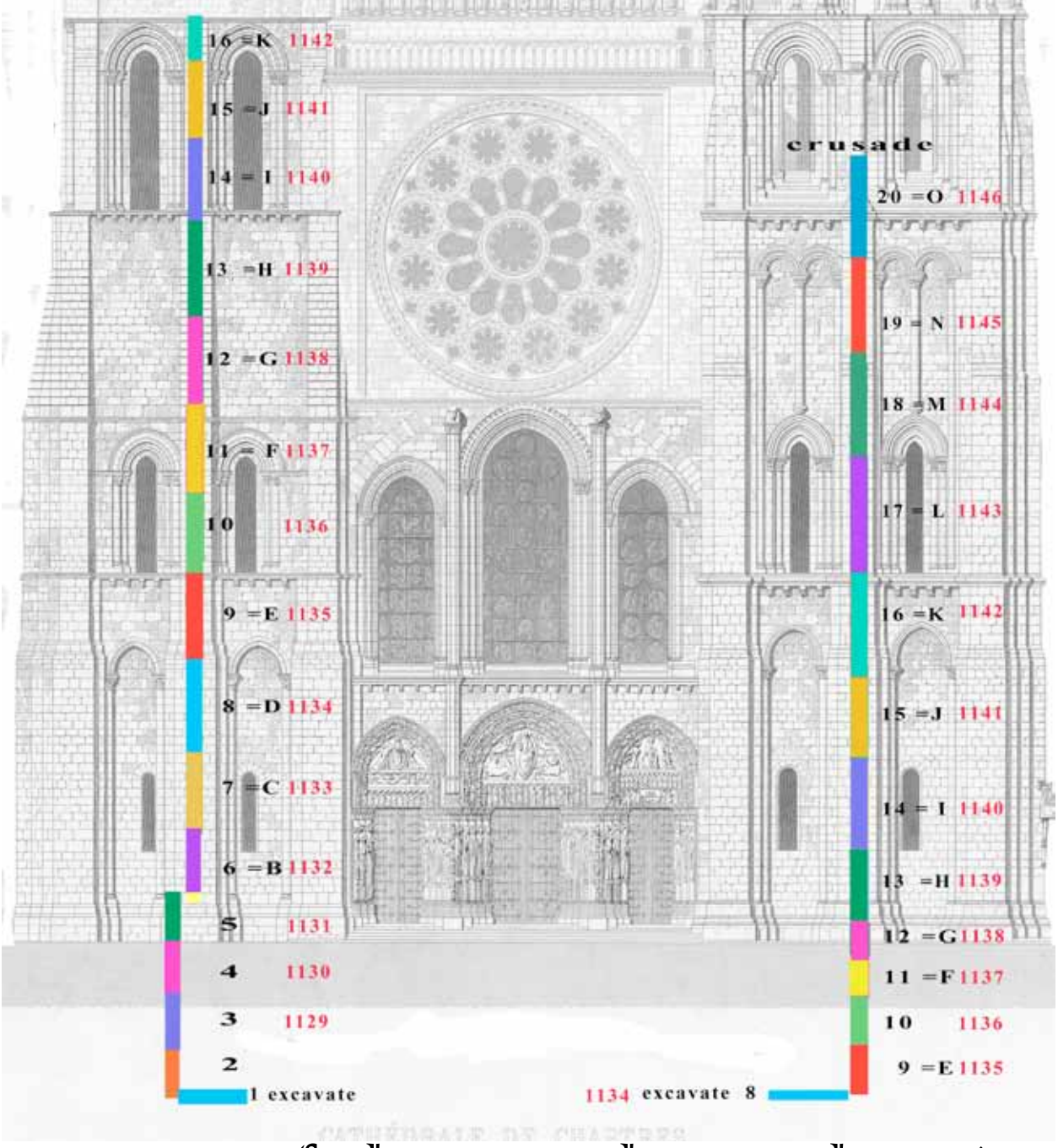


Part 2a of the Royal Portal Series

July 2021

Chartres Royal Portal - towers, campaigns and dates

John James

Long ago, in 1972 I proposed that "The cathedral of Chartres was not designed by three architects, or even five or six: in our sense of the word there were no architects at all, only building contractors" and that after their stint on the job "they would leave the site in a body, the crews intact under their master, to find another project."[1] In no uncertain terms the academic establishment pilloried me for this interpretation. Now, fifty years and over a hundred publications later, I withdraw nothing but for one correction, that the short campaigns were not due to constraints in funding but to something much more fundamental, **the slow-setting quality of medieval mortar**. Many historians have been on the edge of understanding the implications to medieval history, but were held back as I was by the assumptions and memes of our times.

