulary's entries that has geographical content.

II. Where is the Map recorded?⁶

The Böddeken Cartulary (Hs. 44 and 45), commonly called the *Böddeker Kopiar*, is a two-volume paper manuscript measuring 38 x 28 cm, written at the monastery during the fifteenth and sixteenth centuries. Containing mainly charter copies, the cartulary also includes various texts dealing with the organization of monastic life, decisions of the general chapter, extracts from the Augustinian rule, and lists of members of the convent. The first writer calls himself Johannes Custodis de Valber, though he is succeeded by many other hands.⁷ The map is placed between two entries in the cartulary, containing the copy of a charter or a similar kind of medieval document each. Since it is intimately related to them, a brief description of these texts follows.

II.1 Charter 1482-February-21

The Böddeken Map is based on a description of the borders of a monastic estate. This description is closely linked to two entries in the cartulary. The first one on fol. 381v-382r

⁶ Erzbistumsarchiv Paderborn, HS. XLIV-XLV. The examples presented here are all taken from Vol. XLIV.

⁷ For a partial textual edition of the cartulary, primarily covering the parts aside the charters see Ludwig Schmitz-Kallenberg, *Monumenta Budicensia. Quellen zur Geschichte des Augustiner-Chorherrenstiftes Böddeken i. W.* (Geschichtliche Darstellungen und Quellen 2). Münster 1915. Other information about the Manuscripts may be taken from Wilhelm Segin, "Die Namen der Böddeker Chorherren (1409-1803)," *Westfälische Zeitschrift* 128 (1978), pp. 229-281. Inventare Nichtstaatlicher Archive Westfalens, Vol. 3/1, p. 110; Manfred Balzer, "Böddeken," *Westfälisches Klosterbuch* 1 (1992) pp. 105-112, here p. 108; Wilhelm Segin, "Budicensia," *Westfälische Zeitschrift* 123 (1973), p. 96 and 114.

(CCXCVv-CCXCVIr in prior numbering), bearing the title *de holtgramatu et jure silvatico in tudorpper marka* (on lumbering and forestry land easements in the district of Tudorf), immediately precedes the map and contains a complicated description of the hunting rights and silviculture in the environment of Böddeken. The layout of this charter is highly formal, even in the copied version: the year of issue, 1482, is given as the incarnation and pontifical year of Sixtus IV, and the day of issue as 21 February and the Vigil of Cathedra Petri. In this charter, three canons regular from Böddeken delineate, on behalf of their monastery, the rights of lumbering and hunting in the rural districts of the villages of Oberntudorf and Niederntudorf, both situated only four kilometers from the monastery. The bounds are described by their situation next to each other, by their names and the names of their owners. Since this document contains a lot of information about various pieces of land and their adjacent rights, the persons in question are mentioned in the margins (*ius priore; ius brencken*; 381v). The next page, 382v, contains the map itself.

II.2 Protocol, 19 November 1481

The facing folio, 383r, contains the document on which the map is based. It is not formally a charter, but the minutes of a boundary inspection dated 19 November 1481. Towards the end of the Middle Ages, Eastern Westfalia and the northern parts of Hessen had become the main region of such inspections, called *Schnadegang*.⁸ They were carried out on a regular basis to anchor the boundaries of a city or territory in the communicative memory of the local

⁸ A profound analysis of this habit is still due. Initial information therefore still must be taken from Josef Lappe, "Der Schnadzug - ein altwestfälischer Rechts- und Volksbrauch," *Heimatblätter der Roten Erde* 4 (1925), pp. 452-467

population.⁹ The day of first participation in the *Schnadegang* in some rural towns in Westfalia was also the day of granting civil rights to new inhabitants. The author of this document introduces himself as *frater Johannes Valbert*, the first and main writer of the cartulary. He also walks along the boundaries of the monastery's territory as he goes out searching the border stones with three other brothers, *Johanne plebano seniore, Gebordo de Lippia, Johanne Sassen, donato*, stating:

Uppe dat de breve hijr vor geschreven folio lvijij wij arnoldus und folio lix wij olrik debeth verstaen worden und der stene sate und stede de vaster bekant und beholden worden est it gevelle dat de stene verworpen worden. Soe dachte ick frater johannes valbert wo ik sey mochte enkennen unde in sculten unsen nakommen to der ere godes und gemeynenbesten overgeven (383r).

In order to understand the letters written above on fol. lviii by Arnoldus and fol. lix by Olrik Debeth and to make known and maintain the locations of the stones, as it may be that the stones may be removed, I, Brother Johannes Valbert wondered where I could find them and hand them over to our successors in service of the glory of god and the common good.

Although he names his brothers as witnesses, his main interest is to provide a written description of his short trip along the borders of the estate, which might have taken the four canons only one or two days.

Once again, marginal notes attempt to facilitate the reader's orientation. Most of the ways to the eighteen existing stones are described very briefly. Only the environment of the ninth stone is mentioned in greater detail, since it has been transformed from the eponymous hunting spot for foxes into exploitable agricultural surface. This stone and its environment were taken into question by another document also contained in the cartulary, described in the following section.

⁹ The concept of communicative, and cultural memory as forms of collective memory has been introduced by Maurice Halbwachs and amended by Jan and Aleida Assmann. A concise summary is given in Jan Assmann, "Kollektives Gedächtnis und kulturelle Identität," in (eds.) Jan Assmann and Tonio Hölscher, *Kultur und Gedächtnis*. Suhrkamp 1988, pp. 9-19.

II.3 Related document: Charter 1434-April-14

On fol. 125r (LVIII in old numbering) we find a charter (Nr. 225) defining the use and possession of various pieces of land by the monastery of Böddeken and the lords of Brenken. These two documents are linked to each other by those marginal notes. The document was issued on 14 April 1434 and is the first document in this context referring to the piece of land and the border stones that will later come into question. In the course of describing the way along the border stones, we find a footnote symbol referring to one of them in a marginal note. Although this graphical element is the earliest in the cartulary, it is quite probable that it was present neither in the source document nor in its copy in the cartulary, but added only when the map was drawn on fol. 382v.

IV. The Language Used to Describe the Area

The standard method of presenting landscape in a cartulary is with text, and this method is employed in the documents and on the map itself. Therefore, a brief survey of the set of words used to describe the estate will be given. Although it might be insufficient to describe the region covered by the Wewelsburg map, its borders and the ways within, one still has to admit that the way of pointing out directions, in relation to the place of departure, is based on a profound knowledge of the region by those who use the map. This would be the case with the protocol as well. A traveler would know where he would like to go, making the description of directions by points of reference a sensible option.

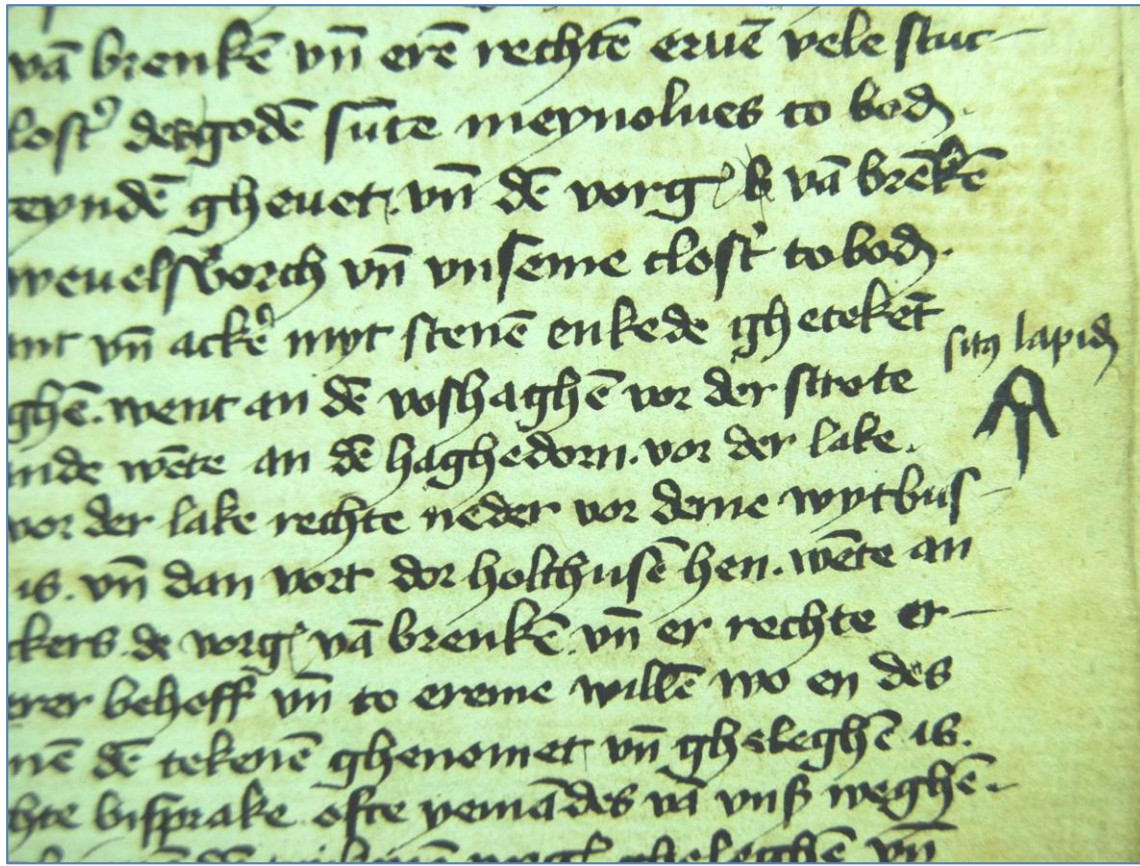


Figure 2 Böddeken Cartulary fol. 125r. Photo: Erzbistumsarchiv Paderborn Handschriften Nr. XLIV "Böddeker Kopiar."

IV.1 Directions

A very common way of describing both rural and urban environments was to explain how various estates were situated in relation to each other. The necessity of creating mental images from the description rises with its length and complexity. We can find simple versions of such descriptions for the cathedral cloister of Paderborn, where a map of the area may be created by comparing the names of the owners mentioned in documents with the names of their neighbours.¹⁰

¹⁰ Erzbistumsarchiv Paderborn (EBAP), Bestand Metropolitankapitel, Repertorium Urkunden 1257-1674. n.D.

Descriptions according to cardinal directions hardly ever appear. In this cartulary and thereby in the document collection it was based on, directions are described using points of reference or orientation. For example, the Alme, flowing through the region in question, is represented by a sentence: *hir vluth de alme neder achter der wewelsborch in dat dorp the Graffen* (here the Alme flows down into the Village of Graffeln behind the Wewelsburg River, 382v).

Looking at the descriptions, we see that we can rely on a well-developed system of milestones corresponding to the practice of the *Schnadegang*, which was presumably established by then. Cities, feudal lords, and private landowners used the system: many crucial crossroads or landmarks are places *daar de steen steyt* (where a stone is set, 125r). They are individually defined as *an dem voschagen vor der strote* (at the street by the fox-garden) or *an dem haghedorn vor der lake* (by the bushes before the pond, 125r). The structure of these place markers is very common, so by linking two objects or one object and a landform configuration, the single stones can be identified definitively. The general descriptions for the landmarks applied is *tekenen* (signs, 125r).

As stated above, the milestones link the two documents in question to each other. On fol. 125r, a footnote sign indicating the beginning of a border description is given. Next to its repetition in the bottom line it says: *hic nominantur sita et loca ubi lapidi situati sunt. Clarius tum infra folio ccxcvii uppe dar* (here the places and situations of the stones are mentioned, more clearly though below on folio cxcvii). CXXCVII is the old folio number of the map.

IV.2 Distances

Distances are described in rods, a unit of length that varied from three to five meters or yards; however, for Eastern Westfalia we can assume four meters or three and a half yards to a

rod. Similar to the *Morgen*, the rod was based on agricultural or silvicultural work: 150 square rods, which were originally taken as units of forest clearance, equalled one *Morgen*, which indicated the size of the piece of land a farmer could plough in half a day. On smaller scales, feet (*vote*, 383r) serve as the next smaller unit.

I mentioned before that marking directions by points of reference implies at least a basic knowledge of the region described. When this system is consecutively applied multiple times, the same applies to distances. For example, when a route description says: *und vort van daer vor der lake rechte neder vor deme wybusche ment in de rode up dat holt dat ok ghetekent is und dan vort dor holthusen hen weiter an de olde regule to graffen wart* (125r), the distance between those places might only roughly be indicated to those familiar with this region.

IV.3 Areas and Surfaces

Quantifying the size of smaller and larger pieces of land was a common practice even in the early and high Middle Ages and units for these quantifications exist for various regions such as currencies do. A common unit for an estate in Westfalia is described as *hove* here (e.g. *ene hove landes* on fol. 125r). Given the places in question, this must roughly be what is called a *manse* or mansion elsewhere, i.e. an estate allowing a whole large family to dwell on it with some excess crops for trade and without any necessity to work in dependency elsewhere.

A major unit of landscape is defined by *marke*, since the text of the charter on fol. 125r mentions *de marken heynrichusen un graffen*. This term appears more often in the two texts, taking other *marken* into account as well. As the words of the texts indicate, this term defines larger pieces of land, consisting of a range of *stucke* or *ackere*. As described in the protocol and the silviculture treaty, most of them seem to have gained their name from some kind of

settlement, at least a mansion. Today, some of those settlements have developed into proper villages, as for instance Tudorf. Graffeln has merged with the village of Wewelsburg and now only gives its name to two streets. Some names persist as the name of a field sector, whereas the settlements themselves are void, and others are completely lost.

In the measurement protocol we can even find an example for the change of place names. The text begins with nine stones being checked. Thereafter, the commission arrives at a narrow piece of forest suitable for hunting foxes (*eyn groit bussch holtes also dat de yeghere den vossen in dem bussche stricke und garne satten*, 383r). Deriving from this quality, the site is named: *und dar kreigh dat holt und stede den namen af propter frequenciam capture vulpium und so verdragh de breif mir der sate der stene*. Since 1434 however, the forest has been removed, and the protocol mentions that the spot is now a suitable place to raise grains.

IV.4 Landform Configurations

A piece of land in general is described as *lande*, as it says *myt deme lande, daer wi twidracht umme hadden* (as for the land we argued about, 125r). These pieces of land then are qualified. Only shortly after, it says *vele stucke und ackere unses landes* (many pieces of land and fields, 125r), disambiguating fields from other forms of agricultural forms of land use. *Stucke* does not yet offer information regarding whether only fields or pastures are meant or if this includes also woods or forests, especially as further down on the leaf one can find the distinction *landes und ackers* (125r) as well. A true definition may be found at the bottom of the leaf, where we find the pair *holtes und weyde* (125r), disambiguating *holt*, *weyde*, and *acker* as forest, pasture, and field, respectively, whereas *stuck* or *land* are more general terms, presumably including wastelands.

Two terms are also used to denote wooded areas. The most frequent is *holte*, and a bit less often, *bussche*. The place for fox hunting, noted above, is a good example of differentiation: *holt* indicates the possibility of an economical exploitation by forestry, whereas *bussche* qualifies a dense and young arboreal area, and perhaps a larger hedgerow. Two different kinds of roads are mentioned: a *stroite* is more elaborate than a *weghe*. Most of the ways are qualified as streets, although it remains unclear whether “street” indicates a solid fundament or the possibility of their being used by carriages in good weather.

IV.5 Differences in Elevation

The region described in the Böddeken cartulary is generally hilly. Differences in elevation do exist and provide a descriptive option for surfaces, but these differences are rarely significant. Consequently, the two attributes, *up* and *neder* (both 125r), are sufficient to qualify as differences in elevation. When used in connection with creeks or rivers, these expressions also describe the direction in which they flow, as, for instance, on the map itself: *hir vluth de alme neder achter der wewelsborch in dat dorp tho Graffen* (here the Alme river flows down to the village of Graffe(l)n, 382v).

IV.6 Preliminary Conclusion

The set of terms employed for the geographical descriptions in the Böddeken cartulary documents is restricted and precise. Reading the charters, prescriptions and protocols, we first get an impression of a writer with a good command of descriptive language suitable for describing the area represented. In the end, the long line of milestones defining single segments of the route makes following the protocol, in a purely textual way, difficult. Looking at the map's

textual elements, we can see that it has not yet become an independent object, but that it derives from the cartulary text.

By the time the cartulary was formed in the late fifteenth century, more elaborate forms of maps did exist, and maybe the monks might have been aware of them. Unfortunately, we cannot tell if that was the case from a source like a library record, since no such source has been found for the convent. Since this map served a new purpose, however, we do have to consider it as an innovation, a new method of describing possessions.

V. The Map

To illustrate the descriptions in his document, Brother Johannes graphically represented the stones researched during his trip. However, in describing this representation, I would like to start with text again, namely the title he gives to the object: *De situatione lapidi iuxta graffen* (about the positions of the stones near Graffeln). It is situated at top right side of fol. 382v and followed by *pro liberatione a deciam vide liber II^o fo. Clviii* (for the disentanglement of the tithe see book II, fol. Clviii). This statement refers to a document on fol. 235r (CLVIII in old numbering), where Cord van Graffen the Elder orders the payment of duties on the piece of land in question. This document, however, has nothing to do with borders or milestones. The protocol is younger, and the inclusion of a reference to this charter from 1421 on the page of the map allows it to serve another purpose, as a reference for other elements of the cartulary.

Since all other pages of the cartulary are textual, one would start to read each in the top left corner and follow the text downwards from left to right, line by line. The map, however, is intended to be read from the left side at the very bottom, following the line of milestones. Consequently, it begins describing the territory before mentioning the first stone. To read the

initial phrase, *de grote hagen* (382v), one has to turn the book upside down. This is the only inscription on the map that requires a reader to do this and indicates that the final shape of the map might not have been quite clear to Johannes in the early stages of drawing the map.

V.1 Directions

In modern cartography, one would think of a straight street represented by a straight line, but expecting this of the Böddeken cartulary would be an error. Only the remaining settlement names of Graffeln, Wewelsburg and Ahden indicate that the path taken generally goes up the Alme River roughly from Graffeln to Ahden. To know how to work with the map, one has to know where *de grote hagen* (the great garden, 382v) is and which way to take from there. Today it is difficult to state this exactly, since *hagen* as a word for garden still is quite frequently found in this region. In the village of Wewelsburg alone, several streets with the name component (e.g. Vor'm Hagen, Oberhagen) still exist.

If the reader begins here, he can follow indications for the directions taken from roads or street crossings. Since there is one way to Graffeln and then two ways to the Wewelsburg crossing, we must think of going up the Alme River at first. The road crossing at stone seven is *via van k'eberg to wewelsburg* (382v). We can read the remaining abbreviation as *kueberg* (the present-day name of a hill and street in the area). The later crossing of a road to Altenböddeken would support this reading and indicates that we turn away from a river for some time, leading even further away since it later touches a road from Altenböddeken to Holthausen.

Relying on the place names given, at the end of this route we must return to the starting point, since it says *hir vluth de alme neder achter der wewelsborch in dat dorp the Graffen* (here the Alme flows down into the Village of Graffeln behind the Wewelsburg River) (382v). Near

the last milestones it says: *de nedersten regule went an den groten hagen*, referring to the *grote hagen* at which we commenced.

This suggests that, if we follow the descriptions written on it, the map will take us on a circular course, which seems unlikely according to the design of the map: its general shape does not correspond completely to the landscape. The distance between Ahden and Graffeln, as shown on the right side of the page, does not correspond to the distance the roads from the various villages would have had to one another.

The graphical composition of the map raises questions, too. Starting on the bottom left side the description of the road moves upwards, turning right after the ninth stone. Then, a diamond with a cross on top, like a *signe-de-renvoi*, indicates to start further left at the bottom again. Therefore, the large black bar on the left side of the page must not be seen as part of the map, but as a separation between the right and the left part of it. In the present context this system of page separation is not very elaborate. By the time this map was drawn, more refined versions of this technique did exist as, for instance, the page separations in the maps of Matthew Paris.¹¹ At the bottom of the page, the turn and stones nine and ten are repeated and the way goes up again, forming a bow after stone thirteen. After stone sixteen, there would have been enough room to continue with one or two more stones, but the way turns right again. After Stone 18, the numerical numbering ends, and the course of the river is depicted in writing from top to bottom. Separated from the numbered stones, at the bottom right side of the page, there are three additional stones only included in the alphanumerical numbering, reaching from *a* to *x*, whereas

¹¹ Daniel K. Connolly: *The Maps of Matthew Paris*. Boydell 2009, p. 55. Cf. Matthew Paris' Itinerary from London to Chambery in his "Book of Additions," British Library MS Cotton Nero D.1, fols.183v-184r.

those with Arabic numerals only run from 1 to 18. Generally, stones are marked by a triangle. When they are situated at crossroads, the triangle is replaced by a square.

It seems that the turns in the course of the way are not accidental. If the writer just wanted to represent the consecutive stones, he could have done so with regular reading lines. So we must think of the turns in the direction of writing indicating turns on the way. The turn between the marks of stone 2 and 3 on the map might have been necessary to put up the abbreviated expression *via van boddeken to graffeln* (street from Böddeken to Graffeln). Also, the turn after stone 9 on top of the page was necessary, because there was no room for more writing or lines. This is not the case, though, concerning the inbound turn after the mark of stone 13 and the 90° turn after stone 16, where plenty space for at least one part of the road was available. Furthermore, in the first description of the environment on fol. 125r – considered insufficient by brother Johannes Valbert-- says *und vort van daer vor der lake rechte neder vor deme wytbusche ment in de rode up dat holt, dat ok ghetekent is* (and [the way goes] further on in front of the pond right down before the willows called “in the clearance” to the forest, which is signposted, too; 125r). *Rechte neder* in this context is just as ambiguous as *right down* in English, covering the meanings of “turning right” and “going on.” The situation is even clearer for stone 9, where it says *van deme negeden stone herde wy uns tor siden ut na der richtern hand xiiii roden lank* (from the ninth stone we turned to the right hand side for fourteen rods, 383r). At the tenth stone, according to the map, there should be only the sharp left turn. But also this turn is described as a right one: *van deme mete wy recht hen weder upwert na dem lohove lxxvii roden* (from this one, turning right and up again towards the Lohof estate we measured 77 rods, 383r). Either the directions were mixed up here or the person measuring took a position facing backwards and thereby thought of another right turn. This is interesting, since the words forming the route

sections always follow the direction described in the protocol and never turn or face backwards.¹² Nevertheless these examples show that turning directions in the map indicate turning directions in reality, too.

V.2 Distances

The indications of distances are as simple as the indication of directions are complicated. Units of distance are regularly defined by the positions of milestones on the map. The distance between the stones is not represented commensurate to reality, but by its literal representation in letters and Roman numerals. Descriptions vertically aligned to these words and numbers either describe ways, paths, or roads, or types of landscapes. In doing so, the length of the route sections follows the length of its written representation and is not proportional.¹³

V.3 Areas and Surfaces

The map does not tell us much about the size of the pieces of land. Defining borders does not seem to have been of special interest to the author of the map. Two areas, *de baggenloen* and *dat holt*, are encircled and hatched, while two others, *de stroit* and *de voshage*, are encircled without hatchings. According to the map, the length of the borders of the pieces of land given as 650 rods, or approximately 2,700 meters. If the borders encircle a closed piece of land, the

¹² Another function similar to Matthew Paris's maps. Cf. Connolly 2009, p. 60.

¹³ Matthew Paris did the opposite in his maps expanding words to an estimated length of a route sections. Cf. Connolly 2009, pp. 57-58.

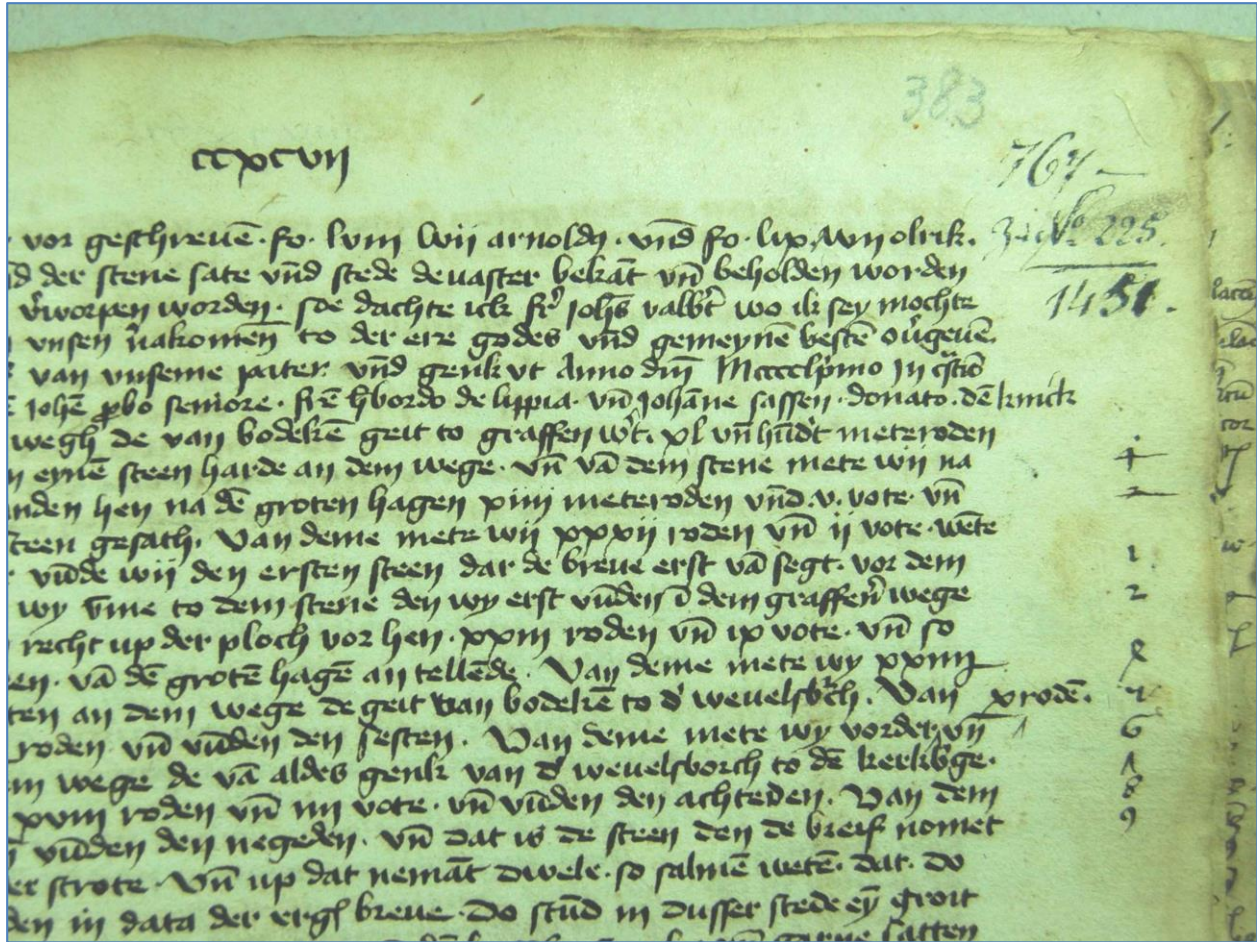


Figure 3 Böddecken Cartulary fol. 382v. Photo: author.

enclosure might be up to 26,400 square rods (0.456km²) in size. The sequence of places to which crossing roads lead, however, makes it rather improbable that there was a round course here.

V.4 Landform Configurations

The hatchings mentioned above also refer to landform configurations. Whereas *de baggenloen* is a name, *dat holt* clearly identifies a forest; *de stroit* indicates a street, though *de voshage* is a name again. The route taken is represented by the lines of words containing the

measure of its length from milestone to milestone, while the roads and street crossings are indicated by lines of words giving their directions. Finally, the Alme River is depicted by a line of words indicating the direction of its flow.

Within this context, the visual representation of the Wewelsburg is special, in a way. It is shown as two adjacent houses, not as the triangular castle built in the early seventeenth century, but as the older fortified houses belonging to different lords that once stood on the same spot. These two estates were much smaller than the triangular Wewelsburg, as it has appeared since the sixteenth-century. Regarding the level of semiotic abstraction, at first glance the sketch of the Wewelsburg appears to be quite representational. We have lines of text for streets and rivers, triangles or squares for milestones, hatchings for forests. For most of these items, there are several examples, whereas the Wewelsburg is singular and, as the estate is situated on a rocky promontory above the Alme River, functions as a landmark in the environment. It is not sure whether its representation mirrors the actual outward appearance of the castle. It is also possible that the double house stands for the two fortified buildings on the promontory.

V.5 Differences in Elevation

Apart from the mentioning *neder* for the direction of the flow of the Alme River, no indication of differences in elevation is given on the map.

V.6 Preliminary Conclusion

The graphical representation of streets, the river and landform configurations, as we know them from other maps or cartographic descriptions, here is quite incomplete. The main problem is that an elaborate representation of directions is more or less completely missing. From the

crossroads mentioned, one can hardly reconstruct exactly where the described route passed. For users of the cartulary, the map was nevertheless of great advantage. Authors and readers of the border protocol would know the area, and the map provides a handy sketch of the indicated milestones, their distances from one another, and their approximate positions.

It was sixty years before the region was again subjected to cartographic efforts. In her book on Wewer, Isa von Elverfeldt has published a map of the environment that is at least sixty years older than the one from the cartulary dated between 1546 and 1595.¹⁴ It comes from the archives of the Imbsen Family contained in the Archives of Landsberg-Velen and is kept in Münster today.¹⁵ This map vacillates between two- and three-dimensional representations of the area of Wewer, and its more naturalistic depictions provide realistic impressions of the shapes and sizes of houses and mills, shown as colored, roughly perspective views along with the arms of the Alme and Lohne rivers that pass by the estate drawn in a two-dimensional plan view.

VI. Communicative and Cultural Memory: Possible Reasons for Writing and Drawing

One reason for the creation of the 1481 protocol was that the communicative knowledge of the distances given had been lost. What was taken as a defined measure in 1434 had to be re-assessed. When the earlier document was created, it was neither precise about the number of stones nor about their exact positions or the distances between them. It seems then, that there was a shared sense about the border between the parties of the Augustinian convent and the lords of Brenken. Forty-seven years later this knowledge had been lost, a process described as loss of a communicative memory by Jan Assmann.¹⁶ The building of a communicative memory derives

¹⁴ Isa Freifrau von Elverfeldt, *Wewer - Mein Heimatbuch*. Wewer 2011.

¹⁵ Landesarchiv Nordrhein-Westfalen, Abt. Münster, Sign. 47.745, Magazin 4a, früher Sign. 14.390.

¹⁶ Assmann 1988, pp. 10-11.

from a community, i.e. a family, neighbourhood, or, a convent. It gets lost through generations: Assmann calculates eighty years or three or four generations. Taking into account that Augustinians do not enter the convent at birth, a monastic generation is shorter than a familial one, and so 47 years may mean three or four generations. In the case recorded here, the knowledge about the borders and the borderstones was lost, not having been transformed into what Assmann calls cultural memory. Yet this transfer must not be mixed up with that from orality to literacy.¹⁷ Important features of cultural memory are reconstructive references for a group, a defined form of organization and liability.¹⁸ In civic communities, this is all featured in the *Schnadegang* carried out on a regular basis. In a convent, let alone in one newly adopted by brothers from another cultural environment (Low Countries), there is no tradition of a practice like that, and thereby knowledge established provisionally five years after the adaptation of Böödeken was lost (until 1481). So, in this case, cultural memory as a durable and liable form meant, not only the shift from orality to literacy, but also the development of an applicable form of graphical representation resulting in an object emerging from text into other forms of visual representation.

VII. The Map – an Imagetext?

The object dealt with has been called a ‘map’ throughout this article. However, after its description, we should turn to the question whether it actually *is* a map or not. I would like to do this, employing notions introduced by W.J.T. Mitchell. Mitchell has introduced a theory of the image built upon a foundation reaching from classical philosophy to modern scientific

¹⁷ Assmann 1988, p. 14.

¹⁸ Assmann 1988, pp. 13-14.

criticism.¹⁹ Although his focus is not on cartography, Mitchell's approach seems to be applicable nonetheless. Mitchell argues that, "The domains of word and image are like two countries that speak different languages but that have a long history of mutual migration, cultural exchange, and other forms of intercourse."²⁰ With this cartulary map, it seems as if we are at a very early stage of mapmaking, when depiction was still emerging from description. Generally speaking, this development has been multidirectional. Looking at other examples of early cartography, one would argue that an image is fed with encoded signs to provide more information on its surface. **(Figure 4)** The drawing by Brother Johannes Valbert works the other way round: as the series of borderstones requires too much abstraction to visualize as a border, a more visual technique is introduced by a writer, starting to carry out visualization by means of writing.

Referring to Plato's *Cratylus*, Michell takes the following as one of the most enduring accounts of the word/image difference:

It might seem, then, that the difference between words and images is not built into our sensory apparatus or inherent in different kinds of symbolic forms, but has to do with different ways of coordinating signs with what they stand for. Images, we might say, signify by virtue of resemblance or imitation: the image of the tree looks like a tree. Words, by contrast, are arbitrary signs that signify by virtue of custom or convention.²¹

On that scale, only the most necessary parts of the information are represented by the cartulary map's images: the sequence of the stones, that they are positioned along a route and, partly, directions. The distances between the stones and the names of places are represented by words

¹⁹ The two most relevant monographs in this context are William J.T. Mitchell, *Iconology: Image, Text, Ideology*. Chicago: University of Chicago Press, 1986 and *Picture Theory: Essays on Verbal and Visual Representation*. Chicago: University of Chicago Press, 1994. For a concise summary of his theory, see William J.T. Mitchell, "Word and Image," in (eds.) Robert Nelson and Richard Shiff, *Critical Terms for Art History*. University of Chicago Press 2nd ed. 2003, pp. 51-61.

²⁰ Mitchell, 2003, p. 53.

²¹ Mitchell, 2003, p. 56.

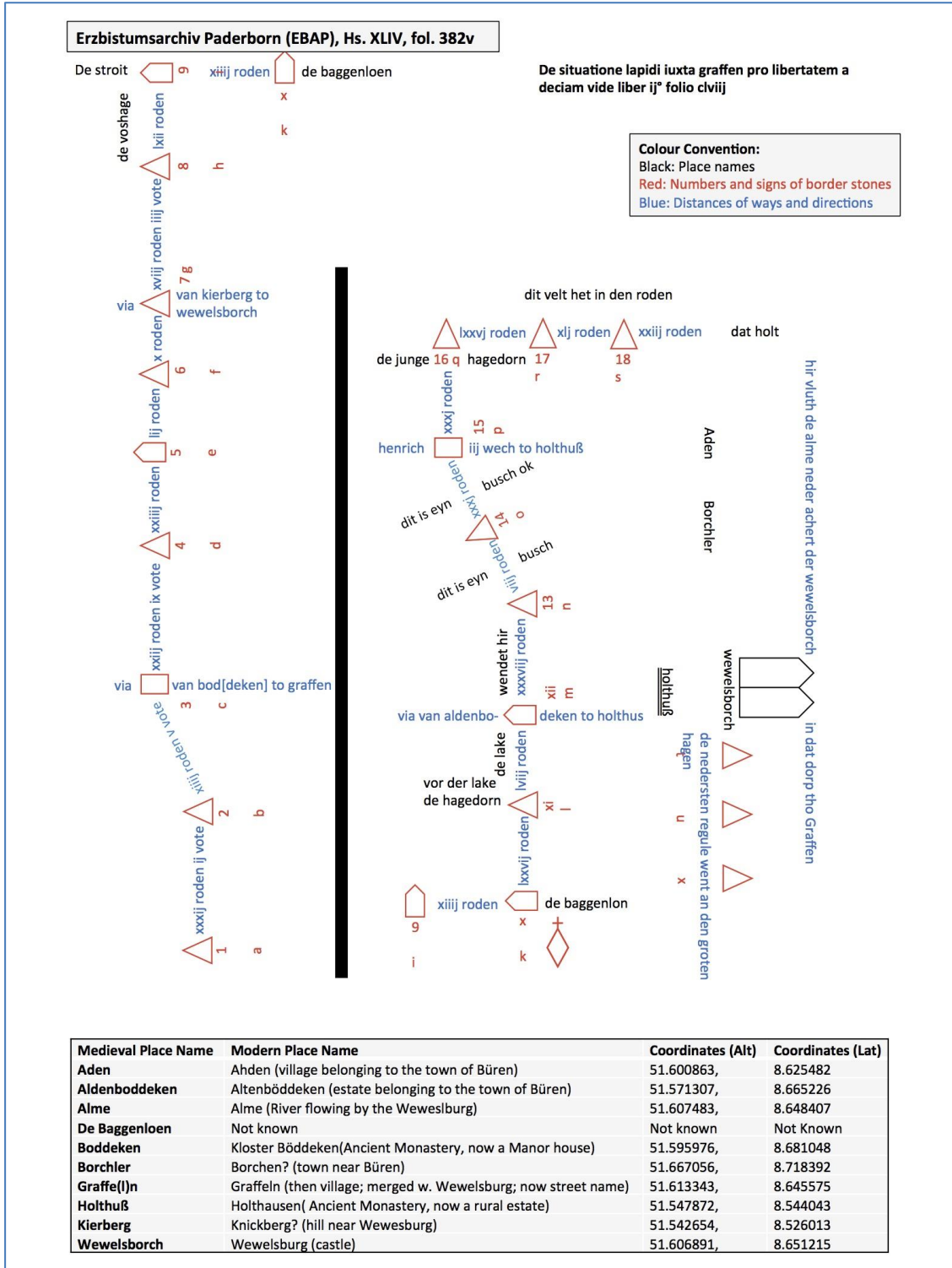


Figure 4 Modern rendition of Map in the Böddeken Cartulary. Diagram: author.

and not by images. Finally, Mitchell sees the word/image difference as a dialectical trope:

It is a trope or figurative condensation of a whole set of relations and distinctions, that crops up in aesthetics, semiotics, accounts of perception, cognition and communication, and analyses of media (which are characteristically “mixed” forms, “imagetexts” that combine words and images).²²

The sketch made for the measurement protocol may be called an *imagetext*, since it is, in Mitchell’s sense, “mixed” media. Deriving from a textual environment, this object incorporates graphical elements containing information, designed to be more legible than pure texts. These graphical elements are representations of physical objects (forests, milestones, a castle), indicate their sequence and the one of crossroads, and make initial attempts at providing directions.

Conclusion

I introduced the object on fol. 382v in the Böddeken Cartulary mainly by introducing the source itself, only taking three models or examples, respectively, into account for comparison. With these three it should be possible to triangulate this object in the vast landscape of late-medieval map making.

Comparing it to the maps of Matthew Paris, it becomes obvious that here a similar, serial form of graphical support for the description of a route emerges from the necessity of supporting the legibility of a written document. If the writer of the Cartulary did have knowledge of map making, he was certainly not as skilled or inventive as Matthew Paris. Nonetheless, judging from the appearance of the object, it is possible that he had some indirect knowledge of the map by word of mouth.

Adapting this object to the model of communicative and cultural memory established by Halbwachs and Assmann, we may think of it as a visual form of cultural memory that became

²² Mitchell, 2003, p. 57.

necessary due to the incapability of other means of commemoration. Since the border stones were not visited on a regular and formal basis, that might have prevented brushwood from hiding and covering them, the design of the map is a shift from orality (or imprecise recordings) to exact literacies and beyond. The object condenses all information from the protocol necessary to retrieve the stones, leaving out those that were interesting only in terms of the use of the land on its sides or its owners. Thinking of Mitchell's "imagetext," one has to admit that the object contains information fitting exactly into this category, especially the main route constructed from sections of written words. It is so even more when we think of an imagetext as a combination of words and images. And this would then strengthen a hypothesis of this object not being a map, *but* an imagetext. This, however, would be too easy. What we find here are clearly efforts to visualize distances, but even more directions and relative positions. These are techniques also applied by Paris and other medieval map designers. And therefore I would call this a map, too, in a contemporary sense. "Narrative map" seems a suitable designation, if one is needed. 🐉



Graphic Record of a Lost Wall Map of the World (c. 1490) by Henricus Martellus

By Chet Van Duzer, Board Member of the Lazarus Project at the University of Mississippi

Henricus Martellus, a German cartographer active in Florence from about 1459 to 1496,¹ was one of the most important mapmakers of the late fifteenth century. There is strong evidence that his maps influenced the geographical thought of Christopher Columbus;² it has been very plausibly suggested that Martin Behaim relied on a map by Martellus in creating his famous terrestrial globe of 1492.³ In addition, Martin Waldseemüller relied heavily on a large world map

¹ Lorenz Böniger has argued that Henricus Martellus should be identified as Arrigo di Federico Martello, an employee of the Martelli family of Florence: see Lorenz Böniger, "Arrigho di Federigho 'Martello': Bürgerknecht, Übersetzer und Kartograph," in his *Die deutsche Einwanderung nach Florenz im Spätmittelalter* (Leiden and Boston: Brill, 2006), pp. 313-348; and Klaus Arnold, "ARIGO - Heinrich Schlüsselfelder aus Nürnberg? Arrigho di Federigho della Magna / Henricus Martellus in Florenz?" *Pirckheimer-Jahrbuch für Renaissance- und Humanismusforschung* 21 (2006), pp. 161-168. But Luisa Rubini Messerli has disproven this identification in *Boccaccio deutsch: Die Dekameron-Rezeption in der deutschen Literatur (15.-17. Jahrhundert)* (Amsterdam: Editions Rodopi, 2012), pp. 163-357, esp. 176-214, and so we are left without any knowledge of who Martellus was.

² See Roberto Almagià, "I mappamondi di Enrico Martello e alcuni concetti geografici di Cristoforo Colombo," *La Bibliofilia* 42 (1940), pp. 288-311, esp. 307. Martellus's wall map now at Yale, which came to light in the late 1950s after Almagià wrote, has been recognized as showing the world much as Columbus imagined it, and there are good reasons to think that this map or another very similar influenced Columbus: see R. A. Skelton, "World Map by Henricus Martellus Germanus, c. 1489, at Berne," January 10-17, 1960 (an unpublished study of the map now held by the Beinecke Library in its folder of documents associated with the map's acquisition), pp. 14-17; and Carlos Sanz, "Un mapa del mundo verdaderamente importante en la famosa Universidad de Yale," *Boletín de la Real Sociedad Geográfica* 102 (1966), pp. 7-46, esp. 11-18. Arthur Davies, "Behaim, Martellus and Columbus," *Geographical Journal* 143.3 (1977), pp. 451-459, went so far as to suggest that the map was made by Columbus's brother Bartholomew, and merely assembled by Martellus; this untenable view is refuted by Ilaria Luzzana Caraci, "Il Planisfero di Enrico Martello della Yale University Library e i Fratelli Colombo," *Rivista Geografica Italiana* 85 (1978), pp. 132-143, translated into English as "Henricus Martellus' Map in the Yale University Library and the Columbus Brothers," in the author's *The Puzzling Hero: Studies on Christopher Columbus and the Culture of his Age* (Rome: Carocci, 2002), pp. 281-291.

³ See Skelton, "World Map by Henricus Martellus Germanus, c. 1489, at Berne" (see note 2), pp. 10-12; George Kish, "Two Fifteenth-Century Maps of 'Zipangu': Notes on the Early Cartography of Japan," *The Yale University*



Figure 1 Attavante’s image of St. Jerome in the Mosteiro dos Jerónimos in Belém, with a map by Martellus on the wall in the background. Lisbon, Arquivos Nacionais da Torre do Tombo, MS 161/7, f. 2r (1497). Photo: Arquivos Nacionais da Torre do Tombo.

by Martellus in creating his famous world map of 1507, which is the first to apply the name “America” to the New World.⁴ Martellus’s surviving cartographic works are few, and fall into three groups: his two manuscripts of Ptolemy’s *Geography*;⁵ manuscripts of his *Insularium*

Library Gazette 40.4 (1966), pp. 206-214; Sanz, “Un mapa del mundo verdaderamente importante” (see note 2), esp. 18-24 and 30; and Davies, “Behaim, Martellus and Columbus” (see note 2).

