



Number 21, 2025

Price £6.50

Welcome to the Welsh Stone Forum Newsletter 21. Although the Forum had a slightly reduced programme for 2024, in part as a product of the cuts to Mineralogy & Petrology section staff at Amgueddfa Cymru - National Museum Wales, I hope that you still enjoy the reports and articles. Thanks are due to all those involved in planning and leading these events. We have held joint meetings with other societies in the past, and our joint meeting for 2024 was a study day in October with the Church Monument Society at St David's Cathedral. This provided an excellent opportunity to view and discuss the interior of the cathedral with those with complimentary interests and knowledge. An enjoyable time was had by all! Although the CMS activity is not exclusively in Wales, we hope that a similar day might be programmed with them in the future. We would like to thank Heather James of the Society for producing such an excellent report of the day.

Following Andrew Haycock standing down as WSF Treasurer we are pleased to welcome Heather Jackson, who has kindly agreed to fill the vacancy. Heather has long had an interest in the use of stone. She gained an M.Phil in petrology, working on lithics from Pontnewydd Cave, N. Wales and works for Amgueddfa Cymru – National Museum Wales. As a reminder, the formal roles on the committee are: Chair, Dr John Davies; Secretary, Dr Jana Horak; Field Secretary, Michael Statham; Field Recorder, John Shipton, although we are always happy to have help from others.

We would also like to congratulate Tim and Caroline Palmer for completing their work on the stones of Strata Florida. This will be published by the Strata Florida Trust (<https://www.strataflorida.org.uk/shop.html>), with support from the WSF and the Curry Fund of the Geologists' Association. We look forward to seeing this in print.

We are always happy to hear about active projects or proposals for field visits at any time during the year. Ideally, we like to visit sites and exposures where there has been some recent research or investigation, however, we may also be able to help projects by providing geological support. Contact Jana (jana.horak@museumwales.ac.uk)

or Michael Statham, if you wish to take up this offer. We will circulate details prior to each trip. Please confirm with Mike Statham that you will be attending any of the field meetings. The WSF holds field liability insurance for our meetings issued by the Geologists' Association (of which we are an affiliated society) but we need to ensure that those on trips are members, or become temporary members, if accompanying a member.

Finally, as always, just a reminder that we always welcome articles for the Newsletter focussed on characterisation of building stone in Wales or examples of their use in the built environment. You can send your articles to me (Jana Horák (Secretary/Newsletter Editor) at the e-mail address above at anytime during the year.

Jana Horák
(Newsletter Editor)

PROGRAMME 2025

AGM 2025: Cardiff

The AGM will be held on 24th May, at 11.00 in Insole Court, Llandaff, Cardiff. (<https://insolecourt.org>). Please forward any agenda items for the AGM to the Secretary (jana.horak@museumwales.ac.uk) by 10th May, and also indicate your intention to attend.

The AGM will be followed by the annual lecture, which this year will be given by Dr Ruth Siddall. She will present an outline of the project she is currently engaged in with Trinity College, Dublin, investigating the social history and geological provenance of stone in 18th century buildings in Britain and Ireland.

Please confirm attendance with the Secretary. Guests will be welcome provided there is prior notification.

June 21st: Defynnog-Llandovery

Leader: Eric Evans

We will visit four churches to show variations in stone use across the area. Sites to be visited. Defynnog, Llywel, Llandovery (St. Mary's and Llanfair-ar-y-Bryn).

Meet at Defynnog 11.00am. Please confirm attendance with Mike Statham.

Details of subsequent meeting will be circulated as confirmed.

Tufa as a building material in south Wales

Mike Statham

Following the excellent tour of some Herefordshire churches by Eric Evans in 2023 (Newsletter 20), where we saw the use of locally sourced tufa from the Wye Valley (both at St. Michael and All Angels, Moccas, which dates from 1166 and is entirely constructed of tufa, and at St. Andrew, Bredwardine, which was built in the early 12th century and has many quoins of tufa), it was decided to investigate the use of tufa in south Wales.

It was soon found that tufa was used in the window recesses of Bronllys Castle (Clarke 1866) not far from Talgarth (SO1491 3467). According to Scourfield and Haslam (2013), was built late 12th century with the tower added soon after 1221, the keep in the early 13th century to which an upper floor was added in the early 14th century. Tufa was also used in the round-headed Norman window on the second story of Hay Castle keep, built c.1200 (Fig. 1).



Fig. 1. Tufa, Hay Castle keep © Michael Statham

Whilst deposits of tufa as a building stone in south Wales have not been mentioned in the geological literature as they are scarce, a search of the historical literature soon revealed that tufa was used at Morlais castle on the outskirts of Merthyr Tydfil (Clarke 1859), which according to Newman (1995) was built 1288-94. Figure 2 shows what remained of the castle in 1741, whilst Figure 3 shows it in 2014. As can be seen, not much remains standing above ground. However, at the base of the keep shown in Fig-

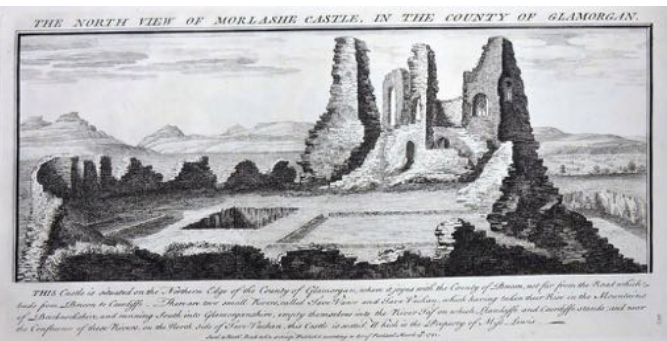


Fig. 2. Morlais Castle, 1741. © W. Clarke, Llandaff.



Fig. 3. Remains of Morlais Castle, 2014. © Michael Statham

ure 2 there is a subterranean chamber that has survived. It is accessed by a small entrance between rocks (Fig. 4) and comprises a polygon of twelve sides with a central column with corresponding facets branching into twelve fan ribs which support the roof (Fig. 5). The ribs are of Carboniferous Limestone, but the infilling is of tufa, almost certainly sourced locally as there are known tufa deposits associated with springs from the limestone in the adjacent upper Taff Valley.

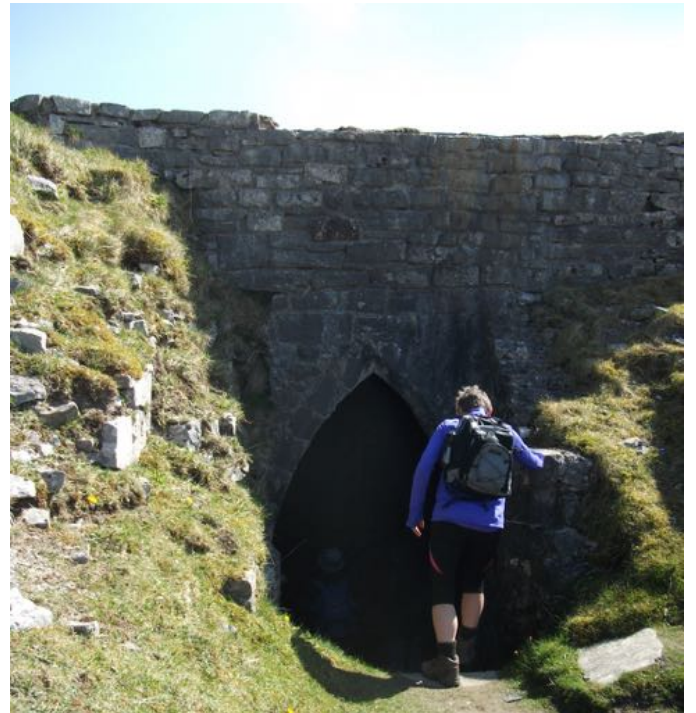


Fig. 4. Entrance to chamber, Morlais Castle. © Michael Statham

It is well known that the Romans liked to use tufa in their buildings, and a particularly well-preserved example was found during excavations at Gelligaer, (Ward, 1909), which comprised three voussoirs in the bath house, a photograph of which has been found in Clarke's archive, (Fig. 6). Tufa was also found at a Roman site at Penydarren Park, Merthyr Tydfil (James, 1906). At both sites, which date between around the late 1st to early 2nd century, the tufa was almost certainly sourced from the same locality at that used later at Morlais castle.