Fatty and slow-setting lime mortar limited what could be built in a season to a dozen courses, and usually much less.[2] The building materials themselves

Links to the Series

In bold those that have been completed.

ensured there was a maximum that could be built in a season. No matter whether the teams were large or small, work still had to stop after a certain amount had been completed.[3] Once the allotted courses were finished and covered with straw against the winter, the teams had to depart. The site would then remain unoccupied for many months while the mortar set.

As a team could work at a number of jobs in a year there were always builders on the move, singly or with families, taking up their tools in one place after another and never resident for long. Their job was not to create the whole, but to start with whatever they were given and increase the work in small increments. Short-term campaigns were unavoidable.

Hence intermittent contracting with different builders each time was the norm. This was the situation for over a thousand years, and the builders were flexible enough to make it work and to build great cathedrals.

Mortar

Modern mortars are hydraulic, for water enables the mortar to set. Medieval mortar, on the other hand, relied on air to enable the set.[4] This is a slow process, and is counted in months, not days.[5] Walls and arches were affected by the time needed to allow mortar to mature from paste to stone,[6] and to settle with the inevitable shrinkage. In large arches there was a second delay while the voussoirs adjusted after striking the formwork.[7] Thus, fatty mortar slowed construction into a number of small campaigns and over the centuries builders created ways to get the best from the situation.[8]

For more than a century historians have incorrectly presumed permanent workshops on all but the smallest sites.[9] Even the most cursory examination,[10] in small churches and large, has confirmed that appointments were short-term and that when finished the master left for another job somewhere else.[11] Over the past fifty-five years I have not only visited, but obtained the keys and climbed over a thousand churches in France, and hundreds more in England, Italy, Spain and Germany.[12] Everywhere the pause between masters is clear from changes in the details.

The multitude of campaigns in most buildings implies a contractual system and a design process that contradicts most of what has been written. Were the campaigns random we might expect loss of funding or accident, but as the tell-tale changes in profiles and elements are nearly always at the same locations, we should look to policy,[13] a policy that made continuous contracting with permanent workshops impossible in most circumstances.The only exceptions seem to have been military works that had no need for the delicacy required in churches. This technical limitation was normal creating with it an industry of discontinuous contracting. I have called this policy the **Standard Maximum.**

As a team could work at a number of jobs in a year, when a section was finished the men would pick up their gear and move to the next site not unlike domestic construction today when you settle on a team and they book their time to come when they can. We could imagine many, perhaps hundreds, of builders on the move from job to job. Their task was not to design from scratch, but to start with whatever they were given and raise it in small increments. Seldom was a master able to complete a building as originally envisaged, and though the execution was personal every master knew how it was going to look in principle if not in detail.

A builder might work on two or three jobs in a season, each taking no more than a few months. We might think this was a recipe for chaos, but not so. The height limits per season meant that builders knew in advance when they were to leave the site and could plan where to go next, just as tradesmen do today.

Two contemporary paintings of labourers puddling the mortar, with a bucket of water nearby.

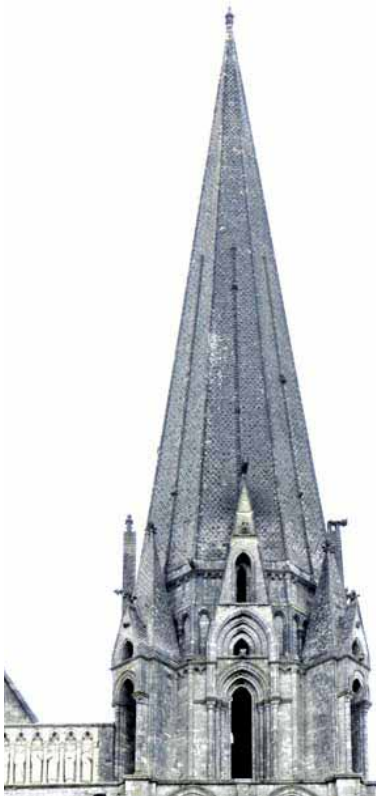
The documents

The narthex of Chartres cathedral is referred to in eight documents, but none refer to the portal sculpture. Two refer to a fire that damaged the town on September 5, 1134. Fulbert's church, then little more than a hundred years old, was not touched.[14] Nothing tells us whether the westwork was commenced immediately afterwards or not, nor whether work had already been begun before that date, but we have one reference to archdeacon Ansgerius "who gave 20 sols for the building of the tower".[15]

It has been much remarked that the Latin word is *turris*, which refers to a singular tower.[16] There is no date to this document, but we know that Ansgerius died in January 1139 and can presume that the gift was made at the latest at this date.

Two documents of 1145 describe people dragging "with their own shoulders wagons filled with stone and wood, grain and other materials, to the work site of the church".[17] They refer to towers (plural), using the Latin word *turres*.[18] Lastly there are references to three gifts of money made some time after 1149 and one after 1150. In the first the Latin plural is used *opus turrium*,[19] while in the second they used the singular *opus turris*.[20]

If we can trust the scribe's grammar, one tower was under construction in the 30s (the north), both under construction in the 40s and only one (the south) still being completed in the 50s or later. And this is, indeed, the commonly accepted view adopted by all writers on the subject. It is from here that opinions differ.



