

Part 4a of the Royal Portal Series

January 2021

Chartres Royal Portal - colonnettes vandalised

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Some of the most intricate and careful carving in the portal is found in the thin colonnettes between the column figures. Some are exquisite. Yet many have been butchered and shortened without any apparent rhyme or reason.

For example [b], on the left the top is finished with a ring, and the bird's delicate head sits comfortably against it. This stone is about 1.2 metres long. On the right there is a short piece to the same design with the same little flowers along the spiral strap. But the bottom edge is broken and sits against a shaft with a very different design, and above that a block of mortar bridges a gap between the shaft and the capital. It looks like the piece on the right came from the bottom of the longer length on the left, and was turned upside down, and even though it was meant to fill the space additional mortar was needed as it still did not fit.¹ This was not the only example of mutilation. Indeed, twenty out of forty-three have been shortened.

Links to the Series

In bold those that have been completed.

1. Summary
- 2a. Revised data and dates
- 2b. Towers, narthex, plinths
3. **Embrasures and jambs**
- 4a. **Colonnettes vandalised**
- 4b. **Designs for the colonnettes**
5. Capitals, plinths and imposts
6. **Lintels and plinth geometry**
7. **Central tympanum**
- 8a. North lintels and archivolts
- 8b. South lintels and archivolts
9. Contractual issues
10. Carvers identified?



The photographic study by Etienne Houvet shows the same number we know today were in place in 1920.² The colonnettes were carved from the fine-grained *liais de Paris* from the quarries along the Seine, at that time transportable by barge along a continuous waterway to Chartres. The remaining uncut shafts are between one and two metres long and 140mm in diameter.

When completed the portal had twenty colonnettes, plus two thinner plain shafts at each end. Most of the colonnettes are made of three separate shafts, two were assembled from four and five in the south are made from only two. Altogether forty-three separate lengths of stone still exist, from which we could estimate that some fifty-six may have been originally carved. At least five are missing.

Patrice Calvel, Architecte en Chef des Monuments Historiques, kindly allowed me to mount the metal scaffolding in front of the portal in 2015 to examine the colonnettes closely [r]. With posts and struts encumbering the space the experience showed how physically hard it was to clamber around without touching the sculpture, and gave me a tangible feel for the difficulties of manoeuvring large and intricately carved stones into place with the great care such work would have required while at the same time maintaining one's own balance on the scaffold. Portal erection was full of dangers, especially to the sculpture itself. It required skill, balance and respect.