Two ruined medieval churches

Jana Horak & Graham Oliver

Visits were made recently to two ruined churches to record the building stone, St Mary's Church, Caerau (Cardiff) and Chapel, Tal-y-garn, Pontyclun.

St Mary's Church, Caerau sits on the ridge on the NNW edge of Cardiff. Built inside the site of a Roman encampment, the church is thought to have been built between 1254 and 1291 (Wools & Guy, 1960). It comprises a nave, chancel, south porch and tower. It has an extensive history of remedial work, with major renovation in 1885 by John Pritchard (then Llandaff diocesan architect) who rebuilt the chancel. It was closed in 1957 and to prevent vandalism, purposely ruined, with the roof removed and the doors bricked up. This was not successful, and vandalism continued with the NE chancel wall extensively knocked down and the east side of the tower damaged. It was subsequently renovated by the incumbent, the Reverend Victor Jones in early the 1960s. However, the church was eventually closed again in 1971 (Lewis & Jay 2006). To note, the current entry in Coflein, was clearly written, or taken from published information, prior to its ruined state.

Although now totally ruined, the original medieval fabric of this building can be seen to be composed exclusively of variably coursed Lias Limestone (Fig 2). Blocks are of differing size, with the largest more coursed stonework having blocks not exceeding 20 cm high by 70 cm wide. These are particularly prominent in the base of the tower, and then again half-way up on the south side, however, most blocks are smaller than this. Although the porch was rebuilt in the 1885 renovation, the large blocks of Lias are considered to be of medieval origin as they correspond in size to those in the tower. Similarly, all remaining evidence of doorways is of Lias; blocks in the base of the south doorway, and the tower doorway. No evidence of the nature of the chancel windows remain (as the walls are only c. 1.2m high).

The chancel arch is of simple design, with blocks laid 'on the bed' in the lower portion but face bedded in the upper part to provide longer pieces of stone than bedding permits (Fig 3). The Carboniferous Limestone in the fabric, particularly noticeable as quoins in the chancel (Fig. 4), date from Pritchard's rebuilding of the chancel. Other stone includes rubble that from rebuilding in the 1960s, with Carboniferous Limestone donated by Wenvoe Quarry, infill of doorways in Pennant Sandstone, and pebbly red sandstone (presumably from the local Lower Old Red Sandstone). During Pritchard's renovation all medieval dressings were replaced with Bath Stone (Fig. 5) (Lewis & Jay, 2006). The composition of the font, described as having 'a cylindrical bowl on a shaft of like



Fig. 5. Ceiling. © Michael Statham



Fig. 6. Tufa voussours, Gelligaer Roman Fort. © W. Clarke, Llandaff.

In south Wales, very minor use of tufa in churches has been observed at Holy Trinity, Newport (Oliver & Horák, 2024) and St Madoc, Llanabadoc near Usk (Shipton, 2019) and one wonders whether these might have been recycled from Roman buildings during the Medieval Period.

References

- Evans, Eric, 2024. West Hereford, June 24th ORS and Tufa churches in the ancient kingdom of Ergyng. *WSF Newsletter* **20**, 20-23.
- Clarke, G. T., 1866. Some remarks on Bronllys tower. *Archaeologia Cambrensis*, **XLVIII**, 441-445.
- Clarke, G. T., 1859. Some account of Morlais castle. *Archaeologia Cambrensis*, **XVIII**, 97-114.
- Ward, John, 1909. The Roman Fort at Gelligaer. *Transactions of the Cardiff Naturalists' Society* **XLII**, 25-69.
- James, F. T., 1906. Roman remains: Penydarren Park, Merthyr Tydfil. *Archaeologia Cambrensis*, **6**, 193-208.
- Newman, John, 1995. *The Buildings of Wales – Glamorgan*. Penguin Books.
- Oliver, Graham & Horák, Jana, 2024. Gwent Levels II, October 21st. *WSF Newsletter* **20**, 31-35.
- Scourfield, Robert and Haslam, Richard, (2013). *The Buildings of Wales – Montgomeryshire, Radnorshire and Breconshire*. Yale University Press.
- Shipton, John, 2019. Usk June 2018. *WSF Newsletter* **16**, 24-25.



Fig. 1. (top left) General view of St Mary's Caerau, from the NE, showing ruined state. Fig. 2 (left middle) Lias limestone blocks in the base of the west wall of the tower, these are c 15cm x 60cm. Fig. 3.(bottom left) Chancel arch worked from Lias limestone, basal 5-6 blocks, laid with horizontal bedding, the arch with faces bedding. Tower arch of Lias blocks seen in the background. Fig. 4. (top right) southeast corner of nave showing limestone quoins inserted by Pritchard. Long Lias blocks on the east wall of the porch seen in background. Fig 5 (middle right) C19 Bath Stone corbel from the west side of the porch roof.

form and decorated with four fleur-de-lys (Anon, 1901)', was not determined as it was removed or destroyed on deconsecration.

Capel Talygarn, Talygarn (ST 02670 80140), is a ruin in the grounds of, and to the northeast of, the 19th century St Anne's church, Talygarn, Pontyclun. Although of medieval origin the exact age of building is not recorded. A Cotswold Archaeology report describes this as a chantry (Cotswold Archaeology, 2004) although elsewhere (e.g. Cadw schedule document and Coflein entry) it is referred to as a chapel of ease. It was used until the new church was built. It is a scheduled monument on the basis of its potential to 'enhance our knowledge of the organisation and practice of medieval Christianity'. (Cadw, 1991).



The roofless building comprises a simple structure of four walls, still intact and the two side walls of a porch on the south side. The west and north walls have no openings (Fig 7) but there are three large segmental headed windows in the south wall. It is thought that these were introduced during restoration in the 1680's under the terms of the will of Sir Leoline Jenkins (Cadw, 1990) (Fig. 7).

The fabric of the building is of local Carboniferous Limestone rubble work (Fig. 8). Dressings are limited to the late 13th - mid 14th century trefoil headed lancet window located in the east wall, worked from Sutton Stone. (figure 9). Sutton Stone quoins are also present at the base of the northeast and southwest corners of the north wall. The three C17 windows in the south wall, have simple dressed openings of Carboniferous Limestone blocks with Pennant Sandstone sills.