⁴ Waldseemüller’s 1507 printed world map, whose unique surviving exemplar is at the Library of Congress, has been reproduced in facsimile with commentary in John Hessler and Chet Van Duzer, *Seeing the World Anew: The Radical Vision of Martin Waldseemüller’s 1507 & 1516 World Maps* (Washington, DC: Library of Congress, and Del Ray Beach, FL: Levensger Press, 2012). Waldseemüller used either Martellus’s large world map now at the Beinecke Rare Book and Manuscript Library at Yale University (signature Art Store 1980.157), or another map by Martellus very similar to it, as a model for his 1507 map. I detail the correspondences between the two maps, particularly the descriptive texts on Waldseemüller’s map that derive from Martellus’s, in my forthcoming study *The World Map by Henricus Martellus at Yale, c. 1491: Sources and Influence*.

⁵ The manuscripts of Ptolemy’s *Geography* made by Martellus are Vatican City, Biblioteca Apostolica Vaticana, Vat. lat. 7289; and Florence, Biblioteca Nazionale Centrale, Magliabechiano XII 16.

illustratum, an island-book illustrated with maps;⁶ and two separate world maps: one printed by Francesco Rosselli,⁷ and Martellus's large world map now at Yale. In 1940 Roberto Almagià described Martellus's cartographic works,⁸ and since that time, only one map has been added to this corpus, a wall map that measures 201 × 122 cm (6.6 × 4 feet). The map surfaced in the late 1950s, was sold, and then anonymously donated to Yale.⁹

In this article, I discuss a wall map depicted in a manuscript Bible made in 1497. The map no longer survives, and because we do not have the map itself, only a depiction of it in a work of art, it naturally raises questions about the accuracy of that depiction, and thus about the reliability of any deductions we may make about the map.¹⁰ But this difficulty will not prevent us from concluding that the miniature represents a wall map made by Martellus, from determining the place of that map among Martellus's other world maps, or from exploring the implications of this image for the diffusion and influence of Martellus's cartographic work.

⁶ The manuscripts of Martellus's *Insularium illustratum* are Florence, Biblioteca Medicea Laurenziana, Pluteo 29.25; Minneapolis, James Ford Bell Library, MS B 1475 fMA; Leiden, Universiteitsbibliotheek, MS Voss. Lat. F. 23; Chantilly, Bibliothèque du Musée Condé, MS 698 (483); and London, British Library, Add. MS 15760.

⁷ One exemplar of this map survives, as Florence, Biblioteca Nazionale Centrale, Landau Finaly, Carte Rosselli, planisfero. For discussion see Sebastiano Crinò, "I planisferi de Francesco Rosselli dell'epoca delle grandi scoperte geografiche," *La Bibliofilia* 41 (1939), pp. 381-405, esp. 393-401; Roberto Almagià, "On the Cartographic Work of Francesco Rosselli," *Imago Mundi* 8 (1951), pp. 27-34, esp. 31-32; Tony Campbell, *The Earliest Printed Maps, 1472-1500* (London: British Library, 1987), pp. 70-78, esp. 72-74; Guglielmo Cavallo, ed., *Cristoforo Colombo e l'apertura degli spazi: Mostra storico-cartografica* (Rome: Istituto Poligrafico e Zecca dello Stato, 1992), vol. 1, pp. 521-524; and Rodney W. Shirley, *The Mapping of the World: Early Printed World Maps, 1472-1700* (London: Holland Press, 1983), #18, pp. 16-17.

⁸ Almagià, "I mappamondi di Enrico Martello" (see note 2).

⁹ On the Yale Martellus map see notes 2 and 4.

¹⁰ Earlier discussions of maps and globes in art include James A. Welu, "Vermeer: His Cartographic Sources," *Art Bulletin* 57.4 (1975), pp. 529-547; James A. Welu, "Vermeer and Cartography," Ph.D. Dissertation, Boston University, 1977; James A. Welu, "The Map in Vermeer's *Art of Painting*," *Imago Mundi* 30 (1978), pp. 2 and 9-30; Bärbel Hedinger, *Karten in Bildern: zur Ikonographie der Wandkarte in holländischen Interieurgemälden des siebzehnten Jahrhunderts* (Hildesheim and New York: Olms, 1986); Yojiro Utsunomiya, "Terrestrial Globes Depicted in Images: The Globe as a Communication Instrument of Information and Allegory," *Der Globusfreund* 47-48 (1999), pp. 19-37; Kristen Lippincott, "Globes in Art: Problems of Interpretation and Representation," in Elly Dekker, Kristen Lippincott, Pieter van der Merwe, and Maria Blyzinsky, eds., *Globes at Greenwich: A Catalogue of the Globes and Armillary Spheres in the National Maritime Museum, Greenwich* (Oxford and New York: Oxford University Press and the National Maritime Museum, 1999), pp. 75-86; Elly Dekker and Kristen Lippincott, "The Scientific Instruments in Holbein's *Ambassadors*: A Re-Examination," *Journal of the Warburg and Courtauld Institutes* 62 (1999), pp. 93-125, esp. 93-98; and James Sykes, "The Terrestrial Globe in Raphael's 'The School of Athens,'" *Globe Studies* 55-56 (2009), pp. 53-72.

The miniature in question is found in volume seven of a manuscript Bible known as the *Bíblia dos Jerónimos*, one of the finest Bibles of the Italian Renaissance.¹¹ It was undertaken for the Duke of Beja, who became King Manuel of Portugal (r. 1495-1521), during the three-year process of the manuscript's creation. The contract for the painting of the manuscript, which is dated April 23, 1494, still survives.¹² The contract is between Attavante degli Attavanti (1452-c. 1525), a leading Florentine illuminator of manuscripts,¹³ and Cipriano di Sernigi, a Florentine merchant. It gives Sernigi the right to inspect Attavante's progress every day, and to assess stiff penalties if he falls behind in his work or if the quality of his work is not what it should be. Sernigi was leaving nothing to chance in the interest of pleasing his patron the Duke. Volume seven of the Bible is dated July, 1497, and the miniature in question is on f. 2r, at the beginning

¹¹ The shelfmark of this volume of the Bible is Lisbon, Arquivos Nacionais da Torre do Tombo, MS 161/7, the final "7" indicating volume 7. For discussion of the *Bíblia dos Jerónimos* see Paolo d'Ancona, "Nuove ricerche sulla Bibbia dos Jeronymos e dei suoi illustratori," *Bibliofilia* 15 (1913), pp. 205-212; Annarosa Garzelli, ed., *Miniatura fiorentina del Rinascimento 1440-1525: un primo censimento* (Florence: Giunta regionale toscana and La Nuova Italia, 1985), vol. 1, pp. 233-235, and vol. 2, figs. 821-834 and 917-919; Jonathan J. G. Alexander, ed., *The Painted Page: Italian Renaissance Book Illumination, 1450-1550* (Munich and New York: Prestel, 1994), pp. 49-51; Albinia C. de la Mare, "Notes on Portuguese Patrons of the Florentine Book Trade in the Fifteenth Century," in Katherine J. P. Lowe, ed., *Cultural Links between Portugal and Italy in the Renaissance* (Oxford: Oxford University Press, 2000), pp. 167-181; Martim de Albuquerque and Arnaldo Pinto Cardoso, *A Bíblia dos Jerónimos* (Lisbon: Bertrand Editora, 2004); and Arnaldo Pinto Cardoso, "The *Bíblia dos Jerónimos*: From Florence to Lisbon," photography by Massimo Listri, trans. Judith Landry, *FMR* 10 (Dec. 2005/Jan. 2006), pp. 43-72.

¹² The text of the contract is supplied by Gaetano Milanese, *Nuovi documenti per la storia dell'arte Toscana dal XII al XV secolo* (Florence: G. Dotti, 1901; Soest: Davaco Publishers, 1973), pp. 164-166; reprinted in Jonathan J. G. Alexander, *Medieval Illuminators and their Methods of Work* (New Haven and London: Yale University Press, 1992), pp. 181-182; and there is an English translation by Dario Tessicini in Carol M. Richardson, "The Contract Between Attavante and a Florentine Merchant for an Illuminated Manuscript," in Carol M. Richardson, Kim W. Woods and Michael W. Franklin, eds., *Renaissance Art Reconsidered: An Anthology of Primary Sources* (Oxford: Blackwell Publishing, 2007), pp. 329-332.

¹³ There is surprisingly little bibliography on Attavante, given the high quality of his work. See Mirella Levi d'Ancona, *Miniatura e miniatori a Firenze dal XIV al XVI secolo* (Florence: L. S. Olschki, 1962), pp. 254-259, 296, 350-352; Renata Cipriani, "Attavanti, Attavante," in *Dizionario biografico degli Italiani* (Rome: Istituto della Enciclopedia italiana, 1960-), vol. 4, pp. 526-530; and Csaba Csapodi, "Die berühmten Florentinischen Miniaturen: Attavante," in *Matthias Corvinus und die Renaissance in Ungarn 1458-1541. Katalog der Ausstellung, Schallaburg, 8. Mai - 1. November 1982* (Krems: Amt der Niederösterreichischen Landesregierung, 1982), pp. 414-419. The best list I know of manuscripts painted by Attavante is in "I codici per la biblioteca di Lorenzo e eredi," in Anna Lenzuni, ed., *All'ombra del lauro. Documenti librari della cultura in età laurenziana: Firenze, Biblioteca medicea laurenziana, 4 maggio-30 giugno 1992* (Florence: Silvana Editoriale, 1992), pp. 140-147.



Figure 2 Detail of the map by Martellus in Attavante's miniature. Lisbon, Arquivos Nacionais da Torre do Tombo, MS 161/7, f. 2r (1497). Photo: Arquivos Nacionais da Torre do Tombo.

of the Prologue to the First Epistle of Paul to the Corinthians. The folio measures 410×278 mm (16.1×11.9 inches), and the miniature is 180×100 mm (7×3.9 inches). Like the opening folios of other volumes of the Bible,¹⁴ it shows St. Jerome with the Hieronymite monks for whom the Bible was intended in the royal Mosteiro dos Jerónimos in Belém, just outside of Lisbon.¹⁵ The depiction of Jerome, who lived *c.* 347–420, in a fifteenth-century monastery is, of course, anachronistic, but expresses the monks' closeness with the founder of their order. In this scene (**Figure 1**), Jerome, on the left, is writing at a lectern. Two monks are seated in front of him, reading; behind them seven monks stand and look towards Jerome, and one of them addresses him. On the wall behind Jerome there is a shelf of books, a piece of paper or parchment with writing on it, a clock, and a wall map in a gilded frame (**Figure 2**).¹⁶ This image is a striking

¹⁴ See for example vol. 4, f. 2r, which shows St. Jerome writing in a study with shelves full of books, and two monks waiting on him; there is a similar scene in vol. 5, f. 3r. For illustrations of these and other similar scenes from the Bible see Garzelli, *Miniatura fiorentina* (see note 11), vol. 2, figs. 826, 828, 832, and 834; and Alexander, *The Painted Page* (see note 11), p. 52 (the scene from vol. 4 of the Bible, in color).

¹⁵ I paraphrase de la Mare, "Notes on Portuguese Patrons of the Florentine Book Trade" (see note 11), p. 181.

¹⁶ For discussion of later maps in Bibles, see Catherine Delano Smith, "Maps as Art and Science: Maps in Sixteenth Century Bibles," *Imago Mundi* 42 (1990), pp. 65-83; and Catherine Delano-Smith and Elizabeth Morley Ingram, *Maps in Bibles, 1500-1600: An Illustrated Catalogue* (Geneva: Librairie Droz, 1991).

Figure 3 The world map in the London manuscript of Martellus's *Insularium illustratum*. London, British Library, Add. MS 15760, ff. 68v-69r (c. 1489). Photo: British Library.



example of the use of maps as decoration in rooms pertaining to scholars, which was becoming fashionable at the end of the fifteenth century, and became widespread in the sixteenth century.¹⁷

The map depicted is the work of Martellus: its similarity to the world maps in manuscripts of his *Insularium illustratum* (**Figures 3 and 5**) and to the world map designed by Martellus and printed by Francesco Rosselli (**Figure 6**) is overwhelming. The projection, a modification of

¹⁷ See Mark Rosen, "Maps as Decoration in the Fifteenth and Sixteenth Centuries" in his "The Cosmos in the Palace: The Palazzo Vecchio Guardaroba and the Culture of Cartography in Early Modern Florence, 1563-1589," Ph.D. dissertation, University of California at Berkeley, 2004, pp. 90-122; and on the increase in this fashion in sixteenth-century Venice, see Federica Ambrosini, "'Descrittioni del Mondo' nelle case venete dei secoli XVI e XVII," *Archivio Veneto* 152 (1981), pp. 67-79; Genevieve Carlton, "Worldly Consumers: The Demand for Maps in Renaissance Italy," Ph.D. Dissertation, Northwestern University, 2011; and Genevieve Carlton, "Making an Impression: The Display of Maps in Sixteenth-Century Venetian Homes," *Imago Mundi* 64.1 (2012), pp. 28-40. Also see Chet Van Duzer, "The Ptolemaic Wall Map: A Lost Tradition of Renaissance Cartography," *Viator* 45.1 (2014), pp. 361-389.

Ptolemy's Second Projection, is the same as that used by Martellus.¹⁸ The area of the world depicted—from the eastern Atlantic to the eastern coast of Asia—is the same as that which Martellus depicts in manuscripts of his *Insularium illustratum*, on his world map printed by Rosselli, and the large Asian peninsula jutting southwest into the Indian Ocean has the same shape that it does in all of Martellus's world maps.¹⁹ The only surviving late fifteenth- or early sixteenth-century maps that have this combination of characteristics are those by Martellus.

Moreover, the color scheme of the map depicted by Attavante, with its blue seas and yellow-brown mountains, is very similar to that on the world map in the British Library manuscript of Martellus's *Insularium illustratum* (**Figure 3**),²⁰ and also to that of the maps painted by Martellus in a manuscript of Ptolemy's *Geography* that is now in Florence.²¹

Attavante had experience with maps some years before he came to paint the miniature in the *Bíblia dos Jerónimos*, for he was involved in the production of two manuscripts of Francesco Berlinghieri's *Geographia* of 1482, an adaptation of Ptolemy's *Geography* in Italian verse that was illustrated with maps.²² Perhaps this very experience helped Attavante make a significant

¹⁸ On the projection Martellus used in these maps see Johannes Keuning, "The History of Geographical Map Projections until 1600," *Imago Mundi* 12 (1955), pp. 1-24, esp. 10-11.

¹⁹ For discussion of the cartographic history of this peninsula see George E. Nunn, *The Columbus and Magellan Concepts of South American Geography* (Glenside, PA: Privately printed, 1932), pp. 44-45; and Benjamin Olshin, "India Meridionalis: The Dragon's Tail," in his "A Sea Discovered: Pre-Columbian Conceptions and Depictions of the Atlantic Ocean," Ph.D. Dissertation, University of Toronto, 1994, pp. 319-377.

²⁰ Martellus uses this same color scheme in the world map in the Leiden manuscript of his *Insularium illustratum*, which is in the Universiteitsbibliotheek, MS Voss. Lat. F. 23, with the world map on ff. 65v-66r. The manuscript is described by Almagià, "I mappamondi" (see note 2), pp. 291-292, and the map is discussed by K. A. Kalkwiek, "Three Mappae Mundi from the University Library in Leyden," *Janus* 62.1-3, (1975), pp. 17-41, esp. 34-39.

²¹ The manuscript in question is Florence, Biblioteca Nazionale Centrale, Magliabechiano XII 16. For discussion see Joseph Fischer, *Claudii Ptolemaei Geographiae, Codex Vrbinas Graecvs* 82 (Leiden: Brill, and Leipzig: Harrassowitz, 1932), vol. 1.1, pp. 219 and 398-404, and two maps from the manuscript are reproduced in vol. 1.2, plate L36; Sebastiano Gentile, ed., *Firenze e la scoperta dell'America: umanesimo e geografia nel '400 fiorentino* (Florence: L. S. Olschki, 1992), pp. 240-243 with plates 47-48; Cavallo, *Cristoforo Colombo e l'apertura degli spazi* (see note 7), vol. 1, pp. 517-521, with a good color reproduction of the world map on pp. 518-519. The manuscript has been published in facsimile as *Ptolomei cosmographia* (Florence: Vallecchi, 2004), with studies by Sebastiano Gentile and Angelo Cattaneo.

²² For the attribution to Attavante of some parts of the Biblioteca Braidense manuscript of Berlinghieri (Milan, Biblioteca Nazionale Braidense, MS AC. XIV. 44), see Francesco Carta, *Codici, corali e libri a stampa miniati della Biblioteca nazionale di Milano* (Rome: Presso i principali librai, 1891-1895), pp. 93-100; for the attribution of

adjustment to the map in the miniature so that viewers would be able to more easily recognize it as a map. If we compare **Figures 2 and 3**, we see that Attavante has made Europe and the Mediterranean, the geographic features most readily recognizable for European viewers, much larger than they are on Martellus's maps. In **Figure 3**, the world map in the British Library manuscript of Martellus's *Insularium illustratum*,²³ the Mediterranean extends about halfway from the western edge of Europe towards the centerline of the map, while in Attavante's image it extends all the way to the map's centerline, and thus is about twice as large as it should be. This change naturally caused other distortions in Attavante's image of the map: the Caspian Sea is much too far to the east, having been pushed eastward by the expansion of the Mediterranean, and a good part of the distension of Africa in Attavante's image may be attributed to the same cause. Thus, the cartographical errors in the artist's reproduction of Martellus's map may be ascribed, not to Attavante's carelessness, but rather to his desire to make the nature of the object he was depicting clear to its viewers. The artist's emphasis on Europe makes that continent almost as large as Africa—a strikingly Eurocentric view of the world.

Given the adjustments that Attavante made to his model map, the question arises as to whether he made other adjustments as well, and whether the map that inspired him was not a wall map, but rather the world map in a manuscript of Martellus's *Insularium*, which he reimagined as a wall map. However, as Martellus is known to have made the wall map now at Yale, Occam's razor would favor the conclusion that the artist was inspired by a Martellus wall

Biblioteca Apostolica Vaticana Urb. lat. 273 to Attavante, see Ada Labriola, "Berlinghieri, *Geography* (Urb. lat. 273)," in Marcello Simonetta, ed., *Federico da Montefeltro and his Library* (Milan: Y. Press; and Vatican City: Biblioteca Apostolica Vaticana, 2007), pp. 136-144.

²³ The shelfmark of the map is London, British Library, Add. MS 15760, ff. 68v-69r. For discussion of the map see Almagià, "I mappamondi" (see note 2), pp. 292, 299, and 304-306. The best reproductions of the map are those in Kenneth Nebenzahl, *Atlas of Columbus and the Great Discoveries* (Chicago: Rand McNally, 1990), pp. 15-17; and Cavallo, *Cristoforo Colombo e l'apertura degli spazi* (see note 7), vol. 1, pp. 420-421.

map over the suggestion that Attavante happened to re-imagine one of Martellus's maps in a format that Martellus himself by coincidence came to use.

And there is additional evidence that the map that served as Attavante's model was indeed a wall map. There would be little point in trying to estimate the dimensions of the map in Attavante's miniature by comparing them with those of nearby objects such as the books on the shelf above or the clock: it is likely that Attavante adjusted the size of the map to fit the scene he had envisioned, just as he adjusted the size of the Mediterranean on the map. But the map's proportions are closer to those of Martellus's one surviving wall map than to those of the world maps in manuscripts of his *Insularium illustratum*. The ratio of width to height in the map in the *Bíblia dos Jerónimos* is about 1.9 to 1, much higher than the ratio in the world map in the British Library manuscript of his *Insularium*, which measures 30 × 46.5 cm (11.8 × 18.3 inches), so about 1.55 to 1. It is also higher than the ratio in the world map in the Florence manuscript of his *Insularium*, which measures 29 × 43 cm (11.4 × 17 inches), so 1.48 to 1.²⁴ The corresponding ratio for Martellus's one surviving wall map, his world map at Yale, is 1.64 to 1, closer to the ratio in Attavante's image. This tends to confirm that the map shown in the Bible was originally designed as a wall map, rather than being a bifolium from a manuscript of the *Insularium illustratum* that was framed and thus adapted to separate display.

Moreover, one geographical feature of the map depicted by Attavante connects it closely with the more detailed depiction of the world on Martellus's wall map at Yale, rather than with the smaller and less-detailed world maps in his *Insularium illustratum*, or his map printed by

²⁴ The world map is missing from the Chantilly manuscript of Martellus's *Insularium*—which is in Chantilly, Bibliothèque du Musée Condé, MS 698 (483)—but that manuscript measures 28.5 × 37.8 cm, so the world map would have measured about 37.8 × 57 cm (14.8 × 22.4 inches), for a ratio of about 1.51 to 1. Descriptions of this manuscript include Almagià, "I mappamondi" (see note 2), pp. 294-295 and 299; and Jacques Meurgey de Tupigny, *Les principaux manuscrits à peintures du Musée Condé à Chantilly* (Paris: Pour les membres de la Société française de reproductions de manuscrits à peintures, 1930), pp. 192-194 and plate 129.

Rosselli. In the northern ocean on the map depicted by Attavante, there is a large gulf north east of Scandinavia, and this same gulf appears on all of Martellus's other world maps. On Martellus's other world maps, the eastern reach of this gulf is defined by land that juts northward and then westward, while on Attavante's miniature, this westward-jutting peninsula is missing, but nonetheless it is clearly the same gulf on all of his maps. On the map depicted by Attavante, there is an island in this gulf, and this island does not appear on any of Martellus's other world



Figure 4 Detail of the northern ocean on the large world map by Martellus now at Yale (compare fig. 7), showing an island in that ocean that also appears on the map in Attavante's miniature (compare fig. 2), but not on Martellus's other world maps. New Haven, Beinecke Rare Book and Manuscript Library, Art Store 1980.157 (c. 1491). Photo: Beinecke Rare Book and Manuscript Library.

maps, except one: his wall map of the world at Yale (**Figure 4**). On the Yale map there is a large cartouche above the island and a small one below it, and the island itself bears the inscription *bannona insula septentrionalis*, “Bannona, a northern island,” a reference to the northern island of Bauonia mentioned by Pliny (*Naturalis historia* 4.13.94).²⁵ That this island appears only on the map in Attavante’s miniature and on Martellus’s wall map now at Yale, but not on any of his other surviving world maps, is strong confirmation that the map depicted in Attavante’s miniature was indeed a wall map.

Regarding the date of the map depicted in Attavante’s miniature, the world map in the Florence manuscript of Martellus’s *Insularium* (**Figure 5**) is generally thought to be his earliest.²⁶ It shows several signs of revision, suggesting that Martellus was still working out how he wanted to depict the world. The text is borrowed from Cristoforo Buondelmonti’s earlier *isolario* (a book of islands),²⁷ so this manuscript is one of Martellus’s first tentative essays at the genre. The evidence of toponyms shows that the world map in the Florence manuscript was made after 1488, so it is reasonable to think that Martellus also made the map depicted by Attavante after that date. Volume seven of the *Bíblia dos Jerónimos* was completed in July of 1497, and thus we have a reasonably tight date range for the map, c. 1488-1497.

²⁵ The full inscription *bannona insula septentrionalis* is legible only in the multispectral images of the Yale Martellus map that I made in August of 2014 with Michael Phelps, Gregory Heyworth, Roger Easton, and Ken Boydston, with financial support from the National Endowment for the Humanities. My study *The World Map by Henricus Martellus at Yale, c. 1491: Sources and Influence*, will contain a full transcription, translation, and study of all of the text on the map that these images reveal.

²⁶ For descriptions of the Florence manuscript see Almagià, “I mappamondi” (see note 2), esp. 295-298; and Gentile, *Firenze e la scoperta dell’America* (see note 21), pp. 237-240.

²⁷ For discussion of Buondelmonti’s *Liber insularum Arcipelagi* see Hilary Turner, “Christopher Buondelmonti and the Rise of the Isolario,” *Terrae Incognitae* 19 (1988), pp. 11-28; and Giuseppe Ragone, “Il *Liber insularum Arcipelagi* di Cristoforo dei Buondelmonti: filologia del testo, filologia dell’immagine,” in Didier Marcotte, ed., *Humanisme et culture géographique à l’époque du Concile de Constance. Autour de Guillaume Fillastre. Actes du Colloque de l’Université de Reims, 18-19 novembre 1999* (Turnhout: Brepols, 2002), pp. 177-217.



Figure 5 The world map in the Florence manuscript of Martellus's *Insularium*. It shows considerable signs of revision, indicating that it was one of his earliest world maps, and shows some affinity with the map in Attavante's image, in that southern Africa does not extend beyond the map's frame (contrast figs. 2, 5, and 6). Florence, Biblioteca Medicea Laurenziana, Pluteo 29.25, ff. 66v-67r (c. 1489). Photo: Biblioteca Medicea Laurenziana.

Additional evidence suggests that the map was made in the early part of this range.

On most of Martellus's world maps, the southern tip of Africa projects beyond the southern border of the map (see **Figures 3, 6, and 7**). However, it does not do so on Attavante's image (**Figure 2**), nor on one of Martellus's earliest world maps, that in the Florence manuscript of his *Insularium* (**Figure 5**). This feature of the map in Attavante's miniature associates it with Martellus's early cartographic work, and thus demonstrates that Martellus was making wall maps from early in his career as a cartographer. No doubt he made additional wall maps that do not survive.

In addition, the map in Attavante's miniature depicts less of the earth's surface than the Yale Martellus map. The map in Attavante's miniature—like the world maps in manuscripts of Martellus's *Insularium*—shows about 240° of longitude, from the eastern Atlantic to the eastern



Figure 6 The Martellus-Rosselli map, designed by Martellus and printed by Francesco Rosselli. Florence, Biblioteca Nazionale Centrale, Landau Finaly, Carte Rosselli, planisfero (c. 1489). Photo: Biblioteca Nazionale Centrale di Firenze.

shore of Asia. The Yale Martellus map shows 270° of longitude, including a more detailed rendering of the eastern coast of Asia, and the proto-Pacific out to and including Japan (**Figure 7**).²⁸ As the Yale Martellus map incorporates additional geographical information with respect to the map in Attavante's miniature, it is very likely that the map in the miniature was made earlier.

²⁸ A high-resolution image of the Yale Martellus map may be consulted at http://brbl-dl.library.yale.edu/vufind/Record/3435243?image_id=1040211.

The Yale Martellus map does not bear a date, but it contains information from an illustrated encyclopedia titled the *Hortus sanitatis*, which was first published in 1491,²⁹ and as the geography on that map seems to have influenced Martin Behaim in making his terrestrial globe



Figure 7 The large world map (201 x 122 cm) by Martellus at Yale. It was a more elaborate map like this one, with a fully rendered eastern coast of Asia, and including Japan, that served as an inspiration to Columbus and as a cartographic model for Behaim and Waldseemüller. New Haven, Beinecke Rare Book and Manuscript Library, Art Store 1980.157 (c. 1491). Photo: Beinecke Rare Book and Manuscript Library.

of 1492, a date of c. 1491 for the map is very likely. So the map in the miniature was probably made between 1488 and 1491.

²⁹ The *Hortus sanitatis* “major,” which is the work that I refer to here, was first published in Mainz by Jacob Meydenbach, June 23, 1491, and is to be distinguished from the *Hortus sanitatis* “minor,” which is a Latin translation of the German herbal often titled *Gart der Gesundheit*, first published by P. Schoeffer, Mainz, 1485. Details and discussion of the early editions of the *Hortus sanitatis* are provided by Arnold C. Klebs, “Herbals of 15th Century,” *Papers of the Bibliographical Society of America* 11 (1917): 75-92; and 12 (1918): 41-57, esp. 48-51 and 54-57. I will detail Martellus’s use of the *Hortus sanitatis* in my forthcoming study *The World Map by Henricus Martellus at Yale, c. 1491: Sources and Influence*.

As indicated above, a map by Martellus influenced Christopher Columbus's geographic thought and also influenced Martin Behaim in the creation of his globe of 1492. One of the great problems in the history of cartography is when and where Columbus and Behaim saw a map by Martellus. Behaim spent considerable time in Lisbon, and for that reason Attavante's image of this map by Martellus in a monastery just outside of Lisbon makes one's heart skip a beat at first viewing. But the matter is not so simple. First, the Martellus map that Columbus saw and that influenced Behaim must have been much more similar to the Yale Martellus map (**Figure 7**) with regard to the configuration of eastern Asia (including Japan) and southern Africa (including a peninsula jutting eastward at the southern end of the continent) than the Attavante image is. For example, Columbus's son Ferdinand in chapter 20 of his biography of his father said that Columbus certainly would have found Japan if he had not believed that the island extended from north to south.³⁰ I know of no early text or map that describes or portrays Japan that way, except for Martellus, so it seems certain that it was from a map like the Yale Martellus map that Columbus got this idea (and others).

Second, we have no evidence that Attavante was ever in Lisbon, and, in fact, the contract for the creation of the *Bíblia dos Jerónimos* cited above demonstrates that he was in Florence during the years 1494-1497, being closely watched by the Florentine merchant Cipriano di Sernigi. Rather than Attavante having seen a map by Martellus in the monastery in Belém, it is much more likely that the artist was placing a map that he had seen in Florence in a Portuguese setting.

³⁰ Fernando Colón, *The History of the Life and Deeds of the Admiral Christopher Columbus: Attributed to His Son Fernando Colón*, ed. Ilaria Luzzana Caraci, trans. Geoffrey Symcox and Blair Sullivan (Turnhout: Brepols, 2004), pp. 69-70 (English) and 271 (Italian). This material is cited by Skelton, "World Map by Henricus Martellus Germanus, c. 1489, at Berne" (see note 2), p. 16.

Nonetheless, the miniature in the *Bíblia dos Jerónimos* provides some evidence bearing on the important question that Gaetano Ferro asks regarding Christopher Columbus, which must also be asked regarding Martin Behaim: “When did he see and obtain his world map of the Martellus type?”³¹ First, the miniature confirms that there were cultural contacts between the Portuguese court and Florence, specifically with a Florentine circle familiar with Martellus’s work.³² It is not difficult to imagine that these contacts had been in place since 1490 or so, and had resulted in the purchase of some of Martellus’s maps for clients in Portugal. Then, Attavante’s image suggests that Martellus’s work was well-regarded in Florence: it was thought of highly enough to be chosen as a decoration of an imaginary elite cultural space. We know that the Yale Martellus map, or one very similar to it, was in Martin Waldseemüller’s workshop before 1507, and Attavante’s image makes it more plausible that a map of Martellus’s similar to the one at Yale reached Lisbon before Columbus sailed on his first voyage and before Behaim made his globe.

Attavante’s image is also valuable for the light it sheds on Martellus’s work, particularly on his creation of wall maps early in his cartographic career. We now know that he had experience making wall maps when he came to design his large and influential world map now at Yale, and that he had experience with the market for wall maps. Moreover, Attavante’s miniature is important for the information it gives us about the reception and use of cartography in the late fifteenth century. Much of the evidence we have about the use of maps to decorate cultural

³¹ Gaetano Ferro, “Christopher and Bartolomeo Columbus, Cartographers,” in *The Genoese Cartographic Tradition and Christopher Columbus*, trans. Hann Heck and Luciano F. Farina (Rome: Istituto poligrafico e Zecca dello Stato, Libreria dello Stato, 1997), pp. 93-129, at 126-127.

³² K. J. P. Lowe, *Cultural Links between Portugal and Italy in the Renaissance* (New York: Oxford University Press, 2000).

spaces, and thus to indicate the owner's educational attainments or ambitions, is textual,³³ but Attavante's miniature provides visual evidence of that use.

In particular, we have little evidence regarding the use of maps to decorate ecclesiastical settings in this period. Attavante's miniature serves as an iconographic complement to a passage in Paolo Cortesi's *De cardinalatu*, a treatise on the conduct appropriate to cardinals that was published in 1510. In describing the proper decoration of a cardinal's palace, Cortesi says that the well-educated Cardinal will delight in an image of the world that shows the latest geographical discoveries:

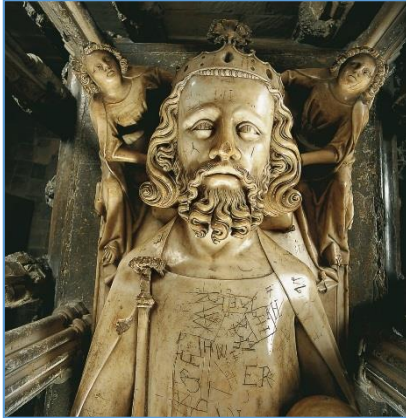
And likewise there is no less delight to the learned in a painted picture of the world or the description of its parts which have recently become known through the daring circumnavigations accomplished by our people, such as the explorations of Manuel King of the Portuguese around India.³⁴

It is surprising that Cortesi would recommend a map for an ecclesiastical officer not in order to illustrate sacred history, but rather to show his knowledge of geography,³⁵ but that is exactly the type of map we see in Attavante's miniature: Martellus took considerable pride in displaying the latest Portuguese discoveries. Thus the context of Martellus's map in Attavante's image, perhaps unexpected to twenty-first century eyes, is in fact consistent with contemporary practice. 🐼

³³ See note 17.

³⁴ Paolo Cortesi, *De cardinalatu* (San Gimignano: Simeone Nicolai Nardi senensis, alias Rufus Calchographus, 1510), ff. 54r-54v; the English is from Kathleen Weil-Garris and John D'Amico, "The Renaissance Cardinal's Ideal Palace: A Chapter from Cortesi's *De Cardinalatu*," in Henry A. Millon ed., *Studies in Italian Art and Architecture, 15th through 18th Centuries* (Cambridge, MA: MIT Press; Rome: Edizioni dell'Elefante, 1980), pp. 45-119 (= *Memoirs of the American Academy in Rome*, 35), p. 97. Also see Juergen Schulz, "Maps as Metaphors: Mural Map Cycles of the Italian Renaissance," in David Woodward, ed., *Art and Cartography: Six Historical Essays* (Chicago and London: University of Chicago Press, 1987), pp. 97-122, at 117.

³⁵ Rosen, "The Cosmos in the Palace" (see note 17), p. 93.



Identity, Status, and Material: Medieval Alabaster Effigies in England

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In September 1327 the deposed king Edward II of England died under mysterious circumstances at Berkeley Castle; he was buried in St. Peter's Abbey, now Gloucester Cathedral, three months later.¹ His body was eventually housed in an elaborate tomb comprised of a locally sourced Painswick oolitic limestone base and tomb chest with Purbeck marble panels, a multi-tiered limestone and Purbeck canopy, and an alabaster effigy (**Figure 1**). The installation of this monument sparked the production of a series of royal alabaster effigies and, following these commissions, an increasing number of aristocratic tomb figures. This essay examines that remarkable flowering in order to suggest an explanation of alabaster's rather sudden popularity as a memorializing material. In doing so, it will consider a network of

¹ There has been some scholarly speculation that he was not murdered at this time, but survived in exile in Italy. The general consensus argues against this however. See Roy Martin Haines, *King Edward II, Edward of Caernarfon His Life, His Reign, and its Aftermath, 1284-1330* (Montreal: McGill Queen's University Press, 2003), ch. 8 "Life after Death, Edward the Penitent Hermit," esp. 220-221 and George P. Cuttino and Thomas W. Lyman, "Where is Edward II?" *Speculum* 53 (1978), 525.



Figure 1 Tomb of Edward II, Gloucester Cathedral. Photo: author.

contributing factors: the beginnings of alabaster mining in England and the material's physical qualities, the reputation of alabaster gleaned from biblical mentions and ancient and medieval lapidaries, the decision to sculpt Edward II's figure from this material, the ongoing memorialization of French monarchs at St. Denis, the patronage of alabaster effigies, and the beginnings of the Hundred Years War. No single one of these phenomena can explain alabaster's popularity, but considering them as a network of interacting agents may suggest how this newly discovered stone gained such appeal in the second half of the fourteenth century.

In examining the employment of alabaster in tombs during the later Middle Ages this essay will focus on its use in English high-status tomb effigies and discuss what the material may suggest about English patrons' attitudes towards status in England, especially during the initial phase of the Hundred Years War, from its beginning in 1337 to around 1428, when the English were defeated at the Battle of Orleans. This period witnessed the relatively sudden availability and exploitation of alabaster in England for high-status tombs. It is significant that it was through the tomb effigy, among the most powerful vehicles for representing one's social and spiritual condition, that alabaster gained such a following among England's elite patrons.

In proposing a constellation of factors I am drawing on the work of Michael Callon and Bruno Latour's actor-network-theory (ANT), which advocates tracing relationships between humans, between humans and other animals, between objects, and between humans, other animals, and objects in differing configurations to explain change. In this theoretical model there is no hierarchical distinction between humans and others,

animate or inanimate, all are equally actors.² For example, Jeffrey Jerome Cohen calls attention to stone's agentic faculty in his recent book, *Stone: An Ecology of the Inhuman*.³ I will argue that the emergence of alabaster in this period is part of such a network of actors in that it offered an alternative to traditional memorial materials such as freestone, and thus allowed for different understandings of the role of tombs in the construction and performance of identity in later-medieval England. For both patrons and beholders of tombs, this new material expanded the potential for the staging of status through memorials, and also suggested a new dimension to the understanding of aristocratic identity in England in the opening years of the war with France. Indeed, through its agency, alabaster may have allowed its patrons and beholders to think Englishness itself in a different way than before.

Alabaster Quarrying and Use for Effigies

As Anne Harris has so eloquently demonstrated, the mining of alabaster had its own network of connections, beginning with the Jurassic oceans that produced the material and determined its characteristics, and extending to John of Gaunt, whose desmesne included Tutbury and Fauld, two of the earliest sites of plentiful, high-quality alabaster. Two of the earliest surviving monumental works in alabaster, a twelfth-century door surround in Tutbury and a fourteenth-century knight's effigy in nearby Hanbury,

² See Bruno Latour, *Reassembling the Social: An Introduction to Actor-Network-Theory* (Oxford: Oxford University Press, 2005). On agency and materiality see also Jane Bennett, *Vibrant Matter, a Political Ecology of Things* (Durham: Duke University Press, 2010) and for stone in particular, Jeffrey Jerome Cohen, "Stories of Stone," *postmedieval* 1:1/2 (2010): 56-63.

³ Jeffrey Jerome Cohen, *Stone: An Ecology of the Inhuman* (Minneapolis: University of Minnesota Press, 2015).

come from this area.⁴ Also included in this constellation would be the topography of the region, whose abundance of waterways allowed for easier transport of the raw material and blocks to the workshops where they were carved or finished, and the alabaster quarriers and carvers responsible for obtaining the stone and for shaping it into the panels and effigies still in evidence today in English churches and museums around the world.⁵ As far as the labor force is concerned, Francis Cheetham long ago speculated that the ravages of the Black Death led to a reduction in workers, increasing the appeal of a material relatively easy and economical to extract from the earth.⁶ In addition, Fergus Cannan notes that many of the quarry owners and quarriers would have owned draft animals and hauling equipment as part of the areas' agrarian way of life, which may have eased the transport of alabaster over land.⁷

The alabaster quarried at these sites was shipped to London to fabricate the most elite fourteenth-century tomb commissions, such as the royal tombs ordered by John of Gaunt in 1374.⁸ Nigel Saul has noted indications that big London carving workshops may have kept supplies of alabaster on hand in anticipation of commissions.⁹ Other

⁴ Anne Harris, "From Stone to Statue: the Geology and Art of English Alabaster Panels," forthcoming in *Art and Devotion in Medieval England*, eds. Stephen Perkinson and Jessica Brantley (Kalamazoo, MI: Medieval Institute Publications). Nigel Ramsey, "Alabaster" in *English Medieval Industries: Craftsmen, Techniques, Products*, eds. John Blair and Nigel Ramsey (London: The Hambeldon Press, 2001), 30-31; Fergus Cannan, "If Marble will not Serve: Medieval English Alabaster Sculpture, From Quarry to Object of Devotion," in *Object of Devotion*, 24. For the dating and attribution of the effigy to Henry de Hanbury (d. c. 1347) see Claude Blair, "The Date of the Early Alabaster Knight at Hanbury, Staffordshire," *Church Monuments* 7 (1992), 1-18.

⁵ Cannan, 28.

⁶ Harris, 3, citing Francis W. Cheetham, "English Medieval Alabaster Carvings and their Connection with Nottingham," from *Medieval English Alabaster Carvings in the Castle Museum Nottingham* (Nottingham: Art Galleries and Museums Committee, 1962), 11.

⁷ Cannan, 28.

⁸ John of Gaunt ordered tomb effigies for himself and his wife, and his effigy was carved by a leading architect, Henry Yvele, and a mason-contractor, Thomas Wrek. See Ramsay, 32.

⁹ Nigel Saul, *English Church Monuments in the Middle Ages, History and Representation* (Oxford: Oxford University Press, 2009), 67.

commissions may have been carved closer to the quarry site, particularly Nottinghamshire and Derbyshire, and the variety of poses employed for the earliest figures suggests local masons learning to work with this new material. Among the diverse poses adopted are the crossed legs of the Hanbury knight and the effigy of Sir William Fitzwaryn, d. 1361, at Wantage, Berkshire. The Fitzwaryn figure also displays hands folded on his chest rather than in prayer, an unusual attitude for effigies. Another early experiment was the figure turned on its side as seen in mid-century fragments from Kingsbury, Warwickshire, Bingham, and Nottinghamshire. After that point, the alabaster effigy pose was standardized into a figure with straight legs, lying flat on its back.¹⁰

By the fifteenth century certain towns such as York and Burton-on-Trent in Nottinghamshire were home to what by then were known as "alabastermen."¹¹ Many of these artisans additionally made alabaster panels for altarpieces, whose production was also expanding. By the early fifteenth century, alabaster carving had become a thriving concern with numerous commissions for effigies, statues, and panels from all over England and abroad. Most of this activity came to an end by the late 1530s due to the impact of the Reformation; only effigy production continued as these figures did not suffer from the taint of Catholic image devotion.¹²

Edward's effigy, and the royal and aristocratic figures that followed, are among a number of high-status European alabaster tomb figures dating from the later Middle

¹⁰ I would like to thank the anonymous reader for the information contained in the paragraph.

¹¹ Saul, 34. For specific workshops and alabaster carvers see two articles by Jon Bayliss, "Richard Parker, 'alabasterman.'" *Church Monuments: Journal of the Church Monuments Society*, 5 (1990): 39-56, and "Richard and Gabriel Royley of Burton-On-Trent, tombmakers," *Church Monuments: Journal of the Church Monuments Society*, 6 (1991): 21-41.

¹² Saul, 37-40. For the later period of effigy production see N. Llewellyn, *Funeral Monuments in Post-Reformation England* (Cambridge: Cambridge University Press, 2000).

Ages. Among these examples from the period in question is the tomb of Pope John XXII at Avignon, dating around 1334, and possibly modeled on the English royal monument, which exhibits an alabaster effigy. Another is the now-lost tomb of Cardinal Guillaume de Chanac, once installed in Saint-Martial Limoges, and known through surviving documentation and a seventeenth-century engraving.¹³ De Chanac's will from 1384 stipulated the use of alabaster, although Julian Gardner describes the vanished monument as carved in marble. Finally, Claus Sluter's tomb of Philip the Bold features alabaster angels and pleurants.¹⁴ As Kim Woods makes clear, alabaster became a favored sculptural material throughout western Europe during this period.¹⁵ In addition, there were plenty of alabaster quarries on the Continent, including France, Germany, and Spain.¹⁶ Nevertheless, England's quarries were the primary suppliers of alabaster in the period and alabaster effigies were especially plentiful within the island's borders.¹⁷

Despite its availability elsewhere in Europe, there is some evidence that English alabaster was considered more favorably on the Continent for tomb figures, as there are documented instances of French patrons importing the material from England for this purpose. In 1390, two alabaster stones were exported abroad from Boston at a cost of 76s

¹³ Julian Gardner, *The Tomb and the Tiara, Curial Tomb Sculpture in Rome and Avignon in the Later Middle Ages* (Oxford: Clarendon Press, 1992), 168-169.