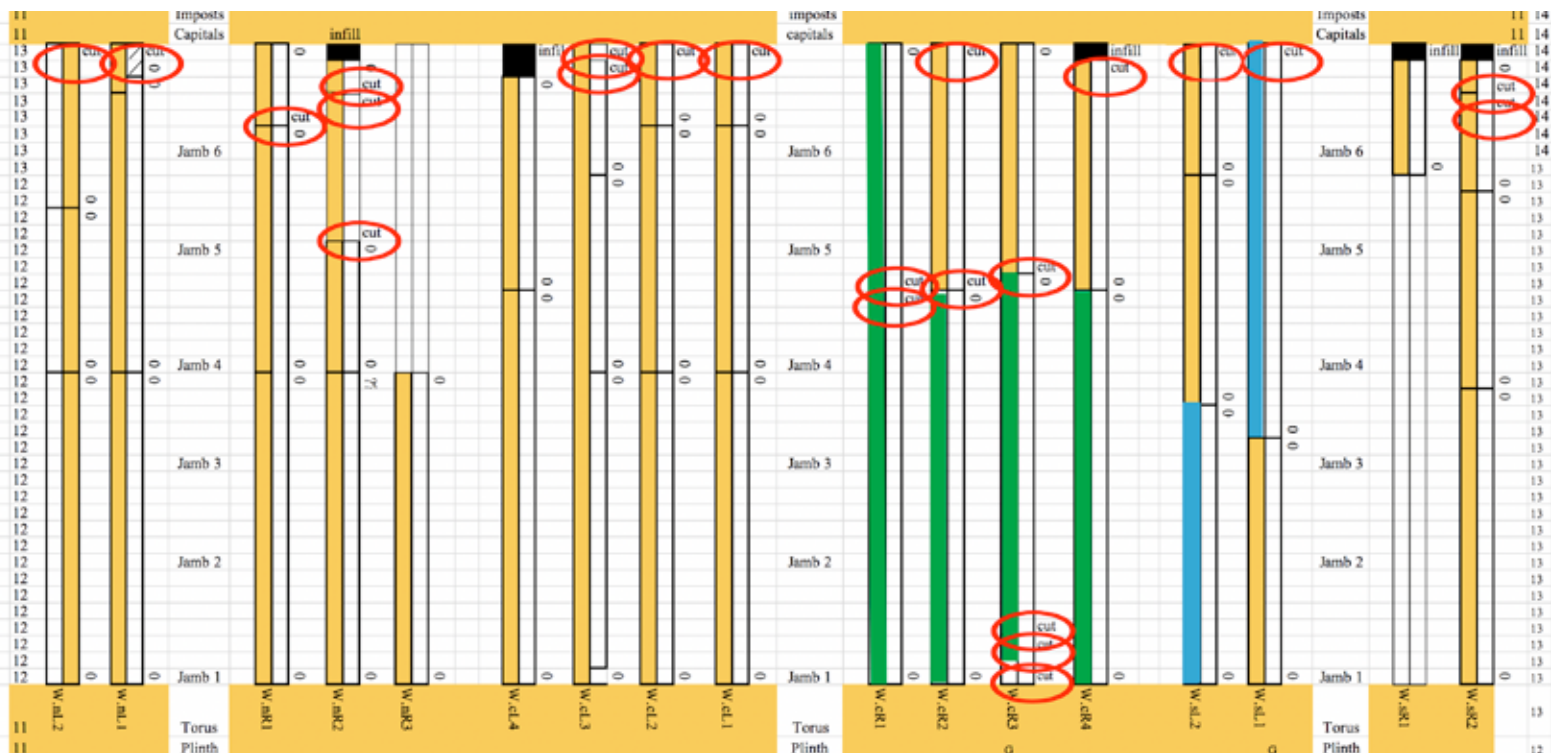


The mutilated remnants

Integrating the shafts into the three groups of jamb figures was a little complex, and I had to work through a number of possibilities. As the embrasure were built over some years, I have had to distinguish the process of carving, erection and truncation by campaign, and to distinguish when carved from when erected. Each shaft is represented by two columns, with the colour of the carving campaign on the left and the colour of the erecting gang on the right.

Twenty shafts out of forty-three were shortened [b], three at both ends, and

Campaign-11 yellow		F
Campaign-12 pink		G
Campaign-13 green		H
Campaign-14 blue		I



Schematic colonnettes, showing assigned teams and location of cut colonnettes. As the embrasure were erected over some years I have had to distinguish the process of carving, erection and truncating by campaign, and so to separate when they were carved from when erected. This is illustrated in two columns, with the carving campaign on the left and their erection on the right. They were almost never erected by those who did the carving.

the discards thrown away.³ Two are illustrated on the first page, and some of the others at the bottom of this page. Some are hard to see, but once we know what to look for, it is obvious that nearly all the upper shafts immediately under the capitals had been reduced. They are marked “cut” in the schematic and highlighted with a red circle.

It is clear which have not been cut as they terminate at each end in small ring-like moulding, marked “0” on the schematic [r]. Some of the scraps are only 20cm long, some as much as 120cm. In five instances they could not get it right and had to fill additional gaps over the shafts with mortar, marked “infill” and coloured black in the schematic. The truncations show they were not erected by those who did the carving.

If the twenty truncated shafts had not been cut there would have been enough to complete the colonnettes if they had been correctly arranged. The sorrow is that they weren't, because something had changed so the shafts carved from the time the templates were made would no longer fit when the next crew came to install them.



The ring moulds that terminate the uncut shafts



Top of nL2t



Top of nL1t



Top of nR1t



Top of nR2t



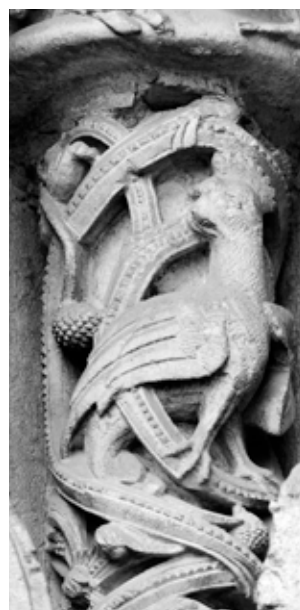
Bottom of nR2m



bottom of cL3t



Top of cL2t



top of cL1



Top of cR2t



Top of sL1t

Explanations

For a century the cut shafts have intrigued scholars searching to decipher the many anomalies in the portal. For a long time it was not recognised that some stonework in the portal was erected with the south tower.⁴ Now that we know that, arguments about the portal being moved or designed for another location no longer have any bearing on the case.⁵ Since then there have been attempts to wriggle through the anomalies by blaming altered locations,⁶ mistaken measurements⁷ or templates,⁸ changed plans,⁹ differences between teams of sculptors¹⁰ and even that it had been put in the wrong place.¹¹ It was even thought that the shafts had been fully decorated at the quarry and cut down after they had arrived when they did not fit.¹²

Yet the shafts were made from the highest quality and the most expensive limestone, and the carvers were among the most highly-paid tradesmen in the medieval world.¹³ The complex detailing shows that some shafts would have taken a month or more to carve and decorate. Why on earth would this much money be spent on shafts that were to be carved “on spec” and then expected to be cut down to suit the job? It stands against all reason. They were a parsimonious people.