References

- Cadw, 1990. Summary Description of a Scheduled Monument, Medieval Chapel of Talygarn, GM442 (accessible at <https://cadwpublic-api.azurewebsites.net/reports/sam/FullReport?lang=&id=614>)
- Lewis, R. & Jay, D., 2006. History of St Mary the Virgin Church, Caerau, Cardiff, web pages of Friends of St Mary's Church at Caerau, accessed Feb. 2025 <http://www.stmaryscaerau.org/history.html>
- Wools, R.M. & Guy, J., 1960. Parish Church of Saint Mary the Virgin, Caerau.[text accessed via Lewis & Jay]

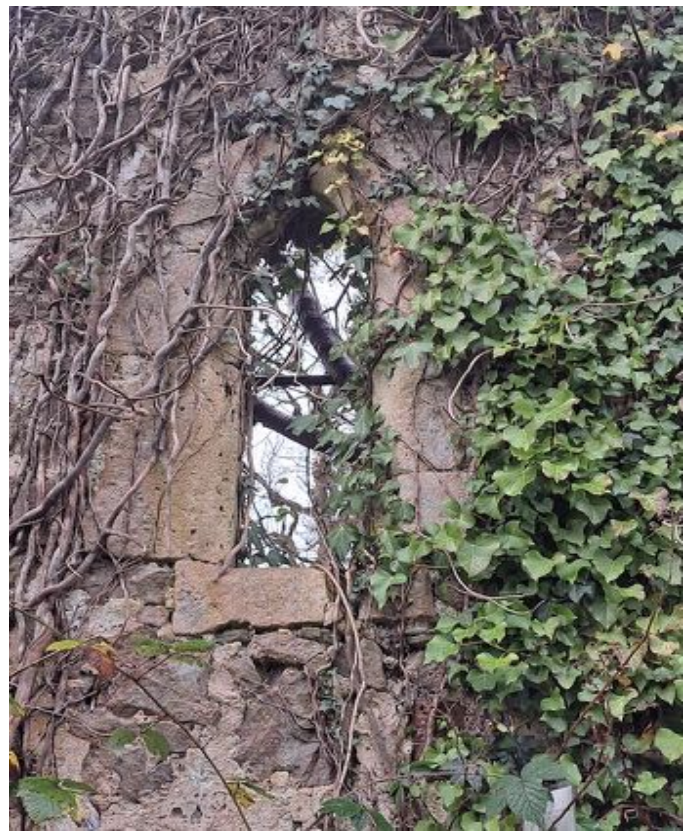


Fig. 8. (bottom left) fabric of Chapel Tal-y-garn composed of Carboniferous Limestone rubble work, with red staining.
 Fig 9. (bottom right) C13/C14 trefoil east window worked from Sutton Stone.

Another WW1 War Memorial by W Clarke, Llandaff

Mike Statham

An article on the WWI war memorials made by the firm of W. Clarke, Llandaff appeared in the 2021 Newsletter (Statham, 2021). However, since then another has come to light, namely Dinas Powys War Memorial (Fig.1). The reason it was missed is that it was not built until 1935, whereas all the other war memorials made by the firm were built between 1919 and 1924.

Guy Clarke was given the go-ahead to design and build the memorial in February 1935. There had been controversy about the form it should take, some favoured building a hospital (Statham, 2021) but erection of a stone memorial was eventually decided upon. Guy Clarke offered designs comprising a cross of Portland stone standing on a stepped base of local stone, examples are shown in Figure 2. However, these designs were rejected in favour of what you see today. An 'as built' design drawing has not survived in Clarke's archive, though a rough sketch exists in Guy's 1935 work notebook. The accompanying notes mention crazy paving was possibly to be supplied by the Blue Lias Quarry, Dinas Powys.

Clarke's Day Book records for the job show that the monument was built entirely of Carboniferous Limestone supplied by the St Andrews Quarry Company. The Purchases Ledger for the period shows the cost of the stone was £37.9s.11d. The names of the fallen were to be on bronze tablets made by W. A. Baker and Co., Newport. There is no mention of crazy paving.



Fig.1. WWI memorial cross, Dinas Powys.

In 1947 Clarke was commissioned to make additions to the memorial. A poorly preserved drawing dating to this time has survived from which it is presumed that this is when the chain-link barriers, crazy paving surround and raised flower bed were added, together with additional WW2 bronze tablets. The crazy paving is from the Bull Cliff Member of the Blue Lias.

References

Statham, M.,2021. WWI Memorials produced by W Clarke of Llandaff. *Welsh Stone Forum Newsletter* No.18., 9-12.
W. Clarke, Llandaff, Day Book 19, pp.71&128.

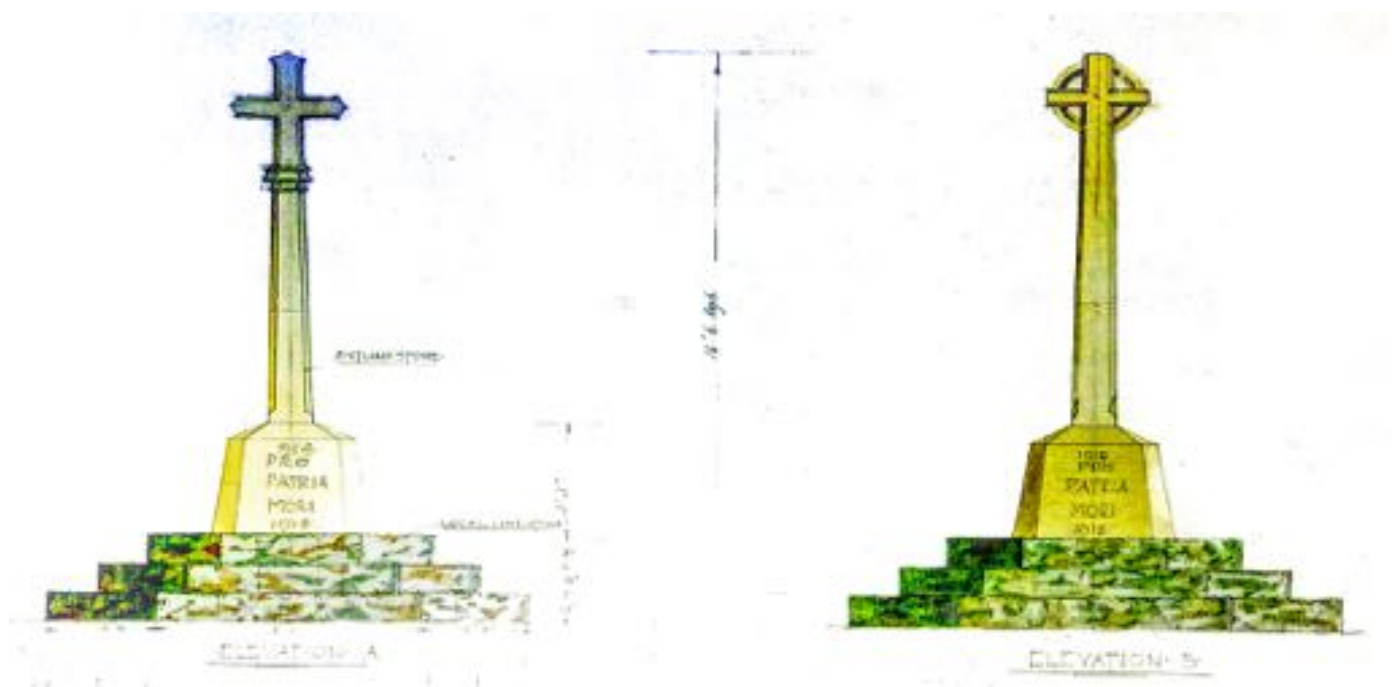


Fig. 2 Guy Clarke's proposed design for memorial cross.

Penarth Alabaster in the USA?

Mike Statham

A guidebook of the Washington National Cathedral published in 1940 contains a photograph of the cenotaph of the first Bishop of the Cathedral, Henry Yates Satterlee (1843-1908). Part of the caption beneath it states ‘...This cenotaph of Welsh alabaster was designed and executed by the late W. Douglas Carøe...’. A guidebook of the cathedral published in 2008 states that the tomb was carved of Welsh alabaster by the Nathaniel Hitch Company of London in 1920. In *The Cathedral Age* (1958) it is noted that the carving of the figure was undertaken by Hitch, but that George Mossman Peacock was responsible for carving ‘some of the embellishment’ during WWI.

Nathaniel Hitch (1845-1938) had worked carving designs by Thomas Nicholls for Cardiff Castle clock tower, built between 1869 and 1873, where it is known from the work of the author (Statham, 2017) that Penarth alabaster was used. It is also known that Carøe used Penarth alabaster to line the staircase of University College, Cardiff c. 1909, so Hitch was undoubtedly aware of the use of Penarth alabaster.



