

Reading Abbey

North Transept

Mortar analysis

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PURPOSE AND SCOPE OF THE WORK

Following the completion of conservation project of the ruins of Reading Abbey, known as *Reading Abbey Revealed*, Historic England agreed to subsidise similar work on the standing remains of the North Transept. These are in the grounds of the Catholic Church of St. James and owned by the Catholic Diocese of Portsmouth.

Over the last few years work on these has included looking at their relationship with the main body of the ruins and cataloguing the stone found on the site. These are reported on the website <https://www.readingabbeyhistory.com/>

During the course of several visits by representatives of Historic England and from Reading Museum, various questions had been raised and possible anomalies noted.



5 m approx.

Flint core of the apsidal chapel. 2018.

Photo John Mullaney

The main question was to what extent the standing ruins represent the original ruined structure or whether they had been altered in some way. The formation of the flint core appears to differ at a higher level, roughly from between 3 to 5 meters, as can be seen on the photograph. It was suggested by both Historic England and by Reading Museum that this may be the result of some conservation work in the 19th or 20th centuries.

Flint core from above 3 to 5 meters approx. appears to have been layered in courses rather than backfilled.

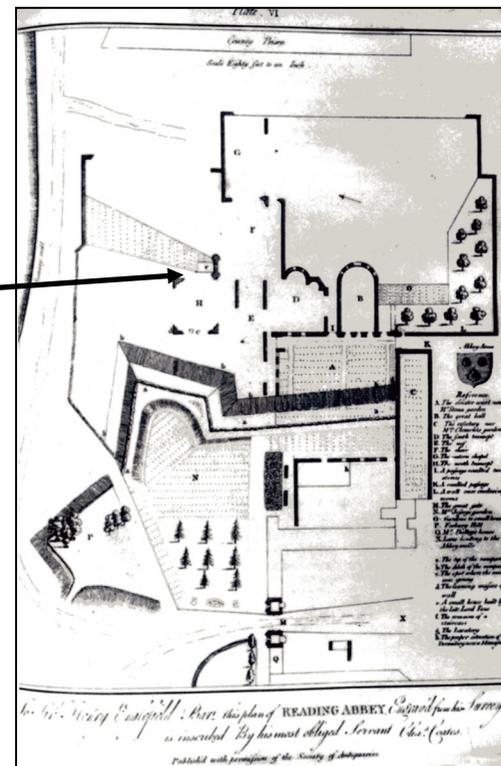
One explanation for this is that up to a certain level the builders may have built up the ashlar blocks or wooden shuttering and poured in the infill mix of flint, cement and other material. Above a certain level, say 3 to 5 meters, it was easier to layer the core in much the same way as a modern bricklayer would build a wall. This would account for the difference in the appearance of the composition between the two levels. In the lower sections there is much more mortar and other infill material, whereas the upper levels are in courses, with the flints bound more tightly together. There is evidence that this was done on the other parts of the Abbey site and that the technique of herring bone layers was used to strengthen the courses. This latter was used by builders of Cluniac monasteries in France, and it should be remembered that the first monks called to found Reading were Cluniacs brought over to England by Henry I in 1121. It was, however, a comparatively widespread method, with examples in England stretching from the Roman era, through Saxon times and throughout the middle ages. See 'Comment 2' below'.

The overall height of the standing remains is about 8.15m. (Harrison *The North Transept*. p3). However, one anomaly is that an 18th century illustration, (below left), does not appear to show the same profile as in a late 19th or early 20th century photograph, (below).



A small house built by the late Lord Fane

In 1779 Sir Henry Englefield of Whiteknights wrote a paper with an illustration showing the results of his archaeological survey. He reproduced a fuller version for Coates' 1802, *History and Antiquities of Reading*. This is the plan shown here. In both versions he shows a small house and its garden, which in his notes he says is, *a small house built by the late Lord Fane*. A small house is shown standing against the ruins in the illustration mentioned above. The plan shows the house in the correct position, against the ruins of the south chapel of the North Transept or, more accurately, of the north ambulatory wall immediately to its east. It should be noted that the chimney, and so flue, does not appear to be attached to the ruins. This is important for our later observations. It is possible that there were two different houses at different times.



Late 19th, or more likely early 20th, century photograph showing a window opening east of the apsidal chapel.

This window would have been in the ambulatory wall, east of the North Transept. This window arch has now completely disappeared. It should be noted that Englefield, when discussing the Chapter House and other parts of the ruins, wrote, *it is now difficult to say, whether or not the windows were round headed; they have the appearance of an obtuse point, as have all the other windows remaining in the abbey, though the doors are every one round*.

This is an important observation from one who saw the ruins before the changes, restorations and conservation projects of the 19th and 20th centuries. Certainly some of the early illustrations and even photographs, such as the one shown here, could be interpreted as substantiating Englefield's observation. Note, however, that he says the evidence is inconclusive, and the angle of the point is not obtuse.