The neatest explanation is that plain prefabricated shafts were delivered from the quarry and then cut to length and decorated on site.

Also, if the carvers had been resident at the quarry we should expect many to have been carved by the same hand, but we don’t. Each shaft is an individual creation, one per carver, even where they shared templates. As a result (as in the Laon gallery¹⁴) there is no consistency in design or placement.

I offer two approaches to discover what happened. Firstly, I will reassemble the uncut shafts to see if it is possible to rearrange them in the way they were intended, and secondly, I will seek the governing geometric principles in that arrangement. If order were possible, and if that order arose from consistent principles, then we may hope to have found an earlier design that was changed so the shafts no longer fitted into the space allocated to them.

Reassembling the uncut shafts

The width of the north door, and this door only, was firmly established by the single stone that forms the threshold [r1]. It is unique in having upstands at each end that locate the plinths on both sides. I have assumed that, along with the plinths and capitals, it was the work of Master-11^(F)¹⁵ Today the door measures 1.945 metres wide by 5.245 metres high.¹⁶ Deduct the plinth and bases at the bottom, and the capitals and imposts at the top, and the space left for the colonnettes is 3.58 metres.

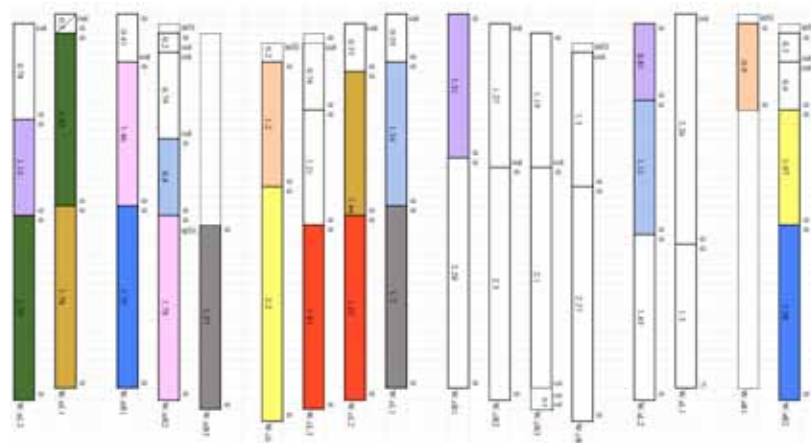
The heights of the other piers are different, perhaps from variations in the height of the six courses in the embrasures.¹⁷ On the other hand, the bases and capitals are consistent to the millimetre, at 1,038mm for the plinth and torus, and 625mm for capital and impost. The ratio between them is 5-3.¹⁸

Whitney Stoddard has measured the shafts.¹⁹ Using his lengths I arranged the uncut shafts in groups hoping to hit on a common length. Search as I might there were no combinations that would suit the current height, but I did find ten that came within a centimetre of a different height [r2].²⁰ This was somewhat less at 3,25cm.²¹

It is 36cm lower than today.



North door threshold with upstands for the plinths.



Schedule of groups of uncut shafts that combine for a colonnette height of 3.25 m.

None of these twenty-one shafts have been reduced or altered. Each has a ring-like base and cap and the decoration fits neatly between. Having ten groups that fit a common height that is lower than what we have today is compelling evidence that the shafts were carved for lower door openings. Therefore, these untouched shafts did not suit the existing embrasure height, but would have been right for the earlier proposal for which the colonnettes had been carved.

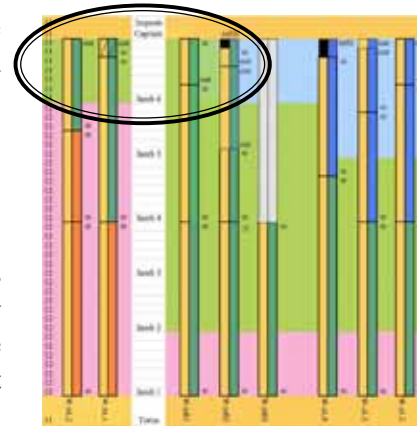
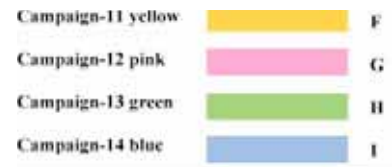
When the height was raised with the placement of the embrasures the shafts no longer fitted and adjustments were inevitable. This has not occurred in other portals because only at Chartres was half the work delayed by years.