Fig. 1 Cenotaph of Henry Yates Satterlee, Washington National Cathedral. *Fig.2* Close up of alabaster in *Fig.1*. Both images Tim Evanson, CC BY-SA 2.0 <<https://creativecommons.org/licenses/by-sa/2.0/>>, via Wikimedia Common.

A photograph of reasonably high resolution found online is shown in Figure 1. At first sight it is difficult to decide if there is any Penarth alabaster present. However, zooming in to detail of the tomb, (Fig. 2), two types of alabaster are evidently present. The carvings do look as though they might be Penarth alabaster, but nearby there appear to be panels (possibly repairs) of Midlands alabaster. Without much higher resolution photographs, it is impossible to confirm this. The effigy of Satterlee appears to be carved from one piece of stone. As Penarth alabaster is not known to have been obtainable in such large pieces it is considered that the alabaster for the effigy is from a different source.

An archive of Hitch’s photographs held by the Henry Moore Foundation contains one black and white photograph of part of the work, which shows only a pair of guarding angels at his feet. On close inspection the photograph is of a clay model, not a carving.

If any of our members knows anyone in Wahington perhaps they might be able get them to provide detailed photographs? Closer to home, an archive of Hitch’s photographs held by the Henry Moore Foundation may be worth visiting next time one of our members is planning to visit Leeds.

References

- Anon, 1958. Washington Cathedral Chronicles - Stone carver located. *The Cathedral Age*, **33**, 16. [access via <https://archive.org/>] accessed February 2025.
- Dawson, Victoria, 2008. *Washington National Cathedral Guidebook*. Washington Cathedral, p.76 [access via <https://archive.org/details/washingtonnation0000daws/page/76/>] accessed February 2025
- Statham, Michael, 2017. *Penarth Alabaster*. Welsh Stone Forum.

Penmon Millstones

Mike Statham

Within the Carboniferous Limestone sequence of Anglesey there are horizons of sandstones and conglomerates. Records of the exploitation of the conglomerates for making millstone date back to the C14 (Anon, 1876), with a the first record of a complaint of trespass ‘in taking millstone from Penmon, Anglesey’, noted by Bulkeley (1615). A later record, Morris (1748), states ‘At Penmon and in that Neighbourhood there are several Quarries of Millstones, of the Grit Kind, of which great Quantities are shipped off there’, and during a visit to be made by the London Geologists’ Society (Anon 1883) it was proposed to walk ‘half a mile north’ [of Penmon Priory] across beds of quartz conglomerate and grit in the Mountain Limestone, like Millstone Grit, and used for millstones’.

Whilst Tucker (1980), who described three quarries for millstones c.10 km west of Penmon, searched for a millstone quarry at Penmon but failed to find one as

the ground was covered in gorse bushes, he noted that similar stone was present in some of the buildings of Penmon Priory.

The archive of the firm of W. Clarke of Llandaff, sculptors, monumental masons and general builders, contains a photograph dated c1902 (Fig. 1) which shows three millstones on open ground near to Penmon point, indicating that there was a millstone quarry in the vicinity. As far as can be determined without visiting the area, the location from which the photograph was taken appears to be close to an outcrop of sandstone [marked on BGS geological map as sandstone within the Loggerhead Limestone Formation] centred on SH 636 810.



Fig. 1. Three millstone on undulating ground at Parc Trwyn-Du, NE of Penmon Priory, Anglesey. © W. Clarke archive.

References

- Anon (1876). Record Society for the Publication of original documents relating to Lancashire & Chester. Chester Chamberlains Accounts 1350-51, 167. Available at <https://archive.org>.
- Anon (1883). London Geologists' Association Visit to Bangor. North Wales Chronicle and Adviser for the Principality, 28 July, 1883, 5. <https://newspapers.library.wales/view/4518200/4518205/41/penmon> accessed 14 March 2025.
- Bulkeley, Richard, Sir (1615). Complaint against Sir William Maurice. <https://archives.library.wales/index.php/cases-concerning-quarries-and-millstones-in-north-wales> reference:L2/29. Accessed 14 March 2025.
- Lewis (1784) Plans of harbours, bars, bays and roads in St. George's Channel etc.. available at <https://archive.org> Accessed 14 March 2025.
- Tucker, Gordon (1980). Millstone Making in Anglesey. In *Wind and Water Mills* Vol. 1 p 16/23. available at <DGT83.pdf>, accessed 14 March 2025.

AGM 20th April, 2025.

The AGM was held in the Anchor Inn, Tintern. It was formally confirmed that Andrew Haycock, had stood down as Treasurer. Nominations for a replacement, had been circulated but no candidates were proposed. Jana agreed that she would explore options for a new Treasurer. The accounts were presented, having been prepared at the end of 2024 by Andrew. He was thanked for his work with the Forum and best wishes were sent to him in his new job.

After lunch, we adjourned outside and Graham Oliver provided a display of samples of Tintern Sandstone, as used in the Abbey, to examine. Will Davies, Inspector of Ancient Monuments for Cadw, and currently co-ordinator of a new phase of restoration for the Abbey, then provided an informal introduction to the Abbey, before providing a tour of the area where preparatory survey work was currently underway. Will was thanked for a highly informative and fact-filled afternoon, and we look forward to hearing about further stages of work. We hope that we will be able to provide an update on this in future Newsletters.



Fig 1 (above) Graham Oliver showing WSF members representative samples of Tintern Sandstone, exposed in quarries in the woods to the west of the Abbey. Fig 2 (below) Will Davies (Cadw) explaining the conservation project - in the nave of the Abbey looking NE.



Hay-Brecon, June 24th, 2024

Jana Horak & John Shipton

Eric Evan met the group to show us three medieval churches on the area between Brecon and Hay-on-Wye. All are located on Old Red Sandstone bedrock.

The day started at St David's Llanddew. The church sits on a bedrock of Raglan Mudstone Formation (RMF). As the name suggests, this is predominantly mudstone, although sandstone beds within this formation occur to the northwest and west of Llanddew. In addition, a more extensive sequence of sandstone in the St Maughan's

Formation outcrops just a few kilometers to the east. Several small quarries are marked in the RMF, but it is not possible to tell the antiquity of these.

A 1995 CPAT report (CPAT, 1995a) describes this church as a cruciform structure with a central tower. The current building appears to date from the C13, with rebuilding in C17 (addition of the tower 1629) and both C18 and C19 restoration. The latter phase included replacement of nave windows and the addition of the porch (Fig. 1).

The group started by inspecting the fabric of the building. This was seen to be predominantly rubblework, although locally more coursed. It is composed of homogeneous, grey, red and buff Sandstone (Figs 2 & 3). Occasional blocks of pebbly sandstone and tufa (Fig. 4) were also

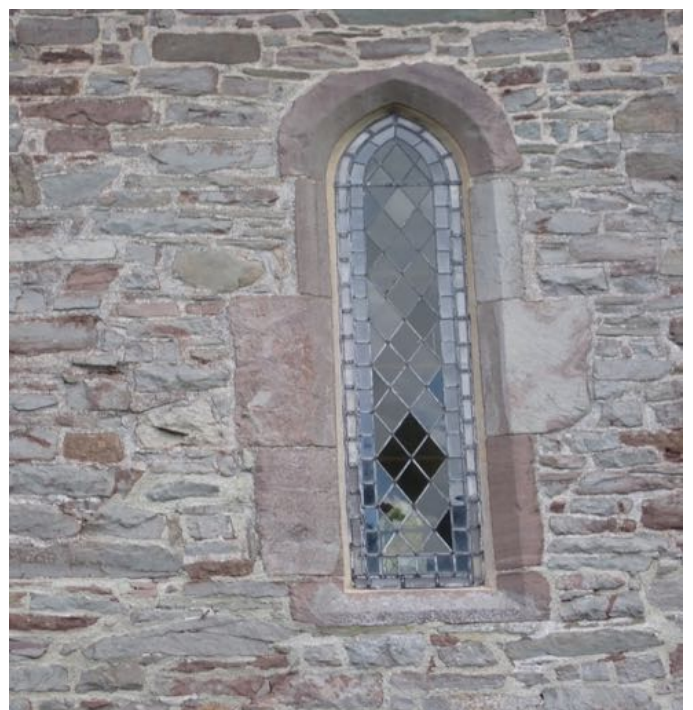


Fig. 1. (top left) St. David's Llanddew, viewed from SE. Fig. 2. (middle left) west wall of vestry showing the west wall of the vestry showing extensive rebuilding. Fig. 3. (bottom left) fabric of chancel wall composed of red and grey rubblework sandstones. Fig. 4. (top right) Rare block of tufa in fabric. Fig. 5. (bottom right) Window, south chancel red and mottled sandstone, replaced during renovation work.