¹⁴ Gardner, pp. 138-140. Gardner credits Francis Bond with the observation concerning the relationship between the Avignon tomb and that of Edward II. For the observation concerning the tomb of Philip the Bold see Kim Woods, "The Supply of Alabaster in Northern and Mediterranean Europe in the Later Middle Ages," in *Trade in Artists' Materials, Markets and Commerce in Europe to 1700*, eds. Jo Kirby, Susie Nash, and Joanna Cannon (London: Archetype Publications, 2010), 88.

¹⁵ Woods, "The Fortunes of Art in Alabaster: A Historiographical Analysis," in *From Major to Minor: The Minor Arts in Medieval Art History*, ed. Colum Hourihane (University Park: Penn State Press, 2012), 82-102. This essay is the most recent standard source for examining alabaster sculpture as a European phenomenon during this period.

¹⁶ Woods, "The Supply of Alabaster in Northern and Mediterranean Europe," 88-91.

¹⁷ Woods, "The Supply of Alabaster," 86.

8d, an amount suggesting stones of suitable size for tomb effigies.¹⁸ In 1408, English alabaster was used for the tomb of John IV, Duke of Brittany.¹⁹ Finally, in 1414, the Abbot of Fècamp purchased a tomb-sized block from Chellaston.²⁰

Alabaster's Place in the Lapidary and Biblical Traditions

The type of alabaster quarried in England and elsewhere differed in composition from that used in the ancient world, which is also known as calcite. Yet, it is not clear that artists and patrons recognized this; indeed, the medieval European stone may have retained, or been granted, some association with its illustrious predecessor. Western Europeans, including those in England, in the Middle Ages would have had at least four major sources for their knowledge of ancient alabaster: Pliny the Elder's (c. 23-79 C.E.) *Natural History*, Isidore of Seville's *Etymologies* (early seventh century), medieval lapidaries and compilations, and the Bible.²¹ Pliny's text is an encyclopedic examination of the world, including its history and its material components. It was widely used in both the Roman and medieval periods and provided the inspiration behind medieval lapidaries, or encyclopedias of stones, gems and minerals, and the so-called Monstrous

¹⁸ Woods, "The Supply of Alabaster," 87 and S. H. Rigby, "The Overseas Trade of Boston in the Reign of Richard II," *Lincoln Record Society Publications* 93 (Woodbridge: Boydell and Brewer), 109,132,135,157,160.

¹⁹ Arthur Gardner, *Alabaster Tombs of the Pre-Reformation Period in England* (Cambridge: Cambridge University Press, 1940), 11. Gardner cites T. Rymer, *Foedera*, vol. VIII, 510 for the royal passport granting the export of the tomb.

²⁰ Woods, "Supply of Alabaster," 87; *History of Chellaston* (Chellaston, 1988), 32; J. Bilson, "A French Purchase of English Alabaster in 1414," *Archaeological Journal* 64 (1907): 32-37; and W. Stevenson, "Art Sculpture in Alabaster, Preserved in France, Considered in its Relationship to the Nottingham School of Alabasterers," *Transactions of the Thoroton Society* XI (1907): 92-96.

²¹ Ramsay, 29; for Isidore of Seville see *The Etymologies of Isidore of Seville*, trans. Stephen A. Barney, W. J. Lewis, J. A. Beach, Oliver Berghof with the collaboration of Muriel Hall (Cambridge: Cambridge University Press, 2006).

Races, which feature prominently on English *mappa mundi*.²² In Book 13, Chapter 3 of *Natural History*, “The Mode of Testing Unguents,” Pliny observes that unguents keep best in boxes of alabaster.²³ He is no doubt referring to Egyptian alabaster, which, as noted above, differs from that quarried in England and other parts of Europe.

Isidore of Seville’s *Etymologies* was also widely disseminated in medieval Europe with Gaul and Ireland being the first places beyond the Iberian Peninsula to feel its impact.²⁴ It was known in England by the late seventh century, and its influence continued to be felt through the fifteenth century.²⁵ In the dedication to the *Etymologies*, Isidore makes very clear that his encyclopedia is drawn from a variety of sources, including those from antiquity.²⁶ One of these sources was Pliny, who is mentioned at least seven times in Isidore’s text.²⁷ Concerning alabaster, Isidore repeats Pliny’s comments about its appropriateness for storing ointments, “*Alabastrites* is a white stone, tinted here and there with various colors. The ointment box spoken of by the Evangelist himself was made out of *alabastrites* (Luke 7:37), for people hollow out this stone for ointment vessels because it is said to be the best material for preserving ointments unspoiled.” He goes on to discuss its geographic origins, “Particularly white alabaster originates around Thebes in Egypt and Damascus in Syria, but the highest quality comes from India.”²⁸

²² Sarah Blake McHam, *Pliny and the Artistic Culture of the Italian Renaissance, The Legacy of the ‘Natural History’* (New Haven: Yale University Press, 2013), 3.

²³ Pliny the Elder, *The Natural History*, Book XIII, ch. 3, eds. John Bostock and H. T. Riley, trans. John Bostock (London: Taylor and Francis, 1855), accessed through the Perseus Project.

²⁴ Barney *et al.*, 24.

²⁵ Barney *et al.*, 25

²⁶ Barney *et al.*, 10.

²⁷ Barney *et al.*, 14.

²⁸ Both quotes Barney *et al.*, 321.

The medieval lapidary tradition built on Pliny and Isidore as well as other ancient predecessors such as Theophrastus's *On Stones*, which dates to the end of the fourth century B.C.E.²⁹ Like their ancient ancestors the medieval treatises emphasize the active properties of stones, their virtues and their capabilities. So, for example, according to Marbode of Rennes's (c. 1035-1123) *De lapidus* jasper cures fever and aids women in childbirth, while sapphire guards against intended harm and helps prisoners to escape captivity.³⁰ Albertus Magnus's (1206-1280) *Book of Minerals* treats alabaster under the name *nicomar*, "Nicomar is the same as alabaster, which is a kind of marble; but because of its marvelous power it is placed among precious stones."³¹ This lapidary goes on to repeat Pliny's and Isidore's explanations, stating that the stone's coldness allows it to preserve ointments, so that the ancients used it for ointment boxes. However, Albertus Magnus adds something new: alabaster also preserves corpses, so that it is frequently used for tombs.³²

In 1398, John Trevisa finished his translation of Bartholomaeus Anglicus's *De Proprietatibus Rerum* in which alabaster is treated in Book 16, the section concerning rocks, gems, and minerals.³³ According to Elizabeth Keen, no definitive version of the Latin text survives, and Bartholomew's identity and place of origin have been the topic of

²⁹ See Theophrastus's *On Stones, Introduction, Greek Text, English Translation, and Commentary*, eds. Earle R. Caley and John F. C. Richards (Columbus, OH: The Ohio State University, 1956), 4.

³⁰ John M. Riddle, *Marbode of Rennes' (1035-1123) De Lapidus: Considered as a Medical Treatise with Text, Commentary and C. W. Kings' Translation Together with Text and Translation of Marbodes' Minor Works on Stones* (Wiesbaden: Franz Steiner Verlag GMBH, 1977), 40-43.

³¹ Albertus Magnus, *Book of Minerals*, trans. Dorothy Wyckoff (Oxford: Clarendon Press, 1967), 107.

³² *Ibid.* Later on in the treatise Albertus confuses alabaster with a stone he labels sarcophagus, whose virtue is that it devours dead bodies, see p. 116

³³ Bartholomaeus Anglicus and John Trevisa, *On the Properties of Things: John Trevisa's Translation of Bartholomaeus Anglicus De Proprietatibus Rerum, a Critical Text*, 3 vols. (Oxford: Clarendon Press, vol. 1 and 2, 1975; vol. 3, 1988). On the historiography and interpretation of this text see Elizabeth Keen, *The Journey of a Book: Bartholomew the Englishman and the Properties of Things* (Canberra, Australia: ANU E Press, The Australian National University, 2007).

much scholarly debate.³⁴ Keen asserts that he was a Franciscan who completed the work in Magdeburg around 1240.³⁵ Trevisa was the chaplain for Berkeley Castle and probably produced his translation at the behest of Thomas Berkeley IV.³⁶ In Trevisa's translation, Bartholomew's text draws on Pliny and Isidore for its description of alabaster, including its preservative properties, adding that it is reputed to help win victory and mastery, and to generate and preserve friendship.³⁷

The most famous biblical reference to alabaster is the episode from the Gospels in which a woman with an alabaster box anoints Christ's feet as he is dining in the house of Simon the Leper. The late-fourteenth-century Wycliffe Bible translates the passage from Matthew 26:6 as "a womman havynge a boxe of alabastre of precieuse oynement."³⁸ In the fourteenth century, both Exeter and Canterbury Cathedrals claimed to possess the *alabastrum* described in the gospel passage, which held the ointment with which the woman, understood to be Mary Magdalene, anointed Christ's feet.³⁹ This suggests the presence of ancient containers made of calcite in at least these two church collections. The similarity in appearance of the two materials, calcite and English alabaster, along with the hallowed ancient and Biblical pedigree of the former, may have resulted in labeling the European stone by the same name as its ancient predecessor.

Alabaster's Appeal to the Elite

For Edward's tomb, this material's availability, its material qualities, and its

³⁴ Keen, 1-4.

³⁵ Keen, 78

³⁶ Keen, 87.

³⁷ *On the Properties of Things*, vol. II, 827-828.

³⁸ Ramsay, 29.

³⁹ *Ibid.*

ancient and biblical associations, suited the desire to emulate the French royal marble tomb figures installed at Saint Denis. England possessed no native sources for this stone and importing marble from the Continent would have been extremely expensive. The Saint Denis series of monuments was initiated during the reign of Louis IX and marked the burials of French royalty going back to the Carolingian period.⁴⁰ According to Georgia Sommers Wright, the intent of this enterprise was to demonstrate the legitimacy of the Capetian dynasty, some of whom were descended from Carolingian rulers through the maternal line, and to reinforce the Abbey's role as a royal burial church.⁴¹ Louis himself was memorialized in a now-destroyed tomb commissioned by his son, Philip III, as part of a campaign for the crusading monarch's canonization, as Stephen Perkinson has noted.⁴² Philip III also commissioned a tomb for his wife, Isabella of Aragon, dated 1275, which features a marble effigy. Philip IV continued this trend by commissioning a tomb with a white marble effigy for his father Philip III between 1298-1307. The practice of using marble for the gisants of French royalty continued throughout the fourteenth century with memorials for members of the Valois dynasty.

To the tomb's commissioners, the qualities of translucence and whiteness, similar to the appearance of marble, may have suggested alabaster as a means of enshrining Edward's body. The king lies recumbent, with his head resting on double pillows

⁴⁰ The major sources on the Saint-Denis royal tombs include Claire Richter Sherman, *The Portraits of Charles V of France (1338-1380)*, (New York: New York University Press for the College Art Association, 1969); Georgia Sommers Wright, "A Royal Tomb Program in the Reign of St. Louis," *Art Bulletin* 56/2 (June 1974), 224-243; Alain Erlande-Brandenburg, *Le roi est mort: étude sur les funérailles les sépultures et les tombeaux des rois de France jusqu'à la fin du XIIIe siècle* (Geneva: Droz, 1975); and Stephen Perkinson, *The Likeness of the King, A Prehistory of Portraiture in Late Medieval France* (Chicago: The University of Chicago Press, 2009).

⁴¹ Wright, 224, 238.

⁴² Perkinson, 102-103.

supported by angels, his feet on a semi-reclined lion, his bent left arm supporting an orb surmounted by a cross, and his straight right arm and hand holding a scepter, now gone. He wears a tunic with tubular folds, a dalmatic, and a long mantle. On his head is a floriated crown, now missing its jewels. His alabaster body gleams under light, and although the figure once displayed polychrome in the crown and other areas, the flesh of the face and hands remained unpainted, so that the luminous, polished yet waxy qualities of the alabaster were and are fully visible. Like marble, alabaster mimicked glowing flesh and imparted an aura of transcendence to the figure.⁴³ Indeed, alabaster's slight waxiness might convey flesh more effectively than a smoothly polished marble surface. Not surprisingly, its use changed artistic practice from covering tomb figures in polychromy and other surface treatments to leaving the exposed "flesh" of faces and hands uncolored.⁴⁴ In the case of Edward II's effigy, alabaster's luminosity produced a suggestion of sanctity which served to gloss over the unsavory events of deposition and possible murder that led to the monument's creation. Such a choice may have been prompted by the fact that Edward's burial site became a pilgrimage goal even before the installation of this elaborate monument, as attested by the *Historia et Cartularium Monasterii Sancti Petri Gloucestriae*, which indicates that their donations helped to finance completion of the building's south transept, the St. Andrew's Aisle.⁴⁵ The luminescence of his effigy once the monument was completed would surely have reinforced any saintly suggestions. Its use for this royal tomb was almost certainly also

⁴³ Perkinson, 96.

⁴⁴ Sally Badham, *Medieval Church and Churchyard Monuments* (Oxford and New York: Shire Publications, Ltd.), 32-33.

⁴⁵ *Historia et Cartularium Monasterii Sancti Petri Gloucestriae*, ed. William Henry Hart, Vol.1 (London: Longman, Green, Longman, Roberts and Green, 1863), 46.

inspired by the French royal marble effigies. Indeed, in his entry for Edward II's tomb in the *Age of Chivalry* exhibition catalog, Christopher Wilson already suggested that the monument was likely commissioned to emulate the French series of memorials.⁴⁶

Wilson's contention is further supported by the fact that after the production of Edward's tomb, two renowned European sculptors, one of whom was associated with the Saint Denis monuments, were commissioned for Philippa of Hainault's tomb. This indicates a clear awareness of the French works on the part of her husband, and the tomb's probable commissioner, Edward III. Jean de Liège, who worked at Saint Denis, is documented as responsible for this tomb, and André Beauneveu might have produced its weepers. It follows that Edward III knew of Continental developments in prestigious tomb carving and of the top sculptors producing these monuments. His choice of artists for his wife's monument indicates his desire to compete with his royal French counterparts.⁴⁷

Recognition of alabaster's capacity for enhancing the spiritual aura of a royal figure seems to have led to the commission of a series of English royal effigies in this material following upon the Gloucester monument. Around 1336, several years after the making of his father's tomb, Edward III likely carried on the material tradition of that work by ordering an alabaster effigy for the tomb of his brother John of Eltham and, several decades later, his wife.⁴⁸ Numerous other members of Edward III's family also

⁴⁶ Christopher Wilson, "Gloucester Cathedral, tomb of Edward II, north side," in London, Royal Academy of Art, *Age of Chivalry: Art in Plantagenet England 1200-1400*, eds. Jonathan Alexander and Paul Binski (London: Royal Academy of Arts, 1987), 416-417.

⁴⁷ This attribution was first made by George Gilbert Scott, *Gleanings from Westminster Abbey* (London: J. Henry and J. Parker, 1863), 63-64. See also H. M. Colvin, *A History of the King's Works*, Vol. 1, *The Middle Ages* (London: Her Majesty's Stationary Office, 1963), 486-487; and Sally Badham, "What Constituted a 'Workshop' and How Did Workshops Operate? Some Problems and Questions," in eds. Sally Badham and Sophie Oosterwijk, *Monumental Industry: The Production of Tomb Monuments in England and Wales in the Long Fourteenth Century* (Donington: Shaun Tyas, 2010), 15.

⁴⁸ Perkinson, 91.

had alabaster effigies. The list includes William of Hatfield (d. 1337) in Westminster Abbey, Isabella de Valois's (d. 1348) now-lost sculpture in the Franciscan Church at Newgate; John of Gaunt and his first wife, Blanche of Lancaster (d. 1368) in Old St. Paul's, London (now destroyed). The use of alabaster for these effigies may have been promoted or reinforced by John of Gaunt, who stood to benefit from the mining of the Tutbury and Fauld seams in his demesne.⁴⁹ Clearly, by the later fourteenth century, this creamy, luminous material had some royal cachet, although later royal effigies would employ gilt bronze instead.

The use of marble for the French royal tombs figures and alabaster for the English examples is likely no coincidence. In each instance the material itself must have had some royal associations. As Paul Binski has noted, the medium and material of a work could function metaphorically, especially in the case of tomb effigies.⁵⁰ In the Saint-Denis monuments, marble, a stone associated with the enormous prestige of the ancient world, was used to confirm and celebrate the legitimacy and long history of the Capetian dynasty; in England, alabaster, with its similar qualities of whiteness and luminosity, was employed to similar ends. It may have worked to confirm the legitimacy of the Plantagenets in the aftermath of a royal disaster.

The question remains, if alabaster signified royal status to Edward III's family and descendants, what did it mean to the aristocratic patrons choosing this stone for their memorials in the late-fourteenth and early fifteenth centuries? Surviving documentary

⁴⁹ Cannan, 25.

⁵⁰ Paul Binski, *Medieval Death: Ritual and Representation* (London: British Museum Press, 1996), 95-96.



Figure 2 Tomb of Thomas Beauchamp and Katherine Mortimer, Warwick Collegiate Church. Photo: author.

evidence in the form of contracts suggests that after the series of royal tombs discussed above, an increasing number of non-

royal, yet elite commissioners turned to alabaster for their effigies, suggesting that the material had come to resonate with the interests and values of this strata of medieval English society.

Typical of aristocratic alabaster effigies is the tomb of Thomas Beauchamp, Eleventh Earl of Warwick, and his wife Katherine Mortimer, dated shortly after 1369 and located in Warwick Collegiate Church. The high-status, military alabaster effigy type was established by the tomb of Hugh Despenser III and his wife, Elizabeth Montacute, in Tewkesbury Abbey. His is one of a group of alabaster effigies commemorating veterans of the Battle of Crecy that also includes the tombs of Thomas, Lord Berkeley, d. 1364, at Berkeley, Gloucester; John de Harteshull, Baron Hatch of Hartshill and Ashton (probably early 1360s), Ashton, Northhamptonshire; and Ralph, Lord Nevill, d. 1367, Durham Cathedral.

The Beauchamp monument is an excellent example of the quality such aristocratic alabaster effigies could attain (**Figure 2**). The carefully rendered costume details on both figures speak to a time-consuming and careful sculptural process. Note,

Figure 3 Tomb of Sir Hugh de Calveley, St. Boniface's Church, Bunbury. Photo: author.



for example, the frilled veil
in a sharply delineated
pattern of the nebulée
headdress, which graces
Katherine's head and

floriated crosses on Thomas's heraldic coat armor, and his hip belt with rondels and a central lozenge.⁵¹ Both the effigy and tomb chest of Sir Hugh de Calveley in Bunbury, c. 1394, are of alabaster and both evidence finely detailed carving (**Figure 3**). While the figure has suffered damage and erosion over the many centuries since its production, the facial features are still intact, save for the broken nose, and the decorative details on the armor are still clearly readable. For example, one can easily make out the flat band on the bascinet with its alternating lozenges and rectangles and five-leafed flowers, as well as the wide belt encircling the hips. The carving on the tomb chest is also very fine with its now empty traceried niches that once held mourners. The figure and chest also retain a great deal of the original color. Enough of this remained in the nineteenth century for Charles Stothard to reconstruct some of the effigy's color in his *Monumental Effigies of Great Britain* (**Figure 4**).⁵² The double tomb of John, Fourth Baron Harington and his

⁵¹ Lawrence Stone, *Sculpture in Britain: The Middle Ages* (Harmondsworth, Middlesex: Penguin Books, 1955, 2d ed. 1972), 182. Stone is rather dismissive of this tomb's quality and refers to the facial features of both figures as summarily handled, an opinion with which I disagree.

⁵² See Claude Blair, "The Effigy and Tomb of Sir Hugh Calveley" from the collection *The Bunbury Papers*, series editor Maurice H. Ridgway, early 1950s (http://www.bunbury.org.uk/papers/Bun_papers.html).

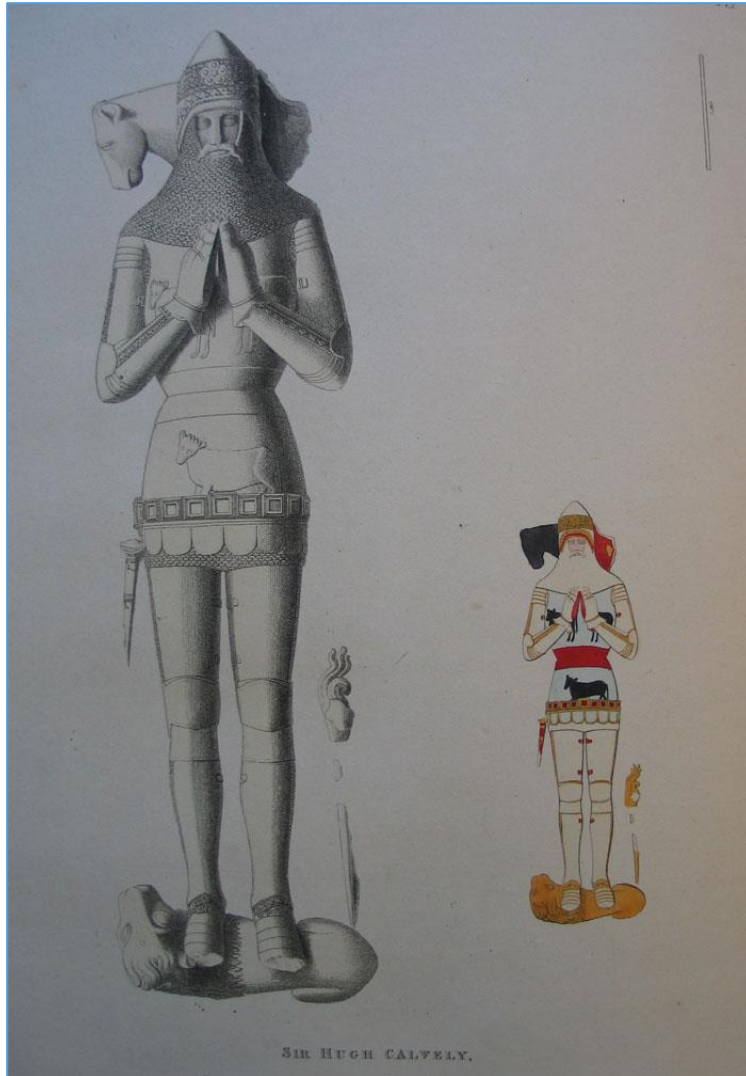


Figure 4 Charles Stothard, Sir Hugh de Calveley, *Monumental Effigies of Great Britain*, facing page 75. Photo: author's copy.

wife, Lady Elizabeth Courtenay, in St. Dubricius Church at Porlock, c. 1418, displays the same high quality as the previous two monuments (**Figure 5**). As with the earlier examples, the sculptor of the Porlock figures has produced carefully and fully rendered details of costume, including the male figure's vambraces,

lames, and elbow and knee cops, and the female figure's cauls held by jeweled nets and coronet.

These monuments, like all tombs, are among the most significant and charged vehicles for the cultural construction and performance of identity. The means by which we mark our burial places engages our highest hopes and deepest fears, especially our fear of death. This was as true in the Middle Ages as it is now. Medieval Christians feared dying primarily because of uncertainty about their fate afterwards. An individual faced a two-stage fate: the first was immediate judgment and consignment to Purgatory in



Figure 5 Tomb of John, Fourth Baron Harington, and Lady Elizabeth Courtenay, St. Dubricius Church, Porlock. Photo: author.

order to work off sins through punishments; the second was the collective judgment to come at the end of time with Christ's Second Coming. Christ's Resurrection held the promise that all the faithful would enjoy eternal life, but there was still the need to atone for various sins in

Purgatory. The belief that one could shorten a stay there in part fueled the making of tombs since medieval Christians believed that prayers offered on behalf of the deceased individual buried there could help lessen her or his time atoning. Consequently, many tombs must have once displayed solicitations for these prayers and the promise of indulgences for the performance of this good work, although most of these statements have not survived, especially if they were painted on the monument. But in order to be most effective, these prayers needed to focus on specific individuals, hence inscriptions identifying the deceased, and effigies representing his or her physical embodiment. Yet, as has been long recognized, the "individual" memorialized in the monuments of

medieval Europe was not the same as in our contemporary understanding. Rather than the particulars of appearance and distinguishing events of personal biography that we use to construct a given individual identity, medieval Europeans looked more to social status, rank and lineage. Contemporary grave markers, when they display figural representations of the deceased, strive to capture that person's actual appearance, the physiological idiosyncrasies that make up his or her face. As noted by many scholars, medieval effigies generally feature little attempt at an individualized portrait. As Stephen Perkinson has recently stated in connection with the Louvre "portrait" of Jean le Bon, traditionally considered the first truly accurate painted likeness of an individual since antiquity, "it is dangerous to assume that present-day conceptions of physiognomic likeness were shared by artists and audiences from different periods and cultures."⁵³ In the case of the alabaster effigies which are the focus of this study, there is not much attempt to present an individualized portrayal; instead, what is represented is a generalized presentation in which identity resides in markers of gender, status and lineage: costume and attributes, heraldic insignia, and, in the case of alabaster effigies, the material from which the figure is carved. English rulers at this period clearly considered this material to be an effective, and practical, means to convey royal status and spiritual elevation. The first nobles to commission alabaster effigies were likely motivated by a similar desire to claim a high rank in both the temporal and spiritual realms, and they drew upon the now-established royal prestige to do so. Using alabaster allowed for an association with the royal commissions, enhancing earthly status and power; it also lent to aristocratic figures the

⁵³ Perkinson, 8.

same aura of transcendence so notable in Edward II's effigy, and in the other royal figures that followed.

It is important to note that there is a distinct difference in quality between alabaster effigies and the numerous panels featuring devotional themes, which form the other major category of alabaster production in England. Effigies tend towards finely detailed carving and customized treatment while panels display a high degree of standardization in iconography and composition. Tomb effigies seem to have been produced by and large for high-ranking elite, while the market for altar panels could range from those of elevated status to those occupying the artisan ranks of late medieval England.⁵⁴ Surviving tomb contracts indicate that high-status patrons specified in great detail exactly what the tomb should show.⁵⁵ Alabaster is soft and therefore easily worked. Furthermore, its creamy translucence allowed the face and hands of figures to remain unpainted yet still present the appearance of luminous flesh. When coupled with the prestige it acquired from royal use, alabaster's appeal to elite patrons must have been very strong.

Readily available, relatively inexpensive, and comparatively easy to work, alabaster offered English patrons an excellent alternative to the marble being used in France. The whiteness and relative translucence of the finest quality alabaster, that found near the ground's surface, provided such royal patrons as John of Gaunt with something comparable to the creamy marble used for the French royal monuments. In addition, pure white alabaster could present the appearance of unblemished purity, rendering it almost

⁵⁴ Ramsay, 36-37; Cannan, 29.

⁵⁵ See Badham and Oosterwijk, *Monumental Industry*, "'Cest Endenture Fait Parentre,' English Tomb Contracts of the Long Fourteenth Century," 187-236.

spiritual in its aura. This would have been highly desirable in a tomb monument intended to showcase the deceased in the best possible state to elicit prayers and to enter the afterlife. Alabaster is also more akin to the appearance of flesh than is freestone, a common effigy material, and could be thought of as more like the perfected glorified Resurrection body desired for one's tomb.

Alabaster and “Englishness”

Thus far this essay has explored the links between the physical characteristics of alabaster, its mining in later medieval England, its use for royal effigies and, ultimately, as a material of choice for aristocratic figures. One last encouragement to the growing preference for alabaster tomb figures may be found in the social and political circumstances at the time. The same period that witnessed the early exploitation of alabaster for high-status tombs also marked the initial phase of the Hundred Years War, from its beginning in 1337 to around 1428, with the English defeat at the Battle of Orleans.

1337 marks the point at which sporadic, yet persistent, belligerency governed the relations between the English and French monarchies. For over twenty years, historians and literary scholars have been suggesting that the Hundred Years War produced a growing sense of singular cultural identity in both adversaries. In the 1970s, V. G. Scattergood, for example, asserted that increased contact with other peoples in the period up to and during the war gave the English an intensified sense of their own identity such that by the fifteenth century phrases like “our Englysshe marchauntes,” “oure Englande,”

and “oure Englysshe men” were appearing with greater and greater frequency in poetry.⁵⁶ Similarly, Kenneth Fowler has noted that this consciousness is apparent in literary production such as the poetry of Lawrence Minot, written between 1333 and 1352.⁵⁷ More recently, Anne Curry has pointed to fourteenth-century chronicles, such as the Brut and the Chronicles of London, and fifteenth century works as displaying both a sense of Englishness and an anti-French attitude.⁵⁸ In addition, John Bowers has offered a postcolonial reading of *The Canterbury Tales* in which Geoffrey Chaucer’s text promotes an Englishness which resists aristocratic England’s francophone heritage in three ways: by employing English, by eliminating any hint of the Norman Conquest in its historical narratives, and by denying any acknowledgment of English regionalism in favor of a homogeneous national cultural discourse.⁵⁹ Finally, Keen speculates that a cultural rivalry may have in part prompted Trevisa’s translation of *De Proprietatibus Rerum*, since it had already been translated into French for the French king Charles V by his chaplain, Jean Corbechon in 1372.⁶⁰

⁵⁶ V. J. Scattergood, *Politics and Poetry in the Fifteenth Century* (New York: Blandford Press, Ltd., 1971), 41-42.

⁵⁷ Kenneth Fowler, "Introduction," in *The Hundred Years War*, ed. Kenneth Fowler (London: Macmillan Press, Ltd., 1971), 20-21.

⁵⁸ Anne Curry, *The Hundred Years War* (London: Macmillan Press, 1993), 7-8.

⁵⁹ John Bowers, "Chaucer After Smithfield: From Postcolonial Writer to Imperialist Author," in *The Postcolonial Middle Ages* (New York: Palgrave Macmillan, 2001), 51-63. Against these theories is the recent book by Ardis Butterfield, which reminds us of the entangled relationship between England and France, with the result that in the author's view the Hundred Years War was not "a war of nation-states where the boundaries of aggression are clearly marked, but a feudal and familial one where the two sides are tightly bound by lengthy and intimate identifications, through marriage and territorial possession." The author's analysis of various literary works, including Chaucer, leads her to assert that they betray no concept of nation, in the modern sense. Instead, what emerges is the simultaneous existence of two vernaculars, French and English, in fourteenth and fifteenth century England. See Ardis Butterfield, *The Familiar Enemy: Chaucer, Language, and Nation in The Hundred Years War* (Oxford: Oxford University Press, 2009), xx.

⁶⁰ Keen, 91.

All of these authors present good arguments, whose conclusions can be confirmed by moving beyond written texts. An examination of visual culture, in addition to written texts, may provide additional insight into English self-consciousness in the second half of the fourteenth century. In fact, a sense of English distinctiveness already characterizes their visual production even before the Hundred Years War. One example is the English response to Gothic architecture as it developed in France. According to Christopher Wilson, English designers mostly absorbed those features of French Gothic which could be adapted to the native taste for elaborate ornamentation, but never really abandoned the thick wall construction and desire for horizontal continuity that had long characterized English buildings.⁶¹ Westminster Abbey, arguably the most "French" of English Gothic buildings, stands as an exception, mainly due to its political significance, since with this structure Henry III sought to rival the French coronation church of Reims with his own construction.⁶² But, as Wilson notes, the English church is not a purely French Gothic structure, but a hybrid which combines English features with selected, and by then dated, French elements compatible with English taste.⁶³ Even the Perpendicular style in its earliest full expression in the south transept of Gloucester Cathedral, does not so much

⁶¹ Christopher Wilson, "The English Response to French Gothic Architecture, c. 1200-1350," in *Age of Chivalry*, 74-82 and Draper, 236.

⁶² There has been some scholarly controversy over the French sources for Westminster Abbey with Robert Branner arguing that The Sainte-Chapelle was the model, due to Henry III's relationship with Louis IX, and Paul Binski reinstating Reims Cathedral as the most important inspiration. See Robert Branner, "Westminster Abbey and the French Court Style," *Journal of the Society of Architectural Historians* 23/1 (March, 1964): 3-18; Christopher Wilson, Pamela Tudor-Craig, J. Physick, and Richard Gem, *Westminster Abbey New Bell's Cathedral Guides* (London: Bell and Hyman, 1986); Paul Binski, *Westminster Abbey and the Plantagenets: Kingship and the Representation of Power 1200-1400* (New Haven: Yale University Press, 1995), 43-44. Sally Badham and Sophie Oosterwijk have also noted the influence of Louis IX's Sainte Chapelle on the design of Westminster Abbey and argued that the design of Henry's coronation church was in part the result of his competitiveness with his French royal cousin. See Badham and Oosterwijk, "The Monument of Katherine (1253-7) Daughter of Henry III and Eleanor of Provence (1253-7)," *The Antiquaries Journal* 92(2012), 186.

⁶³ Wilson, "English Response," 77-78.



Figure 6 Effigy of Jean d'Alluye, The Metropolitan Museum of Art. Photo: ©The Metropolitan Museum of Art/Art Resource.

absorb French Rayonnant as transforms it into a distinctive English idiom of applied rectilinear tracery.⁶⁴ In short, English designers avoided taking over French Gothic as a system, such as occurred in the German churches of Marburg and Trier, as noted by Wilson

Peter Draper has also noted an attitude favoring English distinctiveness manifested in architecture as well as other areas in the thirteenth century. He has contextualized the English allegiance to indigenous traditions by seeing Early English architecture as part of a larger picture. This context included a resurgence of interest in

⁶⁴ Wilson, "English Response," 82.

long-standing cults of Anglo-Saxon saints such as St. Frideswide, St. Etheldreda, St. Ethelbert, and St. Oswin, possibly sparked by the success of the cult of St. Thomas of Canterbury.⁶⁵

Perhaps more pertinent to the subject of this essay is the English approach to the military effigy.⁶⁶ Life-size, three-dimensional military memorials probably originated in France and were subsequently produced all over western Europe in the Middle Ages. In general, these figures followed a standard pattern of recumbent armored figure with hands folded in prayer and straight parallel legs, such as seen in the effigy of Jean d'Alluye, c. 1260, and now in the Cloisters Museum (**Figure 6**). Other effigies, such as those produced in German regions may sometimes display more active hand gestures such as holding up buildings or grasping a sword hilt, but all feature straight, parallel legs. English sculptors dramatically departed from this pattern by giving their armored effigies crossed legs. In addition, many of the figures from the second half of the thirteenth century, and into the fourteenth, feature dynamic sword handling, not just grasping the hilt but actually reaching across the body to pull the sword out of its scabbard (**Figure 7**). The English type of armored figure has no parallel or equal for vigorous movement on the Continent.⁶⁷ Clearly, builders and patrons in medieval

⁶⁵ Draper, 240.

⁶⁶ The major recent monographic sources on English military effigies include Judith Hurtig, *The Armored Gisant Before 1400* (New York: Garland Press, 1979); Harry A. Tummers, *Early Secular Effigies in England* (Leiden: E. J. Brill, 1980); A. Morgenstern, *Gothic Tombs of Kinship*; and Rachel Dressler, *Of Armor and Men in Medieval England: The Chivalric Rhetoric of Three English Knights' Effigies* (Aldershot: Ashgate Publishing Company, 2004).

⁶⁷ Rachel Dressler, "Steel Corpse: Imaging the Knight in Death," in *Conflicted Identities and Multiple Masculinities: Men in the Medieval West*, ed. Jacqueline Murray (New York and London: Garland Publishing, Inc., 1999), 144-145; eadem, *Of Armor and Men*, ch. 4 "The Knight's Social Body," 78-97.



Figure 7 Effigy of a Knight, Dorchester Abbey Church. Photo: author.

England were interested in producing both architecture and figural art with a distinctive English approach.

Mappa mundi also suggest a consciousness of English singularity, this time in relation to its geography and natural resources, including alabaster. Kathy Lavezzo has noted that Britain's, hence England's, marginal location on certain examples of this genre contributed to a sense of cultural distinction.⁶⁸ By privileging their marginality, "on the edge of the world," according to the author, medieval writers resisted a religious universalism that threatened to de-value their island home.⁶⁹ In her discussion of the two-page map, the *Ramsey Abbey Map*, associated with the text of Ranulf Higden's mid-fourteenth-century *Polychronicon*, and presumably commissioned by the monks of that

⁶⁸ Kathy Lavezzo, *Angels on the Edge of the World: Geography, Literature, and English Community, 1000-1534* (Ithaca: Cornell University Press, 2006).

⁶⁹ Lavezzo, 10.

foundation, Lavezzo points to England's (*Anglia*) large size in comparison to the rest of the world and to its distinctive red color as ways that the map focuses on England as a sovereign entity.⁷⁰ She argues that the text of the *Polychronicon* used England's geography to imagine a unified culture at a time of great political upheaval and divisiveness. Thus, in his second preface, Higden argues for a geographic cohesiveness that counteracts England's history of successive waves of conquest by Romans, Anglo-Saxons, Danes, and Normans. Throughout its history, England maintains a spatial continuity and manifests as a land of bountiful natural resources: plants, animals, and minerals.⁷¹

Asa Mittman also notes the anxiety of English medieval writers over their remoteness from the sacred centers of Jerusalem and Rome. This might explain the relatively high number of surviving medieval maps of English production whose purpose could have been to relieve this cultural concern.⁷² Thus, for Mittman, these maps served as vehicles by which the inhabitants of the island explored their own place within divine creation. His analysis of England's consistent location on the edge suggests a more ambivalent attitude embedded in this mapping of place: the edge occupied by England is both the zone of Paradise, Eden, and of monsters.⁷³

In contrast, the *Wilton Diptych* offers a quite different perspective on the relationship between England and divinity. Nigel Morgan has suggested that the painting declares Christ and the Virgin's special attachment to the island and its king.⁷⁴ While the

⁷⁰ Lavezzo, 71.

⁷¹ Lavezzo, 84-85.

⁷² Asa Simon Mittman, *Maps and Monsters in Medieval England* (New York: Routledge, 2006), 10.

⁷³ Mittman, 48 and 59.

⁷⁴ Nigel Morgan, "The Signification of the Banner in the Wilton Diptych," in Dillian Gordon, Lisa Monnas, and Caroline Elam, eds., *The Regal Image of Richard II and the Wilton Diptych* (London: Harvey Miller Publishers, 1997), 179-188.

presence of two royal saints, Edmund and Edward the Confessor, reinforces this reading, it is really the banner, displaying the Cross of St. George, on which Morgan rests his conclusions. As the author notes, the banner functioned as the standard of the nation. The pennant is topped by an orb containing a miniscule depiction of an island with a small double-turreted castle, surrounded by a silver sea supporting a masted boat. This ship serves as a symbol for England and is represented as the dowry of the Virgin.⁷⁵ The painting shows the infant Christ in the act of blessing this banner, underscoring his and his Mother's support of the nation and its ruler.

While they differ somewhat in their conclusions concerning the function of *mappa mundi* for English medievals, Lavezzo and Mittman share a recognition that in these works England's sense of singularity is made visible. Moreover, it is the geographic territory that performs this cultural work. The land itself provides the continuity of identity that the history of England, with its successive invasions and migrations, does not. In Lavezzo's reading especially, the land emphasized by location, size, and color did not simply represent a stable place in the world for a culture in continual flux, but was also perceived as enabling a bountiful existence through its resources.

By the second half of the fourteenth century, one of those resources was alabaster, pulled out of the very land that reinforced England's sense of itself. Indeed, the naming of the material as alabaster, in addition to its ancient and biblical status, may have also been motivated by such a connection between the stone and land from which it comes. As far back as Pliny's *Natural History*, and also appearing in Bede's *Ecclesiastical History* and the Layamon *Brut*, Britain was referred to as Albion, a term derived from the Latin

⁷⁵ Morgan, 185. For the orb see Dillian Gordon, "Introduction," in Gordon *et al*, *The Regal Image of Richard II*, 22-23.

albus, meaning white.⁷⁶ John Trevisa's translation of Higden's *Polychronicon* also employs the term and specifically associates it with whiteness, "First this land was called Albion from its white rocks."⁷⁷ It would not have been much of a stretch to associate the whiteness characteristic of English "rocks" to alabaster, whose whiteness would suggest it as the quintessential English stone, found in abundance in English soil.

Thus, alabaster's prestige value persisted in and may have motivated later aristocratic commissions, but it may have also gained an additional connotation of Englishness due to its identification with the abundant resources of the island. Woods suggests that alabaster also had cultural significance for Edward III and his close associates, as demonstrated by the number of royal monuments employing it after its use in Edward II's tomb.⁷⁸ Obviously, once this formerly undervalued stone was chosen to grace the memorials of kings and queens, it must have acquired enough cachet to appeal to other English elite, but they may have also responded to the same cultural prompt as their rulers.

The close geological association between alabaster and English soil may have added extra resonance to its use in Edward II's and other royal effigies, as well as to the aristocratic figures that followed. Emulation of the Saint Denis royal monuments may have been one of the original motivations for turning to alabaster, however, with the

⁷⁶ The discussion of the Albion's etymology and meaning is taken from the *Oxford English Dictionary (OED)*, the entry for Albion.

⁷⁷ *Firste this ilond higte Albion, as it were the white lond, of white rokkes aboute the clyues of the see that were i-seie wide. Polychronicon Ranulphi Higden Monachi Cestrensis; Together with the English Translations of John Trevisa and of an Unknown Writer of the 15th Century*, ed. Churchill Babington, series, *The Chronicles and Memorials of Great Britain and Ireland During the Middle Ages*, Vol. II (London: Longmans, Green, and Co., 1869), 5. My gratitude to Jennifer Brown for the translation.

⁷⁸ Woods, "The Fortunes of Art," 93.

outbreak of the Hundred Years War, competition may have also figured in the decision to choose a “native” stone. What better way to rival their adversaries, and reinforce their own identities, than for English royals and aristocrats to use an English natural resource for their memorials?

In fact, alabaster may not have just reinforced Englishness, it could also have been instrumental in constructing such an identity because of the material's abundance relative to supplies on the Continent.⁷⁹ As has been well-noted, hundreds of English-made alabaster carvings survive from all over Continental Europe, testifying to the success of the island's alabaster trade in the late Middle Ages.⁸⁰ The raw material was also exported.⁸¹ Since no other area of Europe could produce the quantity or quality of English alabaster, the material would have been closely identified with the island realm. Alabaster resonated with England at home and abroad.

John IV, Duke of Brittany's, tomb presents an interesting variation on this possible link between alabaster and Englishness, for, although he was not English, he had very close ties to the English king Edward III. He lived in exile in England with his mother, Joan de Flandres, and his sister, also Joan, in the early part of the Breton Civil War over rightful succession to the duchy of Brittany in the mid-fourteenth century.⁸² In 1345, he was committed to Edward's care by his father, who had recently escaped from France. He was also briefly married to Edward's daughter, Mary.⁸³ He was dependent on Edward for an income until John's return to Brittany in 1362, at which point he agreed to

⁷⁹ Ramsay, 29.

⁸⁰ Ramsay, 38.

⁸¹ Cannan, 25.

⁸² Michael Jones, *Ducal Brittany 1364-1399: Relations with England and France during the Reign of Duke John IV* (Oxford: Oxford University Press, 1970, p. 16.

⁸³ Jones, 17.

a number of conditions which maintained his bond with the English ruler.⁸⁴ It is possible that the use of English alabaster for his tomb was another sign of his English connection. On the other hand, his commissioning an effigy of English alabaster may also represent a continental recognition of and admiration for this flourishing English practice.