Conclusion: the height of the doors was changed after the shafts were carved.

Consequence: design details were not available to guide later teams.

Outcome: the chaotic assembly that has intrigued generations of scholars.

The change to the height had been set in the upper course by Group-B [r2] on the left side of the north door [green]. At this time some colonnettes could have been installed in their entirety [dark green]. This campaign may have included the column-figures on the left locked in by capitals that were ready to support the lintel. At this moment people could get an idea of what the doorway with its figures and colonnettes was going to look like.



North end of portal, campaign-13.

The geometry

Does the lower door height relate to anything else in the building that might verify its authenticity and would be consistent with the first portal design?

Firstly, the 3,25 colonnette length is exactly the original width of the central door that was established in Part 6, marked in acqua [b].

Add the heights of base and capitals to 3,25cm gives an overall height for the original door of 5,19cm. The shaft height to the total has the comfortable proportion of 5-8 that is easy to construct geometrically [pink]. The same ratio was used between the middle and north doors [red].²² They combine to create a contrapuntal arrangement – the door width is five units to the eight in the height while its width is eight to the five to the side door, as is the height to half the overall width of the portal.²³ Very satisfying, especially as the accuracy is better than a millimetre from the ideal.²⁴

That the uncut shafts could be reassembled into ten groups that suit a common height, that the proportions are consistent across all parts of the portal, and that the accuracy and geometric simplicity of the numeric ratios for the major elements in the portal – the bases, colonnettes, capitals and the openings – together strongly support the argument that all the original the shafts were carved when the portal was designed, being during campaign-11^(F).

Weaving proportions across the major elements of the portal, first scheme Master-11.



Connecting builders and carvers

The simplest way to unravel the history of the lower courses of the Portal is to distinguish the masons from the sculptors. Though both used a similar swathe of tools, they may not have worked in the same teams nor at the same time, nor with the same materials. The masons built the bulk of the church from the quarry at Berchère, only 12 kilometres away; the sculptors carved in fine-grained *liais de Paris* from the quarries along the Seine.²⁵

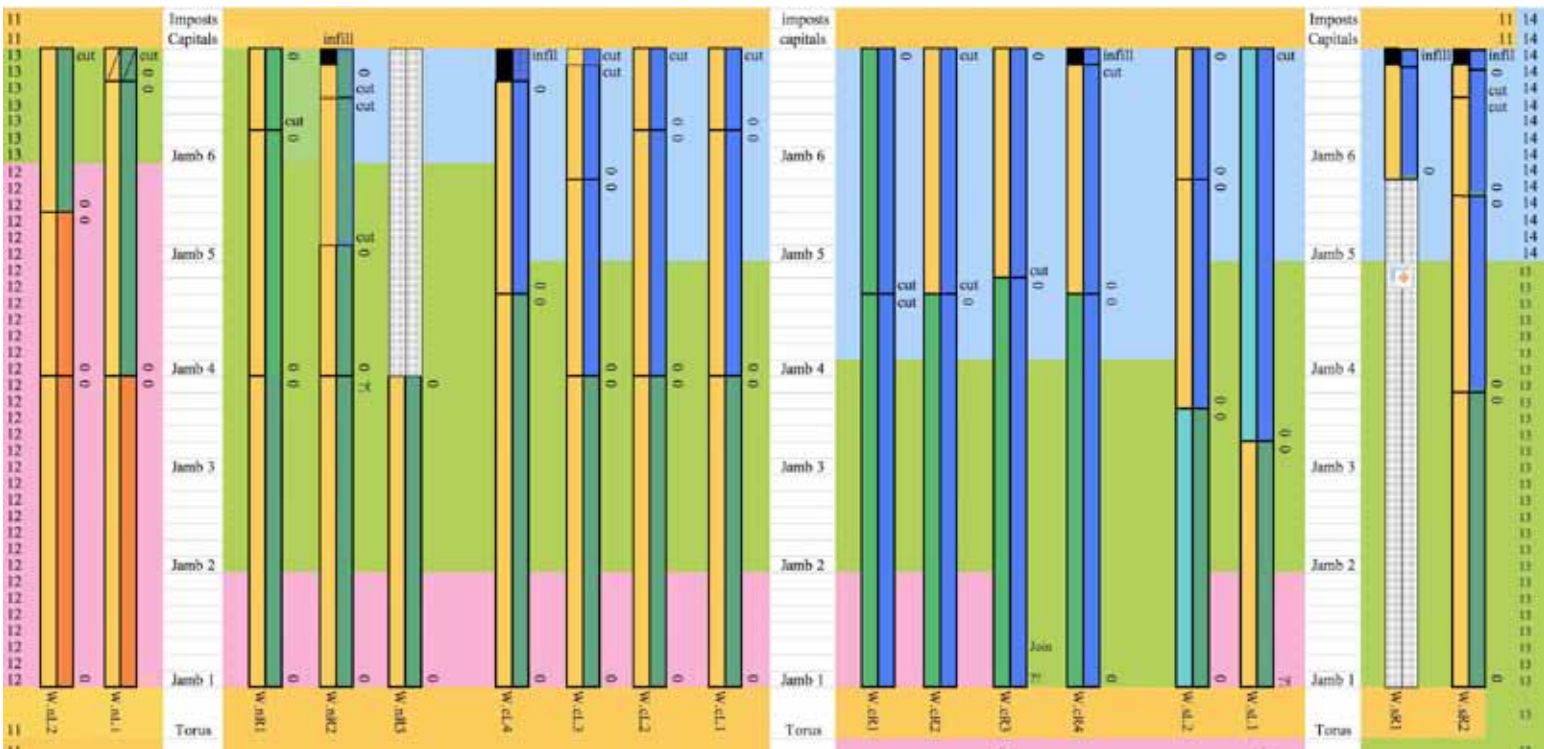
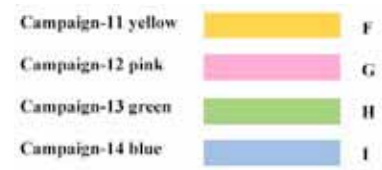
The carving teams may have been independent of the builders.²⁶ They may have come after the builders had left and used their shed; they may have been there at the same time; some of the shafts may have been carved by men on the builder's crew; the *imagiers* may have been under the direction of the mason's master or independent. In short, we don't know anything of the relationship between them except that the *imagiers* were usually better paid than the masons.