Chartres cathedral, the spire from 1150s

Dating down from the octagon

The plan of the south tower was changed from square to octagon above Campaign-20 partway up the second level. The precise location of the junction is seven courses above the stringcourse where two corner columns terminate with undecorated capitals and were replaced with glacis, and the buttresses were altered in shape and size [r2].

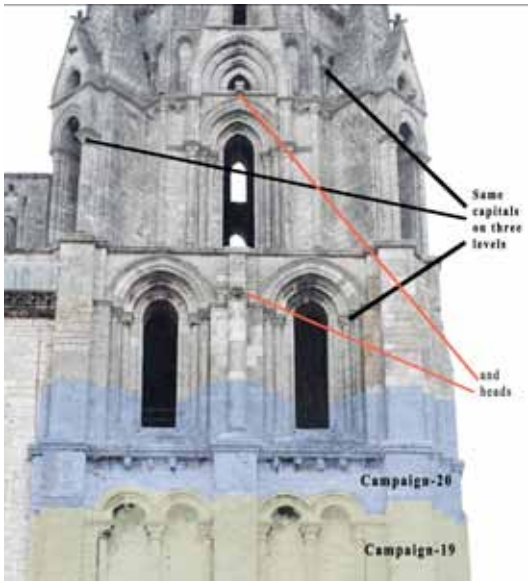
I presume that work at this level was halted by the financial needs of the crusade, as seems to have happened elsewhere in northern France.[21] When construction was resumed the uppermost courses of the square stage had to be completed, and it is within that section that preparation was made to radically transform the tower into an octagon.

In the upper parts, square and octagonal, that the style of the capitals is less austere and more intimate compared to any lower down. The capitals and projecting heads above and below the transformation are by the same hands, which confirms that the uppermost part of the square tower was built with the octagonal support for the spire.[22]

Elsewhere in France octagonal spires were, on the whole, a creation of post-crusade masters.[23] One document states that Count Galeran paid for 17 spires in the 1157-1163 period, half of which were octagonal.[24] We therefore postulate a not unreasonable date for the junction at the top of the south tower to just before the decision for the crusade, and coincided with the probable end of building funds in 1146 as the crusaders set off for war.

Consequent on this, the naming of the campaigns in this series has been amended [r3]. Instead of fifteen campaigns from the base of the north tower to just below the octagonal spire on the south as itimised in earliers parts of this series, there are now twenty. This has a profound impact on the starting date for the narthex and its towers.

Similar adjustments had to be made in the north.



Level 2 square and level 3 octagonal and spire

1127-30	Levels 1-4 are new, excavate north
1131	Level 5 was A
1132	Level 6 was B
1133	Level 7 was C
1134	Level 8 was D the fire, excavate south
1135	Level 9 was E
1136	Level 10 is new layer
1137	Level 11 was F, portal sculpture
1138	Level 12 was G
1139	Level 13 was H
1140	Level 14 was I, portal completed
1141	Level 15 was J
1142	Level 16 was K
1143	Level 17 was L
1144	Level 18 was M
1145	Level 19 was N
1146	Level 20 was O, crusade

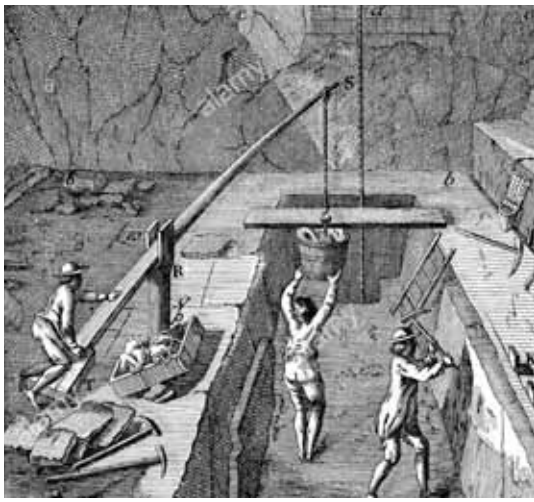
Changes to campaign numbers in Portal Series