It would be interesting to examine mortar samples from the rounded windows in the Chapter House to see if they are medieval or 'modern'.

NORTH TRANSEPT MORTAR SAMPLES (Dr Kevin Haywood)

1. Type A, Light cream-grey lime gravel mortar 2.5 YR 8/1 with ovoid chalk inclusions — primary medieval mortar

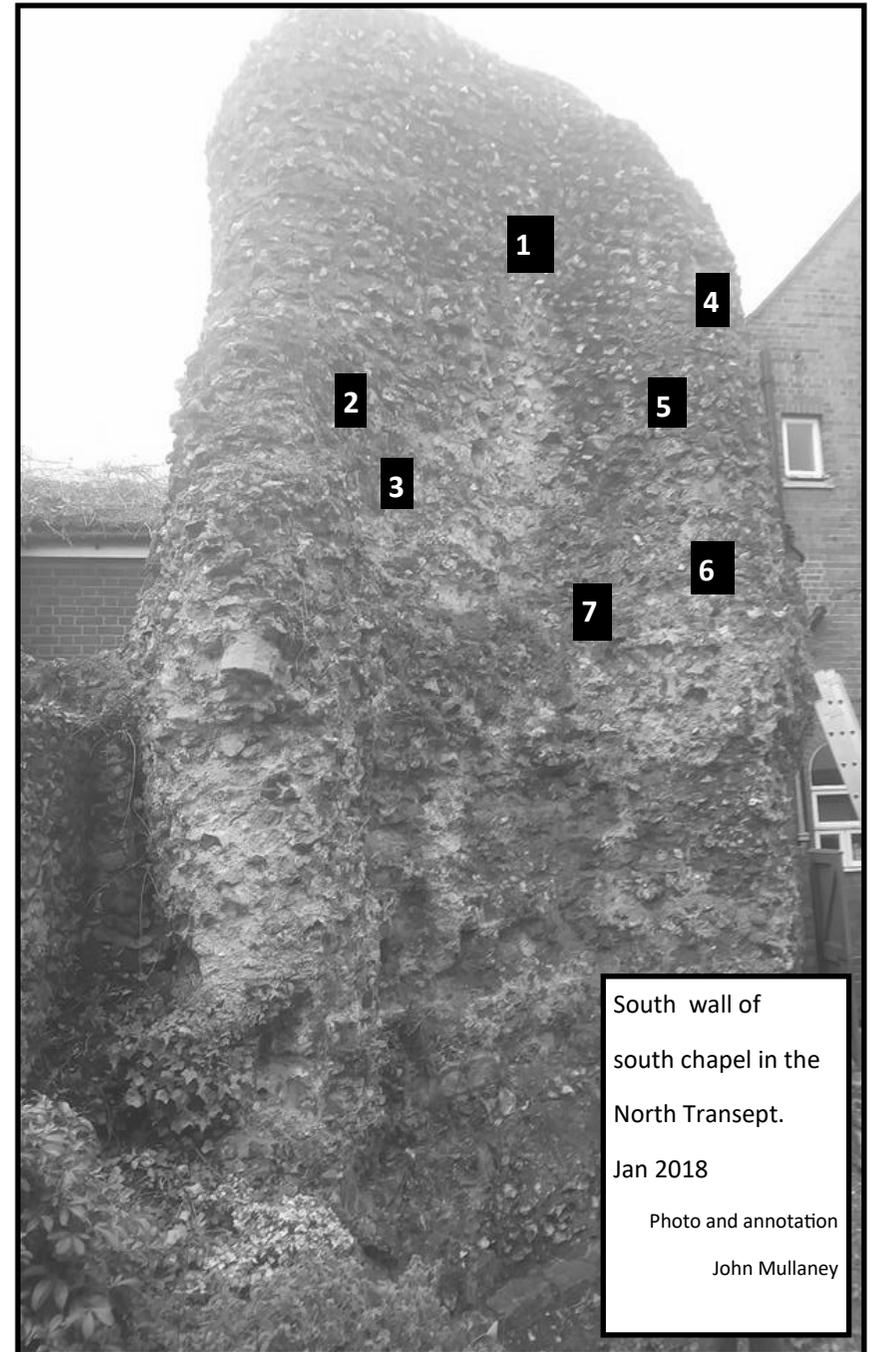


2. As above



3. Mid to late 19th or 20th century mortar. ("Roman cement"). Darker colour. (See comment 1, below).
4. Type A . White grey 2.5 YR 8/1 Light cream lime gravel mortar with 25mm brown flint pebbles rare charcoal. Ovoid chalk inclusions c 10mm. Rare shell. Hummocky tufa like appearance. Possibly primary medieval mortar
5. Type A1 White gravel mortar with 25mm brown gravel flint pebbles and large ovoid chalk humps, but very similar to Type A with one small piece of White-grey 2.5YR light cream gravel mortar with 25 brown flint pebbles, rare charcoal. Ovoid chalk inclusions c10mm. Rare shell similar. Possible primary medieval mortar.
6. Type A White grey 2.5YR 8/1 light cream concretionary lime gravel mortar with 25mm brown flint pebbles. Rare charcoal. Ovoid chalk inclusions c 10mm. Rare shell. Hummocky tufa like appearance. Finer than no 4 above. Possible primary medieval mortar
7. Type A White grey 2.5YR 8/1 light cream lime gravel mortar with 25 mm brown flint pebbles, rare charcoal. Ovoid chalk inclusions c 100mm. Rare shell. Hummocky tufa like appearance . This is slightly harder than items 4 and 5 above but the same sample recipe. Possible primary medieval mortar

Samples 1 - 3 taken July 2019; samples 4 - 7 taken January 2018.