Among the embrasures in the south pier, those in Group-B (green) are bonded into the south tower. This shows that the placement of the plinths and the next three courses were part of campaign-13^(H).²⁷ This is the primary link between the builders in the towers and the carvers in the portal. Working backwards and forwards from this, the five campaigns 11 to 14 in the towers may now be connected to each phase of the portal from footings to drips [r].

Therefore, it follows that the embrasures Group-A [pink] were carved and erected in campaign-12^(G) and Group-C in campaign-14^(I) [b].

The embrasure coursing heights vary from 682mm to 572mm and, unlike the colonnettes, I could find no pattern that would connect them with the height of the colonnettes. This confirmed that the embrasures in Group-A were not carved in the same campaign as the colonnettes.

The coherence of the geometry does help locate the carvers workshop coincidentally with campaign-11^(F). It looks like this team of *imagiers* carved all the bases, all the capitals, all the colonnettes and no doubt some of the column-figures for a wider and shorter portal than we have today.²⁸



Schematic of carvers in columns and embrasures and earliest time for erection of the shafts.

Cutting the colonnettes

The shafts flanking the north door were the first to be cut. This was by Master-13^(H) with the topmost embrasure on the north pier [green]. The erecting gangs just chopped the shafts into short lengths to make them fit, circled [r1]. Five in this campaign were truncated, one at both ends, and so began the chaos we see today. Most were placed at the top where they would be less noticeable.

They soon realised that at this rate they would be running out of shafts and there were not going to be enough to finish the job. This was a builder's problem, the *imagiers* having moved on long before. This is when they would have decided to carve the four longest shafts [dark green], each around 2.3m to suit the taller doorways,²⁹ to the same template, circled [r2]. As all but one of these were cut down, they must have been erected in the later campaign-14^(I) [blue].

Once again, the same lack of communication produced a repetition of the earlier story. On each side of the central door the large number of courses laid by Master-14^(I) [blue] suggest this area had been held back, and with it the central lintel and tympanum resting on it.

There are two out-of-character shafts to the left of the south door that do not fit into any category [r3], but are of significant design and execution [azure]. I have called them Panneau and Saison for analogous reasons by two individuals who were allowed to carve as they wished in a manner completely foreign to any of the other templates. Can one presume that during the many weeks of their stay they were given the freedom to design as they pleased? For this reason, I suggest they may have been two men on their own who arrived during a break between the building campaigns when no master masons were present and perhaps only the cathedral clerk of works was available to direct them.³⁰

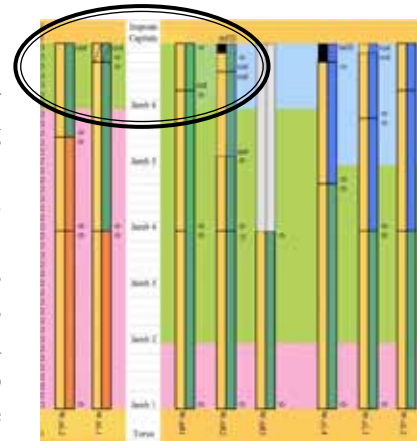
Vandalism

I could not imagine a sculptor would spend a month or more creating a most exquisitely detailed shaft and then remain on site to see it butchered to fill a space that could have been planned for when the stone was first blocked in. The remains of almost a year's sculpting was thrown out as unusable. A cavalier approach to fine craftsmanship.