Footings included

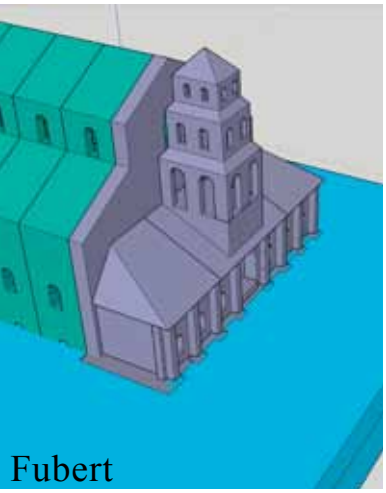
Up to now I have made little effort to include the foundations and the time-consuming connections between the Fulbert crypt and the new work. Philippe Debaud has convinced me of the importance of the sub-soil work.[25] The footings were built within walls of masonry and the space between filled with stones and bulk mortar. There were no details and the footings offered little opportunity for cleverness. The amount of material that would have been removed for the crypt and for the north tower measured about 20,000 cubic metres, all of which had to be hoisted out in buckets, tipped into barrows, wheeled some distance and dumped.[26]

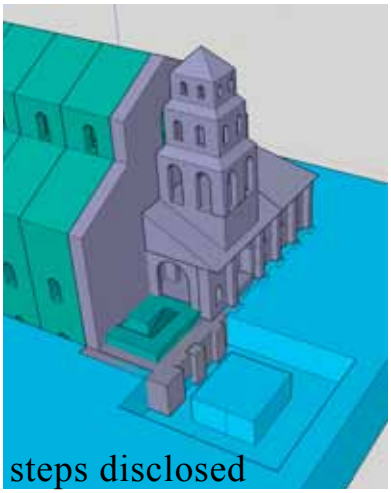
In the earlier church there would have been an exit out of the crypt with stairs into a fore porch.[27] Some of this earlier masonry was in the way and had to be demolished before the labourers could start digging. The distribution of masons marks in the extension to the crypt and the complexity of the vaults suggests four campaigns were needed below ground level: one for planning and excavation and three for extending the crypt into the north tower. In addition, we should not forget the difficulties of working underground in the rain, with waterlogged and frozen trenches, and unstable sides to the excavations [b].

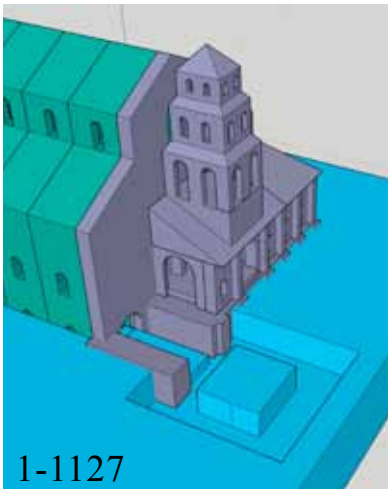
The following images of the Fulbert church and the four below-ground campaigns could be dated 1127-1130±, which is before the fire. The complexity of the work required for the demolition and extension of the crypt is obvious.

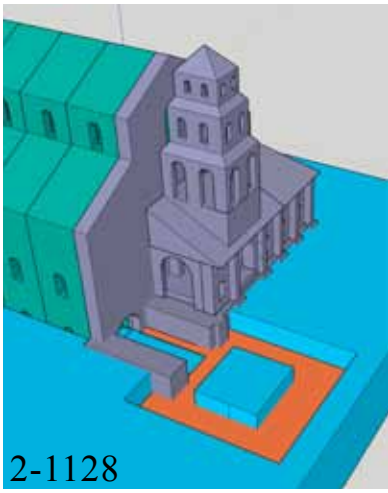


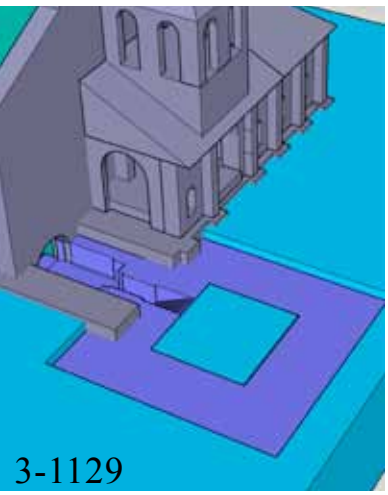
Hoisting material out of a pit, a nineteenth century drawing of a slate mine. Digging and hoisting earth for the footings in the earlier centuries would have been similar.