Conclusion

In conclusion, then, alabaster, a previously undervalued material, may have become so popular for elite memorials starting in the later fourteenth century because it served several needs so adroitly: it was convenient to obtain, easy to work, and similar to marble in its ability to represent pure unblemished flesh. In addition, for English royals, intent on recovering credibility and prestige for the Crown after the disasters associated with Edward II, alabaster's white luminous surface offered not just the aura of sanctity, but also of antiquity suggesting a permanence that transcended the misfortunes and vagaries of any particular reign. It is the same reason that marble appealed to French royals. Finally, alabaster offered English aristocrats a means of outdoing their French counterparts and emphasizing their Englishness at a time of conflict, while also claiming a spiritual superiority. For all these reasons, alabaster was the perfect answer. 🐼

⁸⁴ Jones, 18



*Ampullae, re-imbursed: a formal analysis of medieval “shell-shaped” lead-alloy pilgrim ampullae*¹

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Introduction

Abandoning one’s daily life to go on pilgrimage to a shrine of a saint was an act of religious devotion performed by a substantial number of medieval Christians, from all walks of life; contemporary physical remains relating to pilgrimage reveal much about medieval society and the role of pilgrimage in it.² Especially informative are those pilgrim souvenirs cast in lead or its alloys, since they were mass-produced in vast numbers and a wide range of forms, to satisfy all tastes and pockets.³ One of the most common souvenirs were

¹ The author gratefully acknowledges the aid of the people who helped bring a rather odd initial notion to fruition. Images and permission to publish them without charge were provided by: Michiel Bil (the Netherlands); Stephen N. Fliegel and Elizabeth Saluk (Cleveland Museum of Art); Willemijn Gertsen (Medieval Badges Foundation, Langbroek); the Kings, Heralds and Pursuivants of Arms, London; Amy Taylor (Ashmolean Museum); and Sarah Williams (Museum of London). Willy Peron helped with the Kunera database and provided copies of its images. Professor Michael J. Fuller (St. Louis Community College) provided information on the Tell Tuneinir pilgrim flask, and permitted its image to be published. Yael Gorin-Rosen (Israel Antiquities Authority) discussed glass in medieval-era Palestine. Dennis Trout (University of Missouri at Columbia) and Laura Veneskey (Wake Forest University) helped with the Monza glass ampullae. Mark Taylor (Roman Glassmakers, Hampshire) reproduced ampullae in glass. Meriel Jeater (Museum of London) helped with medieval ampullae, purses and purse badges, and their images. Cynthia Hahn (Hunter College, CUNY) also helped with purses. Poul Grønder-Hansen (Nationalmuseet, København) provided the information for the Slotsholmen St. James scallop-badge. Sarah Blick (Kenyon College) helped with Mont Saint Michel badges, and said this research was worth reporting. The patient assistance of Lynsey Darby (Archivist at the College of Arms) was instrumental in interpreting armorial rolls and their escallop charges. Comments from two reviewers greatly improved the text.

² Blick and Tekippe (2005).

³ Blick (2007); Spencer (1998).

ampullae, small vessels containing oil or water sanctified at a pilgrimage shrine.⁴ Large numbers of ampullae have been recovered across Europe. In April 2014 the Kunera database⁵ recorded over 1150 examples. In England and Wales, the Portable Antiquities Scheme (PAS) has documented over 1000 ampullae since its establishment in 1997.⁶

Many of these ampullae are said to be "shell-shaped,"⁷ assuming the shape and treatment referred in the medieval mind to the scallop, the symbol initially of one of the three greatest medieval pilgrimages, to Santiago de Compostela, and eventually of pilgrimage generally.⁸ However, the "shell-shaped" ampullae exhibit a wide range of styles and features, there are several types of scallop, and scallops are not the only type of shell with potential for use as a Christian image or as a reference to a specific shrine (these potential shells are discussed below). While surface-recovered portable antiquities suffer from an inability to be dated precisely, they are well-suited to spatial and statistical analysis.⁹ This paper presents an investigation of features on medieval "shell-shaped" lead-alloy ampullae based on those recorded by the PAS, with the initial aim of further understanding of the images of shells in common use in the medieval Christian West.

Medieval ampullae and potential shell imagery

Medieval lead-alloy ampullae do not have a shape of their own: all imitate some contemporary container. Some imitate costrels, some reliquaries or *chasses*,¹⁰ but most are

⁴ Spencer (1998), 38-39.

⁵ the online catalogue of European medieval badges and ampullae held by Radboud University, Nijmegen: <www.kunera.nl>.

⁶ the online catalogue of artifacts found by the public, principally by metal-detectorists, held by the British Museum: <www.finds.org.uk>; for its origins and development, see Bland (2005).

⁷ e.g.: Spencer (1998), 244-246.

⁸ Köster (1985).

⁹ Hinton (2005), 2-3.

¹⁰ Spencer (1998), 38-39.

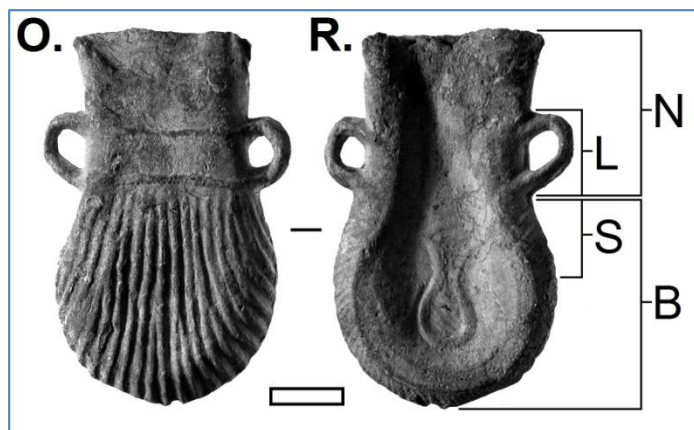


Figure 1 Example of a ‘flask-shaped’ medieval lead-alloy ampulla with obverse ribbing. PAS No. SF-A37D38; Fressingfield, Suffolk. (O.): obverse; (R.): reverse; (L): lug-handle; (S): shoulder; (N): neck; (B): body. Scale bar: 10mm. Amended from PAS (<finds.org.uk>) / CC-BY-SA 2.0.

"flask-shaped,"¹¹ imitating early earthenware flask ampullae (*eulogiai*) from eastern Mediterranean shrines, especially St. Menas' in Egypt, since these were known throughout Christendom.¹² They have a hollow lentoid body with a distended obverse side, a flattened reverse side, and a pair of small lug-handles either side of the body's junction with the wide (typically flaring) neck.¹³

The reverse usually bears an emblematic image.¹⁴ Images are rare on the obverse, where ribs are common (**Figure 1**); these are thought to imitate the ribbing of the great scallop or St. James' shell.¹⁵ Initially an actual scallop-shell acted as a badge of a successful pilgrimage to the shrine of St. James the Great at Santiago de Compostela in northwest Spain, but the shape was replicated in other materials, reproduced in those materials at other shrines, and over time became a visual indicator of pilgrimage in general.¹⁶

This contrast between types of image on mass-produced, mass-marketed and widely-recognized religious objects raised the possibility that more than one type of shell was a familiar

¹¹ Anderson (2010), 184.

¹² Anderson (2004, 2007) outlines the use of these flasks as religious objects; Evely (2010) sketches their prehistoric origin and subsequent development.

¹³ Anderson (2010), 185; Spencer (1990), 58.

¹⁴ Spencer (1990), 58; Anderson (2010) has cataloged and interpreted the English imagery.

¹⁵ Spencer (1990), 41.

¹⁶ Köster (1985); Spencer (1998), 244-246.

image in medieval Christian iconography. **Table 1** lists the shells most probably portrayed: Mediterranean or sub-Arctic European Atlantic equilateral¹⁷ bivalve shells with ribbed sculpture that are fished commonly in Europe, or were at some time in history.¹⁸ The most visible differences between candidate genera are their "ears"¹⁹: differences between species in the same genus (the two *Pecten* scallops, the three *Acanthocardia* cockles, and the two *Cerastoderma* cockles) are subtle, and therefore unlikely to be portrayed on ampullae.

Table 1: Candidate shells: equilateral bivalves with radial sculpture regularly harvested in sub-Arctic Atlantic or Mediterranean Europe

common name	Species name	max size (mm)	No. Ribs	Auricles ('ears')	Distr.
Great Scallop, or St. James Shell	<i>Pecten maximus</i>	150	17	two equal	Atlantic
	<i>Pecten jacobaeus</i>	130	17-19	two equal	Medit.
Queen Scallop	<i>Aequipecten opercularis</i>	100	20	two uneq.	Atl. / Med.
Smooth Scallop	<i>Flexopecten glaber</i>	53	10-11	two uneq.	Med.
Variiegated Scallop	<i>Chlamys varia</i>	65	27-36	one, large	Atl. / Med.
Rough Cockle	<i>Acanthocardia tuberculata</i>	90	18-20	none	Atl. / Med.
Spiny Cockle	<i>Acanthocardia aculeata</i>	100	20-22	none	Atl. / Med.
Prickly Cockle	<i>Acanthocardia echinata</i>	75	18-23	none	Atl. / Med.
Common Cockle	<i>Cerastoderma edule</i>	50	22-28	none	Atlantic
Lagoon Cockle	<i>Cerastoderma glaucum</i>	50	22-28	none	Atl. / Med.

Information for scallops from Wagner (1991); for other shells, Hayward and Ryland (1995) and Tebble (1966).

¹⁷ Those with valves that are roughly symmetrical about the midline: Tebble (1966), 8.

¹⁸ Quero and Vayne (1992) list the modern shellfish; Voultziadou *et al.* (2010) list those with a history.

¹⁹ Anterior and posterior extensions of the hinge which zoologists refer to as "auricles."

Few kinds of shell are known to have meaning to medieval Christians. The image of the great scallop or St. James shell (*Pecten* scallops) and its association with St. James and with pilgrimage is well-studied, and its interment with remains of pilgrims documented archaeologically.²⁰ How and when this scallop became associated with St. James and Santiago is not clear; its association was well known, and its origins mythologized, by the early 12th century.²¹ The survival from Roman times of the Classical association of this shell with the goddess Venus seems just possible; scallops are common along the coast near Santiago, so the symbol may have developed from its easy collection on the shore or its distinctive use in the local cuisine.²² No other genus of scallop was interred in a medieval grave in western Europe, even in large pilgrim cemeteries:²³ in the medieval Christian mind, "scallop" meant the *Pecten* of Santiago fame. The variegated scallop (*Chlamys varia*),²⁴ a delicate little finely-ribbed scallop with a single large "ear" (**Figure 2d**), is often claimed to be a badge of pilgrimage to Mont Saint-Michel;²⁵ however, this appears apocryphal. Catalogs of Mont Saint-Michel pilgrim souvenirs²⁶ show no actual shells. The single possible example, the violet scallop from Slotsholmen in Copenhagen, is a *Pecten maximus*.²⁷ Most shell-shaped St. Michel badges portray St. James scallops, coarse-ribbed with two equal "ears" (**Figure 2a**); few bear enough ribs to portray *C. varia*. The 15th-century arms of the Abbey used the standard St. James "escallop" of medieval

²⁰ Köster (1985) outlines the association of the great scallop with St James; studies of the shells buried with pilgrims include Andersson (1989), Köster (1983), and especially Vallet (2008).

²¹ Hohler (1957), 56-59.

²² See Pullan (2013) for a review.

²³ The shell badges from cemeteries in Toulouse catalogued by Vallet (2008) remains the largest group.

²⁴ The renaming of this species to *Mimachlamys varia* on zoological grounds (Waller 1991, 31) is so recent that almost all literature uses this older Linnaean name.

²⁵ Locard (1888), 12-13; Cohen (1976); Köster (1985), 86; Vallet (2008), 244.

²⁶ e.g.: Lamy-Lassalle (1971); Bruna (1991).

²⁷ Nationalmuseet, Kobenhavn Catalogue No. D 6854 is catalogued as a potential Mt St Michel badge by Köster (1983), 133, No. M41f and Andersson (1989), 11, No. 85, but the museum photograph (Foto No. x 285-1) clearly shows a large, coarse-ribbed, two-eared great scallop.

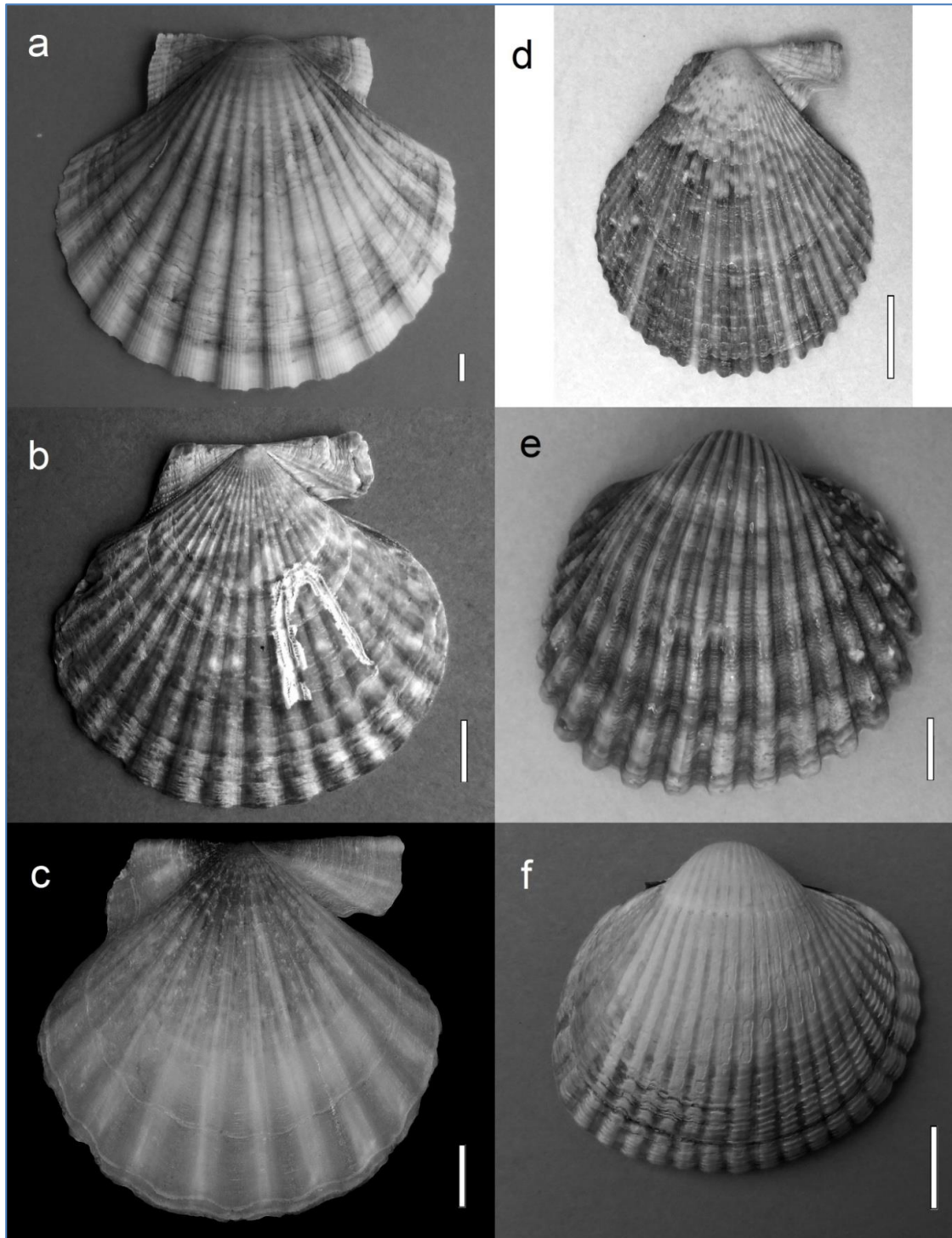


Figure 2 Examples of types of shell potentially portrayed on obverse-ribbed medieval lead-alloy ampullae. (a): St James shell (*Pecten maximus*); (b): queen scallop (*Aequipecten opercularis*); (c): smooth scallop (*Flexopecten glaber*); (d): variegated scallop (*Chlamys varia*); (e): example *Acanthocardia* (*A. tuberculata*); (f): example *Cerastoderma* (*C. edule*). Scale bars: 10mm. *F. glaber*: D. Descouens/Muséum de Toulouse / CC-BY-SA 3.0; others by author.

heraldry, and a 15th-century illumination in the Statutes of the Order of St. Michel portrays copious St. James scallops but no *C. varia*.²⁸ The association of *C. varia* with Mont Saint-Michel appears to be a misunderstanding emanating from a single late 19th century document.²⁹ A few pilgrims were interred with *Acanthocardia* cockles, and a very few with *Cerastoderma* cockles; some of the latter were also enclosed in openwork lead-alloy rattles which might have been votive.³⁰

"Escallop" charges on coats of arms

To understand what images were (and were not) representations of scallops on ampullae, it would be useful to have unambiguous representations of scallops in another medieval context. Unfortunately, the obvious source, lead-alloy badges, while numerous, share the same drawbacks to analysis as ampullae: almost all are un-stratified metal-detectorists' finds and therefore not closely dateable, and all are classified as "scallop-shaped" by modern researchers using the same criteria used for ampullae. Fortunately, contemporary representations of scallop-shells are preserved in medieval illuminated manuscripts as "escallops," heraldic charges on coats of arms in both rolls and ordinaries; these manuscripts can often be closely dated.³¹ Several medieval

²⁸ The abbey's arms are documented by Gout (1910), 215; the frontispiece to Jean Fouquet's *Statuts de l'Ordre de Saint-Michel* of 1470 (Bibliothèque nationale de France Manuscript 19819, fol.1 [<http://gallica.bnf.fr/ark:/12148/btv1b8427226q/f9.image>]) shows only great scallops. Medieval "escallop" heraldic charges are discussed by Bellew (1957), and further discussed below.

²⁹ All the recent assertions that *C. varia* acted as Mont St-Michel badges can be traced back to Germain *et al.* (1880), who illustrate (their fig. 21, p. 125) a *C. varia* with ribbing much reduced (a mere 19 ribs, instead of the typical 25-35 ribs of this shell: Tebble 1966, 59), beside a badge clearly portraying a St. James scallop with two equal "ears," but with its ribbing exaggerated (13 ribs are illustrated, but a later photograph of the same badge (No. 222 in Bruna 1996, 154) shows it in fact has nine ribs).

³⁰ The Worcester Pilgrim's is the most famous *Acanthocardia* badge, Lubin (1990), 15, but there are a few others (e.g.: Vallett 2008, 244). For an example *Cerastoderma* badge, see Köster (1983), 126; for *Cerastoderma* rattles, see Spencer (1998), No. 221.

³¹ Bellew (1957) discusses the "escallop" heraldic charge, and Wagner (1950) catalogues British rolls (illuminated manuscripts recording noblemen present at major events) and ordinaries (pictorial style guides for heralds and heraldic illuminators), providing the dates of their production used here.

rolls and ordinaries were made between the 12th and 14th centuries, when ampullae flourished as souvenirs.³² Therefore the surviving earlier medieval British rolls and ordinaries (those produced before 1400) had the number and nature of their escallops examined in detail (**Table 2**); three rolls from the 16th and 17th centuries were briefly assessed for comparison.

Table 2: escallop charges on British pre-AD 1400 manuscript crests

Date (A.D.)	manuscripts	No. of shields		No. of escallops				
		total	w/ escallops	total	w/ scalloped edge	w/ 'eyes'	w/ cords	w/ ribbing
1270 - 1280	Heralds', Dering, Camden	1291	9	36	9	~	~	3
1307 - 1327	Povey	82	1	3	3	3	~	3
c. 1340	Cooke's, Balliol	625	22	68	21	4	3	6
c. 1380	Jenyn's	1611	39	135	60	51	54	45

manuscript	full name
Heralds'	Heralds' Roll (College of Arms MS B29, pp. 20-27)
Dering	Dering Roll (Brit. Libr. Add Roll 77720)
Camden	Camden Roll (Brit. Libr. Cotton Ch XV, 8)
Povey	Povey's Roll (College of Arms MS B29, pp. 29-38)
Cooke	Cooke's Ordinary (Brit. Libr. Add Ch. 77242)
Balliol	Balliol Roll (Brit. Libr. Add Ch. 77242b)
Jenyn	William Jenyn's Ordinary (College of Arms RRG 73B)

³² Spencer (1998), 3; Anderson (2010), 198 dates the simpler lentoid types principally from the mid-15th to the mid-16th century on stylistic grounds.

Escallops were not early charges: none are recorded prior to the last quarter of the 13th century (**Table 2**), not even on the mid-13th century Matthew Paris's Shields.³³ Escallops were also never common charges,³⁴ appearing on only 2.5% of pre-1400 coats of arms (**Table 2**). Like other armorial charges, which favored recognizability over accuracy,³⁵ early escallops were highly stylized, with narrow elongated necks, reduced "ears," acute or recurved shoulders, a smooth lower edge and no features on the disk (**Figure 3a**), resembling a saddler's knife or an

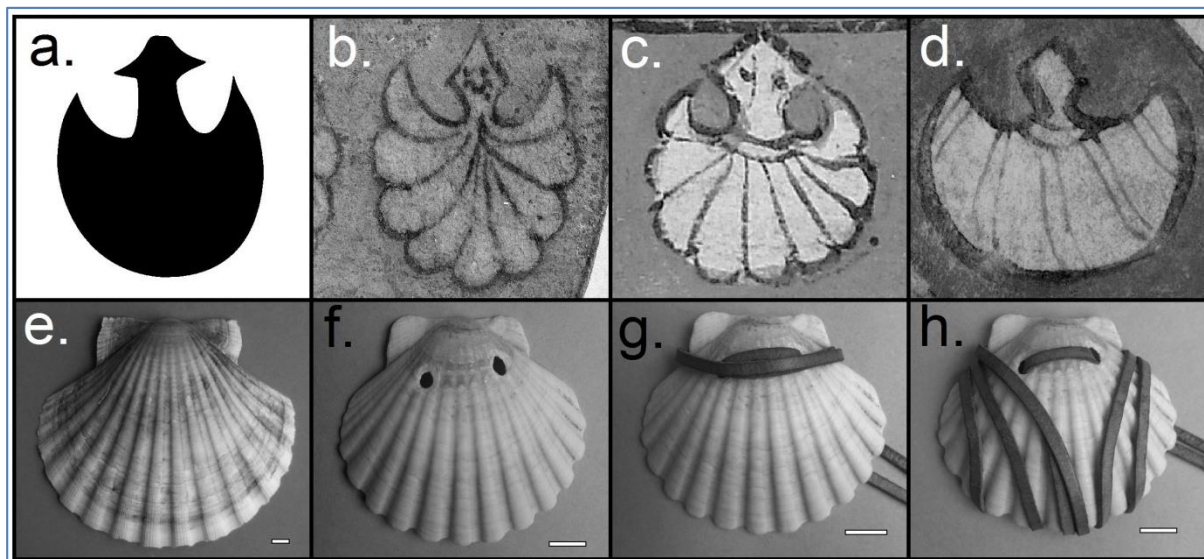


Figure 3 Top row: 'escallop' heraldic charges from coats of arms on medieval English rolls and ordinaries. Bottom row: the objects being represented by the image above. (a.): typical plain form of escallop; (b.): with scalloped edge, rays and 'eyes,' from Povey's Roll (College of Arms MS B.29, p.36); (c.): with horizontal cords across neck, from Jenyn's Ordinary (College of Arms MS 'Jenyn's Ordinary' f 19r); (d.): rare form, with sinuous diagonal cords, also from Jenyn's Ordinary (f 26v); (e.): modern *Pecten* scallop-shell; (f.): author's reproduction of a medieval Santiago scallop-shell pilgrim badge; (g.): badge in (f.) with leather suspension cord, wound horizontally; (g.): badge in (f.) with cord wound vertically across disk. Scale bars: 10mm. (b.), (c.), (d.), reproduced by permission of the Kings, Heralds and Pursuivants of Arms, London.

³³ The collective vernacular term for the numerous heraldic marginalia he included in his *Liber Additamentorum* (British Museum Cotton Nero DI) of c. 1244, and his *Historia Anglorum* (British Museum Royal MS 14 CVII) of 1250-1259.

³⁴ Bellew (1957), 91.

³⁵ Bellew (1957), 92.

Inuit *ulu*³⁶ more than a scallop (**Figure 3b**). In late 13th-century manuscripts, only one shield showed escallops with scalloped lower edges, and only one showed escallops with ribbing. The one heraldic manuscript of the early-14th century (Povey's Roll) features a single escalloped shield; its escallops had scalloped edges, ribs, and "eyes" below the apex (**Figure 3b**), the earliest indication of the perforations for suspension-straps characteristic of Santiago scallop-shell pilgrim-badges (**Figure 3f**). The inclusion of "eyes," ribbing and especially scalloped edges was more common in the mid-14th century (**Table 2**), along with the first examples of horizontal cords at the narrowest part of the neck (**Figure 3c**), probably representing the suspension-strap wrapped around the neck of the scallop-badge (**Figure 3g**). The representation of "eyes", ribbing and cords was almost as common as scalloped edging on escallops in the late 14th century (**Table 2**); one shield (**Figure 3d**) shows escallops with sinuous cords across the disk, probably representing the suspension-strap wrapped around the disk of the scallop-badge (**Figure 3h**). Horizontal cords appeared on 23.6% of the escallops, despite cords being a later development. From the 16th century escallops tended to be more clearly naturalistic, along with other heraldic charges,³⁷ and cords and "eyes" became less common; perhaps the scallop itself had become enough of a symbol there was less need to include elements identifying it as a badge.

Features of obverse-ribbed ampullae

Thanks to the PAS, the reporting of artifacts by the public has grown at a startling rate. By April 2014, the number of medieval ampullae in the PAS database had nearly doubled in

³⁶ Both kinds of knife are described by Mason (1892).

³⁷ Bellew (1957), 93.

seven years³⁸ to a total of 1,059, of which 409 were “shell-shaped.” Of these, 196 had digital photographic images and were preserved well enough to examine. The width of these ampullae were recorded and the digital images of their obverse faces were examined for the numbers of ribs, the form of the ribs, the spacing of those ribs, the shape of the shoulders, and the types of decoration at the base of the neck.

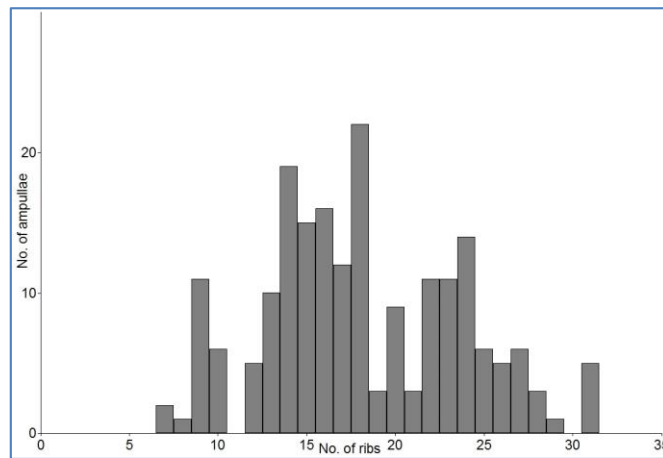


Figure 4 Distribution of rib number in PAS obverse-ribbed ampullae.

Rib numbers

These ampullae bore between seven and 32 ribs, with a mean of 18 ± 6 ribs, but the distribution (**Figure 4**) was not Gaussian normal (the common, 'bell-shaped' distribution beloved of statisticians), so this mean and standard deviation (the usual statisticians' measure of the width of the normal 'bell-shape') was not very helpful for characterising the rib-numbers. There were four broad groups: those with few ribs (less than 11), those coarser ribbed (11-20 ribs), those finer ribbed (20-28 ribs), and the very finely-ribbed (all with 32 ribs). However, there were spikes in the rib-number distribution in the overlap between the coarsely-ribbed and finer-ribbed groups, at 18 and 20 ribs.

³⁸ According to Anderson (2010), 186, the PAS database contained 569 ampullae in late 2007.

These ampullae are not large, ranging in width from 22-44mm and averaging 33 ± 5 mm. Designers did not tend to widen the ampulla to accommodate more ribs: the tendency for rib number to decrease as ampulla width increased was weak but statistically significant (Pearson's r : -0.25; P (no correlation): 0.00046).

It is tempting to use rib number to assign an ampulla to one of the potential bivalves being represented (**Table 1**), but it is not clear to which group an ampulla of 18, 19 or 20 ribs belongs, and these make up a considerable proportion of the recorded ampullae. The few-ribbed and finely-ribbed ampullae are so uncommon that ribs may have been included simply because ampullae required ribs.

Rib Form

Ribs along the left and right margins of the body almost always appeared to radiate from a notional central point somewhere on the midline of the neck, or to curve outwards towards the edge of the ampulla (**Figure 1**). However, ribs in the central half of the body varied in form. Central ribs that clearly radiated towards the margins (**Figure 5a**) were found on only 35% of the ampullae (**Table 3**). This may be an attempt to represent scallops, especially St. James scallops (**Figure 2a**).

On most ampullae, the central ribs were parallel and vertical for most of their length, or only weakly radiate (**Figure 5b**). Weakly radiate ribbing might be an attempt to represent the ribbing on *Acanthocardia* and *Cerastoderma* cockles (**Figure 2e, 2f**), but no European bivalve species bears parallel ribbing. Also, it was not possible to reliably separate weakly radiate ribbing from parallel ribbing, especially if the ribs were numerous: both probably represent the same thing.

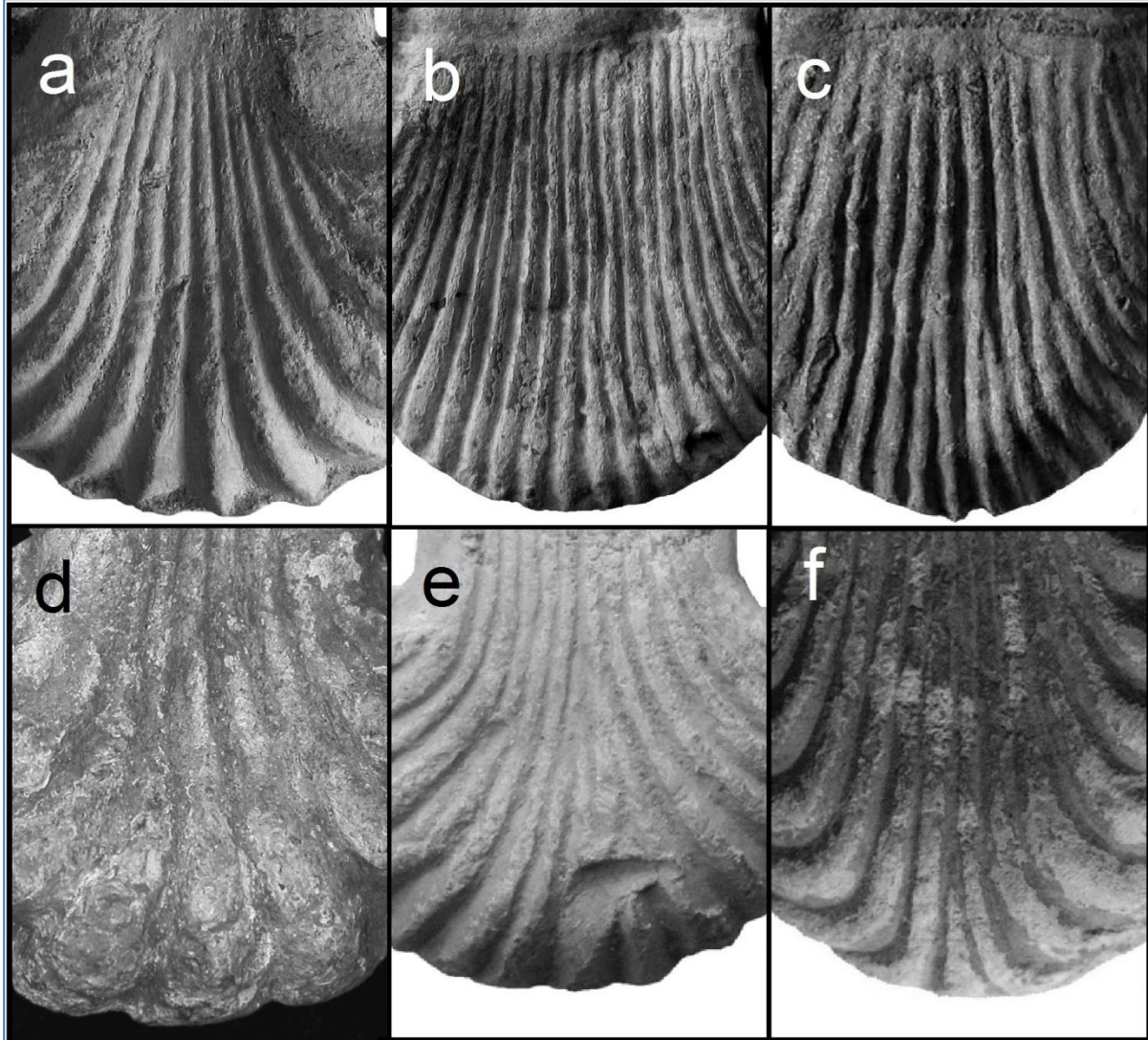


Figure 5 Forms of central ribs on obverse-ribbed medieval ampullae. (a): radiate; (b): parallel / weakly radiate; (c): splitting or branching (d): bulbous; (e): emergent; (f): emergent and recurved. Amended from PAS (<finds.org.uk>): / CC-BY-SA 2.0.

The ribs were complex in 12% of the ampullae (**Table 3**). These complex central ribs could divide, or branch off from a rib which continued on its trajectory (**Figure 5c**); in two ampullae all the ribs on the left branch off a left-central rib. The ribs could have bulbous ends (**Figure 5d**), or could appear to emerge from beneath ribs (**Figure 5e**); in one ampulla, each central rib emerges from beneath the preceding rib, alternately curving to left and right, forming

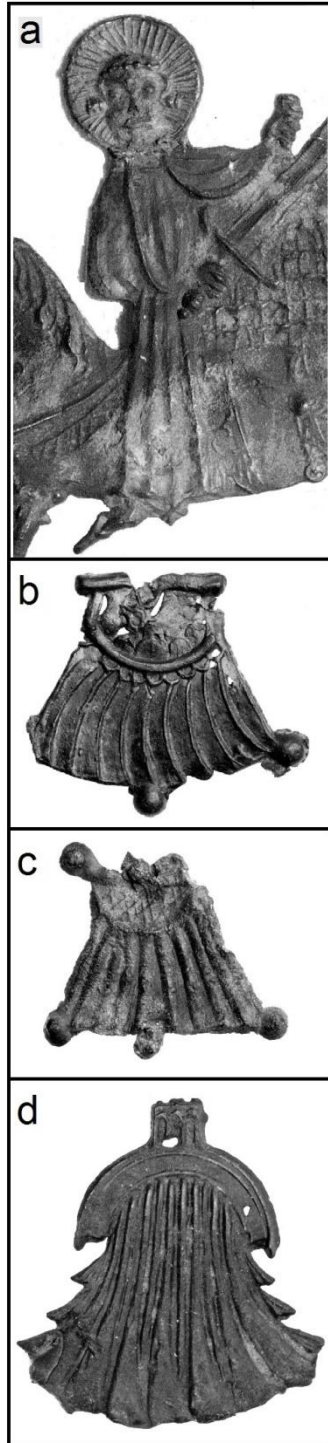


Figure 6 Examples of ribbing on medieval badges. (a): folds in clothing of St Martin, badge in Musée de Cluny; (b): roughly parallel ribbing on purse-badge (Museum of London No. 80.245/1); (c): radiate ribbing on purse-badge (Museum of London No. 22508); (d): complex ribbing on medieval purse-badge (von Beuningen Collection No. 1870). (a.) altered from S.H. Rosenberg/*Peregrinations* Photo-Bank (prg.56); (b), (c) reproduced with permission from Museum of London; (d) reproduced with

a "pleated herringbone." The most common complex form (on six ampullae) features recurving ribs with the center-most pair of ribs emergent (**Figure 5f**).

Complex ribbing also has no real parallels in European bivalves. None have principal ribs that form bulbous ends, divide, branch, recurve or emerge. Secondary ribs develop between the principal ribs on some of the region's bivalves, including some smaller or rarely-harvested scallop species,³⁹ but these do not resemble "emergent" ampulla ribs.

If parallel - weakly radiate and complex ribbing did not represent bivalve shell-sculpture, what were they intended to represent? Such ribbing on medieval badges usually represents folds or pleats in cloth, usually clothing.⁴⁰ (**Figure 6a**) Some badge fragments thought to represent scallops in fact represent pleated skirts.⁴¹ Ribbing similar to that on ampullae is found on badges representing framed

³⁹ For the obscure scallops, see Wagner (1991).

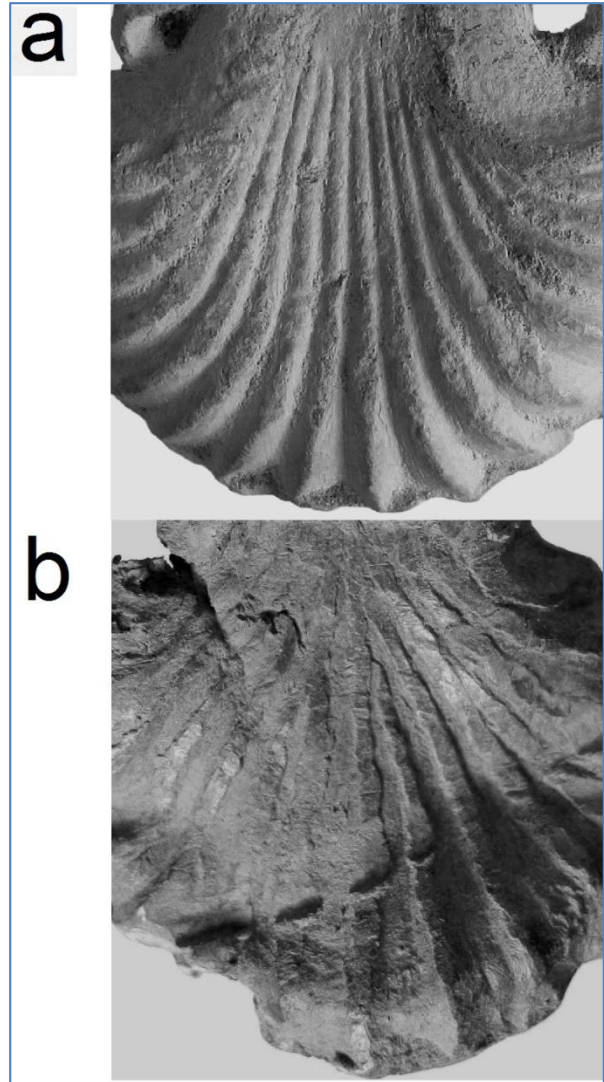
⁴⁰ E.g.: Nos. 143-148 in Spencer (1998), 141.

⁴¹ Spencer (1990, 42) corrects such a misunderstanding of a badge fragment by Michener (1986), 271.

Figure 7 Spacing of ribs on obverse-ribbed medieval ampullae. (a): radiate, adjacent ribs; (b): radiate, separated ribs. Amended from PAS (<finds.org.uk>): / CC-BY-SA 2.0.

purses,⁴² but here the ribbing also represents fabric pleats, in the purse-pouch: as in ampullae, purse ribbing could be roughly parallel (**Figure 6b**), radiate (**Figure 6c**), or complex (**Figure 6d**).

The designers did tend slightly to widen the ampullae to accommodate more complex ribbing, but even more so for strongly radiate ribs: while the width ranges were very similar between the forms, complex-ribbed forms tended to be wider on average ($35.1 \pm 3.5\text{mm}$) than parallel-weakly radiate forms ($30.0 \pm 3.5\text{mm}$), but smaller than the average strongly radiate forms ($37.2 \pm 3.6\text{mm}$).



Rib Spacing

The obverse ribs lay immediately adjacent to each other (**Figure 7a**) in the majority of ampullae (79%), but the ribs were separated by a distinct gap in a sizable minority (21%) (**Figure 7b**). All forms of ribs (parallel - weakly radiate, strongly radiate, and complex) had examples of both adjacent and separated ribs. The difference between the three rib-forms in their

⁴² These badges may have been either secular good-fortune charms Spencer (1998), 315 or religious alms-purses (Fr.: *aumônière*); Bruna (1996), 313.

proportions of adjacent to separated ribs was slight: ampullae with strongly-radiate ribbing had only 15% with separated ribs, while 33% of parallel-ribbed, weakly radiate-ribbed and complex-ribbed ampullae had separated ribs. This contrast in rib-spacing between rib-forms could easily be due to chance alone (χ^2_{12} : 3.98; P (same proportions): 0.13). It is likely that separated ribs were employed to reduce the lead-alloy required for casting an ampulla, rather than for some other design purpose.

Table 3: Numbers of PAS obverse-ribbed medieval ampullae by shoulder form, neck decoration, and rib form

shoulders		neck dec'n		rib form		
cornered	59	absent	53	radiate	47	
				wkly rad.	3	
				complex	3	
		1 cord	2	radiate	1	
				complex	1	
				paired, riblets	1	
	elaborate	3	radiate	1		
			complex	2		
			rounded		137	
	rounded	137	absent	25	radiate	2
					parallel/ wk rad.	16
					complex	7
1 cord			15	radiate	4	
				parallel/ wk rad.	9	
				complex	2	
paired, riblets		32	parallel/ wk rad.	32		
paired, plain		37	parallel/ wk rad.	31		
			complex	6		
			3 cords	1	parallel/ wk rad.	1
elaborate		27			radiate	7
					parallel/ wk rad.	16
	complex		4			

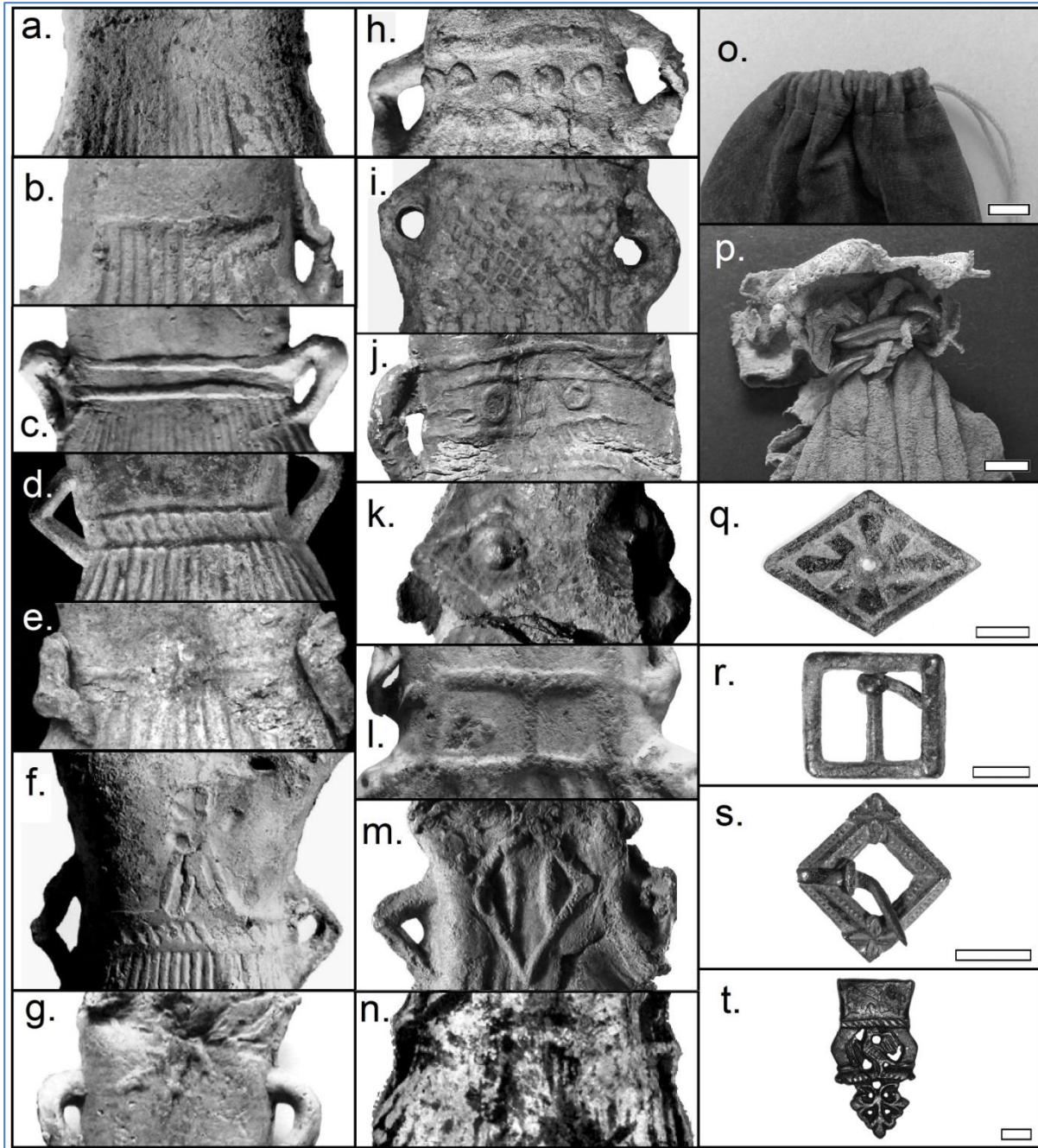


Figure 8 Decoration between lug-handles on medieval obverse-ribbed ampullae. (a.): absent; (b.): single cord; (c.): paired cords, plain between; (d.): paired cords, riblets between; (e.): single cord with knot-boss; (f.): knotted strings; (g.): toggled strings; (h.): pellet-rows; (i.): webbing; (j.): rings between paired cords with riblets ; (k.): lozenge mount/clasp; (l.): rectangular buckle; (m.): lozenge buckle; (n.): strap-end; (o.): drawstring opening of mid-20th-cent.charcoal-bar hand-warmer; (p.): drawstring opening of medieval purse (PAS No. NMGW-5DBD53); (q): medieval lozenge-shaped mount (PAS No. CORN-231947); (r.): medieval rectangular buckle (PAS No. NLM-25194); (s.): medieval lozenge-shaped brooch (PAS No. LIN-9547B2); (t.): medieval strap-end (PAS No. WMID-6479C3). Amended from PAS (<finds.org.uk>): / CC-BY-SA 2.0, except (o.): author's family collection. Scale bars: 10mm.