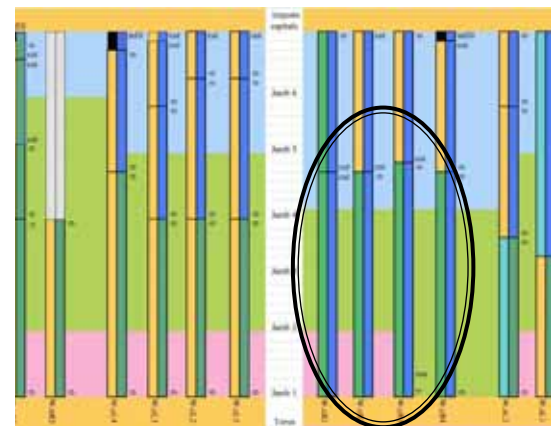
Let us imagine you come on to the site and find a group of colonnettes, superbly carved, possibly with their locations marked on them, but no longer fitting into the space as built. How do you sort them out? You don't dare move them around from place to place to see how they might fit as they could be damaged in the process, and perhaps the shed (already crowded with sculpture) is too small. You cannot measure them with any accuracy as there are no agreed units of length and the tape measure has not been invented. You could cut lengths of wood for each shaft and move them around the site looking for where they might fit, but if you do not have a mind for this sort of analysis it would have quickly become too hard, and you would be sorely tempted to force them to fit by making up the difference at the top where it would not be noticed.

Being unable to recalculate a new arrangement, everything became confused. It seems the erectors may have been too exasperated to care, the unskilled workers on these building sites often being a pretty rough lot.

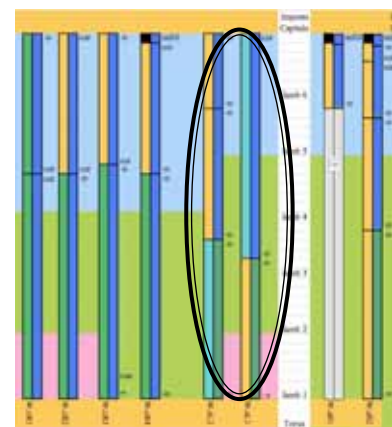
This raises the question on the respect contemporaries may have had for the significance of portal sculpture, for its sacred meaning or even its intended consecration. It looks like the men in the three teams that perpetuated these atrocities did not care about any of these things, but simply butchered whatever was available to complete their project. The "just let's get it done" mentality of the crude and uneducated - masters or erectors?



North end of portal, campaign-13.



Central part of portal with Interlock shafts circled



South end of portal, campaign-14.

Method of erection

The embrasures had to be in place before the colonnettes could be set up. Thin shafts could not be left to stick into the air unsupported while the masonry behind them was being placed. This means that the erection of the embrasures set the program for the placement of colonnettes. As the column-figures and canopies are closely packed with little space between them, the shafts had to be installed first and the statues could be slipped in from the front, and over them the heavy projecting canopies lowered from above, and finally the capitals that stabilised all these separate parts.³¹ The blocks of stone are heavy, and their handling was a delicate and unforgiving business.

The column-statues have much of their weight hanging outwards, away from the centre of the attached column that supports them. The unbalanced figures and their canopies are cantilevered from the wall and attempt to pull the stones off the wall. To prevent this the carvings are held in place with iron hooks.³² One end was flared out and set into a hole in the structure and the other bent down into a hole drilled into the top of the column [r]. Over centuries of wear and weather this technique has stood the test of time.³³

The site would have been encumbered with increasing amounts of scaffolding to support the men, protect what had already been installed and house ingenious hoisting devices immediately above each carving. In addition, the shafts were thin and brittle, and required bracing with timber beams along their lengths until set in place. Rope held the scaffolding together, rope supported the sculpture weighing more than a ton apiece, and rope became fragile in the wet and cold. When one considers the difficulties the men would have faced in lowering the sculpture and attaching it while surrounded by scaffolding and platforms and the supports for cranes and tools and mortar, one's admiration is unbounded. The erection of the portal sculpture would have been one of the most difficult and time-consuming tasks,

Where did the idea of en delit shafts come from?