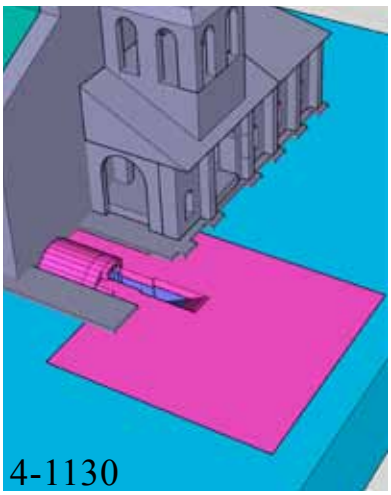




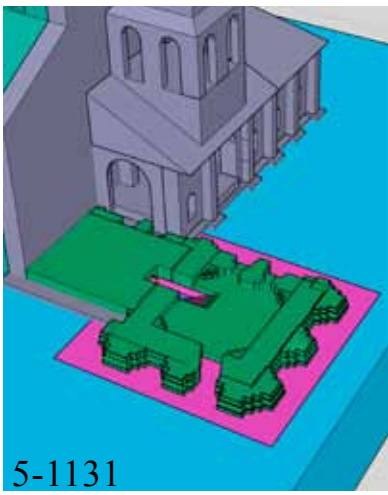








Upper Left - The estimated form of the Fulbert church with a porch added. The tower is a fanciful reconstruction from the Mici drawing and the mural in the crypt.
Steps disclosed: We assumed that the footings unearthed in 1902 extended across the site and encased a staircase from the crypt into the porch (shown with the roof removed).
Campaign-1 - The excavation included demolition of the staircase and the structure above it, leaving only the footings to the porch on each side.
Campaign-2 with the lower 1.5± metre deep footing for the tower and the crypt.
Campaign-3 with walls to the crypt and lower part of new staircase into the tower room.
Campaign-4 footings to ground level and vaults over the crypt, start of inclined vault.
Campaign-5 lowest courses of the tower above ground, the pavng over the crypt and the floor of the room under the tower with entries from the north and south. Notice that the porch footings fixed the distance from new tower to old porch.



Masons marks

There are thousands of masons marks in both towers on nearly every level, though not easily accessible except within the staircases. They form clusters of similar marks that indicate the groups of men in each crew. The junctions between the clusters are often clearly visible. Each level of change coincides with exactly those constructional elements where we would expect delays in the work, especially at arches and vaults where time was required for mortar to shrink and settle.[28]

I have combined the analysis of marks with the more obvious changes to details such as slot windows, door plans, number of risers per turn and the way the tread was attached to the newel, the imposts and the tori, the different profiles to arches and string courses, and the many changes to the buttresses.

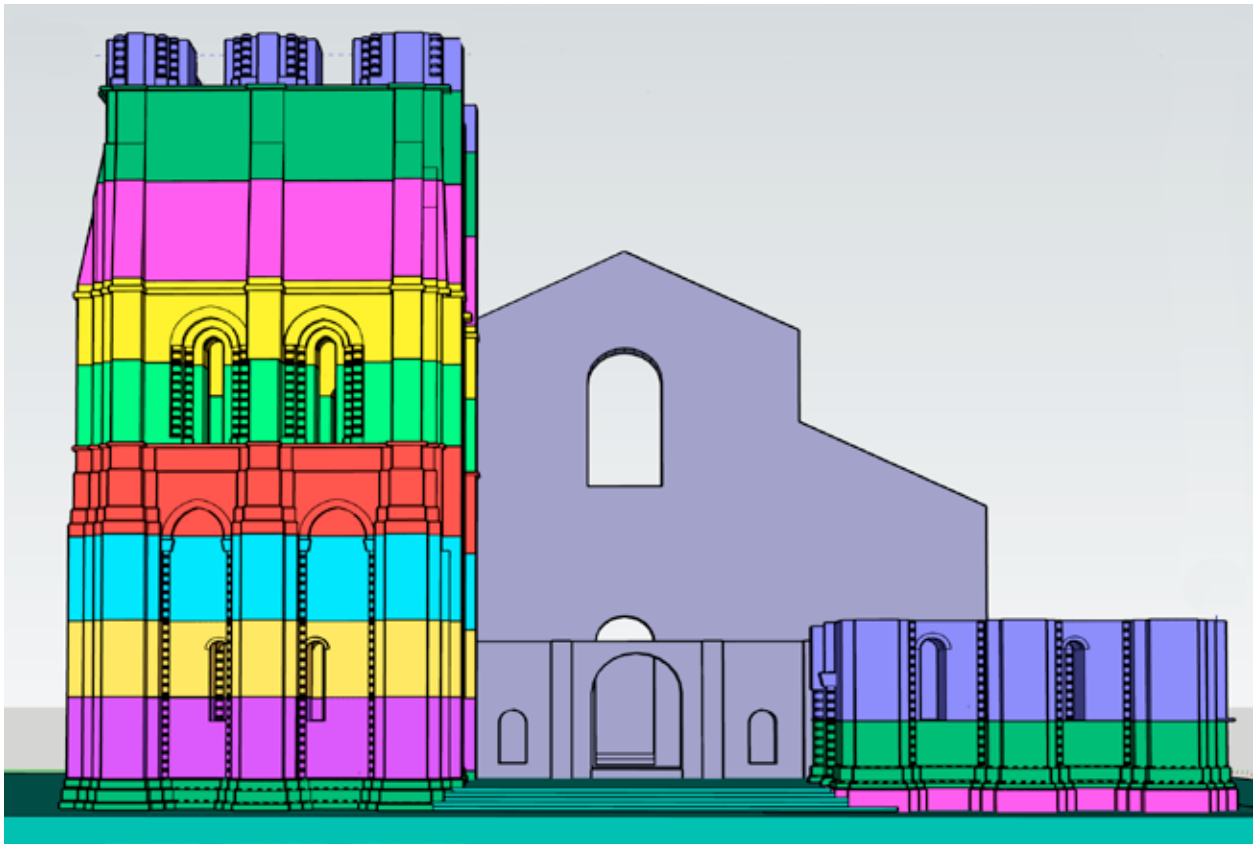
Together they show where the masters and their templates changed, and therefore the junctions between campaigns. It shows that construction proceeded in a straightforward manner, each phase of ten or so courses being added in an orderly way over the ones below.