Neck decoration

It was relatively uncommon for decorative features to be absent from the base of the neck between the lug-handles, occurring in only 40% of the ampullae (**Table 3**). The grooves between the obverse ribbing shallowed upwards until the ribs merged with the neck surface (**Figure 8a**), closely resembling bivalve shell ribbing (**Figure 2**).

Whenever the ampulla neck was decorated, the decorations had no resemblance to any feature on bivalve shells; it is very likely that other structures were being represented. Commonly the neck-decoration incorporated horizontal cords. The same style of corded decoration almost always continued from the obverse onto the reverse of the ampulla neck. A single cord (**Figure 8b**) was the only decoration in 11% of the ampullae. If the ampulla represents a St. James scallop-badge, the single horizontal cord could represent suspension-straps wound around the neck, as shown in some armorial "escallops" (**Figure 3c**). If the ribbing on some ampullae represents pleats in fabric rather than bivalve ribs, the single horizontal cord marks the fabric hem or an internal drawstring within a hem at the fabric edge (compare **Figures 8b, 8o**) used in some medieval pouches or purses.⁴³

About one in three ampullae bore pairs of horizontal cords. It was slightly more common for the space between the pair of cords to be plain (**Figure 8c**), resembling a horizontal belt. The remainder had the space between the paired cords filled with top left – bottom right diagonal riblets (**Figure 8d**); none had riblets on the other diagonal, and only two had vertical riblets. The diagonal riblets between paired cords appear to represent the change in orientation in fabric pleats above and below an external drawstring (compare **Figures 8d, 8p**).

⁴³ For example, No. 1700 in Egan and Pritchard (1991), 350.

Other ampullae also bore features of drawstrings. The center of a horizontal cord could bear an irregular boss resembling a knot (**Figure 8e**). An inverted V-shape of parallel pairs of ribs could rise from the upper cord and end in an irregular boss, resembling a knotted pair of strings (**Figure 8f**). Loosely downward-pointing ribs could descend from a horizontal cord (or a knot-boss), resembling ends of strings. On one, the descending ribs bore complicated structures near and at their lower ends, resembling toggles (**Figure 8g**).⁴⁴

Some other elaborate decorations probably represent belts or straps, which were often elaborately decorated whether owned by rich or poor.⁴⁵ The space between paired cords could also be decorated with rows of pellets (**Figure 8h**). In the most elaborate decoration, the space on the neck between the lug-ears was demarcated at top and bottom by cord-pairs with diagonal riblets between; the riblets in the upper cord-pair were always on the opposite diagonal to the riblets in the lower. The wide space between the cord-pairs was decorated. On one ampulla this wide space was filled by fine cross-hatch ribbing (**Figure 8i**) resembling webbing: such cross-hatching was used to represent the encircling garter on Black Prince funerary badges.⁴⁶ On three ampullae the wide space bore a row of pellets; on the reverse, the wide space between the cord-pairs bore a pair of open rings with a faint irregular boss between (**Figure 8j**) which may represent drawstring-holes reinforced by buttonhole-stitching or by metal eyelets.⁴⁷

Other elaborate decoration included finely-cross-hatched lozenges with an en-ringed central boss (**Figure 8k**) resembling a strap-mount (**Figure 8q**) or jewelled rectangular brooch; horizontal rectangles with a central vertical rib (**Figure 8l**), resembling a rectangular buckle

⁴⁴ These were not representations of arrows occasionally observed on the reverse (Anderson 2010, 187), because they lacked fletched shafts.

⁴⁵ Egan and Pritchard (1991) discuss English medieval belt decoration; Willemsen (2012) discusses the social stratification revealed by medieval belt decoration in the Netherlands.

⁴⁶ Spencer (1990), 273 briefly discusses these badges.

⁴⁷ Egan and Pritchard (1991), 227-228.

(**Figure 8r**); lozenges enclosing a pair of vertical ribs (**Figure 8m**), resembling a lozenge-shaped brooch (**Figure 8s**); and short broad descending tongues (**Figure 8n**), resembling strap-ends (**Figure 8t**); descending strap-ends also featured on Black Prince funerary badges.⁴⁸

Other decoration on the obverse of the neck was very rare. Two ampullae had the Walsingham "W" regularly found on the reverse, and the ampulla with the strap-end (**Figure 8n**) bore an "S," also sometimes seen on the reverse; no ampulla in this sample bore a mitred head (probably St. Thomas Becket), despite these being found elsewhere.⁴⁹

Designers did not widen these ampullae to accommodate more elaborate neck decoration: those with decoration absent were the widest on average ($35.6 \pm 4.5\text{mm}$), while those with elaborate decoration were effectively the same average size ($32.4 \pm 4.6\text{mm}$) as those with a single cord ($32.8 \pm 4.9\text{mm}$), larger than those with paired cords: paired-cord forms with plain space between ($30.3 \pm 3.9\text{mm}$) were effectively the same average size as those with diagonal riblets ($30.2 \pm 3.3\text{mm}$).

Shoulder Shape

A sizable minority of the ampullae (30%) had shoulders ("S" in **Figure 1**) with distinct obtuse- or acute-angled corners (**Figures 9a, 9b**). Coarsely-ribbed or complex-ribbed ampullae could easily give the false impression of distinct corners at the shoulder, when the underlying shape of the shoulder was rounded (e.g.: **Figure 9d**). A cornered shoulder, rather than the angle of the shoulder, appeared the important design factor, since a wide range of angles were employed, and some ampullae had one acute and one obtuse corner. Therefore, all cornered

⁴⁸ Spencer (1990), 273.

⁴⁹ For the "W" and "S" on ampullae reverses, see Anderson (2010, 192-193); for Becket's head, see Spencer (1998), 41.

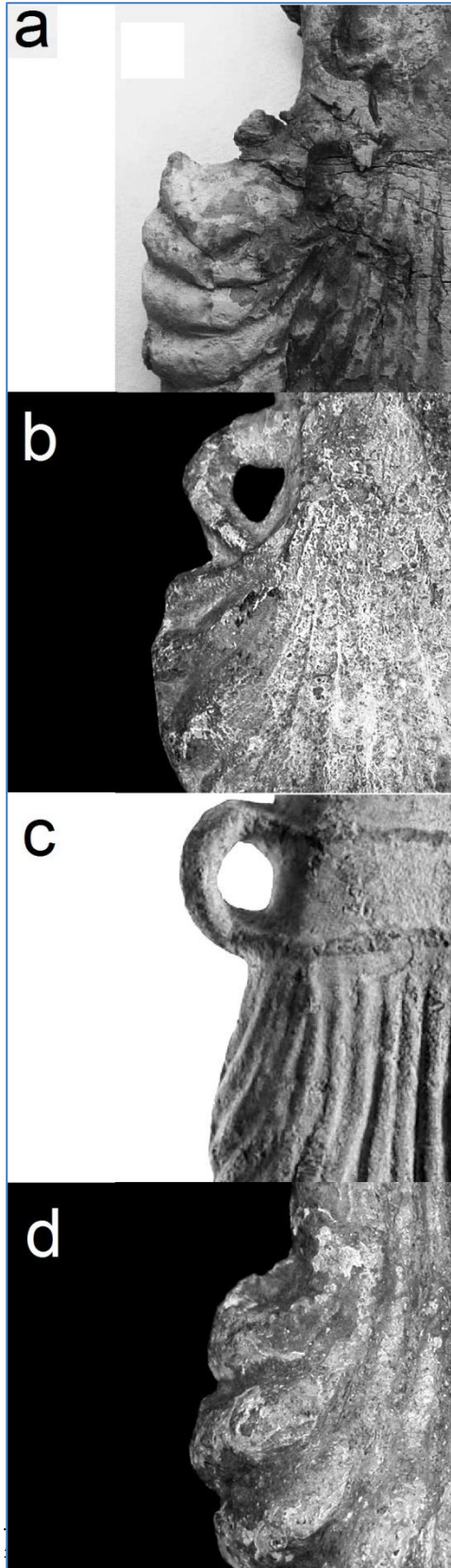


Figure 9 Examples of shoulder forms in PAS obverse-ribbed medieval ampullae. (a): acute corner; (b): obtuse corner; (c): rounded corner; (d): rounded corner, with complex (bulbous-ended) ribbing. Amended from PAS (<finds.org.uk>): / CC-BY-SA 2.0.

ampullae were considered a single group. Spencer⁵⁰ classified these ampullae with "bold, radiating ribs, notched edges and well-defined shoulders" as his Type I, and recognized they closely resembled the Santiago scallop. They are similar in outline to the medieval armorial "escallops" discussed above (**Figure 3**).

Most ampullae had shoulders with a rounded profile without distinct corners (**Figure 9c**). Spencer⁵¹ classified these ampullae "with fine grooves, and smooth edges" as his Type II, which he thought "resembles the common cockle." However, round-shouldered ampullae are generally described as "pouch-shaped."⁵²

Relationship of shoulder shape with other features

Ampullae which differed in shoulder shape also tended to differ in other respects (**Table 3**). Cornered ampullae overwhelmingly had neck decoration absent, while round-shouldered ampullae had considerable

⁵¹ Spencer (1990), 59; he allowed intermediates between the two types (e.g.: No. 136 in Spencer 1990, 60).

⁵² The term is used by Boertjes (2005), 454 and Lee (2005), 366.

numbers with each type of neck decoration; paired cords with plain space between were somewhat more frequent than other decorations.

Cornered ampullae usually had strongly-radiate ribbing (85% of the cornered ampullae), while rounded ampullae usually had parallel or weakly radiate ribbing (74%). Most of the few remaining cornered ampullae had complex ribbing; re-examining these showed they did not resemble any candidate bivalve (**Figure 2**). No cornered ampullae had parallel ribbing, and only three cornered ampullae had weakly-radiate ribbing; these did resemble the ribbing on cockles (either *Acanthocardia* or *Cerastoderma*). The few rounded ampullae not parallel or weakly-radiate ribbed were almost equally divided between strongly-radiate and complex ribbing.

Since strongly-radiate ribbing resembled the ribbing on scallops, the few rounded ampullae with strongly-radiate ribbing were re-examined to determine whether these were portraying candidate bivalves. The two with absent neck decoration had few ribs (12 or 14), and could be representations of St. James scallops. The four with single cords had sparse ribbing (7 - 15 ribs) which could represent either scallops or pleats. No rounded ampullae with the common neck decorations (both forms of paired cords) had radiate ribbing (**Table 3**). Of the seven with elaborate neck decoration, almost all showed decorations portraying fabric closures (drawstrings, brooches or clasps); only one portrayed a belt-like feature, but was distinctly "pouch-shaped"⁵³ with a neck too broad relative to the body to represent a bivalve.

Since the cornered ampullae with weakly-radiate ribbing did resemble cockles, the round-shouldered ampullae with weakly-radiate ribbing were also re-examined to determine whether these were portraying candidate bivalves. Almost all of these were distinctly pouch-shaped and

⁵³ In the sense used by Boertjes (2005), 454 and Lee (2005), 366.

wide-necked, or (if elaborately decorated) bore decorations portraying fabric closures: only eight potentially portrayed cockles.

Cornered ampullae typically had relatively few ribs (7-26 ribs, averaging 17 ± 3 ribs). Only three had more than 21 ribs. These three were the cornered ampullae with weakly radiate ribbing, potentially portraying cockles; they had 22, 23 and 26 ribs, also consistent with cockles (**Table 3**). The cornered ampullae most similar to scallops or "escallops," with radiate ribbing and absent or single-cord neck decoration, all had 21 or fewer ribs (**Figure 10a**). Only five cornered ampullae had less than 12 ribs, potentially representing smooth scallops (**Table 3**). No cornered ampullae had the copious ribbing expected for variegated scallops. All of these had two lug-handles in the positions expected for representations of *Pecten* scallops, rather than the single lug-handle expected for representations of other scallop genera (**Table 3**): this agrees with the burial evidence that only the scallop of Santiago was a Christian symbol.

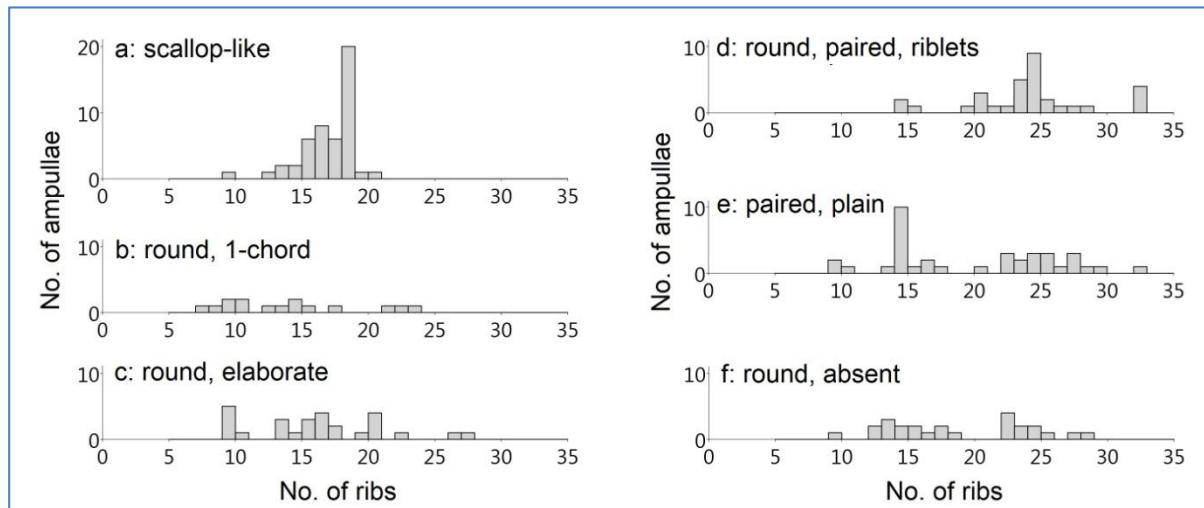


Figure 10 Distribution of rib number in PAS obverse-ribbed ampullae with (a.): cornered shoulders, radiate ribbing, and neck decoration absent or one cord; (b.): rounded shoulders, single cord at neck; (c.): rounded shoulders, elaborate neck decoration; (d.): rounded shoulders, paired cords with diagonal riblets between; (e.): rounded shoulders, paired cords with space between plain; (f.): rounded shoulders, neck decoration absent.

Rounded ampullae tended to have more ribs than cornered ampullae (7-32 ribs, averaging 19 ± 6 ribs). Ampullae with different neck decoration tended to have different numbers of ribs (**Figure 10**). Rounded ampullae with single cords or with elaborate decoration at the neck primarily had 21 ribs or less, like cornered ampullae; in contrast, almost all those with paired cords with diagonal riblets (probably representing drawstrings) had more than 21 ribs. Both those with paired cords with plain space between (possibly representing belts), and those with absent neck decoration, were evenly divided into those with more than 21 ribs and those with less.

Cornered ampullae were considerably larger (37.6 ± 3.2 mm average width) than rounded ampullae (averaging 30.9 ± 3.8 mm), a greater contrast than between forms of ribbing or neck decoration. Designers tended to widen these ampullae not so much to accommodate more ribs or more elaborate neck decoration, but to accommodate more complex ribbing, and especially for cornered shoulders with radiate ribbing.

Discussion

Two kinds of ampulla, not two sub-types

Spencer's separation⁵⁴ of medieval obverse-ribbed lead-alloy ampullae into two broad types based on shoulder shape remains basically sound. Ampullae with distinct corners at the shoulders (Spencer's Type I) tend to be wider, and to have narrow necks relative to the body, less than 21 ribs, generally of radiate pattern, and neck decoration usually absent or a single cord. Round-shouldered ampullae (Spencer's Type II) tend to be narrower, and to have wider necks,

⁵⁴ Spencer (1990), 59.

parallel-weakly radiate or complex ribs, and a wide range of neck decoration, with somewhat more numerous ribs with differing distributions depending on the neck decoration.

However, Spencer's assumption that both types are representations of shells does not hold. Cornered ampullae do seem to portray shells: their radiate ribbing resembles ribbing on shells; their typical rib numbers are similar those on shells, especially St. James scallops; and their shoulders and often narrow necks are similar to those on armorial "escallops." Rounded ampullae are so different that they probably portrayed something other than shells. Their parallel-weakly radiate and especially complex ribbing is more consistent with folds in fabric; their neck decorations appear to represent closing mechanisms for fabric objects (hems, drawstrings, buckles, clasps, and belts); and their round shoulders and broad necks appear to represent drawstring-purses. The simplest reason that Type II ampullae appear "pouch-shaped"⁵⁵ is that they are representations of such pouches/purses.

While seldom preserved archaeologically, pouches were a near-universal personal item of medieval dress, and came in a wide array of designs.⁵⁶ The drawstring-purse is a well-known type of medieval reliquary, with its own development, symbolism and contemporary liturgical function.⁵⁷ Drawstring purses were known in the West from at least the Carolingian era, surviving in cathedral treasuries, and occasionally archaeologically.⁵⁸ Like ampullae, reliquary purses often bear small lug-handles for suspension, making it "conceivable that miniature purses functioned appropriately as reliquary pendants";⁵⁹ from the 7th century, the term *bursa* expanded from the fabric purse to also apply to the metal-clad wooden reliquaries with suspension-rings.⁶⁰

⁵⁵ Boertjes (2005), 454; Lee (2005), 366.

⁵⁶ E.g.: de Linas (1862); Goubitz (2009).

⁵⁷ de Linas (1892), 23 provides some examples, and Hahn (2012), 103-116 outlines their development and function.

⁵⁸ Hahn (2011), 12 discusses some in treasuries; Walton (1989, 369) describes the best-known example from British archaeology.

⁵⁹ Spencer (1998), 315.

⁶⁰ Hahn (2005).

The elaborate decoration of some purses can include representations of closures, such as knots, bands, and jeweled clasps,⁶¹ like those represented in ampulla neck-decoration.

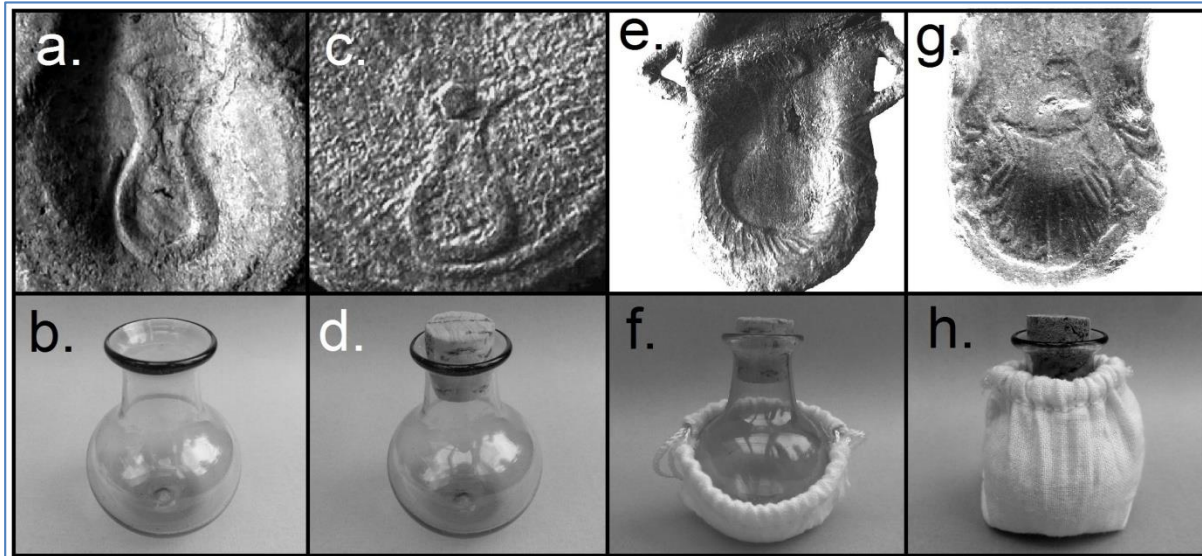


Figure 11 Top row: representations of vessels on reverse of medieval obverse-ribbed ampullae. Bottom row: the object being represented by the image above. (a.): small vessel with wide, open mouth (Anderson 2010 Type II.9); (b.): a modern glass replica of the vessel in (a.), 6.7 x 5.1 cm; (c.): vessel like that in (a.), flat circular boss in centre of mouth; (d.): vessel (b.), stoppered; (e.): vessel like that in (a.), body surrounded by ribbed crescent (Anderson 2010 Type II.25); (f.): vessel (b.) in partially-opened drawstring-pouch; (g.): variant of 'shell' motif of Anderson (2010) below short vertical bar topped with truncated cone (note the change of direction in ribbing above and below neck of the 'shell'); (h.): vessel (b.) in same pouch as in (f.), fully closed. (a.), (c.), (e.), (g.) amended from PAS (<finds.org.uk>): / CC-BY-SA 2.0.

The contents of the pouches

What these pouches might have contained are probably represented in the images, on the reverse of some of the ampullae, of vessels.⁶² Such vessel images are present on 18% of the round-shouldered ampullae, but are absent from the cornered forms. A few show a long-necked *orcel* found as grave-goods in the medieval West, termed "ampoyle" since the 13th century.⁶³

⁶¹ See, for example, Walton (1989), 369; Hahn (2012), 107.

⁶² The term used by Anderson (2010), 187.

⁶³ Foy & Sennequier (1989), 151-159.

Most show bulbous short-necked phials, either open (**Figure 11a, 11b**), stoppered (**Figure 11c, 11d**), partially revealed with the pouch partially opened (**Figure 11e, 11f**), and with the pouch completely closed (**Figure 11g, 11h**).⁶⁴

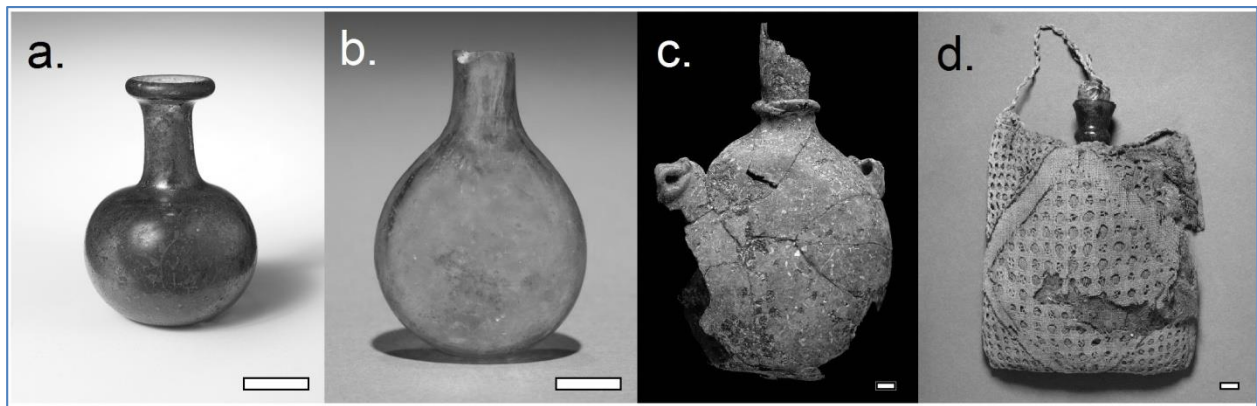


Figure 12 (a.): Glass reliquary bottle engraved with Christian motifs; probably Frankish, c. 7th-8th century (Metropolitan Museum of Art No. 81.10.268), photo: Metropolitan Museum of Art, New York. (b.): Pilgrim's flask; Byzantium, Syria-Palestine, 6th-7th century (Cleveland Museum of Art No. 1995.235), photo: Cleveland Museum of Art. (c.): Pilgrim's flask cached near sacked church; Tell Tuneinir, Syria, 11th century, photo: Professor Michael Fuller, St. Louis Community College. (d.): Pilgrim's flask in embroidered linen bag; Egypt, 14th-15th century (Ashmolean Museum No. EA 1994.113), photo: Ashmolean Museum, University of Oxford. All images reproduced with permission (a.: MMA OASC). Scale bar: 10mm.

The rarities being imitated: medieval glass ampullae

Glass ampullae could easily have been used as receptacles for holy water or oil in medieval times, even though few survive. Some early Christians were buried in Rome with glass ampullae: a few catacombs are literally plastered with them.⁶⁵ The early 7th-century Monza-Bobbio ampullae in lead-alloy are well-researched, but those in glass are more numerous, and

⁶⁴ The example in Figure 11g would be assigned to 'shell' in the typology of Anderson (2010), but the ribs alter direction either side of the horizontal cord, like those in fabric but never in scallops.

⁶⁵ Decoration of Roman catacombs with glass ampullae is discussed by de Santis (2000).

come in a wide range of forms: globular, lentoid, conical and square-sectioned.⁶⁶ While rare, similarly early glass ampullae are known from elsewhere in Western Europe (**Figure 12a**).

Some small medieval glass reliquary ampullae are lentoid.⁶⁷ Their use is potentially rooted in early pilgrimage to the Holy Land: some, made in 6th-7th century Byzantine Palestine were used as grave-goods;⁶⁸ others, probably for medicines, were made in Palestine in the Umayyid and Fatamid periods (8th-11th centuries);⁶⁹ a few of the slightly larger (**Figure 12b**) were clearly made to European tastes.⁷⁰

It is also possible that small lentoid glass vessels are reduced versions of larger lentoid vessels recognised as the proper containers for ceremonial liquids. The Monza-Bobbio lead ampullae are thought to be reduced versions of Holy Land *eulogiai*, such as St. Menas ceramic "pilgrim flasks."⁷¹ Some Byzantine Holy Land lead-alloy ampullae (small, lug-handled, and oval-sectioned like the typical obverse-ribbed ampullae) are reduced versions of slightly larger contemporary round-bodied ceramic *eulogiai*.⁷² Also, small glass pilgrim souvenirs, imitations of larger ewers and jugs, were made in Palestine and distributed across the Empire in the 3rd - late 4th centuries, and were used as grave-goods until the early 7th century.⁷³ Large lentoid glass vessels were used in Palestine throughout the Roman occupation,⁷⁴ and occasionally served as grave goods in later Roman Palestine;⁷⁵ a few were very like St. Menas flasks, with two lug-

⁶⁶ The Monza-Bobbio ampullae in lead-alloy are discussed by Grabar (1958), Barag and Wilkinson (1974), Vikan (2010), 33-36, and Hunter-Crawley (2012); those in glass are noted by Trout (2005), and illustrated by Testini (1958), 30, Fig. 2.

⁶⁷ E.g.: the San Gennaro relic at Naples, described by Garlaschelli *et al.* (1994)

⁶⁸ Stern (2001), 316 lists some examples.

⁶⁹ Hadad (2008), 168 includes a brief discussion; Lester (2004), 192 describes the medicinal examples from Tiberias.

⁷⁰ Ferber (1975) describes Corning Museum No. 69.1.2.

⁷¹ Anderson (2007).

⁷² Israeli and Mevorah (2000), 207.

⁷³ Stern (2001), 271-272.

⁷⁴ Stern (2001), 271-272.

⁷⁵ E.g.: 3rd century Kafr Kama: Gorin-Rosen (2007).

handles and richly-decorated faces.⁷⁶ Simpler forms, sometimes with lug-handles, were used in Palestine during the Byzantine era (occasionally as grave-goods), and later by Crusader-era Christian communities, such as Tell Tuneinir (**Figure 12c**) and Akko (Acre).⁷⁷ Medieval-era Islamic lentoid vessels could also be very elaborately decorated.⁷⁸ The occasional examples used as medieval reliquaries in the West⁷⁹ were probably Holy Land *eulogiai*, like some lead-alloy ampullae from either the Byzantine or Crusader era.⁸⁰

The imitations survived, the rarities lost...

Whether imitations in lead of pouches holding bulbous glass ampullae, small lentoid glass ampullae, or reduced versions of large glass flasks, obverse-ribbed lead-alloy ampullae of Spencer's type II are far more commonly known than the original glass vessels they represent. This is to be expected. Firstly, lead-alloy ampullae in general were cheaper, more numerous mass-produced representations of rarer objects, so the glass ampulla was probably never common. Secondly, ampulla and pouch would easily become separated over time, changing them from a pilgrimage artifact to just another glass phial and another empty pouch, although medieval-age glass lentoid flasks in pouches have been recovered (e.g.: **Figure 12d**). Finally, glass is fragile, and drawstring bags are textile: neither material survives well in archaeological deposits, or can be spotted with metal-detectors. If most glass ampullae were discarded into the fields once empty, as most lead-alloy ampullae were,⁸¹ almost none would survive.

⁷⁶ Stern (2001), 52.

⁷⁷ For the Byzantine grave-goods, see Stern (2001), 272 & 275; examples from Tell Tuneinir were excavated by Michael Fuller (pers. comm); those from Akko are being analyzed by Yael Gorin-Rosen (pers. comm.).

⁷⁸ E.g.: Corning Museum No. 55.1.125: Whitehouse 2010, 231-2; Corning Museum No. 66.1.3.

⁷⁹ E.g.: Arad (2007), 61.

⁸⁰ These are discussed by Boertjes (2014), 171-175.

⁸¹ Anderson (2010) discusses the discard patterns of these ampullae.

New names for the two kinds

Inevitably for a type of object manufactured at several shrines by many craftsmen over several centuries, some of these obverse-ribbed ampullae are intermediate between the two types, as Spencer himself recognized.⁸² A handful of cornered-shouldered ampullae bear features more common in round-shouldered forms, and some round-shouldered forms with absent or single-cord neck decoration could be representations of shells, especially cockles. Therefore it would not be productive to sub-divide the two Types defined by Spencer, seeking too closely for representations of specific genera of bivalve shell; that would confound attempts to define more meaningful sub-types associated with specific time-periods or shrines based on the images on the reverse.⁸³ It would be an aid to clarity if only Type I ampullae were referred to as "shell-shaped," with Type II and those few cornered but with complex ribbing or neck decoration as "purse-shaped," and as "intermediate" those few round-shouldered without features of pouches. This restriction of the term "purse-shaped" to obverse-ribbed ampullae prevents confusion with the existing use of the term "pouch-shaped" for the general form of many medieval lead-alloy ampullae.⁸⁴

Implications of there being two kinds

This realization that these ampullae come in not one but two types has some serious implications for their future interpretation. There may have been considerable differences in how the two types were employed by medieval people, which will be reflected in differing geographical distribution, association with saints or shrines displayed on the reverse, and time-

⁸² Spencer (1990), 60.

⁸³ These will rely on the work of Anderson (2010), 187.

⁸⁴ The term "pouch-shaped" has been used in this general way by Boertjes (2005), 454 and Lee (2005), 366.

period of use.⁸⁵ The pan-European database (<www.kunera.nl>) uses the same chronology, probably for the same reasons; all their obverse-ribbed ampullae are also distinguished into Spencer's Types. Shell-shaped ampullae are much less numerous and much less diverse in overall appearance than purse-shaped ampullae; perhaps more complex purse-shaped forms (with complex ribbing or elaborate neck decoration) were more common in periods in which purses (such as *aumônières*) or costume generally was more elaborate, or more diverse between social strata.

Perhaps the most interesting implication is about the role imagery played in authenticating eulogic or apotropaic power, in this case how the shape of a vessel assured its medieval observers that the vessel contained holy, and not ordinary, water, oil or dust. Medieval lead-alloy ampullae imitated containers whose form had an established and widely-comprehended reputation in the medieval period for authenticating their contents,⁸⁶ so obverse-ribbed ampullae must also have done so. Those that imitated more or less elaborate pouches containing small vessels, probably of glass, show this type of pilgrimage souvenir also had such an established reputation during those times, even though this type of souvenir is now effectively invisible. These purse-shaped ampullae are more numerous than shell-shaped ampullae, so the small pouched container, properly labelled, was probably more widely recognized as a eulogic authenticator than the classic symbol of pilgrimage, the scallop-shell.

⁸⁵The most recent review of these ampullae distribution in England, by Anderson (2010), concentrated on reverse imagery and employed Spencer (1998) as the most up-to-date chronology and typology; there is no more recent chronology incorporating well-dated examples from recent archaeological excavations (at least in English).

⁸⁶ Spencer (1998), 38-39.

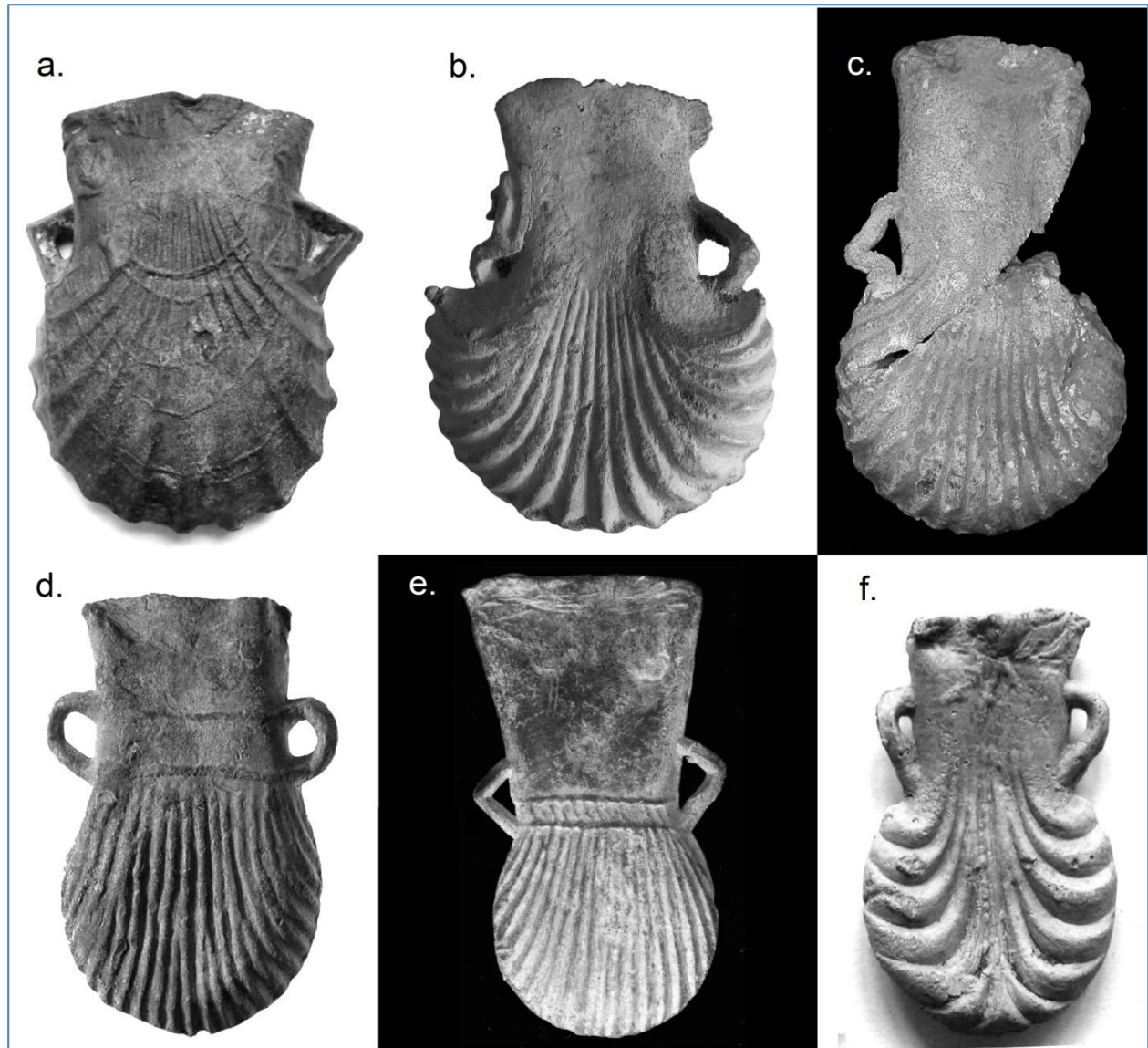


Figure 13 The range of forms in medieval obverse-ribbed ampullae. (a.): Aardenburg, the Netherlands (Kunera No. 16895; <www.kunera.nl>), showing both radiate and concentric surface sculpture of *Pecten* scallop (private collection M. Bil, the Netherlands); (b.): Nettleton, Lincs. (PAS No. LIN-13E791), Spencer Type I, imitating the 'escallop' charge; (c.): Lowick, Northants. (PAS No. LEIC-F08BA1), intermediate between Spencer Types I and II, resembling *Cerastoderma* cockle; (d.): Fressingfield, Suffolk (PAS SF-A37D38), typical Spencer Type II; (e.): Waveney, Suffolk (PAS NMS-62E398), diagonal ribbing between horizontal bands representing drawstring purse; (f.): Revesby, Lincs. (PAS NCL-AB3421), representing drawstring purse with recurved pleats, central vertical row of studs/jewels, toggled drawstrings at neck. All images reproduced with permission: Amended from PAS (<finds.org.uk>): / CC-BY-SA 2.0, except (a.): © M. Bil.

Conclusions

Obverse-ribbed lead-alloy ampullae literally representing shells of St. James scallops are very rare; there were none in the PAS catalogue, and only one (**Figure 13a**) in the 1150 ampullae in the Kunera database. Many are representations of "escallop" charges (**Figure 13b**); the heraldic symbol for the scallop superseded its accurate representation in general use in medieval Europe, rather like the *fleur de lis* supplanted accurately-rendered lilies. A very few could be representations of cockles (**Figure 13c**); none are convincing as other species of scallop. Most ribbed ampullae have ribbing that represents pleats in cloth rather than ribs on shells (**Figure 13d**), and many of these have features that strongly suggest drawstring purses (**Figure 13e**); some could represent nothing else but purses (**Figure 13f**). Almost all of the scallop-like ampullae were of Spencer's Type I, although a few of these bore features of drawstring pouches. Most of the purse-like ampullae were of Spencer's Type II, although a few could represent cockles. Imagery of glass vessels on the reverse of the purse-like ampullae suggest these ampullae were meant to represent real glass ampullae in drawstring pouches, a type of artifact that would be almost invisible in the archaeological record. Spencer's Type I ampullae could generally be regarded as "shell-shaped," while Type II should be regarded as not shell-shaped, but "purse-shaped." The notion that the Santiago scallop was a widespread symbol of pilgrimage in general is no longer so strongly supported by these lead ampullae; the more general symbol of pilgrimage in the medieval mind was the glass flask of holy oil or water, safe in its drawstring purse. 🐚

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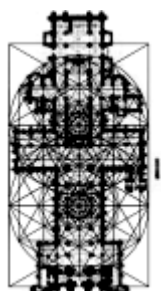
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The Dual Language of Geometry in Gothic Architecture: The Symbolic Message of Euclidian Geometry versus the Visual Dialogue of Fractal Geometry

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1. Introduction

When performing geometrical analysis of historical buildings, it is important to keep in mind what were the intentions of the originators, even though these intentions have likely changed many times as the master masons changed. For the medieval builders, geometry in design was a tool used to structure ideas and aesthetic impulses or perhaps to incorporate into this work a meaningful system of symbols; it was the internal logic of the building that mattered more than achieving beauty or following the correct canonical models as was the case in Renaissance era.¹ Geometry was used in Gothic architecture as visual tools for contemplating the mathematical nature of the Universe, which was directly linked to the Divine, the architect of the Universe as illustrated in the famous painting of *God the Geometer* (Austrian National Library, Codex Vindobonensis 2554). To seek these principles would thus be worshipping God.

The 1390s- *Constitutions of Masonry* or *The Regius Poem* opens with: "Here begin the Constitutions of the art of Geometry according to Euclid."² Regardless of the accuracy of this document, the medieval masons clearly understood that the science of Geometry that they used was received from its inventor: *Euclid*.

¹ Robert Bork, *The Geometry of Creation*, 2011: 5.

² William Hughan, *The Old Charges of British Freemasons*, 1872: 2-3.

The medieval geometry of Euclid had nothing to do with the geometry that is taught in schools today; no knowledge of mathematics or theoretical geometry of any kind was required for the construction process of medieval edifices. Using only a compass and a straight-edge,³ Gothic masons created myriad lace-like designs, making stone hang in the air and glass seem to chant. In a similar manner, although they did not know the recently discovered principles of Fractal geometry, Gothic artists created a style that was based on the geometry of Nature, which contains myriad of fractal patterns.

Architectural theorists Nikos Salingaros and Christopher Alexander believe that buildings must convey languages, among them are pattern language and form language; the former is the basic system for the design of any space, while the latter is what makes the former unique and beautiful; patterns are general and consistent throughout certain style, while forms are local and changeable from one building to another.⁴ Applying this to Gothic architecture, one may say that its general features, like pointed arches or high spires, are pattern language, while the specific design of each building and how these patterns came together is the form language. Salingaros also writes that, with the elimination of the ornaments and details within the range of scales -5mm to 2m or thereabouts- which corresponds to human scale, the dialogue between architecture and human beings is also removed.⁵ Based on this, the paper assumes that the Gothic cathedral, with its unlimited scale, yet very detailed structure, was an externalization of a dual language that was meant to address human cognition through its details, while addressing the eye of the Divine through the overall structure, using what was thought to be the divine language of the Universe. It discusses the hypothesis that geometry was used in the Gothic style to reproduce forms and patterns that reflect this dual language. In doing so, master masons distinguished between the abstract overall proportional lines of plans and elevations (form language), and the organic ornamental patterns on walls, ceiling, openings, and pavements (pattern language). It is suggested here that Euclidian geometry was employed for the, usually invisible, proportional or working lines of the

³ Lon Shelby, *Gothic Design Techniques*, 1977: 82–83.

⁴ Nikos Salingaros, *Twelve Lectures on Architecture*, 2010: 26.