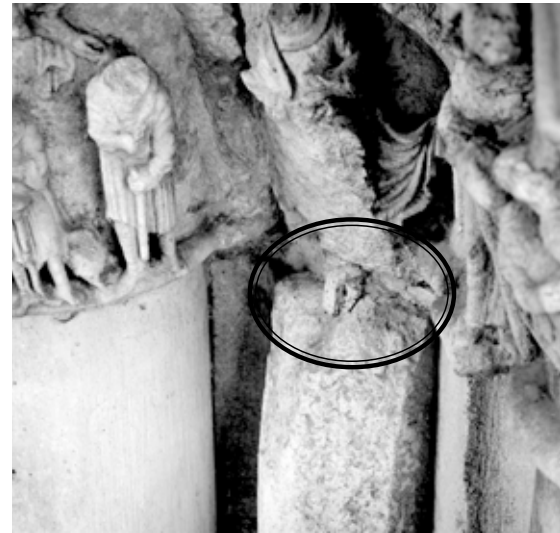
The first *en delit* shafting appears in short lengths in windows, such as the Lavillettere nave, the Saint-Martin-des-Champs axial chapels and the Maule choir clerestory from the mid-20s.³⁴

Olsen³⁵ argues that it reflected an aesthetic imperative, which makes sense when we consider the tendency to conceive the building as a skeleton, the growing depiction of the building as axes rather than mass, and the growing understanding that structure could be conceived as thrust rather than load.³⁶

In addition, and as a necessary prelude to diaphanous architecture, there is a fundamental building issue. Independent vertically stacked shafts would not have been conceivable without the cultural drive to weightlessness,³⁷ nor possible without an improvement in building skills.³⁸

Mortar joints were becoming thinner and settlement minimal. Really fat joints were common before the First Crusade, as in the unrestored parts of Courville, Morienvall and Oulchy. Within a generation joints just a millimetre thick along the entire bedding of the stone were becoming common. At the same time ashlar was being cut more accurately with the use of chisels rather than axes. It was not until the builders had improved the quality of their work to ensure there was practically no settlement could they install shafts (or other items) with the grain set vertically.

Also, there are cases where a campaign of walling stops just under the capitals, such as in the north embrasure. This allowed time for the wall to settle before the pin into the tops of the *en delit* shafts were fixed into the capitals.



The hooked iron let into the top of the shaft.