found; the latter suggesting an origin at the boundary between the RMF and SMF (see Horak, Newsletter 15 for more detail on this context). The nave window dressings were replaced during restoration work in red and grey sandstone, similar to that of the fabric (Fig. 5) but of post-medieval origin. The roof was noted as of red/grey stone tiles; those in the chancel and transept date from C19 restoration work. These may be derived from the St Maughan Formation.

Inside the building the font was seen to have unusual swirl markings, which were considered not to be applied ornament, but a tracing of original bedding features in the reddish local Devonian sandstone with red mudstone clasts. The chancel arch was noted as of rough grey sandstone. The group were then given access to the vestry (north transept) to view a C8-9 inscribed stone. (Redknapp

& Lewis, 2007), once embedded in the south transept wall, but removed to conserve it. Jana had described this for the above work, and it is identifying it as a locally derived, pale pink-grey sandstone, with the shape defined by bedding planes. Two other pieces of carved stone were also examined, again of local sandstone.

The group then moved northeast to **St. Matthew's Church, Llandefalle** (Fig. 6) CPAT (1995b) documents it as having C13 or C14 origins (north nave wall, tower and south doorway) with the remainder (chancel, south aisle and porch) of C15. They record little C19 restoration work. The church is now limed (including the east window!), which precluded close examination of the stone, but earlier images show it to be composed of dominantly of thinly bedded grey-green sandstone with minor red/brown sandstone. The grey-green stone is still

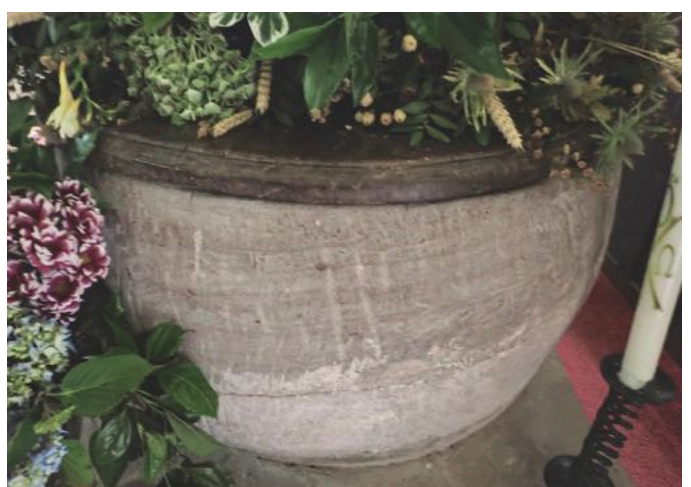


Fig. 6. (top left) St Matthew's church, Llandefalle, viewed from the south. Fig. 7. (bottom left) south doorway, of streaky maroon sandstones, with inset detail showing cross bedding. Fig. 8. (top right) C13 font of red banded sandstones similar to that seen in the south doorway. Fig. 9. (bottom right) faux slate monument with inset showing sandstone composition.

visible in the upper parts of the tower. The top two layers of which are if C17 rebuild, but are of similar stone, if slightly thicker bedded.

Entering the church, the south doorway was seen to be of maroon streaky sandstone (Fig. 7). This doorway was reinstalled when the C15 south aisle was built. Such mottled sandstones are known from the St Maughan's Formation.

The stone used for the C15 south aisle columns, is a very homogenous grey sandstone, although it had been pointed with dark mortar. The sandstone within the RMF and SMF have some similarities, but in the latter the bedding may be of greater thickness. This suggests the columns may be derived from the SMF. The C13 font was then examined and seen to be a banded sandstone similar to that of the south doorway (Fig. 8) Finally it was observed that the C18 monument on the north chancel wall, was not of slate as it initially appeared but a local grey-green sandstone painted to emulate this (Fig. 9).

After lunch in Talgarth, the group made the final stop of the day at **St. Eigon's Church Llanigon** (Fig. 10) set in as circular churchyard. The church is composed of a nave, chancel, south porch with a small lean-to on its east side,



Fig. 10 (top) St. Eigon's church, Llanigon. Fig. 11. (bottom) large slabs of grey/maroon sandstone, south chancel wall.

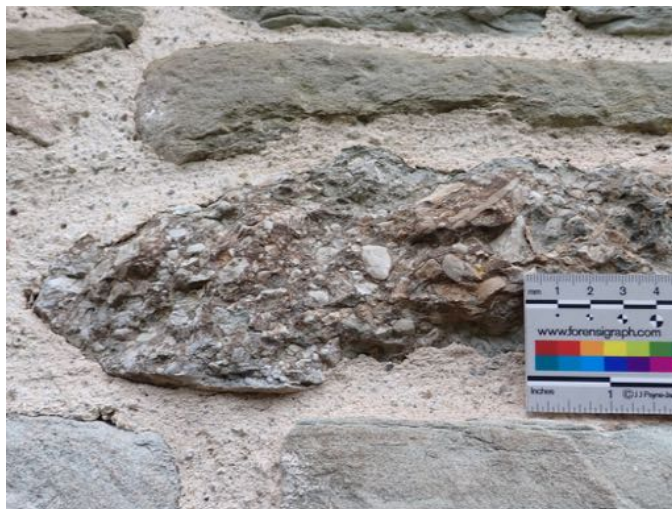


Fig. 12. Calcrete block is rubblework. Fig. 13. Close up of Fig. 12 showing the texture of the carbonate nodules.

and a north vestry.

CPAT (1995c) suggest the nave retains a C13 fabric with the chancel and porch added in C14. Only one original C13 window remains. It has been the focus of restoration work on several occasions, the most recent as a result of a Second World War bomb. The south porch has an unusual bell chamber above added in 1670. Chancel arch was replace in 1857.

The fabric was again seen to be of local sandstone. Most commonly this is as small to medium sized slabs and blocks of red and grey sandstone, but a mix of different sandstones, some coursed, some fine-grained, regularly shaped but randomly coursed is present. The nave south and east walls however, show significantly longer (up to 70cm) blocks of grey and red banded sandstone (Fig. 11). Occasional blocks of pebbly sandstone and calcrete were also found (Figs 12 & 13). Such pebbly sandstones have been recorded from the base of the SMF, in adjacent Herefordshire, (English Heritage, 2012) and such a source would be consistent with the presence of calcrete blocks. A major calcrete horizon (Bishop's Frome Limestone Members) sits just above the base of the RMF and SMF.

Grey sandstone, similar to that seen in the C15 south aisle



Fig. 14. Grey homogenous sandstone quoins, SE nave, inserted during C19 restoration work.

pillars at Llanddew, was seen as quoins in the south wall of the nave, but here its use dates from the C19 restoration. . The 'new' (C19) font was then examined and Tim Palmer confirmed this to be of Painswick Stone, from near Stroud, Gloucestershire 9 (Fig. 15). He also reminded the group of the key features of Painswick Stone. The old font was then viewed in the porch (Fig. 16). Inspection of this showed it to be of pebbly sandstone a discussion followed as to whether this was derived from the SMF or from a pebbly unit in the overlying Brownstones Formation (BF). John Davies, who has made a study of the pebbly facies within the BF, suggested that this was from that formation rather than the SMF. The similarity of sandstone textures within the Lower Devonian, emphasises the difficulty sometimes encountered in that assigning a specific formation as a sources.