⁵ Nikos Salingaros, *Architecture, Patterns, and Mathematics*, 1999: 61-72.

former, which are perceived only by the designer himself or by analytical view of the drawings with a mesh of imaginary lines; while Fractal Geometry, was used for the visible details of the latter, at which the worshipers can gaze and wonder about and may establish a "visual dialogue"; the former is to address the eye of the Divine, while the latter is to address the earthly eye of humans.

This paper will test this hypothesis by finding the actual logic and context (proportional lines, decorating pattern, invisible line, visible details, etc), with which these two types of geometry were used in Gothic buildings, locating the settings (in structural elements, in plans, in decoration elements, ...etc.), in which they functioned in these buildings. It also aims to find the bridge(s) that linked and integrated them into a unified whole. To achieve this, the paper depended on a qualitative methodology, using purposefully selected examples/case studies from different western-European countries that typify the geometrical characteristics of Gothic architecture. With regard to the applications of Euclidian geometry, theoretical reviews and documents of the period, as well as extensive geometrical analyses of several examples of the period (at least three examples for each category of Euclidian geometry), will be introduced in order to seek documented, analytical and illustrative support for the applications of the different notions of Euclidian geometry. As for the applications of fractal geometry, geometrical analysis and illustrative comparisons for the most prominent motifs of Gothic architecture against the different models of fractal geometry is accomplished and supported by some recent theoretical reviews. In both cases, the focus of the analyses includes locating the settings of the applications and their context as well as the aspects in common that linked the two types.

This paper concludes that both kinds of geometry were used to represent the geometry of Nature in its own way. While Euclidian geometry was used to compose an overall form language, using invisible proportional or working lines that were meant to address the eye of the Heaven through its *symbolic expression*, fractal patterns were used to reproduce the patterns of Nature in a more *visual expression* through ornaments and details. It was also found that ***geometrical***

progression, the *language of nature* and *modules* acted as bridges, linking these two kinds of geometry in a unified composition.

2. Theoretical Background

Plato described geometry as “the reference to the very laws of the Divine Will and Harmony of Being.”⁶ The term Sacred Geometry is commonly used to encompass the spiritual beliefs surrounding geometry in various cultures, where symbolic meanings are ascribed to certain geometric shapes and proportions, mostly derived from Nature and the mathematical principles at work therein (**Figure 1**). It is a catch-all term covering Pythagorean geometry and neo-Platonic geometry, as well as the perceived relationships between organic and logarithmic curves.⁷

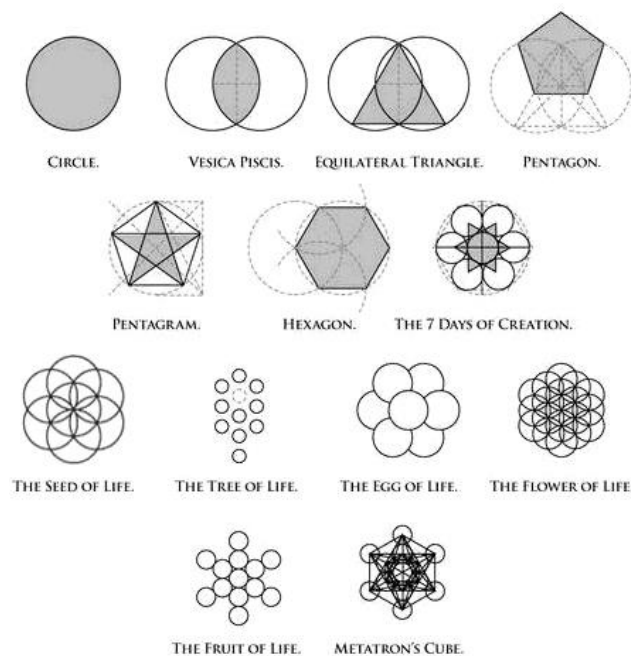


Figure 1 Principle elements of sacred geometry. Diagram: author.

⁶ Loai Dabbour, *Geometric Proportions*, 2012: 380-391.

⁷ Stephen Skinner, *Sacred Geometry: Deciphering the Code*, 2009: 91.

This geometry here was not aimed at beauty, though it often arrived at it, but at harmonization with the divine geometry of God's creation.⁸ In addition to representing cosmological and philosophical structures at the level of form, it was seen as powerful representations of some central concepts of the divine nature. The geometry and proportions of human body, as the culmination of God's creation, was one of the most important sources of this geometry (**Figures 7, 8, 10**).

Colin Dudley writes that: "It is in the light of the ancient cosmology that one needs to envisage the culture that created the great medieval churches, all of which incorporate a geometry that is purposefully created in order to provide, though its supposed supernatural power, divine protection from the destructive powers of the earthly world and the Devil, and to attract the presence of the Almighty, creator of all the geometry in the universe."⁹ That is, the form language in these churches was not addressing the humans' eyes, but rather the eyes of Heaven. To build a house of God without his geometry would be vain; the purpose of geometry here was to "unite the building with the eternal world of Heaven and thus to preserve it from disasters."¹⁰ This did not have anything to do with its static structure; at this time no one, including master-masons, bishops and abbots, was aware of the laws of structural engineering.¹¹

The renowned booklets of *Schmuttermeyer* and *Roriczer*,¹² together with other related documents of the period,¹³ are telling much of the manner in which these great buildings were created geometrically. For example, the circle and the sphere were seen as forms that belonged to the eternal and all-powerful heavens, while the square belonged to the earthly world. In this context, geometry acquired two rules: one is that all constructions must begin with a circle; the other is that symmetry must be maintained. The latter has its origins in the Augustinian belief in that the

⁸ Bork, 2011: 370-372.

⁹ Colin Dudley, *By craft of Ewclyde*, 2001: Chap. 1:16

¹⁰ Dudley, 2001: Chap. 1:20

¹¹ Walter Leedy, *Fan Vaulting: A Study of Form, Technology & Meaning*, 1980: 146-149

¹² Matthäus Roriczer, was a 15th-century German architect, master builder of Regensburg cathedral, and author of several booklets on medieval architectural design. In one of these texts, *Büchlein von der Fialen Gerechtigkeit* (1486), he describes the manner in which medieval masons used a "single dimensional unit" to produce a ground plan, when there was no internationally agreed upon standard of measurement, to give other relative measurements in a process called "constructive geometry". Similar instructions are found in another period publication by Hans Schmuttermeyer of Nuremberg, who was an artist, goldsmith, and master mason, whose booklet (1487) graphically illustrates how to design a pinnacle and gable (small gable)

¹³ Shelby, 1977; Bork, 2011: 29-40

universe owes its stability to the perfect balance of its elements as instituted by the Creator, a stability that will be denied to any building that does not possess symmetry.¹⁴ The former is because architects were aiming in their designs to bring Heaven down to earth, but even more cogent reason is that it was impossible to them to construct a true square, an equilateral triangle, octagon, etc. without a pre-existing circle.¹⁵

The most prominent geometrical patterns produced according to the Euclidean postulates are those developed from square within a circle, (*ad quadratum*) and triangle within a circle (*ad triangulum*), where any geometric design starts with a circle, from which the pattern starts to unfold (**Figure 2**). And for this reason Gothic builders found the *Euclidian geometry* appropriate for their cathedrals.

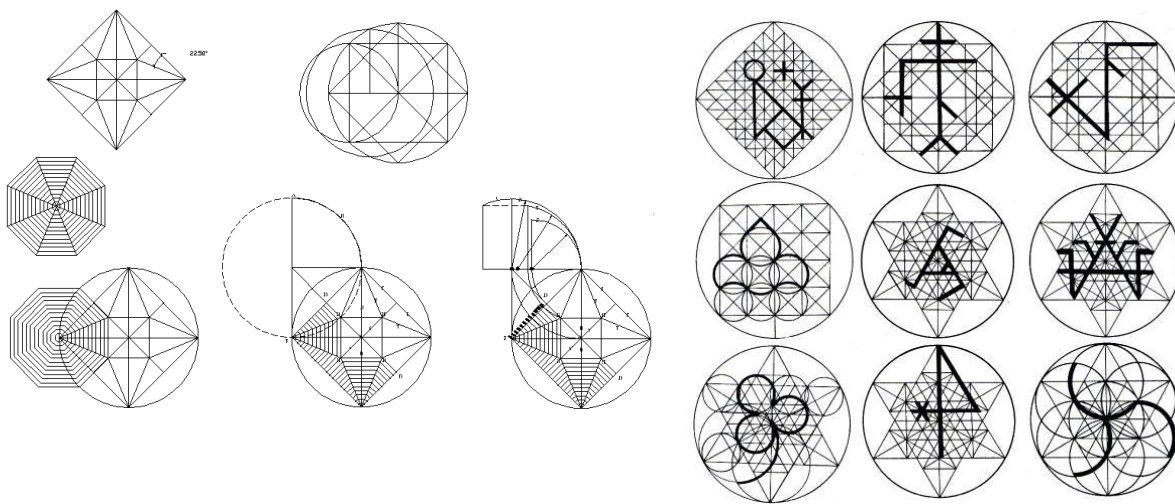


Figure 2 Applications of *ad quadratum* and *ad triangulum* in Gothic architecture: (Left) Methods of constructing Gothic vaults based on *ad quadratum* after Philibert De l'Orme, *Le Premier Tome De L'architecture* (1567), p. 110; (Right) geometrical analyses of mason's marks on different drawings of Gothic cathedrals. Photo: after Franz von Rhiza, *Studien über Steinmertz Zeichen*, 1917, pp. 44-45.

¹⁴ Dudley, 2001, Chap. 1:17-18

¹⁵ Dudley, 2001, Chap. 2: 38

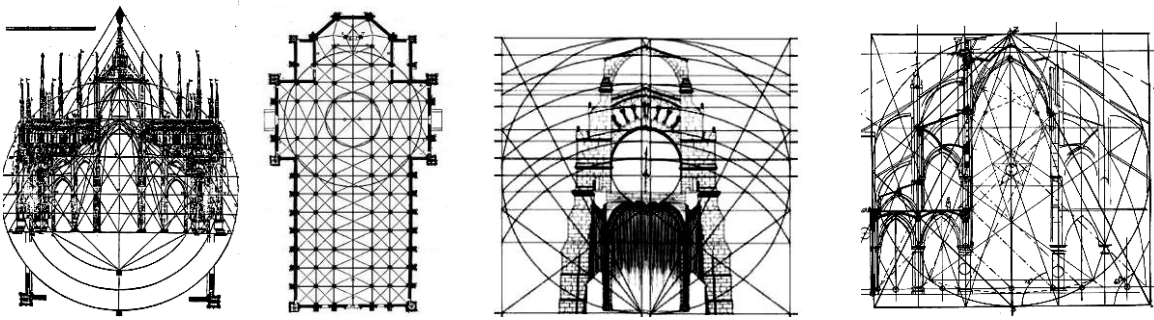


Figure 3: *Ad quadratum* and *ad triangulum* schemes as proportional, imaginary, or working (invisible) lines in the design of medieval churches: (Left) Milan Cathedral plan and section, (middle) partial section at Chartres Cathedral, and (right) Viollet-le-Duc's cross-section of Notre-Dame in Paris. Diagrams: (left) after Paul Frankl, *The Secret of the Medieval Masons* (1945), p. 46-60, (middle) after Rubino, Pinterest, (2001) <http://www.pinterest.com/emmatuzz/south-france-mysteries/>, and (right) after Frederik Lund *Ad Quadratum* (1919), p. 36.

Several architectural historians have long stated that medieval church's geometry of all sorts depended on *ad quadratum* and *ad triangulum* schemes (**Figure 3**). Other authors argued also for the widespread application of other figures, such as the pentagon, which was related to the Golden Section.¹⁶ The drawings in **Figure 3** show also how the lines of the *ad quadratum* and *ad triangulum* schemes were used as proportional working lines that did not appear in the construction itself. The use of geometrical progressions in these schemes is also evident.

Moreover, Euclidian geometry, in addition to being able to create all the simple whole number ratios, also can be used to create those strange ratios that express what are known as *irrational* or *silent* numbers that cannot be accurately expressed numerically. An example of this is $\sqrt{2}$, created by the diagonal of a square, which today one might take to be 1.414, but even this is only an approximation. Similar *surds* also include $\sqrt{3}$ and $\sqrt{5}$, all easily produced as geometric ratios, but comprehended numerically only by the Creator of the cosmos. Euclidian geometry was therefore needed to create micro cosmos with simple regular polygons, which can be easily included into the design process (**Figure 4**). For example, the square includes $\sqrt{2}$, the hexagon

¹⁶ The 45-degree triangle was championed by von Drach in "Das Hüttengeheimnis von gerechten Steinmetzgrund; The Pentagon Figure in Witzel's, Untersuchungen über gotische Proportionengesetze and the Use of Golden Section in Cologne Cathedral by Haase" in *Der Dom zu Köln am Rhein*.

includes $\sqrt{3}$, and the pentagon includes the Golden Section, which was a representation of many natural forms.¹⁷ These figures were, therefore, considered sacramental geometry.

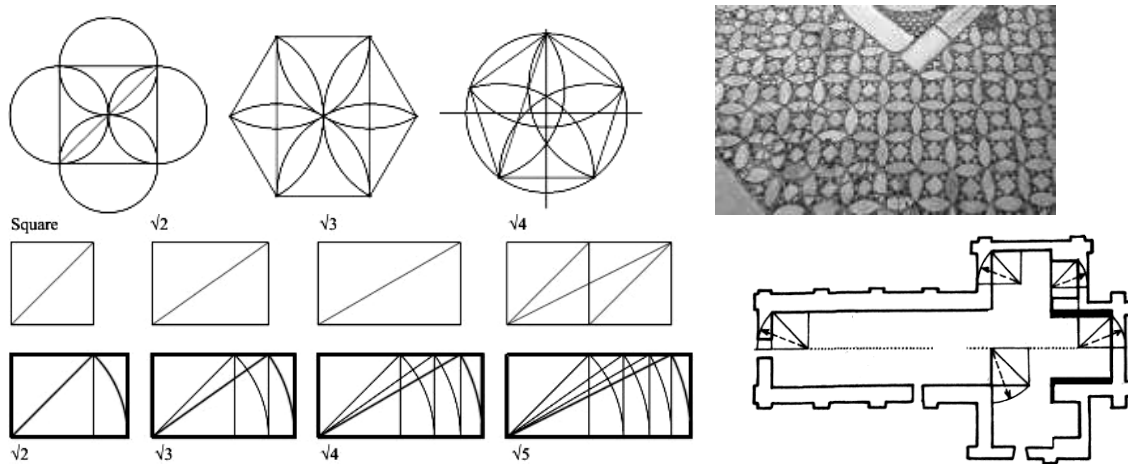


Figure 4: Proportional roots in Gothic architecture: (above left) the geometry of proportional roots based on the circle; (below left) $\sqrt{2}$, $\sqrt{3}$, and Golden Section, roots based on the diagonal of the square; (above right) the geometry of $\sqrt{2}$ in floor tiling at Spoleto's Duomo (below right) proportional roots based on the square. the use of $\sqrt{2}$ geometry to be included inside the wall-thickness in medieval churches, (right). Diagram: after Kinsella, *Thoughts on Medieval Architecture* (2013), <http://soffits.wordpress.com/>

The most mysterious ratio, however, was that between the diameter and the circumference of the circle, known as π . It can not be expressed neither as a root, nor as a ratio between roots, and unlike the square roots, it cannot be created geometrically except by drawing a circle. Such a number is called 'transcendental' and was regarded as truly divine.¹⁸

One further principle controlling the geometry of sacred buildings at this time was that of continuity. When any building was extended or altered it was essential that the geometry of the new work conforms geometrically with the existing work. If it did not, it would not receive divine protection from disasters.¹⁹

It was through *geometrical progression*, which was also originated from *ad quadratum* and the *ad triangulum* principles, that the geometry of a building was thought to receive this protection and be integrated with the geometry of God's universe. A geometrical progression exists when a

¹⁷ Dabbour, 2012, 380-391

¹⁸ Jorge Gracia, *The Transcendentals in the Middle Ages*, 1992: 113-120.

¹⁹ Dudley, 2001, Chap. 2:40.

series of shapes are consecutively related to one another by a common factor, such as square within square within square. It can extend in either direction, larger or smaller, to an infinite degree, to the dome of heaven and beyond. But, unlike arithmetical progression, it can never become a minus quantity or reduce to zero. For this reason, mediaeval theologians believed that it had the power to provide security from destructive forces.²⁰ This means that, on one hand, it has the power of integrating the building into the overall geometry of God's Universe, and on the other hand it has the "divine protection" of continuity, and the immunity from "destructive forces." So, it would have

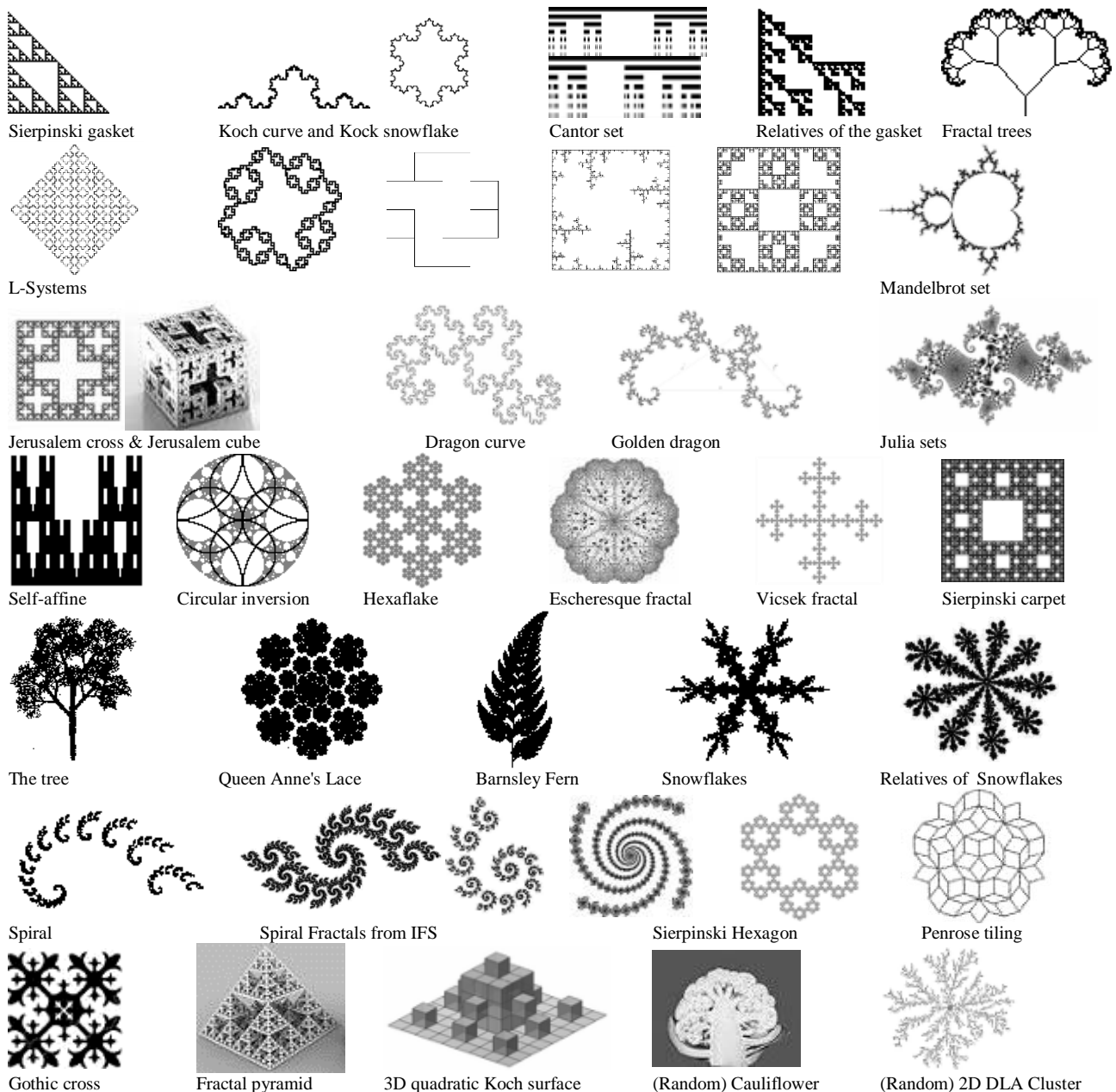


Figure 5: Examples of fractal shapes. Diagram: author.

²⁰ Dudley, 2001, Chap. 2: 41.

been, in the light of such ideas, that theologians, in cooperation with the geometers of Middle Ages, used these progressions as a binding tool to bring its overall geometry in a unified "protected" wholeness and in the same time integrate it into the divine geometry of the universe.

Geometrical progression, together with the tendency to follow the laws of Nature's language, were probably the leading forces behind the development of the other type of geometry, in which these two concepts are essential characteristics, which is *Fractal geometry*. Even though its principles, as they are understood today, were unknown; Gothic cathedrals are considered to be one of the best architectural representation of these principles.²¹

A Fractal is a pattern that repeats itself at different scales to an infinitely small/large scale; this is what mathematicians call *self-similarity* (**Figure 5**). In his book, *Fractals: Form, Chance and Dimension*, Mandelbrot coined the term *fractal* to describe these structures; he derived this term from the Latin *fractus*, defined as broken or shattered glass.²² Fractals are not produced by mere repetition of a shape; they are rather generated by the repetition of a process, which is applied to a shape. This process should be in a way or another related to geometrical progressions (**Figure: 6**), which enables it to extend, larger or smaller, to an infinite degree. In the study of fractals, geometric series often arise as the perimeter, area, or volume of a self-similar figure.²³ In addition to the geometrical progressions built-in in their structure, Fractals are also ideal for modeling Nature as they capture most of its vital qualities, i.e. roughness, self-similarity, intricate detail..., etc.

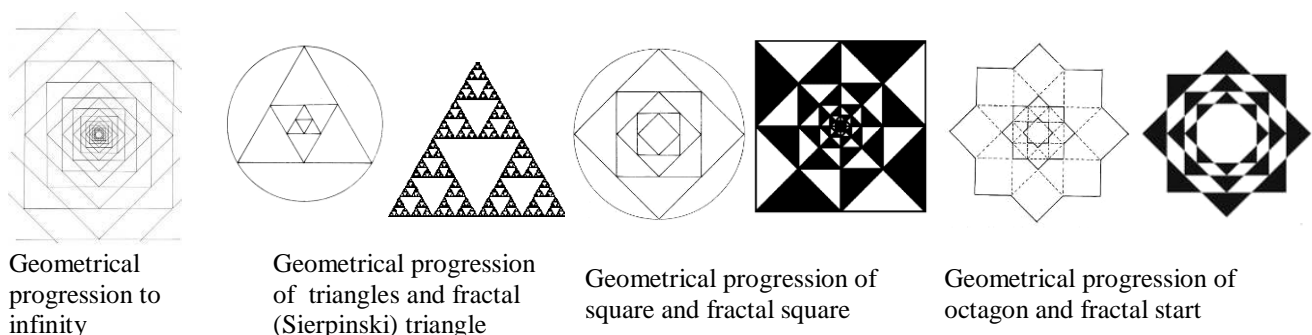


Figure 6: Fractal figures as repetition of geometrical progressions that may extend to infinity and never vanish. Diagram: author.

²¹ Good examples for fractals can also found in Hindu temples, Baroque, and Islamic styles.

²² Benoit Mandelbrot, *Fractals: Form, Chance and Dimension*, 1977: 17.

²³ Luiz Bevilacqua *et al.*, *Geometry, Dynamics and Fractals*, 2008: 11-21.

Fractal Cosmology relates to the usage or appearance of fractals in the study of the cosmos.²⁴ Almost anywhere one looks in the universe; there are fractals or fractal-like structures. Scientists claimed that even the human brain is optimized to process fractals, and in this sense, perception of fractals could be considered as more compatible with human cognitive system and more in tune with its functioning than Euclidian geometry. This is sometimes explained by referring to the fractal characteristics of the brain tissues,²⁵ and therefore it is sometimes claimed that Euclidean shapes are at variance with some of the mathematical preferences of human brains.²⁶ These theories might actually explain how Gothic artists intuitively produced fractal forms, even though they did not have the scientific basis to understand them.

Self-similarity in fractals might refer to: *a) strict self-similarity*, where every detail of the fractal is an exact copy of the whole structure, such as Sierpinski triangle (**Figure 6**); *b) quasi self-similarity*, where the substructure is recognized as being similar to the superstructure, but not in an exact mathematical way, as in Mandelbrot Set (**Figure 5**); and *c) statistical self-similarity*, where some statistical measure or trend is preserved over different scales of magnitude, such as in the random fractals.²⁷

In *The New Paradigm in Architecture*²⁸ and *The Architecture of the Jumping Universe*,²⁹ Charles Jencks argued that fractal architecture can provide an artistic interpretation of physical reality and thereby express the dynamic, creative and self-organizing universe. A strict mathematical definition of a fractal implies that its self-similarity stretches to infinity, which entails that, neither architecture nor anything else in this physical world, can be fractal. A possible alternative is to adopt a more liberal interpretation, where a structure is fractal when it shows a proper degree of self-similarity (5 - 6 hierarchical scales). So, a façade can be given a fractal

²⁴ Jonathan Dickau, *Fractal Cosmology*, 2009: 2103–2105.

²⁵ R.Taylor *et al.*, *Perceptual and Physiological Responses to the Visual Complexity of Fractal Patterns*, 2003, 89-114.

²⁶ Yannick Joye, *Fractal Architecture Could Be Good for You*, 2007, 311- 316.

²⁷ Heinz-Otto Peitgen *et al*, *Chaos and Fractals*, 1992, 55–66.

²⁸ Charles Jencks, *The New Paradigm in Architecture*, 2002.

²⁹ Charles Jencks, *The Architecture of the Jumping Universe*, 1997.

outlook, by repeating architectural details and elements on different scales. Eglash suggests that even a three-fold iteration can be enough to get the concept.³⁰

3. Analysis:

Before starting this analysis, it might be helpful to overview some qualifying comments about the regional differences in Gothic style.

The distinctive characteristic of French cathedrals is their height and their impression of verticality, while in English cathedrals the main internal emphasis was upon their extreme length. French cathedrals tend to be stylistically unified in appearance when compared with English cathedrals, where there is great diversity in almost every building and sometimes every part within the same building as it was not unusual for every part of the building, being built in a different century, to be built in a different style, with no attempt at creating a stylistic unity.

The east ends of French cathedrals are polygonal with ambulatory or chevette of radiating chapels, with slight or no projection of the transepts and subsidiary chapels, while English cathedrals sprawl across their sites, with double, strongly projecting, transepts. The west fronts of French cathedrals are highly consistent, having three portals surmounted by a rose window, and two large towers, where in English cathedrals the west front is usually not as significant, the usual congregational entrance being through a side porch. Their west windows are very large and almost never feature a rose window, which are reserved for the transept gables. The Gothic architecture of Central Europe generally follows the French formula, but the towers are much taller and are surmounted by enormous openwork spires.

The distinctive characteristic of Italian Gothic is the use of polychrome decoration, both externally as marble veneer on the brick façade and internally, where the arches are often made of alternating black and white segments. With the exception of Milan Cathedral which is Germanic in style, Italian cathedrals have few and widely spaced columns. The façades have projecting open

³⁰ Ron Eglash, *African Fractals: Modern Computing and Indigenous Design*, 1999: 3.

porches and ocular or wheel windows rather than roses, and they do not usually have a tower, where the crossing is usually surmounted by a dome.³¹

In the following, an analytical illustrative study is performed on examples of Gothic cathedrals showing the applications of both Euclidian and Fractal geometry in them. The analysis here does not aim at proving the Euclidian or the fractal characteristic of these buildings, which had been explored by many researchers before, such as Bork, Dudley Goldberger and others, but rather aims to find the context or logic, by which they were used, the setting in which they functioned, and the common link(s) or bridges that integrated them with each other.

3.1. Euclidian geometry in Gothic architecture:

In the following, geometry in Gothic architecture, as based on the essential harmonies of Nature, together with various symbolic meanings and theories of perfect proportions, will be reviewed. Man as the core of God's creation, who possesses the most perfect proportions that reflect the divine harmony of being, was the prominent feature of this architecture.

3.1.1. The Golden Mean:

The Golden Mean (or Ratio, or Section) is a proportional system, whereby two elements, or two segments of a line, not equal to each other are related in the formula: $a/b = (a+b)/a = 1.61803$. Some scholars argue that, until Pacioli's 1509 publication, the Golden Ratio was unknown. While others argued that Euclid, in his book *The Elements*, mentions it as: a line AB that is divided in *extreme and mean ratio* by C if $AB:AC = AC:CB$.³² Although he did not use the term, this shall be called the Golden Ratio.³³

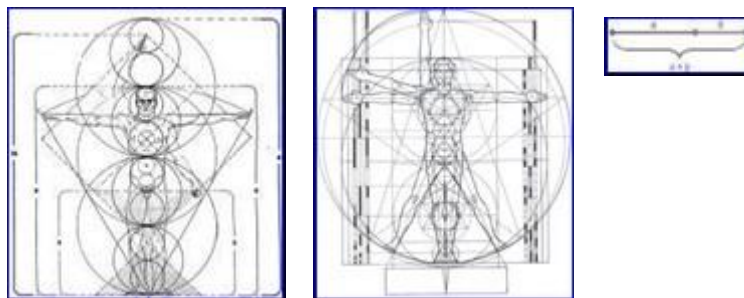
The Golden Mean is the most common proportional system used in architecture throughout history to mirror the divine proportion of the human canon as clearly exhibited in the Vitruvian Man around 1490 (**Figure 7**). These divine proportions were frequently applied to plans, sections or

³¹ Banister Fletcher, *A History of Architecture on the Comparative Method*, 1905: 420-421.

³² The definition appears in Book VI, but the construction is given in Book II, Theorem 11.

³³ Adolf Zeising, *Der goldene Schnitt*, 1884: 4; Max Livio, *Searching for the Golden Ratio*, 2003: 52-58.

Figure 7: Vitruvian man and the Golden Ratio. Diagrams: after Ernst Neufert, *Bauentwurfslehre* (1936), pp. 8-9.



elevations of Gothic cathedrals (**Figure 8-a, b**), to express the spiritual idea of the church as "the body of the Lord".³⁴ In Beauvais Cathedral for example, the height of choir in relation to the overall height of the cathedral is an approximation of the Golden Section as noted by Stephen Murray³⁵ and earlier with regard to a number of Gothic facades by Frederik Macody Lund in his 1919 book *Ad Quadratum*.³⁶

The mathematics of the Golden Ratio is related to the *Fibonacci Series*, which was first published in the 1202 book *Liber Abaci*. The rule governing this sequence is that the next number is the sum of the previous two numbers, as follows: 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, etc. If any number in this sequence is divided by the one before it, for example 144/89, or 89/55, the answer is always close to 1.61803.³⁷ The most famous visual expression of this series in Nature are the spiral shapes (**Figure 9-a**), which were frequently seen in Gothic art and architecture in reference to their cosmic significance (**Figure 9-b**).

³⁴ 1 Corinthians 12:12-14.

³⁵ Stephen Murray, *Plotting Gothic*, 2014: 1-14.

³⁶ All the lines that refer to their proportions are imaginary lines that hide behind the actual lines of the building. Walking through the plan of the cathedral or gazing at the actual lines of the facades, a normal beholder would never see any of these lines or any reflection of a human figure as seen in these figures. The domination of modular order is also to be realized in all these illustrations.

³⁷ Parmanand Singh, *The So-called Fibonacci numbers in ancient and medieval India*, 1985: 229-244.

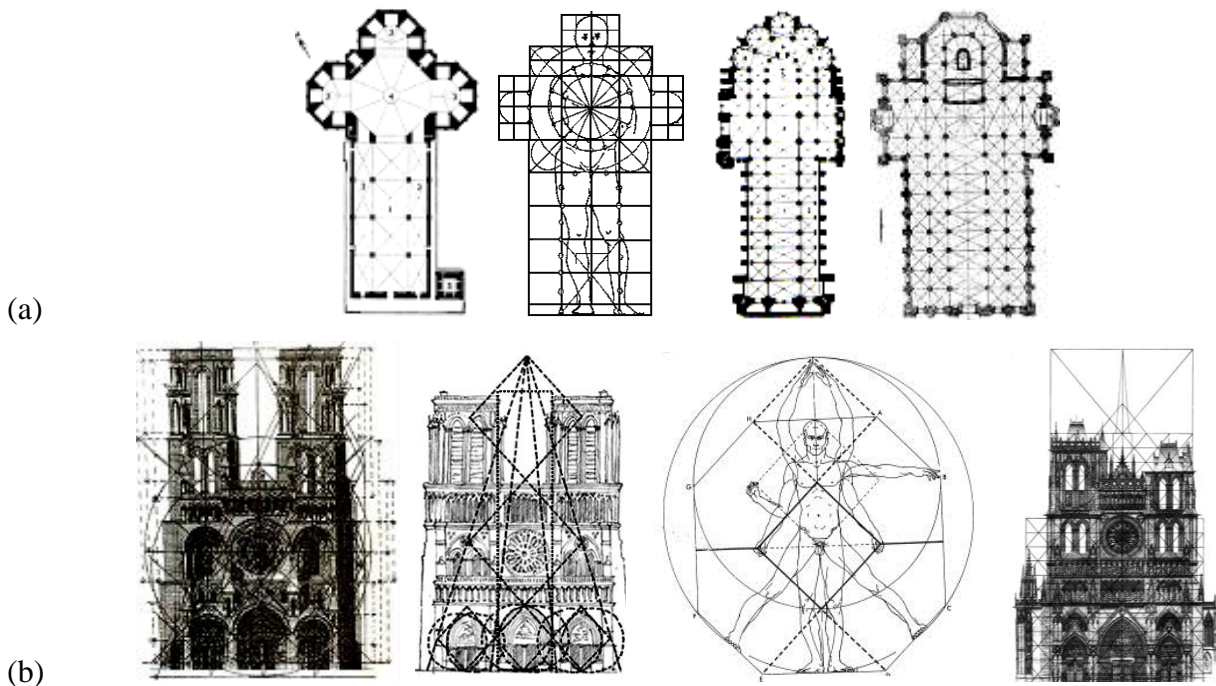


Figure 8: Human proportions in Gothic cathedrals (a): Human proportions and modular system in floor plans of Gothic cathedrals: (from left to right) Florence Cathedral, diagrammatic Latin cross plan based on the proportions of human body, Reims Cathedral, and Milan Cathedral. Figures: after Banister Fletcher, *A History of Architecture on the Comparative Method* (1905), p. 366, 409. (b): Human proportions as imaginary invisible lines with geometric progressions in the façades of Gothic cathedrals: (from left to right) Notre-Dame of Laon, Notre Dame of Paris, and Amiens Cathedrals. Figures: after Lund (1919), p. 48

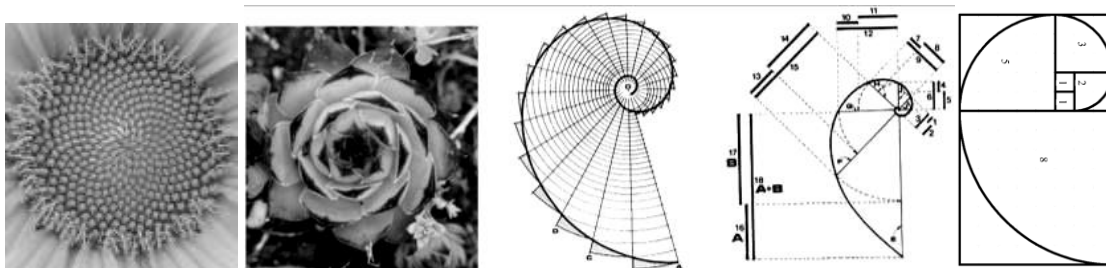


Figure 9-a: 'Fibonacci Series' geometric progression spirals in nature. Diagram: after Adolf Zeising, *Der goldene Schnitt* (1884), p. 220.

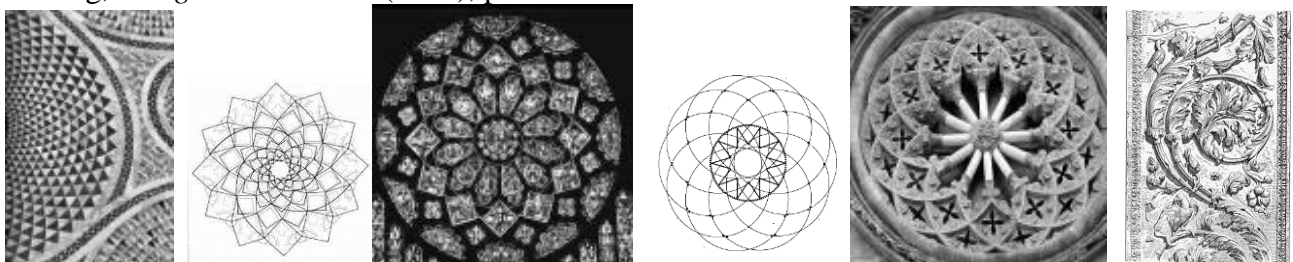


Figure 9-b: *Fibonacci Series* geometric progression and geometry of Nature and in Gothic architecture. (Left to right) *Cosmati* guilloche pattern from San Marco, Venice - Rose windows from Chartres Cathedral and San Francesco d'Assisi, Palermo - Carving on the pulpit in Strasbourg Cathedral. Drawing: after Thomas R. Smith, *Architecture* (1908), p. 172.

3.1.2. The Pentagram Star

In *The Elements*, Euclid presented some applications of the above-mentioned "extreme and mean ratio" such as the regular pentagon. He proved that the diagonals of the regular pentagon cut each other at this "extreme ratio,"³⁸ as illustrated in **Figure 10-a**. During the medieval era, the pentagram star was seen as the symbol of mankind. This idea was related to the ancient Secret Doctrine that "man is a star; an eternal soul that shines deep down beneath the physical, corporeal body."³⁹

Pentagram proportions were present in the designs of Gothic plans, section, and elevations (**Figure 10-b, c**). In Lincoln and Chartres Cathedrals, distances between pillars and the lengths of the nave, transepts, and the choir are all multiples of the Golden Mean.⁴⁰ The overall ground plan in both are based on the intersection of (invisible) two circles containing (also invisible) pentagram in a shape that was called the *Light Matrix*, or, *Ain Sof*, where Spirit (*light*) and Matter (*man*) come together (this is an oculist symbol like those in the book of Agrippa).⁴¹

On another hand, the *Sephiroth* or the *Tree of Life* is another symbolic configuration of ten spiritual principles, arranged in three columns that refer to: the nature of revealed divinity, the human soul, and the spiritual path of ascent by man. In medieval literature this symbol was developed into a depiction of the *Map of Creation*.⁴² This ten-point-symbol, associated with a twin or overlapping pentagrams, was frequently used as geometrical base of Gothic plans (**Figure 10-c**). Again, by looking at the figure, one can see that the lines representing these symbols do not appear as actual elements or walls in the body of the plan, but only as imaginary or working lines and points that enclose the building and bind its components together.

³⁸ Livio, 2003, 52-58.

³⁹ Heinrich Cornelius Agrippa, *De Occulta Philosophia Libri Tres*, (first published 1510) 1949, Book I: 11.

⁴⁰ Francis Bond, *Gothic Architecture in England*, 1906: 216.

⁴¹ Rabbi Krakovsky, *Kabbalah - The Light of Redemption*, 1970: 19.

⁴² Krakovsky, 1970: 19; and Agrippa, 1949, Book III, 10.

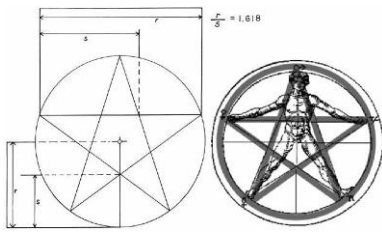


Figure 10-a: Pentagram star as a representation of Euclid's extreme ratio and a symbol of Mankind.

Figure: after Agrippa (1949), p. 11



Figure 10-b: Pentagram star in Gothic façades: (left) Rose window in Exeter Cathedral, (middle) side window in Amiens Cathedral, and (right) carving from the baptismery of the St. John Cathedral, Šibenik, Croatia. Photos: author.

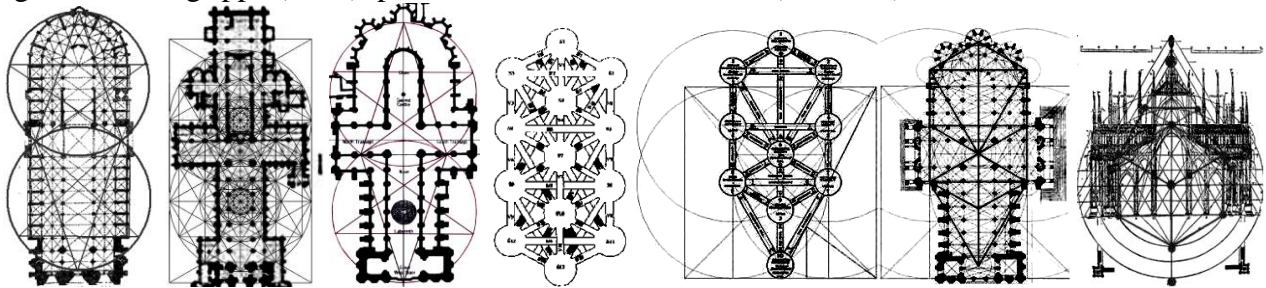


Figure 10- c: Pentagram proportions as invisible working lines in Gothic cathedrals: (left) plans of Notre Dame of Paris and Lincoln Cathedrals, (middle) plan of Chartres Cathedral and its relationship to both the *Light-Matrix* and the *Tree of Life* (both related to the pentagram and the Vesica Pisces), and (right) section of Milan Cathedral showing its relation with both the pentagram and the *Tree of Life*. Diagrams: after (left to right) author, <https://aftermathnews.wordpress.com>, and http://www.bibliotecapleyades.net/cienciareal/cienciareal_ritualcathedral.htm, <http://www.pinterest.com/emmatuzz/south-france-mysteries/>, and Frankl (1945). p. 46, 60.

3.1.3. The Octagon:

Designs based on the octagon are used to create the so-called $\sqrt{2}$ system of proportion. This is because the diagonal of a unit square is $\sqrt{2}$ units in length (**Figure 11**). In Euclidian geometry, it is created by the intersection of two squares in the Sacred Cut or the intersection of nine circles revolving around a fixed center of the Octagon Rosette.⁴³ The relationship between octagons and their circumscribing circles appears frequently in Gothic drawings, especially when "octature" is seen alongside "quadrature" as one of the foremost proportioning strategies of the era (**Figure 12**).⁴⁴

⁴³ Philibert De l'Orme, *Le Premier Tome De L'architecture*, 1567: Pl. 18.

⁴⁴ Bork, 2011, 11.

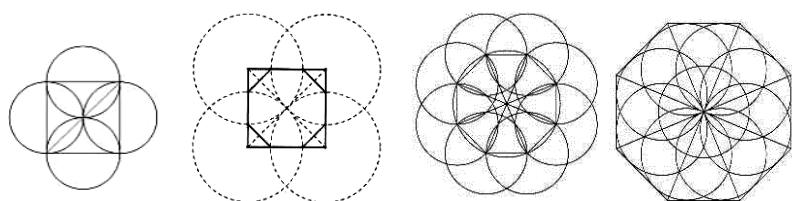


Figure 11: $\sqrt{2}$ system and geometric *rotational* progression in the Sacred Cut and the Octagon Rosette. Diagrams after De l'Orme (1567), pl. 18; and Drunvalo Melchizedek, *The ancient secret of the flower of life* (2000), p. 13.