More clearly than anything else, the masons marks show that the upper section of the north tower was being constructed at the same time as the lower part of the south [r]. Later articles published by the *Société Archéologique d'Eure-et-Loir*[29] and in *Avista Forum*[30] enlarge on the evidence that the upper levels of the north tower are connected to the lower parts of the south [b].

Some of the coursing in Campaigns-13 and -15 of the south tower is directly connected to the portal masonry to show that the portal sculpture was installed with the walls of the south tower. As this series shows, the history of the portal and its sculpture was far more complex than the towers. The connections are discussed in Parts 3 and 8 of this series.

Masons marks from Campaign-13 in both towers

Masons marks from Campaign-14 in both towers



The three upper levels of the north tower that were built at the same time as the lowest three visible levels of the south. The probable outline of Fulbert's church is in grey. For clarity, the work on the portal has been omitted from this drawing.

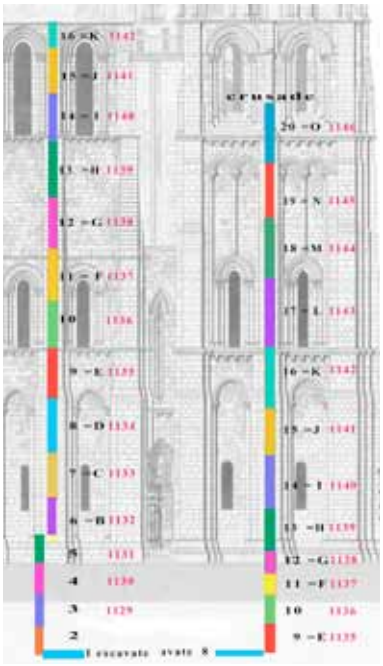
Revising campaigns and dates in both towers

Below the octagonal section the work on the towers is readily divided into twenty fairly equal campaigns: the north tower from Campaign-1 to Campaign-16, and the south from Campaign-8 to Campaign-20 [r1]. The colours in the model correspond to those in the image. Counting downwards from the start of the octagon after 1146, the excavations for the north tower would be dated to 1127±. This was definitely before the fire. All historians have presumed that the fire of 1134 marked the start in the north,[31] but as Debaud has pointed out so eloquently, the document refers only to fires in the town.[32]

Working across the connections between the towers and the number of campaigns, the first sod in the south would have been turned in 1134. If that date holds, then the fire would have triggered the start of the works in the south by damaging the Hotel Dieu that was built in the place now occupied by the south tower. It dates the north seven years behind the south.

In a continuous series of short campaigns, the two towers, and the portal and narthex between them, were built from about 1127 to 1146 [r1]. The project rose at about 10-12 courses each season above pavement level.

After the crusade and after Campaign-20, the completion of the upper chamber in the south and the adjustments for the octagon and including the spire were built together in a gigantic achievement of possibly two long campaigns, probably before the mid-60s.



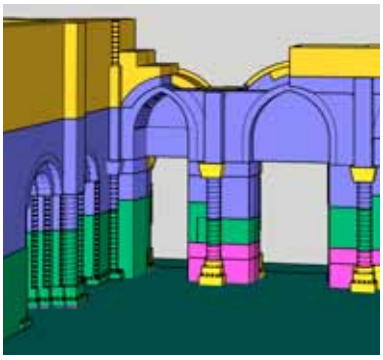
North and south towers from the west, to display the 20 campaigns. It is a compacted Tversion of the larger elevation on the first page.

The portal and the towers

I have been working towards a history of the Portal for fifty years, each time looking for deeper guidance from the anomalies in the stones themselves rather than iconography or historical context. Etienne Fels observed,[33] that the south embrasure of the portal was built with the adjacent courses of the south tower, and therefore, that the portal was intended for this location and theories that attributed the anomalies to re-siting were incorrect. "Il est facile de prouver que le portail Royal a été monté in situ, la ou il se dresse encore aujourd'hui. Ses assises sont liées a celles de la tour sud et plaquées contre la tour nord."[34]

Years later I wrote on the northern lintels and archivolts that some sculpture had been adjusted twice, once for the earlier error in the plinths and later to accommodate changes to the architectural layout.[35] Both adjustments occurred during construction and implemented ideas not present when the work began.