South wall of
south chapel in the
North Transept.

Jan 2018

Photo and annotation

John Mullaney

COMMENTS

1. These and other samples were taken from every face of the ruins. There is little difference in the spread of the types of mortar. Most of it, by a long way, is primary medieval mortar. However, at various points, modern, so called "Roman mortar", dating from the second half of the 19th century to the 20th century, appears haphazardly both on the front face and on the reverse side of the standing remains at St James'. These consist of patches of cement which appear to have been placed over the flint and existing mortar in recent times, presumably to stabilise areas that were crumbling. They form only a small fraction of the whole.

The conclusion must be that the structure dates to the medieval period and that the area with the layered appearance, therefore, likewise dates to the same time frame. In short the layered flints are not a modern rebuilding.

2. The building method at Reading was commented upon by Englefield. He wrote: *The vast strength of the walls and the perfection of their cement is a circumstance very worthy of notice. They were evidently built by laying course upon course of the coating stone (ashlar blocks), and running the interior parts full of fluid mortar, mixed with small flints. Where the walls were not coated with stone, I fancy boards were used to confine the liquid wall, and their traces are in some places visible.*

The use of shuttering, as we would refer to it today, was not uncommon and was used from Roman times.

Although Englefield mentions two possible ways in which the Abbey was constructed, the fact that there are layers of flints and more careful work such as herring bone, indicates that a third method was also employed, namely 'flintlaying', similar to bricklaying.

4. The dark staining on the face of the apse wall raised some questions. A representative from Historic England, among others, speculated that it may be the consequence of a fire or flue from a house. This is a possibility but, for the reasons pointed out earlier, it is unlikely to be the small house erected by Lord Fane, or at least the one shown in the illustration. One medieval specialist, Professor Anne Curry, does not believe that it could be the consequence of a fire during the time of the Abbey. One such devastating fire was recorded in the Abbey's annals for St Gregory's day, 1209. Professor Curry pointed out that it is highly improbable that the fire would have penetrated the ashlar to such an extent as to cause the discolouration visible today. Fire was a common problem during the middle ages and the evidence from other buildings does not support the theory that a fire at Reading could have caused the scorching of the core.



5. It is worth mentioning the stones at the base of the chapel wall. These had been hidden for many years, covered with a pile of flints and other debris. They are tied into the wall. The more easterly end has the base of a single shaft. The most westerly three stones have mason's marks, the most spectacular being a saltire inside a square. They are laid tightly together, but with room for some infill. The infill is unlike the hard mortar reported above; rather it resembles a modern dry mix. Of course it is possible that this is just dust and debris from other sources. However, there are gaps at points between the stones and so it might be expected that these would have been filled in. All are made of Taynton stone.



6. Finally, the great column base on the south of the transept wall merits a mention. Englefield's plan indicates its existence and it is in the correct position to match the base for the supporting east column of the South Transept. When this was uncovered, I was struck both by its completeness and by the high quality of the craftsmanship. It is also the most complete base on the whole Abbey site. This, and the fineness of the mason's art, was noted by Historic England as worthy of special attention. This was commented upon by several people, such as Stuart Harrison in his report to the Diocese of Portsmouth and by Professor Anne Curry of the University of Southampton.

What is noticeable is the lack of mortared joins. The carving is so exact that each block sits tightly and firmly with its neighbour. The mortar in the core is of the same light cream lime gravel mortar as seen elsewhere. There are some patches of late 'Roman mortar' as described above.

7. The use of herringbone layering to strengthen the bond is an interesting feature which is to be found in several places throughout the Abbey ruins. Further reference to the use of flint in building may be found in the following: <https://www.chilternsaonb.org/uploads/files/ConservationBoard/PlanningDevelopment/ChilternsFlint.pdf> and The Grove Encyclopedia of Medieval Art and Architecture, Volume 1 p234.

CONCLUSION

The mortar samples from the North Transept show that the remains of the North Transept belong to the same building period and that the change in appearance is not due to later additions in the post medieval period.

It would be of interest to know whether, following the 2018 conservation work, it is possible to take similar mortar samples from other parts of the ruins. They may be able to help determine, for example, whether the window openings, such as those in the Chapter House, are original and if not, to what extent they have been altered, and when this work was carried out.