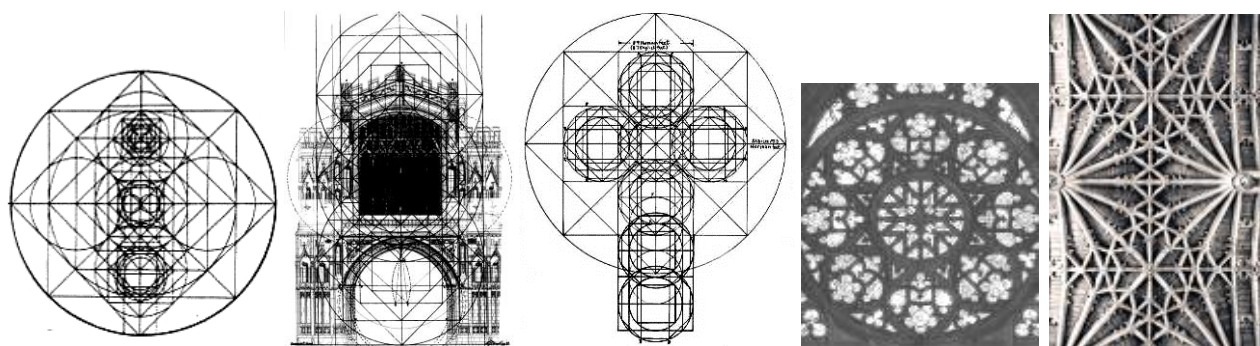


Figure 12: Octagons in Gothic architecture: (a) as invisible working lines with geometric progressions and constant module in the nave, plan and elevation of Peterborough Cathedral. Diagrams after Colin Dudley, *By Craft of Ewclyde* (2001) p. 151, 164, (b), as a center of rose window in St. Vitus Cathedra, Prague, and octature-quadrature proportions in the ribs of the vaulting at Oxford Cathedral. Photos: author.

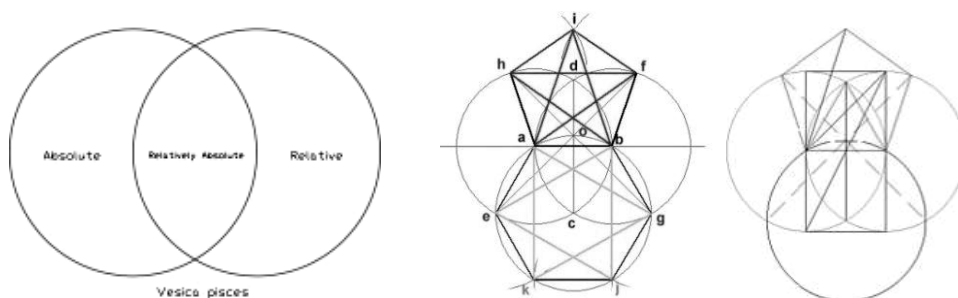


Figure 13-a: Vesica Pisces in Gothic architecture: Relatively Absolute, proportional roots and Golden Mean within the *Vesica Pisces*. Diagrams after De l'Orme (1567), pl. 13.

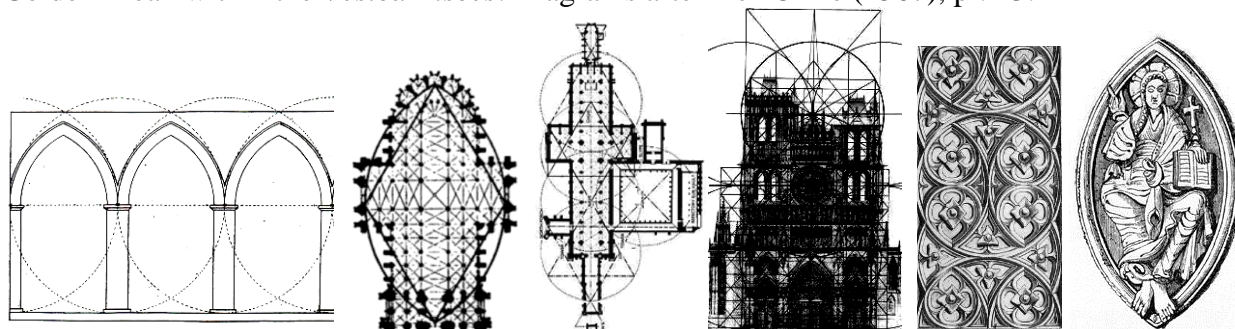


Figure 13-b: Vesica Pisces in the working lines of Gothic architecture: (left to right) the geometry of Gothic pointed arches, plan of Beauvais Cathedral, and Glastonbury Cathedral (<http://www.ancient-wisdom.co.uk/sacredgeometry.htm>), façade of in Amiens Cathedral. Photo: after Lawlor (1979), p. 95; wooden tracery and tympanum icon from Ely Cathedral after Matthew Bloxam, *The Principles of Gothic Ecclesiastical Architecture, Elucidated by Question and Answer* (1882), p. 82.

3.1.4. Vesica Pisces

Vesica Pisces was one of the key starting blocks of sacred geometry throughout the history of the Europe art and architecture. It is the intersection of two circles with the same radius in such a way that the centre of each circle lies on the perimeter of the other and was derived from Euclid's Elements Book 1 Prop 1. The name literally means the 'fish's bladder' in Latin. It represented the symbolic relationship between the absolute and the relative by two overlapped circles. The realm enclosed within this overlap is the '*Relatively Absolute*' and within this realm, the primary proportional roots, i.e., $\sqrt{2}$, $\sqrt{3}$, and $\sqrt{5}$, as well as the Golden Mean, are all present.⁴⁵ By intersecting it with another circle, an equilateral triangle, a hexagon, a pentagon, a square and so on, may be drawn (**Figure 13-a**). As the interlocking/underlying structure between the Pentagram (Man) and the Hexagram (Star of David) it was regarded as a template of the *Demiurgic Science of Creation & Manifestation*.⁴⁶

The Vesica Pisces was frequently used as proportioning system in Gothic architecture as illustrated in Cesare Cesariano 1521 book *The Rule of the German Architects*. This appears in the proportions of the exquisite arches of Gothic architecture that capture the celestial proportions and anchor it into the terrestrial realms. The common rhombus floor in churches and variations of carving and ornaments are also based on the Vesica Pisces proportions. It was also associated with the Christian common symbol of the fish, upon which the geometry of some cathedrals were based (**Figure. 13-b**).



Figure 14-a: The primary circle of the Seed of Life, the six days of Creation, and the geometrical progression of Golden Ratio nested in the figure's evolution (Diagram after Richards, <http://www.goldenspiralresearch.co.uk/geometry.html>), denoting wholeness, completion, unity and infinity.

⁴⁵ Dabbour, 2012, 380-391.

⁴⁶ Gnosticism presents a distinction between the highest, unknowable God and the *demiurgic* creator of the material. In various ancient belief, mainly Platonism and Gnosticism, this is a deity responsible for the creation of the physical universe. The precise nature and character of the Demiurge however varies from a benign architect of matter in some, to the personification of evil in others.

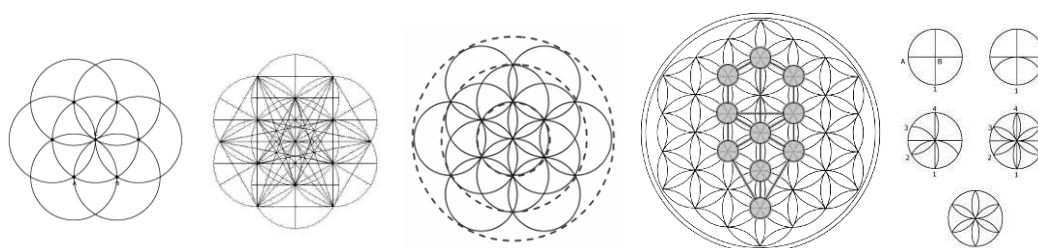
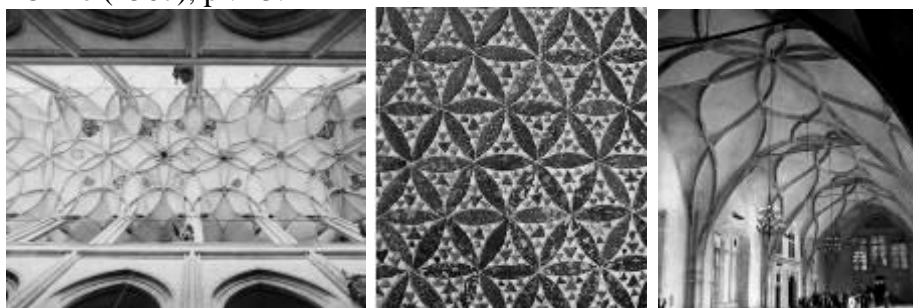


Figure 14-b: The Seed of Life and its associate figures (language of Nature): (left to right) the Seed of Life, the Golden Mean, the Flower of Life (with another geometrical progression in its structure illustrated by imaginary dotted-lines), the Tree of Life and proportional roots. Diagrams after De l'Orme (1567), pl. 13.



Lierne vault in St. Barbara Cathedral, Czech Republic' Westminster Abbey vault at Vladislav hall, Prague

The hidden geometry of medieval framing .Diagrams after De l'Orme (1567), pl. 13.

Figure 14-c: The Seed of Life in Gothic architecture. Photos: author.

3.1.5. Seed of Life or Circle of Unity:

The hexagon is formed in Euclidian geometry from seven circles revolving around a fixed centre in six-fold symmetry, forming a pattern of circles and lenses that is called the Circle of Unity or the Seed of Life (**Figure 14**). In Christian tradition it is a symbol that supposed to depict the six days of Creation (**Figure 14-a**). Further multiplications of the shape produce the symbolic figures of the Flower of Life and Tree of Life (**Figure 14-b**). These grids, in addition to the Fibonacci (geometrical) sequence nested in its structure (**Figure 14-a**), are able to keep repeating themselves to infinity inward and outward in a continuous geometrical progression because a circle around the whole drawing would simply be the central circle of a still larger grid (**Figure 14-b**).⁴⁷

This pattern was used in Gothic vaults, evident in those created by lierne ribs. Robert Willis in *On the Construction of Vaults of the Middle Ages*,⁴⁸ also overviews some Gothic vaulting

⁴⁷ Drunvalo Melchizedek, *The ancient secret of the flower of life*, 2000: 15

⁴⁸ Robert Willis, *On the Construction of Vaults of the Middle Ages*, 1910.

techniques as originally illustrated by Philibert De l'Orme,⁴⁹ Francois Derand⁵⁰ and others. Here, he explains how medieval builders used only such revolving circles (as invisible working lines) to geometrize Gothic vaulting (**Figure 14-c**).

3.1.6. Results:

Looking at **Figures 3, 8, 10, 12, 13**, the following common characteristics are evident:

- (a) The overall design of plans and elevations begins always with one or two **circles** that embrace the building and from which all the other lines start to unfold. Nonetheless, a normal worshiper, who visited the church every week, **would never see this circle**, or any of the other circles and lines unfolding from it, because these are imaginary lines that do not actually appear in the body of the building. The purpose of these circles was not to be seen, but to make the buildings, as discussed in the previous section, belong to Heaven.
- (b) **Figures 8 to 14** illustrate the idea of continuity through an extensive use of **geometrical progressions**, in both visible (in **Figures 9, 14**) and invisible formats (in the rest of the figures).
- (c) The proportional and geometrical lines and ratios that were employed in these buildings were believed to be included in, or representative of, the **geometry of Nature**, while also reflection symbolic spiritual connotations.
- (d) Yet, these lines and ratios are **neither visible nor perceivable** for the medieval layman. Unlike, for example, the façade of the Parthenon, in which the employment of the Golden Ratio is easy to recognize in the actual, continues lines of the columns and the entablature, in these churches, such as in Notre-Dame of Laon (**Figure 8-b**), it is only by drawing a complicated mesh of imaginary lines all over the façade, that one can recognize the role of this ratio in its design. Even the symbolic meaning of these ratios was to be realized only by theologians and clergymen. These lines and ratios were, therefore, probably meant to be a sort of sacramental geometry that addresses the eye

⁴⁹ *Le Premier Tome De L'architecture*, 1567.

⁵⁰ *L'architecture des voutes*, 1643.

that can see the "invisible" working lines and comprehend the "unperceivable" ratios in common between the building and Nature and their connotations; this is the eye of the Creator.

3.2. Fractals in Gothic Architecture

In order to understand the fractal character of Gothic style, it is important to note that architects sometimes use a "module" as main organizational element (**Figure 15**). In this regard, Konrad Hecht noted that Gothic designers worked almost exclusively in modular fashion.⁵¹

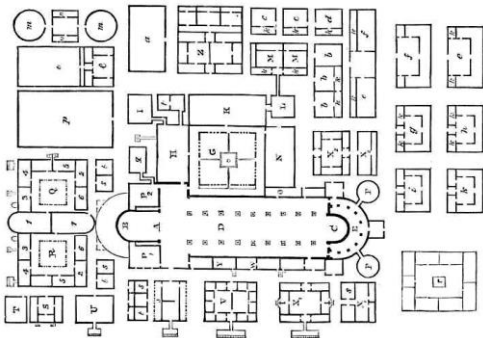


Figure 15: *Module* in the plan of St Gall Switzerland. Figure after Fletcher (1905), p. 261.

The medieval designers aimed to enrich every constructive feature and to embody within the decorative detail the greatest possible amount of allegory and symbolism. Its texture reveals rich set of designs progressing from large to small scale, with ever-increasing intricacy exactly as in fractal elements. An example of this similitude is shown in (**Figure 16**), where the scaling over several levels in both Mandelbrot set⁵² and the exterior of Milan cathedral is illustrated.

3.2.1. Fractals in Gothic Plans:

The most important characteristic of Gothic plans was the apsidal termination of the choir, forming single or double ambulatory or chevet. Looking at the examples in (**Figure 17-a**), the fractal character of chevets and their resemblance with the fractal shape of *Koch Curve*⁵³ are immediately recognized. The moldings found in the cathedrals, too, had similar shapes. This

⁵¹ Konrad Hecht, *Maß und Zahl in der gotischen Baukunst*, 1979, 334–361.

⁵² A set of complex numbers 'c' for which the sequence $(c, c^2 + c, (c^2+c)^2 + c, ((c^2+c)^2+c)^2 + c, (((c^2+c)^2+c)^2+c)^2 + c, \dots)$ does not approach infinity.

⁵³ A mathematical curve that starts with an equilateral triangle, then recursively altering each line segment.

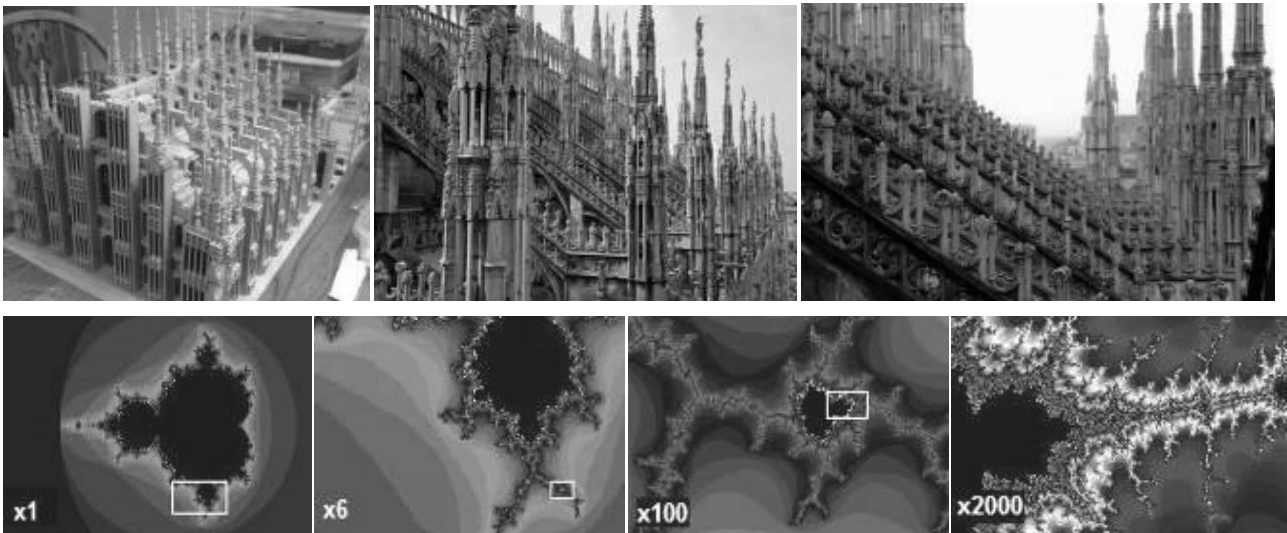
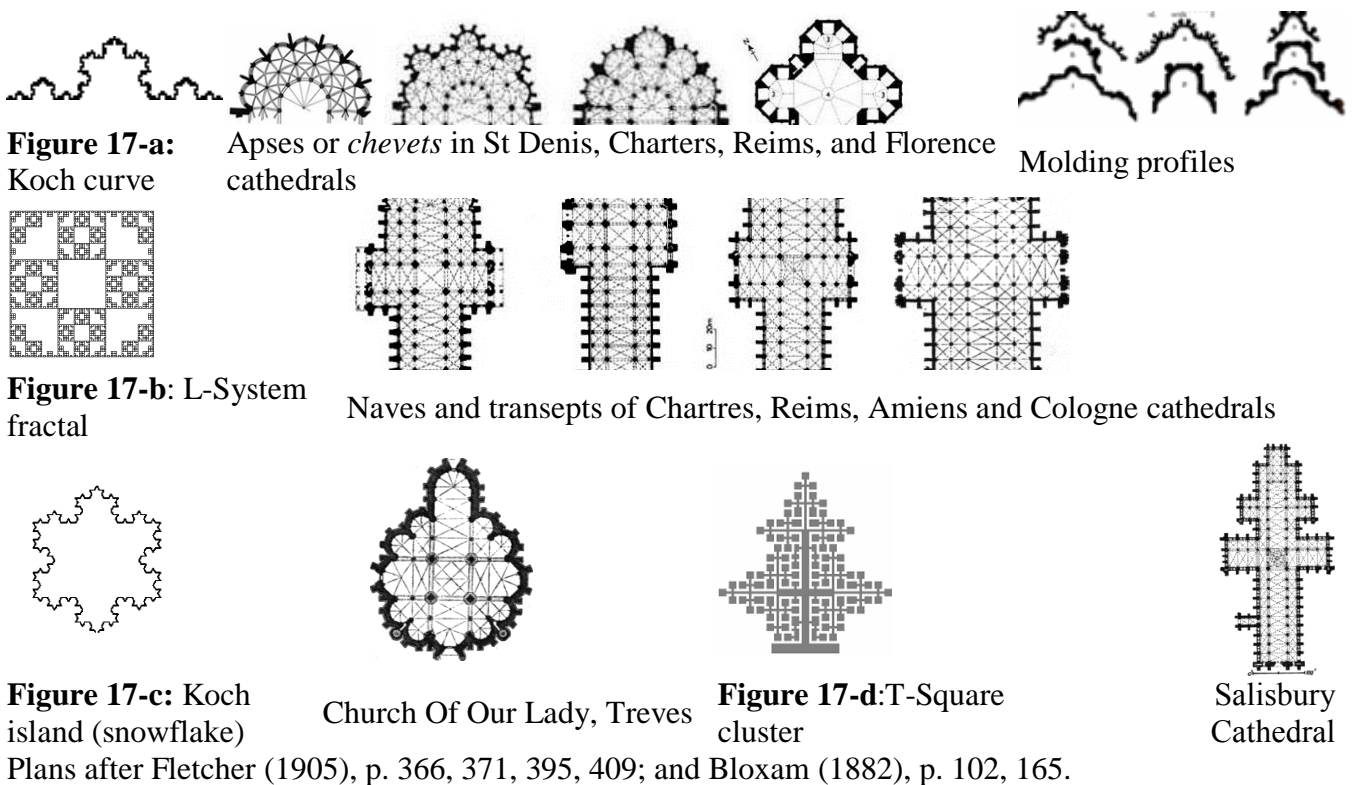


Figure 16: Milan cathedral (above) and Mandelbrot set (below): as one zooms in on the images at finer and finer scales, more patterns appear in an infinitely complex texture. Figures of Mandelbrot set after <http://en.wikipedia.org/wiki/File:Mandelbrot-similar-x6.jpg>. Photos of Milan cathedral: author.

characteristic was further emphasized in the plan of the Church Of Our Lady, Treves, which seems to have been produced by doubling this arrangement on both sides of the transverse axis, in an arrangement that recalls the *Koch Island*.⁵⁴ (Figure. 17-c)



⁵⁴ A shape based on the multiplication of the Koch curve.

Another attribute of Gothic models was the multiplication of chapels, where lateral chapels were built at each bay of the side aisles, flanking the nave as well as the choir in fractal-like arrangements (**Figure 17- b**) that follow the L-System model of fractals.⁵⁵ In English cathedrals, the choir had a square termination with secondary transepts with arms of different dimensions symmetrically clustered around the main rectangular. These arms consist of further miniatures, and their corners are filled in with smaller chapels and niches in another fractal-like arrangement (**Figure 17-d**).

An obvious disadvantage of fractal ground plans is that the fractal design is barely visible to the viewer. More conceivable applications may be fractal patterns on tiling. The pattern known as a Cosmatesque or Cosmati (**Figure 18**), which is a style of geometric decorative inlay stonework, was typical of medieval Italy and which later spread throughout Europe.⁵⁶ Interlaced circular patterns known as Guilloche are the focal points of a Cosmati pavement and the polygonal patterns were used to fill up empty spaces inside and between successive interlocking circular shapes (geometrical progressions) with fractal-like patterns. Here, unlike the previously discussed applications of Euclidian geometry in plans, fractal patterns in plans are visibly reflected in the form of: actual walls/components in the body of the building (**Figure 17-a, c, d**), modular rhythm in the space (**Figure 17-b**), and geometrical patterns in tiles (**Figure 18**).



Figure 18 Fractals and geometrical progressions in Cosmatesque pattern: (left) Sierpinski's triangles inside circles: pavement of Santa Maria Cathedral, Trastevere, Italy; (right) double Guilloche filled with fractal details, San Cesareo Cathedral, Terracina, Italy. Photo: author.

⁵⁵ A model that describe the behavior of plant cells and the growth processes of plant development.

⁵⁶ "Cosmati" Russell Sturgis, *A Dictionary of Architecture and Building*, 1901, 691.

3.2.2. Fractals in Gothic Exteriors:

Even more comprehensible are certainly the three-dimensional applications of fractals, or *Arkhitektoiniki*, where the largest component of a building is surrounded with a cascade of smaller and smaller copies.⁵⁷ The same concept is seen in almost all Gothic exteriors (**Figure 19**).

Goldberger states "Fractals capture several key features of Gothic architecture; its carved-out appearance, its wrinkled crenellated surfaces, and its overall self-similarity ... From a distance, the sharp spires are the dominant feature. Closer proximity reveals that these spires are not smooth, but have spiny, outgrowths. Yet closer inspection reveals even more pointed detail superimposed on these ornaments."⁵⁸

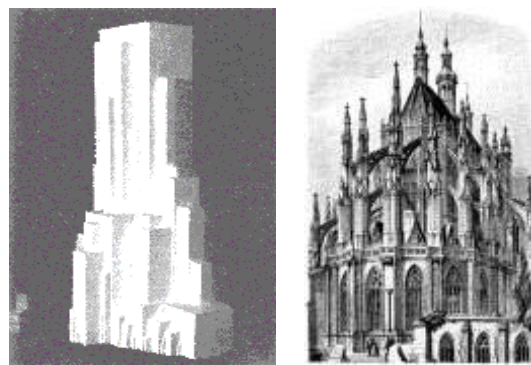


Figure 19: Scaling over several levels: (left) *Arkhitektoiniki* architecture, (right) St. Barbara, Kuttenberg. Photo: Smith, (1908), p. 100.

In the 15th-century booklet of Matthäus Roriczer, the design of Gothic spires or pinnacles is discussed as a process that bears Euclidian order, modular system and geometrical progression. He notes that it starts with a square (Euclidian), rotating a square within it, and then rotating another square within that (geometrical progression). Then these modules are *pulled up* into the third dimension in a process that he calls "Auszug" which means to "extract" it.⁵⁹ These technical processes (all were done in imaginary lines) are then "dressed" in a fractal outfit as in (**Figure 20**), which shows the different logic and context, by which each type of geometry was used.

⁵⁷ Miroslav Novak, *Emergent Nature: Patterns, Growth and Scaling in the Sciences*, 2001: 280.

⁵⁸ Al Goldberger, *Fractals and the Birth of Gothic*, 1996, 99-104.

⁵⁹ Robert Bork, *Gothic Architecture, Geometry, and the Aesthetics of Transcendence*, 2012
(<http://www.uni.edu/universitas/article/gothic-architecture-geometry-and-aesthetics-transcendence>)

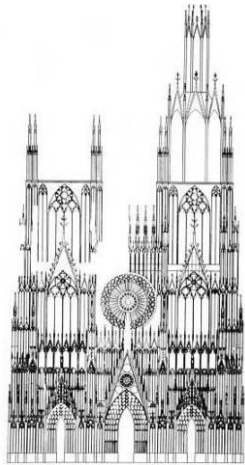


Figure 20-a

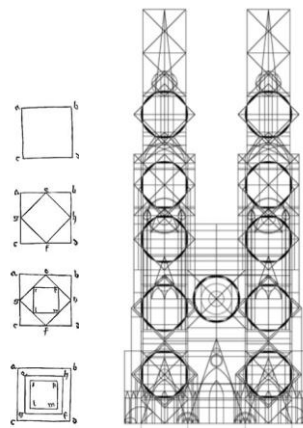
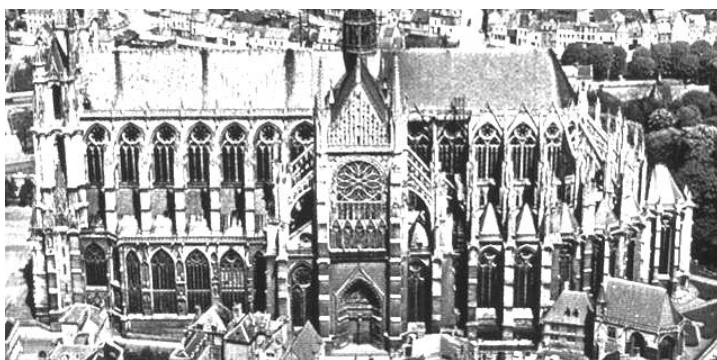
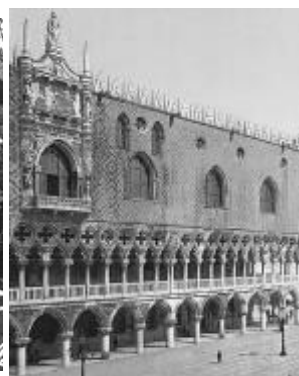


Figure 20-b

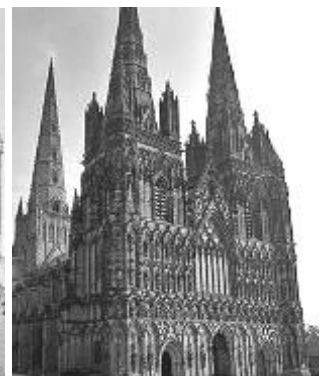
Fractal/Euclidian characteristics in Gothic façades: In (a) fractal order is expressed in the façade of Strasbourg Cathedral in actual visible settings and elements, while in (b) elements of Euclidian geometry are shown in the stages of Gothic spire design according to Roriczer by imaginary lines. It shows also the modular division of the spire's parts (*right*) and the use of geometrical progression (*left*). Figures after Bork, *Gothic Architecture, Geometry, and the Aesthetics of Transcendence* (2012), <http://www.uni.edu/universitas/article/gothic-architecture-geometry-and-aesthetics-transcendence>; and Matthäus Roriczer, *Das Büchlein von der Fialen Gerechtigkeit und die Geometria deutsch* (1490), p. 11.



Amiens Cathedral



Doge's Palace, Venice



Lichfield Cathedral

Figure 21: Fractal repetition, modularity and continuity in Gothic exteriors. Photos: author.

Further visualizations of fractal order in Gothic exteriors are shown in (**Figure 21**). In the Gothic cathedrals of France, and central Europe in general, the shape of the main portal recurs on a smaller scale in the two side portals, or in smaller versions in the different arched windows, which are sometimes divided into smaller parts. The contours of the portals are then repeated inwardly,

surrounded by a wealth of details. The complexity of façades is further increased by the mere repetition of arches, buttresses, spires set in different scales in a combination of complexity and order.

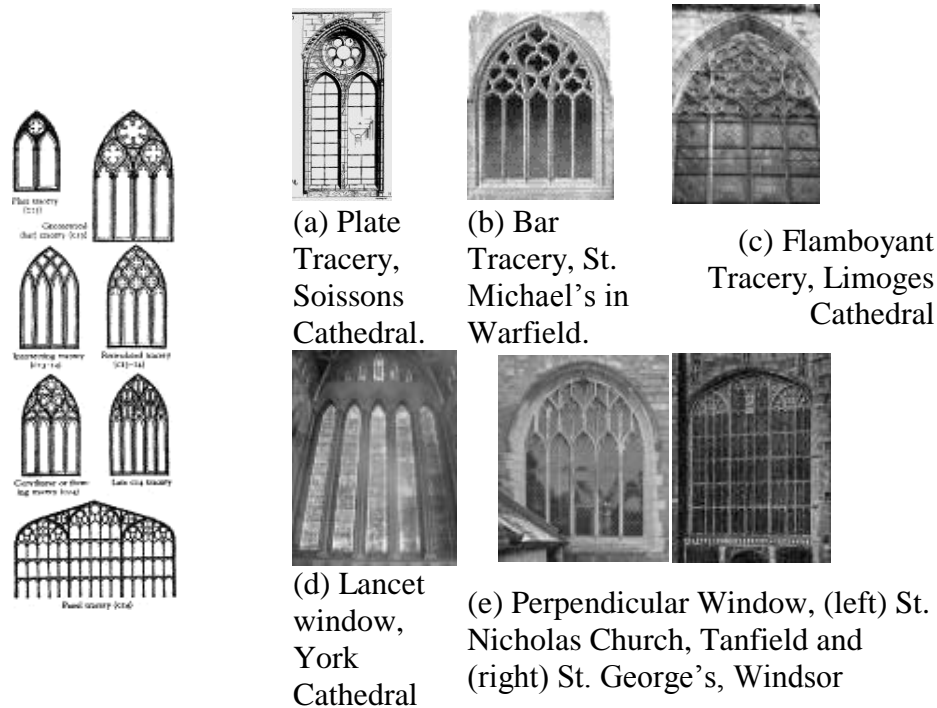


Figure 22: Fractals in Gothic windows and tracery: (left) General patterns of different Gothic panels (right) examples of different styles. Photos: author.

As for windows, a Gothic window is usually an arch sub-divided by two arches, each of which might be made of two still smaller arches and so on in another fractal-like structure (**Figure 22**). Traceries⁶⁰ of interlocked arches were developed in several styles in Gothic architecture to strengthen windows against the pressure of wind. In its earlier forms, tracery consisted merely of decorative openings pierced through slabs of stone (plate-tracery), filling the window-heads over coupled windows (**Figure 22-a**). Later on, the stonework was made lighter and richly molded (bar-tracery) (**Figure 22-b**). These patterns were then abandoned for more flowing and capricious (Flamboyant) tracery (**Figure 22-c**). In England, during the Early English Period (1200– 1300) *lancet windows* were tall, narrow and generally grouped by twos or threes (**Figure 22-d**). In the

⁶⁰ A *tracery* is the ornamental intersecting work in the upper part of a window, screen or panel, or used decoratively in blank arches and vaults.

later Perpendicular Style (**Figure 22-e**) the mullions were carried through to the top of the arch and intersected by horizontal transoms that were developed later into larger and more-detailed forms.



Figure 23: The resemblance between cusping in Gothic architecture and different stages of Koch Curve. Photos: author.

Cusping (**Figure 23**) was another type of Gothic decoration that was used for decorating arches or circles by triangular projections on their inner edge in a fractal-like repetition all over the facades.

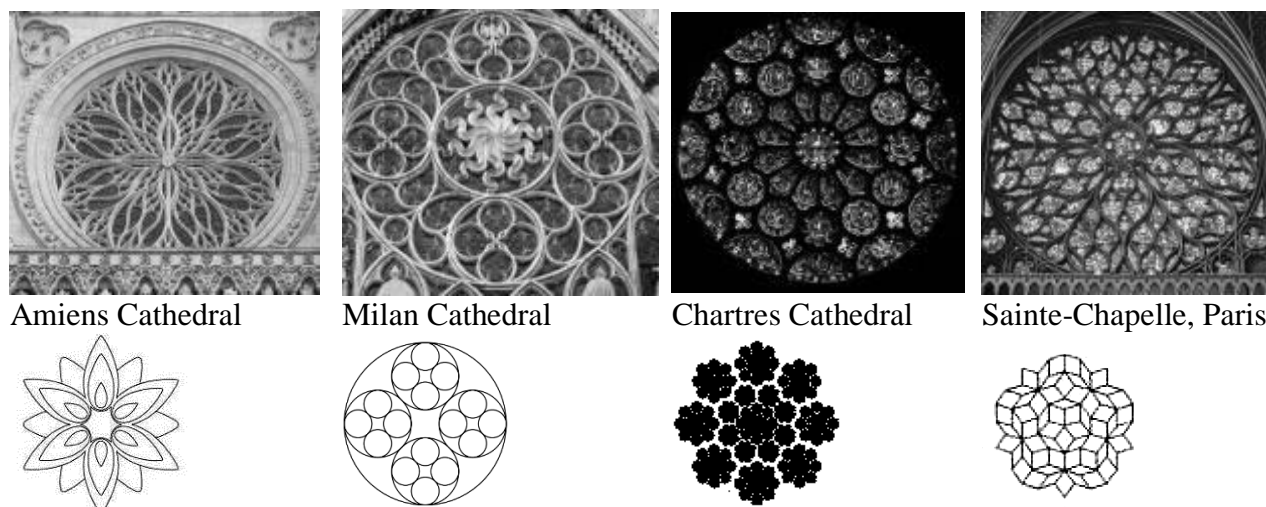


Figure 24: Fractal patterns, language of Nature and geometric progressions in Gothic rose windows. Photos: author.

Fractal components of Gothic cathedrals also speak from the rose windows (**Figure 24**). They all depict an overall circular form, in which fractal-like shapes are inscribed. Around this circle, further circles of varying sizes (geometrical progression) are usually placed, and some of these contain more fractal-like patterns.

3.2.3. Fractals in Gothic Interiors:

The properties of fractal hierarchical self similarity is also evident in the interiors of Gothic buildings, where all the verticals (arches, windows, moldings, etc.) are repeated on different scales,

within the same bay and then in the adjacent bays all around (**Figure 25 –a, b**). Even the structural system of Gothic cathedral shows fractal-like skeleton of arches, vaults and buttresses (**Figure 25-c**).

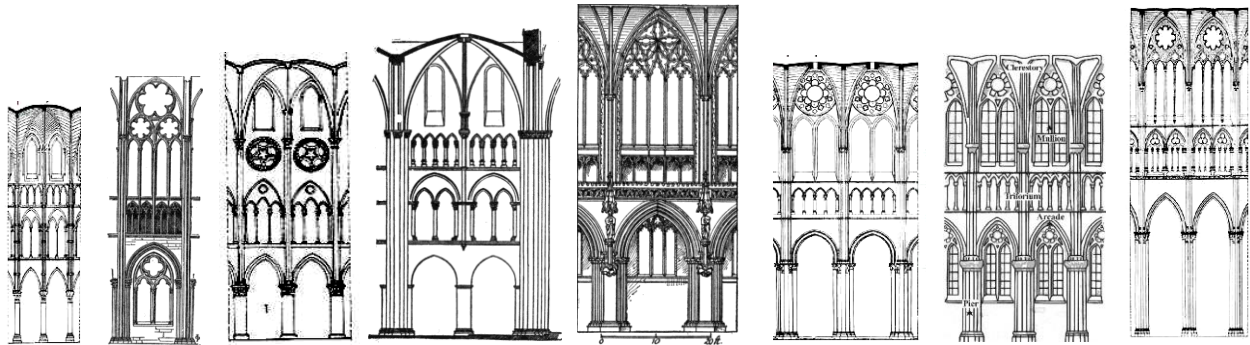


Figure 25-a: One bay at Laon, St. Denis, Notre Dame, St. George in Limburg and Lichfield cathedrals

Figure 25-b: Two bays at Charters, Reims and Amiens, cathedrals

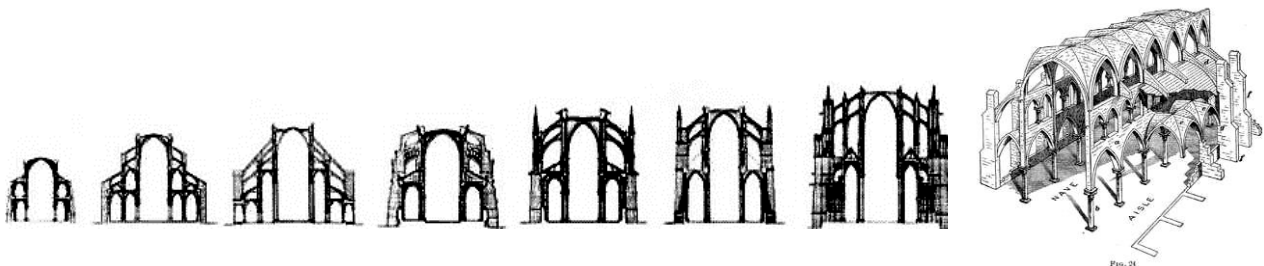


Figure 25-c: Fractal-like structure in Gothic cathedrals: (left) cross sections in Laon, Notre Dame, Bourges, Charters, Reims, Amiens, and Beauvais cathedrals (right) typical Gothic structure Figures after Fletcher (1905), p. 366, 395; Smith, (1908), p. 81, 94; Bloxam (1882), p. 44, and Charles Jencks, “Architecture Becomes Music,” (2013) (<http://www.architectural-review.com/essays/architecture-becomes-music/8647050.article>)

In this structure, shafts and supports sweep unbroken from floor to ceiling to meet the ribs of the vaults, like a tall tree spreading into branches, in one of the most common fractal patterns (**Figure 26**). By springing a large number of ribs from each point of support, the vaulting treatment took different shapes and techniques. At first, intermediate ribs, known as tiercerons (**Figure 26-a**), were introduced between the transverse and diagonal ribs. An increase and elaboration of the tiercerons led to a new set of ribs known as Stellar (from star) *or* Lierne (from the French *lien*), which means to bind or hold (**Figure 26-b**). These vaults led, by a succession of trials and phases, to a shape of vaulting known as fan, palm or conoidal vaulting (**Figure 26-c**) that was especially popular in England.⁶¹

⁶¹ Fletcher, 1905, 335-41.

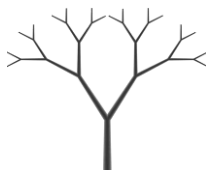
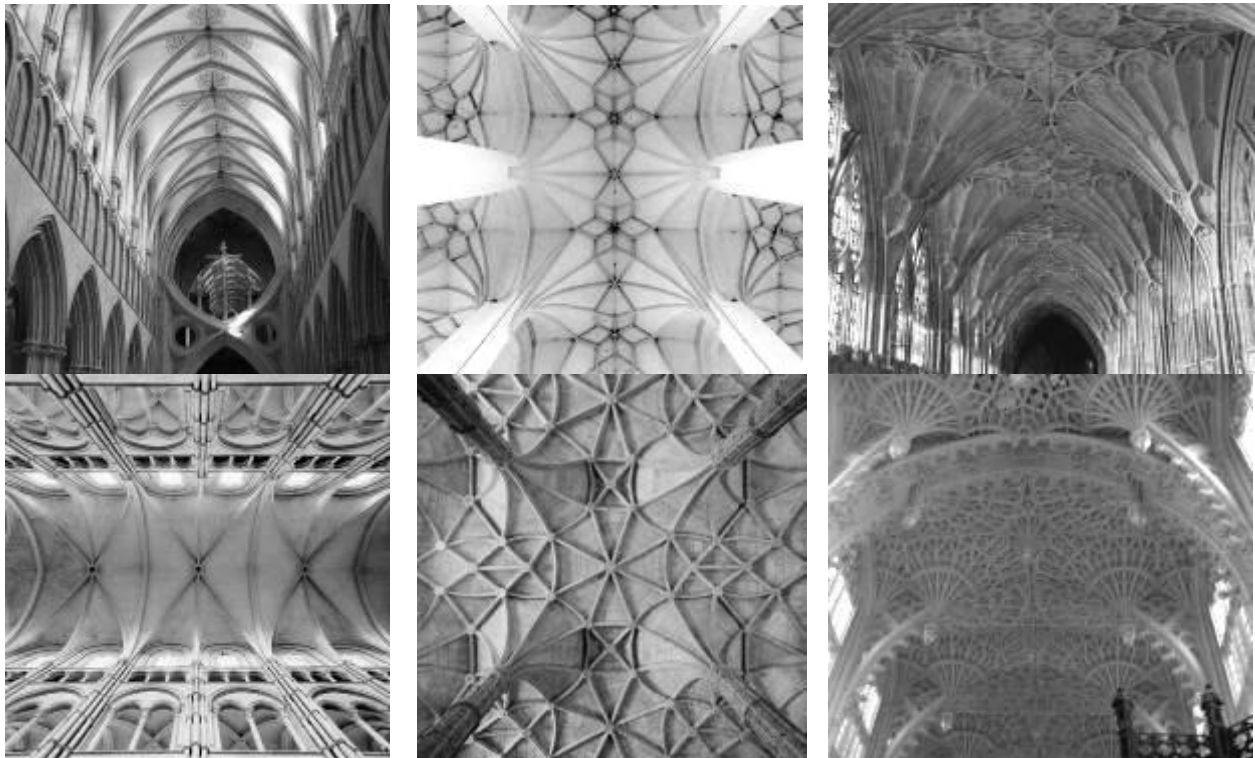


Figure 26-a: Shapes of Gothic vaults as variations of fractal trees (language of Nature): Ribbed vaulting: (above) Wales Cathedral, England and (below) Laon Cathedral, France.

Photos: author.

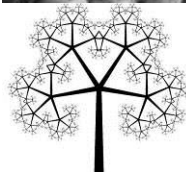


Figure 26-b: Shapes of Gothic vaults as variations of fractal trees (language of Nature): Lierne ribs: (above) Church of Hieronymite Monastery, Portugal and (below) Frauenkirche, Munich, Germany.



Figure 26-c: Shapes of Gothic vaults as variations of fractal trees (language of Nature): fan-vaulting: (above) Gloucester Cathedral, England and (below) Chapel of Henry VII, Westminster, England.

3.2.4. Results:

From the discussions above, as illustrated by **figures 17 to 26**, it is to realize that **no imaginary or working lines were needed** to grasp the fractal patterns on the plans, façades and structural elements of these buildings (as it was the case with the *ad quadratum* and *ad triangulum* Euclidian geometry in part 3.1), **nor are there any more symbolic indications**, but rather direct visual expression. In these examples, fractal orders and patterns were used to vividly visualize the language of Nature (its laws, shapes, and patterns) through a wide spectrum of visual expressions including: Cosmatesque or Cosmati tiles on plans; Arkhitektoiniki scaling, trceries, cusping, rose windows, etc. on façades, as well as hierarchical growth and variations of fractal branching

structures in the interiors of the vaulting systems, which allowed a visual dialogue to be established with these elements at each inch of the building. **Modular rhythm, qualities of Nature, and extensive use of geometrical progressions** were also common features demonstrated in these elements and self-evident in fractal structures in general.