Since the embrasures of the Royal Portal are built into the courses of the south tower [r2], we can establish a date of 1137 for the erection of the first plinths by the north door. As the installation of the portal sculpture continued to keep pace with the tower, progress in the tower shows it was not until 1141 that the last of the drip moulds were placed.



Location where the connections between the portal and the south tower are most clearly demonstrated, from the inner narthex side.

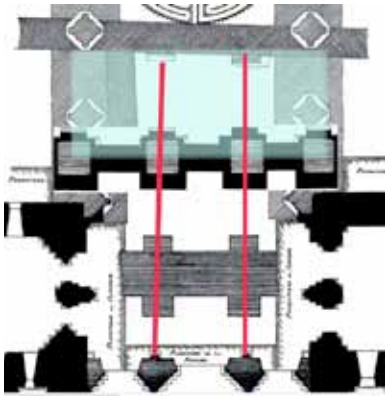
Conclusion

This may be why we so love the Middle Ages, for its architecture is organic, just like nature. It is not regular nor authoritarian, but empathetic as each part evolved from what had gone before and reflected personality rather than causes. There is almost nothing in our own times to match such a community of creative people that together, without long-term employment or master plans, were able to create such enduring architecture. These buildings are the culmination of an organic evolution of commonly held concepts through the combined creativity of every master who was there.

References

1. John James, "The Contractors of Chartres (ch. 1-5)", *The Architectural Association Quarterly,* iv 1972, 42-53.
2. John James, "Mortar, measure, masonry", article in preparation.
3. English "contracts state that a height of about ten or twelve feet per year was considered best", John Harvey, *The Gothic World 1100-1600*, London, 1950, 17. Louis Salzman, *Building in England down to 1540*, Oxford, 1952, 445, refers to the Berkeley Castle contract of 1372 for a bell tower that restricted the builder to a maximum of twelve feet per year. The availability of money was important, but in most cases less than setting time. As they knew how much was to be built in a season it was possible to plan for regular funding, as when fraternities were urged to raise a certain amount each year through annual subscriptions: Harvey, *Gothic World,* 13. Robert Mark, *Gothic structure,* 13-15, and 77 discusses three types of shrinkage and the different times required for each.
4. John James, "Medieval mortar and the constraints of formwork", *The Template-makers of the Paris Basin,* 1989, 63-81, especially 78-81. https://www.creationofgothic.org/COGA/files/articles/Medieval-mortar.pdf. I am indebted to John Ashurst's lucid booklet, *Mortar, plasters and renders in conservation,* 1983, London; and to Brian le Mar and Peter Long, both *Magister fabricae* at Canterbury, to Georges Duval, Inspecteur Général des Monuments Historiques, Guy Nicot, architect in charge of restorations at Chartres, and my long-time collaborator and translator, Dominique Maunoury, architect, all now passed on. John Fitchen, *The construction of Gothic cathedrals. A study of medieval vault erection,* Oxford, 1961 and in Appendix G "The slow setting time of medieval mortars and its consequences", 262-265; John James, *The contractors of Chartres,* Wyong, ii vols. 1979-81, 12 n.12; Viollet-le-Duc, *Dictionaire raisonné,* vi, 402-403.
5. 3-12 months, John Fitchen, "The slow setting time of medieval mortars and its consequences", Appendix G in *The construction of Gothic cathedrals*, Oxford, 1961, 263.
6. In discussions with the foreman at Westminster Abbey, who re-laid the southern flyers in 1989, French hydrated lime was used in the medieval manner. The arches were left for six weeks before the formwork was struck. As the quality control over medieval lime was poorer, prudent setting time would have been longer. The same considerations apply to bulk fill over vaults.
7. The prime example is that during the restoration of the high vaults at Soissons after the war, some of the mortar was still fatty. The engineers in Ove Arup's organization at York Minster recognized that formwork would have been struck only after a full twelve months.
8. James, *Contractors,* 13-14.
9. James, "Introduction". *Template-makers*, 4-7.
10. The technique is called Toichology: the study of existing stone structures, derived from the Greek word 'toichus' meaning a standing stone wall. It was formulated in James, *Template-makers;* belittled by Robert Russell, *Avista Forum*, vii, 1993, 9 and my riposte "In defence of Toichology: A Reply", *Avista Forum*, vii 1994, 9. https://creationofgothic.org/COGA/files/articles/Discipline of toichology.pdf
11. Examples in James, *Template-makers*, 9-30.
12. My on-site research for more than 50 years. First laid out in John James, "An investigation into the uneven distribution of churches in the Paris Basin, 1140-1240", *Art Bulletin,* lxvi 1984, 13-46; James *Template-makers,* and more thoroughly on the COGA site where the phases of construction for 840 churches in the Paris Basin are listed and may be analysed as a group. Perhaps it is the mood of our period, perhaps time has worn away the old-fashioned prejudices that met my publication of the *Contractors* in 1972, but I now find there is a general agreement that discontinuous contracting does describe the working relationship of that period. The map is in https://creationofgothic.org/COGA/list-new.php?srch_for=&page=map&srch_importance_1=1&srch_importance_2=2&srch_importance_3=3&filter_outlier=1
13. Most of my writing has been dedicated to locating and interpreting these changes, particularly in *Template-makers* and, of course, *Contractors*, where on pp. 547-48 I list the twenty most important and "unfettered" decisions taken over as many campaigns that made significant changes to the design of the cathedral each indicating that the master was in control, not the client.
14. Merlet and Clerval, *Un Manuscrit Chartrain*, 84-85; L.Merlet and de Lépinois, *Cartulaire de Notre-Dame de Chartres,* Chartres, 1862-1865, i, 18.
15. Merlet and de Lépinois, *Cartulaire*, iii, 130-131
16. Robert Branner, *Chartres Cathedral*, New York, 1969, 74-76.
17. Merlet and de Lépinois, *Cartulaire,* i, 147-148. I do wonder if the carting of materials by the populace came about as funds were diverted to the crusade. It was reported esewhere for the same period.
18. Roberti Abbatis de Monte, *Appendice ad Sigbertum*
19. Victor Mortet, and P. Deschamps, *Recueil des textes relatifs à l'histoire de l'architecture et à la condition des architectes en France, au moyen âge, XIIe-XIIIe siècles*, Paris, 1929, xiv, 318-319, 319 and 290.
20. Merlet and Lépinois, *Cartulaire*, iii, 80, 189, and 200 for the first three, and iii, 17, 33, and 205 for the second.
21. John James, "Boundaries that delineate periods in art-history between 1090 and 1180", *Avista Forum Journal*, xxii 2012, 23-46.
22. Compare the illustrations in James, *Ark of God*, iv 369-384 and the 57 capitals in phases 20-21 in https://www.creationofgothic.org/COGA/capitalphases.php?id=CHARTRES.
23. The Crusader Recession is discussed in detail pages 9-12 in https://www.creationofgothic.org/COGA/files/articles/06-GrippleSon-and-the-Crusader-Recession.pdf.
24. James, *Ark of God*, v, 1758-59; John James and Stephen Gardner, "The work of Count Galeran", *Avista Forum*, x 1996-7, 9-10.