Fig 15. (top) John Shipton guarding the C19 font worked from Painswick Stone. Fig. 16, (bottom) the 'old' (C13) font of pebble red sandstone.

References

- CPAT, 1995a. Brecknockshire Churches Survey - St David's, Llanddew. Available at <https://heneb.org.uk/archive/cpat/Archive/churches/brecon/16819.htm>
- CPAT, 1995b. Brecknockshire Churches Survey - St Matthew, Llandefalle. Available at <https://heneb.org.uk/archive/cpat/Archive/churches/brecon/16827.htm>
- CPAT, 1995. Brecknockshire Churches Survey - St Eigon, Matthew, Available at <https://heneb.org.uk/archive/cpat/Archive/churches/brecon/16881.htm>

English Heritage, 2012. Strategic Stone Survey - A building
Welsh Stone Forum Newsletter No. 21, 2025

- Stone Atlas of Herefordshire. *English Heritage*, pp 20.
- Horak, J. 2018. What is Bishop's Frome Limestone? *Welsh Stone Forum Newsletter*, **15**, 23.
- Inscribed Stones and Stone Sculpture in Wales*, vol 1, University of Wales Press.
- Scourfield, R. & Haslam 2013. *The buildings of Wales*, Powys. Yale University Press,

'Pop-Up' Study Day at St Davids Cathedral, October 5th

Heather James

*with supplementary geological content
from Jana Horák & Tim Palmer*

Some 20 members of the CMS and WSF were welcomed to the study day in the north transept of St Davids Cathedral by Mari James, Cathedral Librarian. Our event formed part of a week-long programme in the annual 'Libraries Week' at the Cathedral.

We began with a talk by The CMS publicity officer Professor Emerita Maddy Gray on 'The Lost Monumental Brasses of St David's'. She first drew attention to the rather surprising fact that Wales has only seven surviving monumental brasses, a stark contrast to England. The 'go-to' reasons for this usually highlight the poverty and remoteness of Wales, but more nuanced explanations should be considered. She went through the surviving seven, all of which diverge in different ways from English norms. They generally commemorate those of 'the middling sort' all of whom had origins or connections outside Wales as well as local success either in profession or marriage. The explanation of poverty cannot be the sole reason since brasses generally cost less than monumental effigies, but even these are less common in Wales, possibly due to the loss of craft skills from the high mortalities of the Black Death. Cultural reasons may also be suggested: in late medieval Wales commemoration was as likely to be in the commissioning and recital of poetry – the somewhat formulaic *marwnadau* or funeral odes.

Turning to the cathedral, Maddy pointed out that we have to rely on antiquarian evidence for the lost brasses and their inscriptions in the cathedral, and such indents as survive. Nevertheless, the total tally nearly exceeds the seven surviving for Wales, and this belies the common perception of medieval St David's as remote, and poverty stricken. Despite loss and displacement, the Cathedral still retains an impressive array of monumental effigies. Maddy introduced the question of why Henry VII should have chosen a brass to commemorate his father Edmund Tudor on the tomb removed from the Carmarthen Grey Friars to the Cathedral and this was discussed at greater length in the afternoon.

The second presentation was provided by Dr Tim Palmer, who took up the question of remoteness and poverty in his talk on the materials used both for the building of, and commemoration in, the Cathedral. He quoted from the seminal work of Jones & Freeman (1856), *The History and Antiquities of St David's*: 'altogether there is no part of the island (i.e. Britain) south of the Tweed more thoroughly and completely out of the world, and certainly, none in which we should less expect to find the Cathedral of an extensive diocese'. Tim drew attention to the

well attested costs of transporting stone overland in the medieval period; with around 13 miles distance doubling the cost of the stone, and greater distances increasing the cost further. However, he next showed a map of Britain and Ireland that demonstrated how accessible St Davids is via the sea from the three major 'marine motorways' of the English Channel, the Western approaches and Irish Sea, and the Bristol Channel. He went on to explain that the 'shelly marble' noted for some monuments in antiquarian sources can be identified as Purbeck Marble from Dorset, used extensively for monumental effigies and as base slabs for brasses. It is best known for use for fonts in southern England. The bowl of St Davids font is also of Purbeck Marble. Another freestone used was Beer stone from quarries at Beer in east Devon. From Severnside and via the Bristol channel came Dundry stone, quarried and exported on a massive scale from 1100-1500. Tim showed Dudley Waterman's map of the dense coastal distribution of Dundry and other imported stone in south-east Ireland's buildings and monuments, indicating an active Irish Sea trade. Within Wales, quarries on or close to the Glamorgan coast produced both the dense, muddy Blue Lias limestone, and also cream-coloured Sutton Stone (limestone), with cavernous weathering and included fragments of Carboniferous rock. Close to St Davids, high volumes of a purple-coloured fine-grained sandstone of Cambrian age, and a greenish-gray version of the same stone, were extracted from quarries in the small embayments of Caerbwdi and Caerfai. The stone has been used extensively in the cathedral as a building stone, and for dressings and effigies.

Questions and discussion followed from these two papers and Bishop Wyn Evans noted, somewhat ruefully in view of his long service at the Cathedral both as Dean and Bishop, that whilst Caerbwdi stone is durable inside it does not weather well outside leading to a continuous programme of expensive replacement in maintaining the cathedral exterior.

Following lunch at the excellent cathedral Refectory in the restored St Mary's College chapel we began a tour around the cathedral monuments. Photocopies of a recently discovered Turner watercolour were on display in St Nicholas's chapel and there was much discussion on the mixture of accuracy of depiction and elements that enhanced the picturesque aspects of the then part ruinous chapel. Most notably Maddy pointed out that Turner had drawn the very weathered drapery on the early 15th century tomb of John Hiot as though it was a cadaver tomb, which it is not, the Archdeacon being conventionally shown wearing his chasuble about to celebrate mass. This monument is worked from Dundry Stone but is however, very worn by weathering from the period of time between the Civil War and the late 19th C when it was exposed to the elements. There is further extensive use of Dundry stone for dressings in the chapel. Both here and in the

screen on the north side of the Holy Trinity chapel, Bath stone is also present. Some discussion followed as to which of this was primary use and which repairs. Inspecting the screen on the south side of the Holy Trinity chapel, Tim Palmer pointed out the use a wider range of limestones. These include Dundry, Bath, Painswick and Sutton stone. A detail plan of the stone in the southern screen is included in his chapter in the recent publication by Wooding & Evans (2024).

We then clustered around the tomb chest of Edmund Tudor in the presbytery (Fig. 1), placed there in front of the high altar by Thomas Lloyd, precentor, sometime after 1538 when it was removed from the dissolved Carmarthen Greyfriars. In this dominant position in front of the high altar it rather eclipses the shrine of St David and is a powerful statement of the new Tudor Dynasty and the protestant church. Maddy explained the complexities of the three successive tombs of Edmund Tudor and why a brass should have been used rather than an effigy. The brass itself is modern (Gilbert Scott's restoration) but may have copied the original. The geologists' lenses were produced for close examination of the Purbeck marble of

the tomb (Fig. 2). The Purbeck stone varies in colour and different levels of polish, depending where it was located within the tomb. It is possible that some of the more weathered slabs had been replaced by Scott.

