

Could Suger have built the whole choir in only four years?

It has generally been argued that Suger constructed the whole choir from crypt to high vaults in the four years between 15 July, 1140 and 12 June, 1144, though he himself claimed it was only three years and three months. This is based on the reading of the text that the work was completed "...from the crypt below to the summit of the vaults above, elaborated with the variety of so many arches and columns, including even the consummation of the roof." This has been taken to mean the summit of the high vaults "above" the altar, and the "roof" assumed to be the main roof above the high vaults.

Sumner Crosby printed a well-known section that showed an elevation not unlike Saint-Germain-des-Prés with a gallery, clerestory and high vault. (*The Royal Abbey of Saint-Denis*, 264) Yet Crosby was not totally satisfied by this, for he wrote that "even my own enthusiasm for Suger's abilities questions the possibility of his erecting such a complex structure, especially one so novel, in such a short time". (p. 217-8) I feel he went along with the belief from his loyalty to the French historiography and his colleagues, an impression I gained when I spoke with him on the subject at Yale some time ago.

For myself, I have not been happy with this belief. My gut feeling from my experience as a builder and architect tells me it could not have been finished in that time. Here is the evidence that convinced me:

1. There no stonework above the aisle vaults from the 1140s. The twelfth-century stones visible within the roof over the vaults all stop at the same level.
2. Lime mortar needs a certain time to set before the formwork under arches can be struck. This is generally six to eight weeks, depending on temperature. During the winter more time is needed. Even eight weeks would be conservative under snow and frost. Once struck, the arches need to be left for at least two weeks to settle before being loaded. That is, the small cracks between the voussoirs need to be given time to close up under the weight of the stones so that there will be no further creep when they cells and walls over them are laid up. Failure to do this will result in the arch settling after the stones above have been placed, leaving a gap between the two. (*Template-makers of the Paris Basin*, ch. 4)
3. (a) At Saint-Denis the formwork for the window and vault arches in the crypt could have been set up at the one time, limiting the delay at that level to 8-10 weeks.
(b) The cells for the lower vaults would have needed similar setting time, but as they are solid, probably no more than 6 weeks.
(c) The design in the ambulatory is such that the window arches would have been constructed first, and when completed with the additional stones over the arches, ready to support the vaults. Delay 8-10 weeks.
(d) The ribs were next, and as we know from the description of the storm, were "not supported by any scaffolding nor resting on any props". They would have just had the formwork under them removed and were waiting to settle without props before having the cells placed onto them. Delay at this level, another 8-10 weeks. Since the storm was in winter, January, the latter is the more probable.
4. We also need to allow time for setting out, demolishing the old building, and laying the foundations. Some work had already been accomplished by July 15, 1140 when the first stones were laid. Let's presume a further eight weeks for the other preliminary tasks, including bringing the foundations up to ground level.
5. Finally, we have to allow for the erection of vaulting formwork, arches and cells. Though some of this could be prepared while the walls were being erected, some would have taken all available masons and erecting gangs away from the walls. Let's say four weeks in the crypt, eight in the ambulatory and ten in the high vaults.
6. Adding these delays together, the work had to pause for forty-four weeks minimum if only the ambulatory were built, or eleven months. BUT if the gallery was also built, with the clerestory windows and high vaults and the cells over them, we would have to expect further delays of at least another twenty-six weeks. In a four-year project this leaves only 35 months to complete the walls of the lower building, and 29 to 30 for the taller.
7. To see if this would have been enough to construct the whole fabric of a three-storey building plus crypt, lets count courses above the ground. From the crypt to the top of the ambulatory there are 43 courses, and to the top of a hypothetical high vault (scaling off Crosby's drawing) there would be 80. This would allow sixteen working days for each course in the first instance, but only seven-and-a-half days in the second (allowing for five working days each week, to except Sundays and the manifold saint days as well). It does not improve matters that the taller the building the more time is lost in erecting scaffolding, constructing cranes, lifting stones and the general difficulties in working at great heights.

No matter how many people were employed, to carve and lay one course, often with complex mouldings, there is a physical limit to how many men can work in a given space, how many cranes were available, and so on. I personally have to conclude that it is extremely unlikely, if not impossible, for Suger to have completed the whole choir to the high vaults in the space of four years.

So, what of the words he wrote? Take each phrase separately:

1. "...to the summit of the vaults above" - above what? The altar or the crypt? If the former he meant the high vaults, if the latter the vaults of the ambulatory.
2. "...with the variety of so many arches" which words do not readily describe the simple four-part arrangement of the ribs of a main vault.
3. "...and columns". Now, where are the columns under the high vault? Surely he would have referred to the gallery or the clerestory windows. To refer to columns suggests he was speaking about the ambulatory.
4. "...including even the consummation of the roof". If he is referring to the main roof this "even" is curious, as roofs were erected before the high vaults to keep out the rain and carry the lifting gear, so it is more likely he would have used "even" to refer to the vaults. But if he was referring to a temporary roof at aisle level so ritual could continue while the upper parts were being completed, the word "even" would be absolutely appropriate. There are precedents for temporary roofs.

From this I paraphrase what I think Suger meant to write "...from the crypt below to the summit of the ambulatory vaults above those of the crypt, elaborated with the variety of so many arches and columns, including even the consummation of the temporary roof."

If we can accept this argument, then the nature of Suger's upper stories remain unknown. He may have intended a simple wall and small windows like Saint-Martin-des-Champs, or a wooden roof, or any other contemporary solution. He may have intended six-part or four-part vaults, but we will never know which. Whatever it was to be, the choir would have remained, for almost a century, a low-roofed and relatively small building without much light, with a temporary roof at the same level as the roof over the ancient nave and that over the recently completed narthex. I wonder if the low ceiling over the choir would explain why no other architect copied the wide windows and spaciousness for another twenty years?

After Suger's death when the monks withdrew the monastery from active participation in the political and administrative affairs of the kingdom, they seemed content to remain within the unfinished structure. Keeping noisy workmen off the site would, as we all know from our own building operations, ensure a contented and peaceful life! Their decision to build a tall clerestory over the choir in the 1230s was then a natural one, dispensing with the temporary roof and keeping the same ceiling level over all parts of the new building.