25. Philippe Debaud, *Les Maitres Tailleurs de Pierre de la Cathédrale de Chartres, leurs marques identitaires dans les chantiers du XII^{ème} siècle*, unpublished m/s.
26. My guess is that this material was dumped in what is now the Bishop's Garden. The delivery of sculptural stone from the Oise quarries from the river would have been via the Tertre Saint-Nicolas where they could have built a ramp to slide materials uphill on rails, as still exists today in Mont-Saint-Michel. The rails would rise up the steep slope, through the garden to the east end of the cathedral. The lift would be 75 metres above the surface of the river, and across a horizontal distance of 200 metres. The slope of about 20^{o} would not be too difficult, and could have been in two stages with space for a winch or for two teams of horses for the upper haul. Illustrated in https://www.creationofgothic.org/COGA/files/articles/Chartres-Portal-6.pdf
27. The footings to the east of the towers disclosed by Lefevere-Pontalis [r] that he claimed were the original supports for the Royal Portal, were more likely to have been part of a fore-porch to the nave that contained the exit stairs from the crypt. Eugène Lefèvre-Pontalis, "Les façades successives de la cathédrale de Chartres au XI^{e} et XII^{e} siècle", *Congrès archéologique*, lxvii 1900, 256-3.
28. James, *Template-makers*, ch. 4.
29. John James, "La construction du narthex de la cathédrale de Chartres", *Bulletin de la Société Archéologique d'Eure-et-Loir,* lxxxvii 2006, 3-20.
30. John James, "Impact of climate change on building construction: 1050-1250", *Avista Forum Journal,* xx 2010, 43-49.
31. Lepinois and Merlet, *Cartulaire,* i 18.
32. With possible damage to the Hotel Dieu located where the south tower now stands, Debaud, *Les Maitres Tailleurs*.
33. Etienne Fels, "Die grabung an der fassade der kathedrals von Chartres", *Kunst Chronik,* 1955, 149-151.
34. Etienne Fels, "La facade de la cathédrale de Chartres au XII^{e}", *Bulletin Societe Antiquaire de France*, 1967, 23.
35. John James, "An examination of some anomalies in the ascension and incarnation portals of Chartres Cathedral", *Gesta,* xxv 1986, 101-108.



Footings to the towers and in the narthex from the excavations of 1902.