Moving into the choir stall, an even closer examination followed of a worn and damaged slab reinserted in the Gilbert Scott retiling of the choir floor to see the small fixing holes of a long- lost head and shoulders brass recently noticed by Maddy Gray. Normally brasses were supplied to 'customers' from workshops already mounted on their stone slabs – but here the stone might be a local sandstone and not from an English workshop. Initial examination revealed a fine-grained quartzose sandstone containing mica flakes and showing some cleavage (Fig. 3). This was provisionally identified as Nolton stone, of Carboniferous age from Pembrokeshire, but further investigation is required to confirm this.

Moving westwards down the south choir aisle, we then progressed to the 14th century effigy of the 12th century Lord Rhys and his son Rhys Grug, worked from Painswick stone. This is characterised by an oolitic texture, with ooliths visible on the worked surface (in contrast to Bath



Fig.1 (top left) Edmund Tudor tomb chest showing polished Purbeck Marble top and variably coloured Marble side panels. Fig. 2. (bottom left) close up view of Purbeck Marble showing whole and fragments of *Viviparus* gastropods shells. Fig. 3(top right). Tim Palmer inspecting ?Nolton Stone slab in the choir stall. Fig. 4. (bottom right) effigies of Bishops Iorwerth and Anselm both worked from Lower Jurassic Blue Lias limestone.



Fig.5 (top left) tomb of Bishop John Morgan, craved from Beer Stone. Fig. 6 (bottom left) close up of Beer Stone chalk texture. Fig 7 (top right) Characteristic burrow structures in Beer Stone. Fig. 8 (bottom right) close up of dark glauconite grains in burrow.

stone, where ooids fall away forming an ‘egg-cup on the tray’ structure (Palmer, 2008). Similar close examinations were made of the adjacent 13th century effigies of Bishops Iorwerth and Anselm both worked from Lower Jurassic Blue Lias (Fig. 4). Tim observed subtleties in the Lias (the apparent abundance of bivalved mollusc burrows), possible suggesting that the base of Iowerth’s tomb (rear tomb) and all of Anselm’s, were worked from similar Lias horizons with the Iowerth’s effigy worked from a different horizon.

The tomb of Bishop John Morgan in the south aisle, provides an example of the use of Beer Stone (Fig. 5-8) a rock seen less commonly in Wales. It occurs at the base of the chalk sequence in Devon, but the coccolith microfossils characteristic of chalk, have been winnowed and mixed with shelly fossil fragments of bivalve, foraminifera and echinoderm debris. The stone is white to pale cream-coloured when fresh, becoming grey on exposure (www.dorsetbuildingstone.org). Tim pointed out the presence of distinct scattered dark glauconite grains (glauconite is an iron, potassium mineral of the mica group). These were green when deposited but subsequently have oxidised black. A greater concentration of these grains was observed in burrow structures, a characteristic feature of the middle

and lower beds in the Beer stone sequence. Minor repairs to the tomb had been executed in Bath stone.

We then retired to the refectory for tea and Welsh cakes. Mari James drew our attention to the large recess in the former college chapel wall that had once contained the tomb of Bishop Adam Houghton, made Bishop in 1377 and founder of St Mary’s College. Remnant stone in the walls on either side of the recess were found and identified by Tim and Jana as Dundry Stone, providing an indication of the material used. All agreed that this had been a most enjoyable ‘pop-up’ but also ‘cross-over’ day with both monument and geology specialists.

References

- Jones, W.B. & Freeman, E.A. 1858. *The History and Antiquities of Saint David’s*. reprinted, Pembrokeshire County Council Cultural Services, 1998, 461pp.
- Palmer, T. 2008 *Limestone petrography and durability in English Jurassic freestones*. *England’s Heritage in Stone: Proceedings of a Conference (York 2005)*, English Stone Forum, 66-78.
- Wooding, J.M. & Evans, J.W. 2023. *The Condition of Menevia; Studies in the History of St Davids Cathedral*. University of Wales Press, 176pp. (Special Issue of *The Journal of Religious History, Literature and Culture* 2023). <https://www.dorsetbuildingstone.org/beer-stone---se-devon.html> (accessed October 2024).

Gwent Levels III, July 13th

*Jana Horák, Graham Oliver
& John Shipton*

The last field-based meeting of the year returned to the Gwent Levels to continue examining the use, predominantly medieval, of building stone (*see* Newsletters 17 & 20). This trip focused on illustrating the use of Dolomitic Conglomerate and Sudbrook Stone; Triassic buildings stones of local importance between the Wye and Usk, and to observe variations in each of the lithologies. Occurrences of Sudbrook Stone in medieval buildings has been recorded by Allen (2006), with stone sourced from coastal exposures at Sudbrook but also possibly reusing masonry from Roman sites such as Caerwent Roman city (*see* Newsletter 11). In contrast, the specific source of Dolomitic Conglomerate (Dcg) has not been established and it is likely that medieval sources have been exhausted. The morning was spent at St Mary's Church, Undy, (GR ST439 869) and St Mary's Church, Magor (GR ST425 869), followed by a revisit to Caldicot Castle after lunch.

St Mary's Undy

The day started by meeting at St Mary's Undy, which sits on the boundary between dolomitic limestone of the 'Lower Dolomite' (Black Rock Limestone Subgroup, Carboniferous) and Dolomitic Conglomerate (Dcg) of the Triassic, Marginal Mercia Mudstone Group. These are local potential sources of stone. St Mary's church has



Fig. 1. St Mary's church Undy, viewed from northwest.

a simple structure comprising a chancel, nave and south porch, and originates from the C12 (Newman, 2000). The tower was removed during renovation in 1878 and replaced with a bellcote (Fig.1).

Examination of the fabric showed this to be semi-coursed, composed predominantly of Carboniferous Limestone. This varies in colour and texture, including grey micrite with silicified fossils, yellow dolomitic limestone and

reddened iron-stained limestone. Small amounts of yellow Sudbrook Stone and red fine-grained sandstone (Old Red Sandstone) were also noted. The quoins are of Sudbrook Stone. Many of the original dressings were replaced with Bath Stone during the C19 renovation work. The nave is roofed in dark and pale slate, and inspection of a detached fragments suggests this is from Pembrokeshire. The Chancel in contrast is of grey, micaceous stone tile, suggestive of Pennant Sandstone.

The group viewed the west wall. The two-trefoil lancet window c. 1300 (Newman, 2000) which provides an example of the medieval use of buff Dolomitic Conglomerate (Fig. 2). It contains angular limestone fragment, mostly less than 5mm, but some up to 25 mm and is similar to the medieval Dcg seen at Redwick (Newsletter, 20). This stone is seen again in the doorway at the east end of the south wall (although this doorway shows repairs in Bath Stone) and in the later Perpendicular south window, and Tudor east window. From this it can be concluded that Dcg was the stone used for dressings prior to the C19 renovations work.

These examples of medieval use of Dolomitic Conglomerate contrast with that seen in the porch (Fig. 3), which was added in 1790. It is constructed from ashlar blocks (c. 40cm -50cm x 40cm) with relatively smooth faces. This seems to be the latest date for the use of the stone that we have noted in Monmouthshire. A notable feature of this stone is the presence of cavities (vugs), typically up to 10 mm in diameter, lined with white crystals of calcite. Some larger lithic fragments up to



Fig.2. Dolomitic Conglomerate window in west wall.



Fig. 3. (top left) South porch of ashlar Dolomitic Conglomerate. Roof of nave behind displaying two shades of grey slate. Fig. 4. (bottom left) Dolomitic Conglomerate from porch ashlar, showing slightly smaller clasts than stone used in earlier medieval dressings. Fig. 5. (top right) West doorway worked in Dundry Stone. Fig. 6. (bottom right) Close up of Dundry Stone in Fig. 5.

40 mm are also present (Fig. 4, see also Newsletter 18, for more details of textures in Dcg), but they are not as abundant as in the medieval stone.