4. Discussion

From the discussions, the figures, and the results of part 3.1, it had been shown that Euclidian geometry in Gothic architecture was not merely a drawing tool, but rather a high art explored by people of the highest intelligence and greatest abilities working in a period of religious intensity. The analyses and the examples in this part show that Gothic architecture developed under strict geometric rules that was based on the architect's understanding of natural forms, geometric principles and mathematical ratios that were thought to be the dominant ratios of the Universe. As such, **the viewer was not meant to be a mere observer; but rather a recipient of the force and metaphysics that was intended to be embedded in the cathedral through this geometry.** Analytical illustrations in the previous section (particularly **Figures 8, 9, 14, 24 and 26**) show that in both cases: Euclidian applications and fractal applications, geometry aimed at reproducing forms and patterns that are present in Nature, which was considered to be the **underpinning language of the Universe**. Medieval theologians believed that God spoke through these forms and it is through such forms that they should appeal to him, thus Nature became the principal book that made the *Absolute Truth* visible. So, even when they applied the abstract Euclidian geometry, the Golden Mean and the proportional roots, which they found in the proportions of living forms, governed their works.

In doing this, Gothic designers distinguished between the abstract proportional lines of plans and elevations (form language), and the ornamental patterns on walls, ceiling, openings, and pavements (pattern language). As shown in 3.1.6 and 3.2.4., only the latter was meant to be directly perceived by human beings, while the former was largely hidden from view and incomprehensible by the beholder. Not only due to their nature, as imaginary working lines, but also because in a

time, when a good many people were illiterate, it is hard to think that the proportional systems of the surds or the Golden Mean were expected to be realized by the eye of the worshipers, neither were their connotations, such as the Light-Matrix or the tree of life known to them, even though their pleasing influence must have been unconsciously sensed. Therefore, it is likely that these lines were not aimed at beauty, though they often arrived at it, but were rather related to a certain internal logic of the building or to a symbolic or metaphorical expression that aimed to address the eye that may comprehend this symbolic system with its invisible lines, complex ratios, and theological connotations; this is the eye of Heaven.

To answer the question of how these theological concepts had been conveyed to the masons, it should be emphasized here that during the Middle Ages, the monasteries and convents were the main centers of instruction, and the clergy were the guardians of treasuries of civilization. Beside teaching religion, they were the masters of science, literature, diplomacy, and all kinds of art including the art of war.⁶²

In his book, *The Gothic Enterprise: A Guide to Understanding the Medieval Cathedral*, Robert Scott explores the various factors that shaped cathedral construction process. Scott delves into historical, social, political, and theological causes and concludes that cathedrals were fundamentally a product of the religious mindset of the various social classes of that time period. Scott gives a perfect example of this in recounting Abbot Sugar's theological vision for the Abbey Church of St. Denis in France, which was the initial model of Gothic style.

At this time, the bishops and priests did not take for granted that God would inhabit any church building; they strove to make the cathedral mirror their concept of heaven as much as possible, so that it becomes entitled to God's presence. Therefore, filling the cathedral with bountiful light and constructing it according to the heavenly geometrical design were major priorities. Scott says, "In essence, new structures and forms were invented to solve problems created by theological purposes," he adds then that "Because the designers were trying to reconstruct an

⁶² Ben Crenshaw, *The Gothic Cathedral as a Product of the Religious Medieval Mind*, 2009: 12-13.

imitation of heaven according to the clerical understanding of heaven, the cathedral was a model of symmetry, perfect geometric proportions, and repeated patterns and volumes." Scott explains in some depth that since the designers and masons, who oversaw the building projects, had been educated in religious schools, they would have been well-versed in these concepts and eager to implement them in their work. ⁶³

On the other hand, the applications of Fractal geometry (part 3.2) were much more visible, comprehensible and related to human scale, erasing the difference in scale between the huge structures and the human scale and establishing a visual dialogue that externalizes the laws of Nature to the eye of the beholders. Spires and pinnacles emphasize the sense of upward thrust, while leafy crockets and other foliate patterns literalize the organic growth metaphor and reproduced the patterns of Nature in another language that was easily realized by the human eye. These notions are summarized in **Table 1**, which illustrates the different logic and contexts in which each of these two types of geometry was employed. In his study of the geometric proportioning strategies in Gothic Architecture, Robert Bork supports this idea when he demonstrates how geometric manipulation was responsible for the placement of decoration, such as string courses and crockets, as a cross-over point between the large scale and the more visible. ⁶⁴

From the results in 3.1.6 and 3.2.4, one can conclude that three basic elements were the bridges that linked these two types of geometry to each other: (a) modular order, (b) the language of Nature, and (c) geometrical progressions.

Context	Euclidian geometry	Fractal geometry
Language	Form language	Pattern Language
Terminologies	Proportional ratios of Nature	Floral, foliage and ornamental details
Dialogue	Symbolic expression	Visual expression

⁶³ Robert Scott, *The Gothic Enterprise*, 2003: 166-168.

⁶⁴ Robert Bork, "Dynamic Unfolding and the Conventions of Procedure," 2014. <http://journal.eahn.org/articles/10.5334/ah.bq>

Setting	The overall structure of the building: plans, elevations, structural elements on a huge scale	Ornaments and details: spires, stone carving, vaulting ribs, windows, tailings on human scale
Lines	Working imaginary lines that do not refer to walls or actual elements	Actual lines representing walls and visible architectural elements

Table 1: A comparison between the contexts in which each type of geometry was used

5. Conclusion:

The new science of complexity and Chaos theories are leading architects now into a new era of scientific design, where science will serve to create the technology, while art will provide the spirit. This paper shows that the pleasant atmosphere of Gothic cathedrals was not an outcome of a mere design process that aimed at creating beautiful buildings, but rather at reproducing the geometry and proportions of Nature, which theologians and master masons thought to be the divine language of the Universe. In these buildings Euclidian geometry was used to symbolize the cosmic order of the Universe for the eye of Heaven, whereas Fractal geometry was used to visualize this order for the eye of the worshipers.

As seen in the analysis and results in part 3, the overall geometry of the building was based on Euclidian geometry, where a mesh of proportional and working lines were not meant to be built into walls or actual element, but acted like reinforcing steel-mesh within the concrete slabs of a modern building. These lines were neither visible, as they were not actually built into walls or structural elements. They were not comprehensible to the normal viewer, as they reflected complex geometrical ratios. Nonetheless, they determined where visible elements, such as outer walls, piers, ornaments, were placed. The symbolic connotations of these ratios, which were always related in a way or another to cosmological issues, were also unknown out of the circles of theologians and clergymen. Because of this, it is likely that the purpose of this geometrical structure was essentially to sanctify the building by integrating it geometrically with divine geometry; thereby making the building receptive to divine grace and preserving it from the destructive forces of evil. That this geometry produces proportions that were pleasing to the human eye is due to the inherent integrity

of the Euclidean geometry and that the proportions of Nature are fundamental to the sensation of beauty. This mesh of reinforcement was then enclosed by a beautifully ornamented envelop of Fractal geometry that visualized this language of Nature in a glorious variety of visual expressions.

From the results in 3.1.6 and 3.2.4, it is also to conclude that there are three basic design strategies that worked as the bridges, by which these two kinds of geometry were thought to become integrated with each other (and with that of the Heaven); these are: (a) modular order, (b) the language of Nature, and (c) geometrical progressions:

(a) *Geometrical Progression*, which sets up a geometry that extends outward to the limits of the Heavens and inward to the smallest particle, but never vanishes. This characteristic is self evidently built-in in fractal patterns. Through its system of scaling down, it brought these huge buildings down to the size of people. On the other hand, the discussions in part 3.1 and the illustrations in **Figure 3** and **Figures 8–14** show the extensive use of such progressions in the Euclidian *ad quadratum* and the *ad triangulum* geometries of these buildings.

(b) It is important here to also refer to the module as main organizational element that was used by Gothic designers, who worked "almost exclusively in modular fashion."⁶⁵ The geometry governing the architecture created with the aid of modules remains Euclidean, but they were so organized to allow a fractal organization/hierarchy in these buildings.

(c) The tendency to follow the laws of Nature's language and copy its geometry was another linking bridge; the **unintentional adoption** of fractal repetition is evidence of this fact. It was believed that God spoke through these forms and it was through these forms that people should appeal to him. Architects, who worked within this tradition, may well have been aware of this awe-inspiring concept, though none of them would ever have read one word of Euclid, neither did they know

⁶⁵ Hecht, 1979.

anything about the recently discovered principles of Fractal geometry. Thus, it is likely to refer here to an "unintentional" use of it that was adopted from what was seen as the **geometry of Nature**.

From the results in 3.1.6 and 3.2.4 and the discussion in part 4, as summarized in table 1, the paper concludes that the language of Nature was interpreted in Gothic Cathedrals into two types of architectural expression, symbolic language of form and visual language of patterns. Euclidian geometry was used to compose a form language, using invisible proportional lines that were meant to address the eye of the Heaven through its symbolic expression, while fractal patterns were used to reproduce the principles of Nature in a more visual expression that was fully integrated into the overall Euclidian structure via geometrical progressions, modular order, and the tendency to express the language of Nature.

This visual dialogue, that directly addresses the human's fundamental sensation of beauty, certainly played a role in endowing Gothic cathedrals with this pleasant effect and helped make their huge dimensions more acceptable to human scale. It is also still able to inspire contemporary architects an innovative approach to insert their own legacy and metaphors into their buildings through science and geometry. 🐼

Abstract: As new trends in architecture tend to depend upon scientific rules rather than stylistic dictates, they tend to pursue to duplicate the positive, pleasant feelings of the great historical buildings, without copying, neither their form nor their style. Geometry, which was traditionally considered the sacred language of Nature ever since the classical times, played an important role in these styles. This paper aims at analyzing the geometric principles of Gothic architecture from the perspective of the originators, where geometry, with its related metaphysics, acted as the vocabulary underpinning both form and pattern languages. The paper tries to find the context and the settings, in which two different kinds of geometry were employed in this style; Euclidian geometry, as form language, and Fractal geometry, as pattern language, as well as find the bridge(s) that linked them. In this, it comes to a conclusion that the Gothic cathedral, with its unlimited scale, yet very detailed, structure, was an externalization of a dual language that was meant to address human cognition through its details, while at the same time send appeals of protection to Heaven through the overall structure, using what was thought to be the language of the Universe; geometry.

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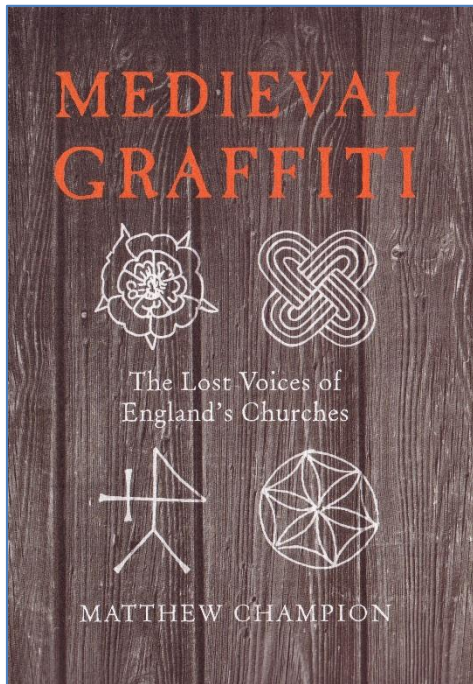
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Book Review: Matthew Champion, Medieval Graffiti: The Lost Voices of England's Churches (London, Ebury Press), 2015, 253 pages.

By William Anderson, University of Melbourne

As an undergraduate student in Norwich, I spent many days exploring the city's medieval fabric – roaming its sinuous streets and alleys, seeking out its flint-encrusted churches, and searching its hidden and obscure corners. I went on missions to find the chapel of St William on Mousehold Heath; to gain admittance to Jurnet's House, the twelfth-century Jews' house on King Street; and to access as much of Norwich Cathedral and its close as I could. Walking up from the railway station, I always took a detour along the River Wensum, passing Pulls Ferry, where there are remnants of a canal dug to transport stone shipped from France right up to the building site of the cathedral. The feat of bringing vast quantities of stone such a distance at the end of the eleventh century amazed me.

The imported Caen limestone was used to clad the cathedral's flint and mortar core and to form its innovative architectural features. Inside, the cream-coloured stone is worked into a stunning arrangement of columns, capitals and arches. But the fine-grained masonry was not only a medium for master craftsmen commissioned by Norman bigwigs: it was a canvas for generations of townspeople who engraved letters, symbols and illustrations into its surface. On the piers and panels of the crossing, nave and ambulatory are hundreds of

markings – shallow scrawls and scratchings, accurately rendered geometric patterns and accomplished representations of ships, animals and human figures

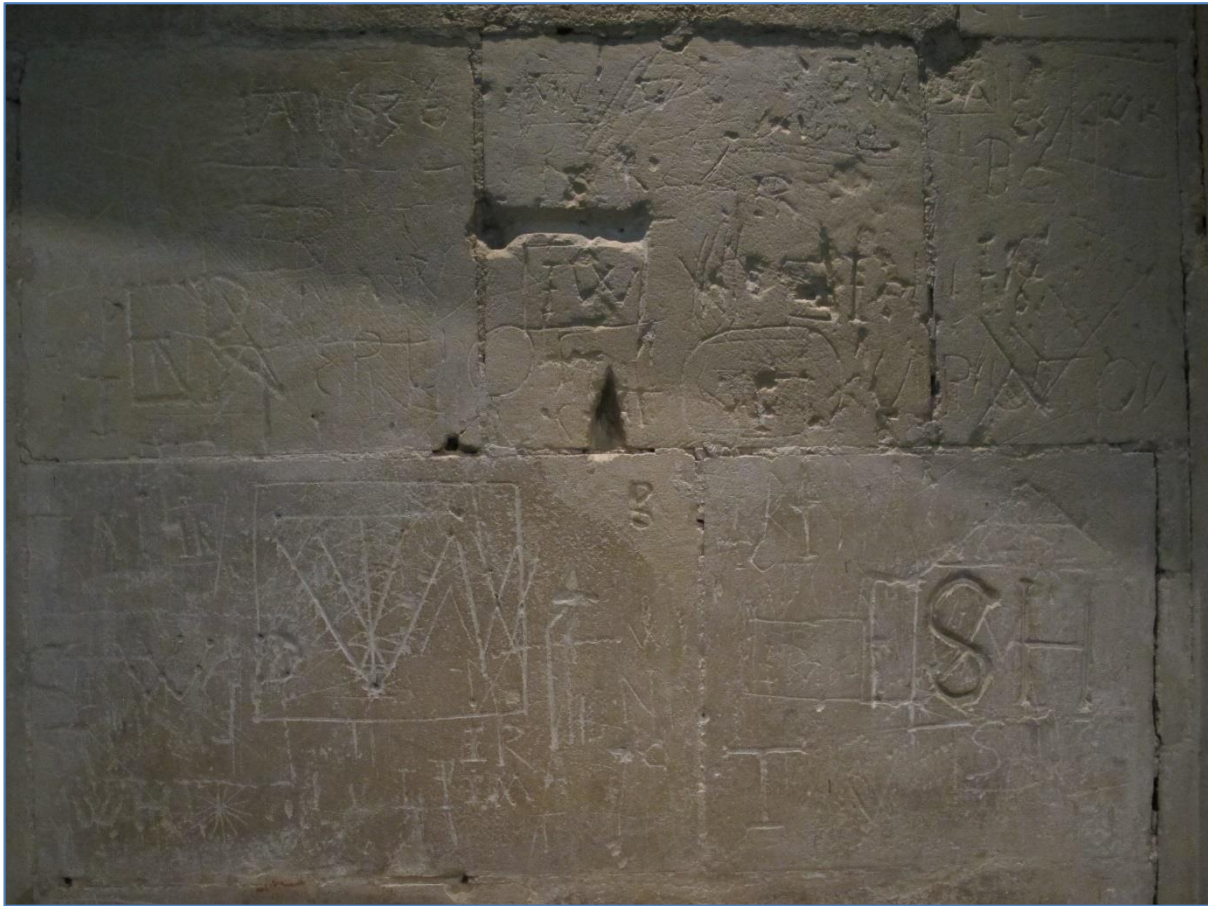


Figure 1 Heavily inscribed wall, Norwich Cathedral. Photo: William Anderson.

Matthew Champion, in his book on medieval graffiti, is unapologetic for privileging East Anglia as a primary source of evidence. He reports that over 5,000 separate markings have been recorded in Norwich Cathedral alone. Suffolk and Norfolk were among the most populous regions of medieval England; they have a high concentration of parish churches and a corresponding proliferation of graffiti. Within the counties there are trends peculiar to specific localities, for example, the maritime subjects in the parish churches of Glaven port on the north Norfolk coast. Incised into the red-coated piers of St Nicholas church at Blakeney “dozens of examples of ship graffiti ... would have looked like a small white fleet sailing across a deep red-ochre sea.”

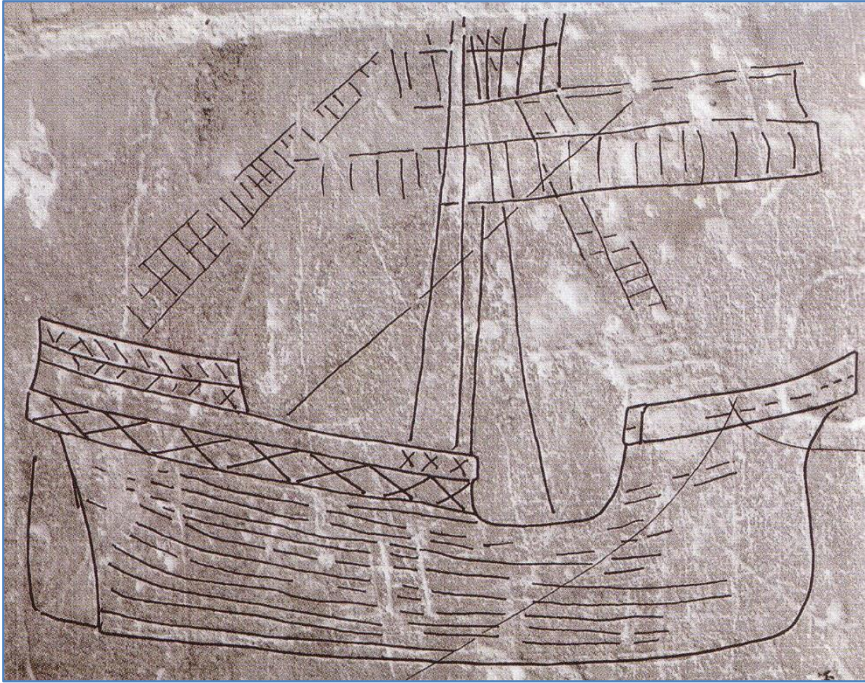


Figure 2 Late-medieval ship graffiti, Norwich Cathedral. Photo: Matthew Champion.

Despite the East Anglian slant, Champion draws on examples from churches throughout England. This synthesis of evidence collected from hundreds of sites and incorporating the results of recent surveys is among the first of its kind, most previous scholarship being confined to individual churches or localities. Chronologically, the book's scope deals mainly with the high and later medieval periods, though continues beyond the Reformation of the mid-sixteenth century. Certain ritual signs of the medieval period persisted even into the nineteenth century, although the Reformation did bring about substantial changes in the content of graffiti, which “becomes more territorial and memorial in nature.”

The term “graffiti” is here used in a very broad sense, denoting a variety of markings with an even greater range of functions and meanings. Despite superficial similarities, medieval graffiti is not analogous to modern-day “tagging.” Unlike today's criminalized “graffers,” those carving marks into medieval churches were not regarded as vandals. Church authorities seem to have tolerated the practice, clerics themselves left markings, and graffiti tended to be retained rather than erased. Moreover, the line between the rituals that were

acceptable and unacceptable to the Church was hazy: the beliefs expressed in some graffiti appear far removed from orthodox Christianity. So inscribing the walls of churches was a distinctive phenomenon that relates to the world-views of medieval people. That is not to discount universal aspects of marking symbols and images into stone. Seen from a global perspective, medieval graffiti might even be conceived as “rock art” (indeed, designs such as circles, swastikas and hand outlines appear in many unrelated cultural contexts). Yet, with the wealth of supporting evidence – textual, architectural, pictorial and artefactual – these markings can be situated specifically in the realm of English medieval beliefs, customs and society.

Geometric symbols identified as apotropaic, also known as ritual protection marks or “witch marks,” are among the most ubiquitous. Of these, compass-drawn, circular designs – the daisy wheel and hexfoil – are especially common. Their protective force works on the principle that evil spirits would be trapped within the shape’s “endless line.” The pentangle, a five-pointed star, is another motif that offered protection against evil spirits. Unusually, this symbol’s meaning is historically attested – in a digressive passage in the Middle English poem *Sir Gawain and the Green Knight*. But other symbols remain enigmatic and their meaning was probably mutable in different historical and geographical settings. Especially prevalent is the “VV” motif, of which there are multitudes in Norfolk churches. Its connection with the Virgin Mary has been posited, but the sign’s continued use in post-medieval times and in situations with no apparent relationship to Marian worship, make this one possibility among many.

Through telling and re-telling, myths and misconceptions have grown around certain motifs and their meanings. In seeking more rigorous explanation, Champion critiques a number of enduring tales, for example that compass-drawn designs were made by master masons or that these designs represent the sites of consecration crosses. It is not that these

explanations might be true in some cases, but that they are essentialist and so overshadow more-complex or multifaceted interpretation. Dismissing the notion that carved crosses were the work of pilgrims, Champion takes aim at the “ancient vicars and antiquarians [who] had simply found a story that explained the existence of the graffiti, put it forward as one possible interpretation, and, with no other obvious or documented answer coming forth, it has become regarded as fact as the decades and centuries have passed.” The same might be said for many customary explanations in archaeology, and it is refreshing to see these being deconstructed in an intelligent and undogmatic manner.

How, then, can we explain this mark-making habit? Some carvings have a relatively clear, functional purpose, for example, masons’ marks and architectural designs. Less obvious are the numerous repeated symbols which we may regard as “ritual.” But modern distinctions between the symbolic and the practical simply did not exist in the medieval mind. The potential power of a mark inscribed in a consecrated church was very real. Nevertheless, it remains possible to attribute protective, commemorative and even vengeful meanings to certain graffiti. In this sense, the markings materialize people’s beliefs, literally setting in stone their aspirations, anxieties and prayers which would have been communicated in speech, or would simply be swirling around inside their heads.

Whether the subject matter is identified as ritual, astrological, heraldic or the “professional” marks of masons and merchants, definitive explanation is rarely possible. Even inscriptions with an apparently obvious function raise problems of interpretation. Mass dials, for example, appear in locations and at a frequency that calls into question their use for timekeeping. Usually we can simply offer a number of plausible interpretations, although some are more convincing than others. One of Champion’s central arguments is that by inscribing marks into the fabric of the church their power was enhanced and that the intentions of the marker were made permanent. The specific, architectural context is therefore

essential.

The location of particular signs within churches offers tantalizing clues about their meaning and the intentions and identity of their makers. Hexfoils frequently appear on fonts, both as part of the original decorative scheme and as informal graffiti, and this suggests a connection with baptism. Champion proposes that some of these were made by women, not only because of the association with childbirth and infants, but because the designs would often have been made with shears, a common female accoutrement in the late Middle Ages. But, as always, this is not the only way to explain the design. Hexfoils also occur on parish chests, where the important documents and valuables of the parish were kept under lock and key, and so in these cases they served a different protective purpose. Another spatial trend is the frequency of crosses on doorways and porches. Despite being a seemingly peripheral part of the church, the porch was used for wedding ceremonies and other official occasions, and crosses may have been made to seal these transactions. A more specific example of spatial patterning is the placement of ship graffiti within the church at Blakeney, concentrated on columns near to a shrine of St. Nicholas, so probably associated with this cult.

The success of this book is to connect the particular with the general, linking recurring and individual designs with cultural and political aspects of medieval society. Biographical details emerge from certain examples, especially those that record personal names. We have the fifteenth-century curse directed against the Keynford family of



Figure 3 Compass-drawn Hexfoil or “daisy wheel,” All Saint’s church, Barnardiston, Suffolk. Photo: Matthew Champion.

merchants, whose name appears in well-cut, but inverted script alongside an unusual astrological symbol in Norwich Cathedral; tragedy is conveyed at the church of Kingston in Cambridgeshire in the inscribed names of three children of the Maddyngley family, who died during an outbreak of the plague in 1515; and political defeat is made tangible in the names left by Leveller mutineers imprisoned by Oliver Cromwell in Burford church in Oxfordshire, one inscription reading “Anthony Sedley – 1649 – prisner,” being singled out as “almost tangibly bitter.” This is graffiti as historical record, but equally as instinctive human expression, especially at moments of heightened emotional and political intensity.

Arranged into chapters that address different categories of subject matter and illustrated with color plates and line drawings, Champion’s book is both a coherent text and a useful point of reference. The lack of notes and bibliographic references may frustrate purists, and it does hinder the reader from following up the research, debates and examples discussed. However, it also prevents the text from becoming clogged up with numbers and potentially distracting asides. Another criticism is that there is little quantified analysis so that the incidence of particular subjects is described as “frequent” or “rare,” or found in one region more than others, but without the numbers to back up these statements. But these criticisms are far outweighed by the book’s erudition and accessibility. While rigorous in its scholarship – packed full of information and insights which have come from research pursued over many years and collected by a dedicated team of surveyors – it is eminently readable. Champion’s achievement is to bring a vast body of obscure evidence out from the shadowy interiors of England’s churches and to show its importance in understanding the lives and beliefs of medieval people. 🐼



A Byzantine church ruin in Athrun, Libya similar to one that will be featured at the Ashmolean Museum

Byzantine 'flat-pack' church to be reconstructed in Oxford after spending 1,000 years on the seabed

Centuries before the Swedes started flat-packing their furniture, the Holy Roman Emperor Justinian had his own version, sending self-assembly churches to newly conquered parts of his empire. Now one of the “Ikea-style” churches, which spent more than 1,000 years on a seabed after the ship carrying it sank, is to be reconstructed for the first time in Oxford. The Byzantine church will be on display at the Ashmolean Museum of Art and Archaeology as part of the exhibition *Storms, War and Shipwrecks: Treasures from the Sicilian Seas*, opening in June. Paul Roberts, co-curator of the exhibition, said: “Everything in the exhibition will be from under the sea. It’s very different from what’s been done before. All these different movements of people and goods have left their imprint on the seabed in a way you don’t get on the land.” Among the most intriguing exhibits are the remains of the portable church, which dates to around 550 AD. The museum, which is attached to the University of Oxford, will erect it using up to six of its pillars and the early pulpit or ambo. No museum has attempted to reconstruct the pieces until now, and the Ashmolean director Alexander Sturgis said he hoped it would be easier than putting together flat-pack furniture.

From his base at Constantinople, Justinian sent out stone-carrying ships – known as *naves lapidariae* – carrying marble church interiors to sites in Italy and north Africa to fortify and

regulate Christianity across his empire. There they would be installed inside the shell of a building put together with local material. “You show your power by planting churches,” Dr Roberts said. “He sent out flat-pack, self-assembly churches – Ikea churches.” Remains of the completed buildings still survive in Ravenna in Italy, in Cyprus and Libya. Yet the ships were so heavy that some became unbalanced and capsized in stormy weather. It is unclear where the remains in the exhibition were heading. Hundreds of the prefabricated marble elements of a church basilica were found in a shipwreck off the coast of Sicily in the 1960s by German archaeologist Gerhard Kapitan, and most of it has been kept in storage. Still more remains on the seabed. The exhibition will display other discoveries from the bottom of the sea off the coast of Sicily made by underwater archaeologists over the past 60 years. 🐼

From: <http://www.independent.co.uk/arts-entertainment/art/news/byzantine-flat-pack-church-to-be-reconstructed-in-oxford-after-spending-1000-years-on-the-seabed-a6732376.html>

Archaeologists Find Exquisite Medieval Ring with Obsidian Gemstone in Bulgaria’s Rock City Perperikon



A massive gold-plated silver ring with an obsidian gemstone dating from the Late Middle Ages has been discovered by the archaeologists excavating the ancient and medieval rock city of Perperikon (Perperik) near the southern Bulgarian city of Kardzhali in the Eastern Rhodope Mountains. The team of archaeologist Prof. Nikolay Ovcharov has presented its latest finds from Perperikon with the completion of the 2015 excavations and restoration works in the rock city. “We discovered the ring back in September but it was in a very bad condition, and covered with a thick layer of patina,” Ovcharov explains, as cited by the [24 Chasa](#) daily. They were especially impressed with the fine polishing of the gemstone made of obsidian, i.e. volcanic glass, “This semi-precious stone is very hard to process so we have really come across an incredible jewel,” says the archaeologist.

It is believed that the gold-plated silver ring belonged to an aristocrat from the Second Bulgarian Empire (1185-1396 AD), or, alternatively, to a Byzantine noble as the Perperikon Fortress changed hands between Bulgaria and Byzantium a number of times in the Late Middle Ages. The discovery of the ring with the obsidian gemstone is said to confirm once again the wealth that the rock city of Perperikon enjoyed in the 14th century. The archaeologists have already found hundreds of gold and silver coins, earrings and other decorations as well as crosses or engolpions (encolpions) worn on the chest by Eastern Orthodox Christians. 🐼

From: <http://archaeologyinbulgaria.com/2015/11/05/archaeologists-find-exquisite-medieval-ring-with-obsidian-gemstone-in-bulgarias-rock-city-perperikon-complete-excavations-of-its-acropolis/>

Archaeologists Unearth Large Early Christian Basilica with Roman Grave Right Outside of Bulgaria's Capital Sofia

One of the largest Early Christian basilicas in Bulgaria, which is located in the Buhovo Monastery "St. Mary Magdalene" near the town of Buhovo in Sofia Municipality, to the



northeast of Sofia's main urban area, has been completely unearthed, with the archaeologists also discovering a grave of a Roman citizen from the 4th century. The ruins of the Early Christian basilica in Buhovo are situated about 27 km away from the Sofia downtown, the location of the archaeological structures of the Ancient Thracian and Roman city of Serdica. The basilica has now been

fully explored and researched, after three years of archaeological excavations led by archaeologist Snezhana Goryanova from the National Institute and Museum of Archaeology of the Bulgarian Academy of Sciences. The Early Christian basilica in the Buhovo Monastery which dates back to the 4th-6th century, is of impressive size – it is 41 meters long, and 27 meters wide at its widest section. According to archaeologist Snezhana Goryanova, the basilica was a one-apse, nave and two aisle plan with a narthex, and two accessory rooms.

In its southeast corner was a funeral room where the archaeologists found the grave of a Roman citizen who appears to have been important for the local Early Christian community. In the grave, archaeologists found a coin, the so-called obol for Charon, the ferryman of Hades who, according to Ancient Thracian, Greek, and Roman mythology, carries the souls of the newly deceased across the rivers Styx and Acheron in the underworld. "Under one of his heels,

we have found a coin of Emperor Constantius Gallus (r. 351-354), Caesar of the Eastern Roman Empire under Emperor Constantius II, helping to date the burial. Other artifacts found in the grave include bracelets, crosses, and fragments of glazed tiles used to adorn the exterior walls of the basilica.



During the later Middle Ages and Early Modern period (14th-17th centuries), long after the basilica had been destroyed, its ruins became the site of the necropolis of a nearby Bulgarian settlement. After the 17th century, the site had been completely abandoned and forgotten. It would be found again at the end of the 19th century by locals following a legend that told of its existence. In 1881, these locals built the small church St. Mary Magdalene which is still in operation today, but is in dire need of repairs and rehabilitation. 🙏

From: <http://archaeologyinbulgaria.com/2015/09/08/archaeologists-unearth-large-early-christian-basilica-with-roman-grave-right-outside-of-bulgarias-capital-sofia/>

Vatican Library digitizes ancient manuscripts, makes them available for free

One of the oldest libraries on the planet is digitizing its archive of ancient manuscripts — and they're all available to view free of charge. The Vatican Apostolic Library is undertaking an extensive digital preservation of its 82,000 document collection. Over the course of a few years, with the assistance of Japanese company NTT DATA, the library has catalogued nearly 4,500 manuscripts online — and it hopes to reach the 15,000 mark within the next four years.



Vatican librarian, wearing white gloves, turns the pages of a facsimile copy of the Borgianus Latinus, a missal for use at Christmas made for Pope Alexander VI. Photo by Alessandro Bianchi/REUTERS

Monsignor Cesare Pasini, Prefect of the Vatican Apostolic Library, called the project a “true effort in favor of the conservation and dissemination of knowledge at the service of culture throughout the world;” writing on the library’s site that the project could eventually lead to 40 million digitized pages and 43 petabytes worth of data. The entire undertaking is expected to take at least 15 years and cost more than \$63 million dollars — an effort the Vatican Library is attempting to support, in part, by crowdsourcing funding.

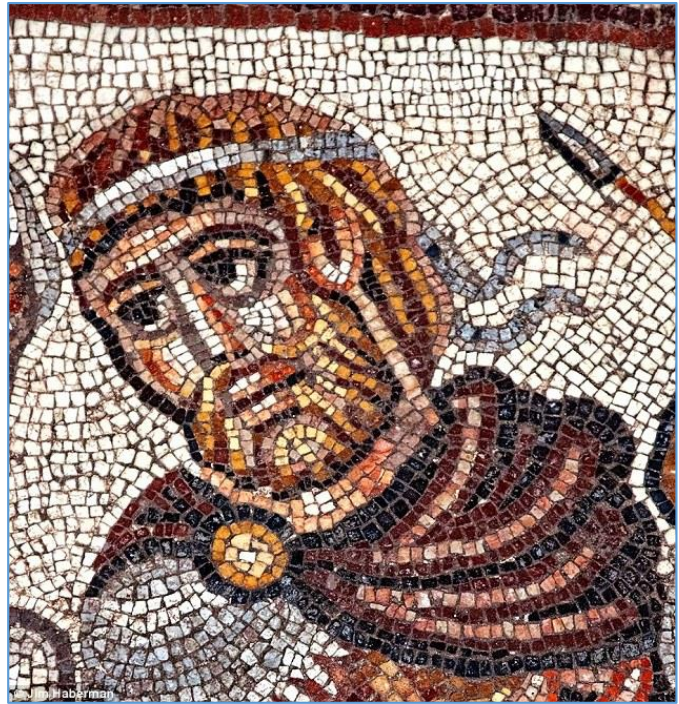
“Thanks to Digita Vaticana it will be possible to contribute to an undertaking on which the preservation and safeguard of the oldest knowledge depends,” the site writes. “Technology gives us the opportunity to think of the past while looking towards the future, and the world’s culture, thanks to the web, can truly become a common heritage, freely accessible to all, anywhere and anytime.” The current list of digitized manuscripts can be viewed through the Vatican Library website. <http://www.digitavaticana.org/?lang=en> 🐼

<http://www.pbs.org/newshour/rundown/vatican-library-digitizes-ancient-manuscripts-shares-free-charge/>

Mosaic of Alexander the Great meeting a Jewish priest is the first ever non-biblical scene to be discovered inside a synagogue

A team of archaeologists led by Professor Jodi Magness, of the University of North Carolina at Chapel Hill came across the intriguing scene in the floor mosaic which includes three horizontal strips containing human and animal figures, such as elephants. The largest top strip contains the scene showing a meeting between two men, who perhaps represent the legendary warrior and a Jewish high priest. In the scene, a bearded soldier wearing battle dress and a purple cloak leads a bull by the horns, followed by other soldiers and elephants with shields tied to their sides. He is meeting with a grey-haired, bearded elderly man wearing a ceremonial white tunic and mantle, accompanied by young men with sheathed swords, also in ceremonial clothes.

Professor Magness said the identification of the figures in this mosaic is unclear because there are no stories in the Hebrew Bible involving elephants. “Battle elephants were associated with Greek armies beginning with Alexander the Great, so this might be a depiction of a Jewish legend about the meeting between Alexander and the Jewish high priest,” she said. “Different versions of this story appear in the writings of Flavius Josephus and in rabbinic literature.” The Huqoq excavations, which also involved a team from the Israel Antiquities Authority, began in 2012 when the first mosaics were found at the site, including an image of Samson. This summer, more of the floor has been uncovered, including a dedicatory inscription, figures, animals and mythological creatures arranged symmetrically around it. These include winged cupids holding roundels with theatre masks, muscular male figures wearing trousers who support a garland, a rooster, and male and female faces in a wreath encircling the inscription. In 2012, a mosaic showing Samson and the foxes was discovered in the synagogue’s east aisle. The next summer, a second mosaic showing Samson carrying the gate of Gaza on his shoulders was found. “It is not clear if there is a thematic connection between the Samson scenes and the other mosaics in the east aisle,” Professor Magness said. Adjacent to Samson are riders with horses, apparently representing Philistines and the Biblical figure is depicted as a giant in both scenes, reflecting



later Jewish traditions that developed about the judge and hero. Biblical scenes are not uncommon in Late Roman synagogue mosaics, but only one other ancient synagogue in Israel, at Khirbet Wadi Hamam, is decorated with a scene showing Samson. “The discovery of two Samson scenes in the Huqoq synagogue suggests that it was decorated with a Samson cycle - the first such cycle known in Israel,” said Professor Magness. 🐘

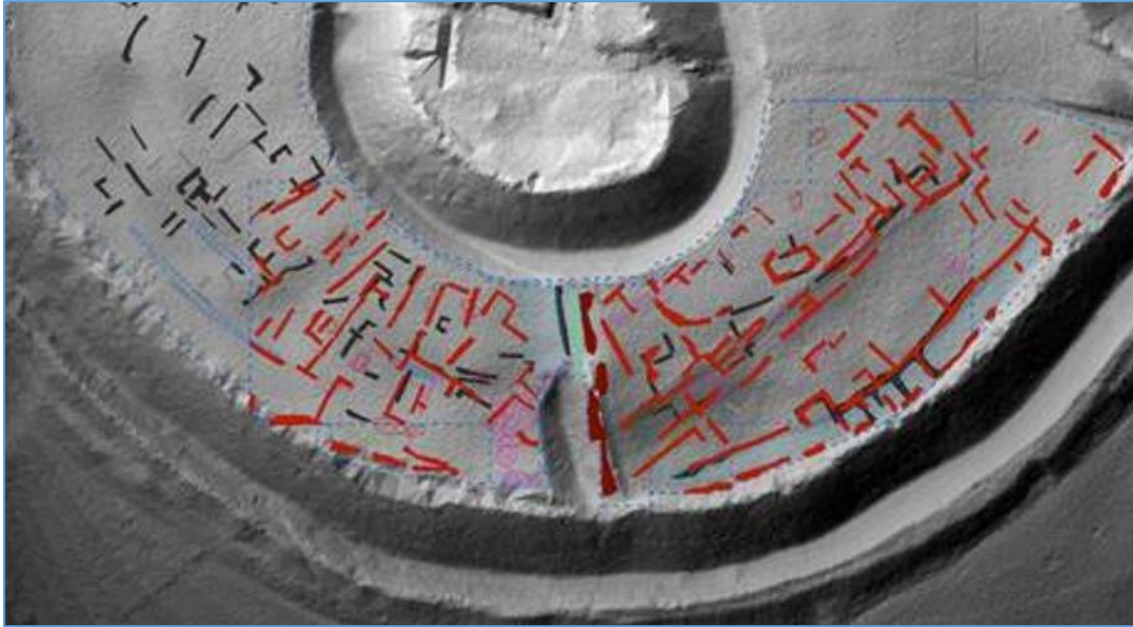


From: <http://www.dailymail.co.uk/sciencetech/article-3161093/Mosaic-Alexander-Great-meeting-Jewish-priest-non-biblical-scene-discovered-inside-synagogue.html#ixzz3tgtzeVXG>

Archaeologists find vast medieval palace buried under prehistoric fortress at Old Sarum

Archaeologists in southern England have discovered what may be one of the largest medieval royal palaces ever found – buried under the ground inside a vast prehistoric fortress. The probable 12th century palace was discovered by archaeologists, using geophysical ground-penetrating ‘x-ray’ technology to map a long-vanished medieval city which has lain under grass on the site for more than 700 years.

Located inside the massive earthwork defenses of an Iron Age hill fort at Old Sarum in Wiltshire, the medieval city was largely founded by William the Conqueror who made it the venue for one of Norman England’s most important political events – a gathering of the country’s nobility at which all England’s mainly Norman barons and lords swore loyalty to William. The Old Sarum geophysical survey is being carried out by archaeologists from the University of Southampton - and is giving scholars an unprecedented and unique opportunity to more fully understand Norman town planning.



So far they have been able to reveal the buried foundations of literally dozens of ordinary houses – and a vast mystery complex that is likely to have been a huge royal palace. The 170- meter long and 65 meters-wide complex, was arranged around a large courtyard. A space, 60 meters long, was probably a great hall and there appears to have been a substantial tower and multi-story buildings with upper floors almost certainly supported by substantial columns. Its walls measured up to three meters in thickness.



“The location, design and size of the courtyarded complex strongly suggests that it was a palace, probably a royal one. The prime candidate for constructing it is perhaps Henry I sometime in the early 12th century,” said Dr Edward Impey, Director-General of the Royal Armouries. It is the first time that archaeologists in Britain have ever found what is probably a previously unknown medieval royal palace of that size. Up until now historians have thought that the only royal residence at the site was a much smaller complex on top of a man-made castle mound.

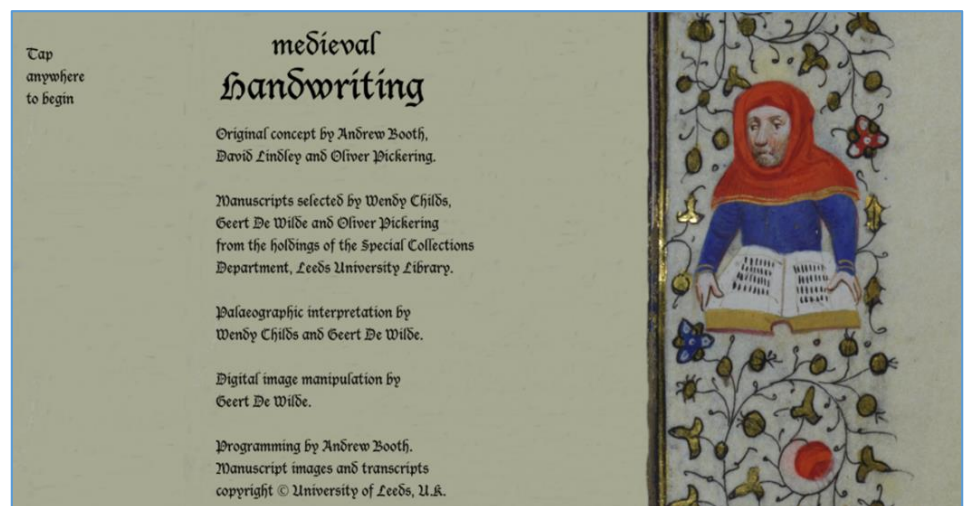
Because the city was largely abandoned up to 140 years after most of it had been built, and because it has remained a green field site ever since, it is giving academics a unique opportunity to study a Norman city. “Archaeologists and historians have known for centuries that there was a medieval city at Old Sarum, but until now there has been no proper plan of the site. Our survey shows where individual buildings are located – and from this we can piece together a detailed picture of the urban plan within the city walls,” said the archaeologist leading the geophysical survey, Kristian Strutt of the University of Southampton. 🐼

<http://www.independent.co.uk/news/science/archaeology/archaeologists-find-vast-medieval-palace-buried-under-prehistoric-fortress-at-old-sarum-9898759.html>

Medieval Handwriting App

If you want to study medieval scripts, handwriting, and manuscripts or simply want to get acquainted with some of the finest medieval codices here is an app to get you started. The origins of the app – Medieval Handwriting – with online exercises in palaeography was developed

at the Institute for Medieval Studies at the University of Leeds, U.K. Users can examine 26 selected manuscripts, zoom in on individual words, attempt transcription and receive immediate feedback. They can optionally compare their transcription with a full transcript. The user’s transcripts can be saved and reopened. The saved transcripts are accessible via File Manager apps. The app is available for both **android** and **apple**. 🐼



From: <http://www.medievalhistories.com/medieval-handwriting-app/>