References

1. Whitney Stoddard, *Sculptors of the west portals of Chartres cathedral: their origins in Romanesque and their role in Chartrain sculpture*, New York, 1987 and Motokazu Kimata, "Les colonnettes ornées du Portail royal de la cathédrale de Chartres: origines et diffusions d'un motif architectural", *Dissertation*, U Paris I, 1987. Stoddard, 169 concludes the date for the portal 1143-1148, I suggest only 5 years earlier, before the crusade.
2. Etienne Houvet, *Cathédrale de Chartres*, vii vols., Chartres, 1919-21. Since then a few may have been replaced with facsimiles carved with care to retain the details and finish of the originals.
3. Involved 20 of the shafts, not ten as usually stated. The scaffolding enabled me to get closer to these shafts. Vibeke Olson, "Oh Master, You're wonderful! The problem of labor in the ornamental sculpture of the Chartres Royal Portal", *Avista Forum Journal*, xiii 2003, 6-13 and Vibeke Olson, "Colonnette production and the advent of the Gothic aesthetic", *Gesta*, xliii 2004, 17-30.
4. Etienne Fels, "La façade de la cathédrale de Chartres au XII^e", *Bulletin de la Société Nationale des Antiquaires de France*, 1967, 232-33; John James, *The contractors of Chartres*, Wyong, 1979, i 219-221.
5. Summarised in Olsen, "Colonnettes", 28.
6. Willibald Sauerländer, "Sculpture in Early Gothic churches: The state of research and open questions," *Gesta*, ix 1975, 33; Adolf Katzenellenbogen, *The sculptural program of Chartres Cathedral*, New York, 1959.
7. Paul Popesco, "Nouvelles observations sur la façade ouest de la cathédrale de Chartres," *Bulletin de la Société nationale des Antiquaires de France*, 1972, 94-95.
8. Motokazu Kimata, "Colonnettes"
9. Marcel Aubert, "La portail royal et la façade occidentale de la cathédrale de Chartres", *Bulletin Monumental*, xcvi 1941, 177-218.
10. Jean Villette, "Le portail royal de Chartres a-t-il été modifié depuis sa construction?" *Société Archéologique d'Eure-et-Loir*, xxv 1970, 255-270.
11. Stoddard, *Chartres*.
12. Olsen, "Colonnettes", 23.
13. Vibeke Olson, "Oh Master".
14. In the Laon gallery the groups of individuals and their templates pose a similar situation to what we have at Chartres. See *COGA/20-Laon-Choir-Gallery.pdf*. Note that COGA refers to the pdf files in <https://www.creationofgothic.org/COGA/files/articles/>
15. In earlier publications, before the study in Part 2a, I had assembled the campaigns from larger groups of courses. I have reallocated the campaigns in chunks of 8-12 courses noted by number, with the earlier alpha notation in superscript.
16. All dimensions are taken from the laser survey kindly shared by Andrew Tallon. The current ratio of the width to height has the proportion of 10-27.
17. The coursing heights in the four piers vary from 682 to 572mm.
18. Ideal 1039.4mm and 623.6mm, which is twice a unit of 321.8mm, close to the well-known Pied-du-roi.
19. Stoddard, *Chartres*, 158-160 argued that five years were needed for all the figures at Chartres. He detailed this on the basis that sculptors did not share their work and that many hands were not involved in each piece. He also excludes the significant contribution from assistants and apprentices who were part of gangs of up to six to eight men. Advice from sculptors is that thirty to forty weeks would have been enough, not the 120 which he cites.
20. W.cL1b and W.nR3b; W.nL1m and W.nL2b; W.cL2m and W.nL1b; W.sR2m and W.cL4b; W.nR1m and W.nR2b; and finally W.cL3b and W.cL2b and one group of three W.nR2m, W.cL2m and W.sL2m.
21. Within the same tolerance of a centimetre as in Stoddard's figures.
22. $5.19 \cdot 3.25 = 1.95$ display 8-5-3.
23. Ideal: centre door width 3,246mm, height 5,193mm, colonnette height 3,246mm, width side doors 1,947mm, length central lintel 4,220mm, height lintel 11-3 at 115mm, plinth 5-3 at 1,038mm and capitals 625mm, 5/8ths of half the full portal width of 16,37cm is 5,12, showing in this case an error of 7mm.
24. Ideal in millimetres 5,193-3,245-1,947 from a common 649mm, which is twice a unit of 324.5mm, which is also close to the well-known *Pied-du-roi*.
25. Summarized in Janet Snyder, "On the road again: Limestone sculpture in twelfth century France", Vibeke Olsen ed., *Working with Limestone: The science, technology and art of medieval limestone monuments*, Burlington, 2011, 167-188.
26. Studies of the Laon gallery showed "the majority of carvers did not arrive together nor did they stay until the end", John James, "The capitals of the Laon cathedral choir gallery", *COGA/files/articles/20-Laon-Choir-Gallery.pdf*
27. In two courses there are misalignments of a millimetre or two, which is understandable within current tolerances when mortar thicknesses varied, different stone types were being used and they were shaped by different masons. See discussion of tolerances in James, *Contractors*, v.1
28. All at the one time? Bases because they are the same height to the millimeter and no changes in detailing. For capitals see Part 5. Colonnettes as discussed above. Column-figures because it would be logical to have carved some at this time. See further discussion Part 2b.
29. To make the situation worse, the piers to the central door are +25mm and +13mm higher than the north,
30. James, "Laon gallery" for solo carvers, 18-20.
31. Olsen believes that *en delit* shafts would "speed up construction", which I seriously doubt as the time needed to carve long shaft and the erection time needed to protect delicate work would, at the best, be no quicker than laying ashlar with included shafts. Vibeke Olson, "Colonnettes", 22.
32. Holes are drilled into the top and bottom of each stone and the pin is secured with lead. One might think that iron pins would have rusted over the centuries, but medieval furnaces were fired with charcoal that could not purify the iron as we do, and enough carbon migrated into the metal to prevent the rust. Medieval smelters could not create a temperature greater than 700 degrees. That produces a red-hot slightly plastic solid, or bloom that the smith hammers into shape. An alternative to pinning stones together was that one end of the steel was flared out and set into a hole in the structure and the other bent down into the hole drilled into the top of the column. Over centuries of wear and weather these techniques have stood the test of time.
33. The section is made up of three or four parts. A shaft raises the statue above the plinth, sometimes decorated. Above that is the statue, and often a canopy in a separate stone. There is usually a further plain shaft to complete. The lower three section could all be installed in segments as they are attached to the wall with metal brackets. The upper section invariably is a tight fit under the capital. There is no room to manoeuvre this stone in place after the capital is paced as there is no space to insert a bracket between the shafts and the capital. But it is really easy to drop a peg through the capital if they are put up together.
34. The reasons for these dates are part of a holistic study into families of capitals and their connections across time and space. In this approach the alteration of the date of one phase will have an impact on every other building with similar carving, which will continue a knock-on effect on a multitude of other buildings. As set out in COGA.
35. Olsen, "Colonnettes".
36. James, *Contractors*, our understanding of how they conceived vectors emerged from the geometric studies of the clerestory level of Chartres cathedral.
37. John James, "The canopy of paradise", *Studies in Cistercian art and architecture*, lxix 1984, 115-129.
38. Forthcoming article to discuss the effect slow-drying mortar, mobile crews and lack of measurements had on medieval building practice.