The only medieval 'imported' stone noted at St Mary's was seen in the west doorway (Fig. 5). This dates from the c. early C14 (Perpendicular) with multiple shallow



Fig. 7. (top left) south doorway of Dolomitic Conglomerate with some replacement by Bath Stone. Fig. 8. (bottom left) Chancel arch of Sudbrook Stone, stone on middle left shows characteristic yellow/red mottling. Fig 9. (top right) square, C12, font of Sudbrook Stone.

arch was revealed by observing red mottled streaks within the yellow/buff stone, helping to confirm that this is of locally derived Sudbrook Stone (Fig 8). Last but not least, the front was examined. This is C12 (or early C13) of square shape with a scalloped underside. The form, prior to the visit had raised expectations of Dundry Stone, but was rapidly identified as of Sudbrook Stone (Fig. 9). A final stop in the churchyard was made to examine the medieval churchyard cross, and base. This had a serious coating of lichen and algae but a concerted attempt was made to find an exposed piece to view with a hand lens. Jana and Graham concluded it was Sudbrook Stone.

St Mary's Magor

The second stop of the day was at St Mary's Church, Magor. This is an impressive church, displaying the use of Dolomitic Conglomerate (Dcg) and extensive, and previously undocumented, Dundry Stone. Newman (2000) summarises the building as having 'a central tower of C13 date. The chancel, quite long, is Dec (*Mid C13*). The three bay Perp (*early C14*) nave with aisles continues E-wards to clasp the tower and two-storeyed N porch, all built in a single campaign'. Cadw's, listed building schedule in contrast attributes the nave and aisle rebuilding to C15 and the porch possibly to early C16. Most of the cut stonework was renewed during renovation by John Nolton in 1861-68 (Newman, sic) but evidence remains of the nature of the original stone (Fig 10).

moldings. Newman (2000) considers this strangely located on the south edge of the wall and 'oddly handsome for this simple building', implying that this may not have been made for this location but was relocated from a more prestigious building. Examination confirm that this is worked from Dundry Stone, supporting a possible recycled origin and a later insertion, as no other Dundry was noted in the building (Fig. 6).

Inside the church, of note are the south door, chancel arch, and the font. The south door was examined and was seen to consist of original Dolomitic Conglomerate, but with jambs replaced on the left-hand side in Bath Stone (Fig. 7).

Moving into the church the composition of the chancel



Fig.10. St Mary's church, Magor viewed from the north.



Fig. 11. (top) Medieval socket stone, Dolomitic Conglomerate.
Fig. 12. (Bottom) Stepped base (Tintern Stone) and socket stone
?Dundry

The visit started with an examination of two cross bases in the churchyard, both of unspecified medieval ages. The smaller of the two (Fig. 11) is a large socket-stone 'some 0.76m square by 0.77m high with large broached (or "bull-nosed") stops. The top of the stone is chamfered with an unusual octagonal socket, off-set to the north-east' (Cadw scheduling citation). Examination rapidly identified this as being worked from Dolomitic Conglomerate, with grey angular clasts of Carboniferous Limestone. The larger base (c 2.72m square) with three steps was viewed next (Fig. 12). The lower two layers were clearly different being shaped blocks of coarse quartz arenite containing white quartz pebbles (up to 20mm) and pink quartz grains. Jana indicated that this was Devonian in age and attributed it to the Tintern Sandstone Upper Devonian sequence. On top of this sits a socket stone. This proved a bit more of a challenge to the group, the composition not being easily determined as it was extensively coated by lichen. A small area, in a most inconvenient place to access, showed a pale, fine-grained bioclastic, non-oolitic, limestone resembling Dundry Stone. However, Tim Palmer was a little uncertain if this was Dundry *sensu stricto*, he also suggested that this could be a re-worked Roman altar.



Fig. 13. Porch, St Mary's Magor. Window, outer arch of doorway, and replaced stone below window, Bath Stone. Ashlar; Dolomitic Conglomerate, Dundry Stone, Sudbrook Stone, with minor red 'Tintern Sandstone'.



Fig. 14. Close up of stone in porch buttress. Red = Tintern Sandstone, yellow = Dolomitic Conglomerate, Cream = Dundry Stone. Doorway Bath Stone.

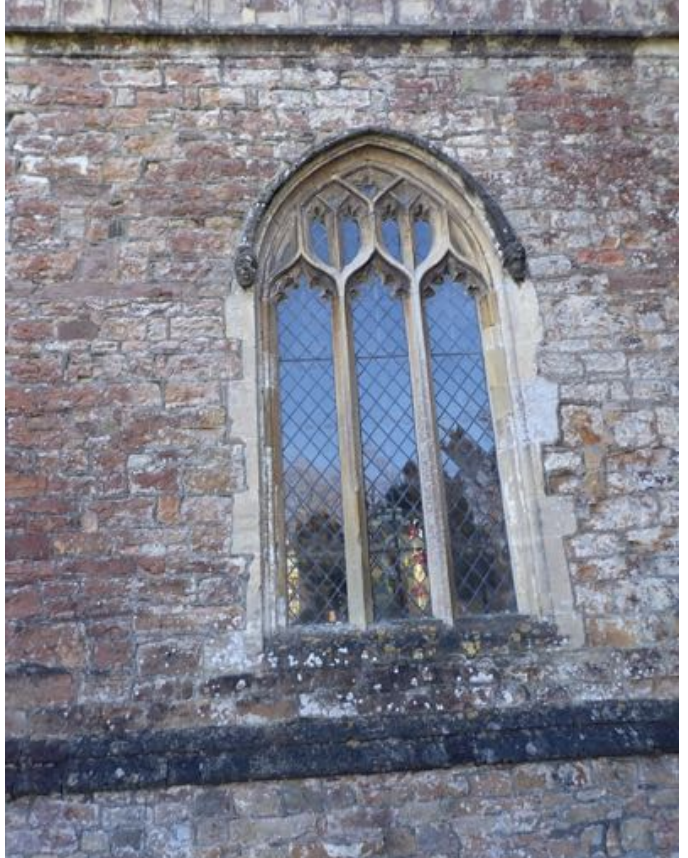


Fig. 16 (bottom) north wall of nave with C14 window of Dundry Stone, with replaced tracery and mullions.



Fig. 15 Nave, fabric dominantly Carboniferous Limestone, locally reddened by a coating of algae, string course of Tintern Sandstone and battlements of ? Dundry Stone.



Fig. 17. buttress in south nave composed of blocks of Tintern Stone and Dolomitic Conglomerate.

Moving on to the body of the church, the porch (either C14 or C16!), located on the north side was examined first. The pleasing ashlar façade was seen to contain blocks of Dolomitic Conglomerate (Dcg), Dundry and Bath stone, with the diagonal buttresses to the east and west a mixture of Dcg and 'Tintern Sandstone' (Figs 13 & 14). The window (inaccessible) was clearly replaced during C19 renovation, so assumed to be of Bath Stone. The fabric of the porch, although appearing red (described by Cadw as 'of rubble red sandstone'), was seen to be dominated by

Carboniferous Limestone, variably iron tinted or dolomitized, and extensively red coloured by algae. On the west wall (yellow) this was roughly coursed rather than rubble.

Moving to the nave, the fabric was seen to be dominated by Carboniferous Limestone topped (as is the porch) by ornate battlements (Fig. 15). On the north side these are more ornate than those on the south side, emphasizing the importance of the north side and the ornate porch. It was conjectured that the battlements are of Dundry Stone,

but this needs confirming on closer examination, if the opportunity arises.

Inspection of the 14C aisle windows (two on north wall, one east end of the north aisle, and four in south aisles and one on the west end of the south aisle) showed mullions and tracery replaced by J. Nolton with Bath Stone. Careful examination of the sills and side stones, however, revealed that they were originally worked from Dundry Stone (Fig. 16). The small doorway in the north wall of the nave, was not Dundry Stone, as anticipated, but of Tintern Stone. This is seen again in the string course around the nave (north and south walls) and locally was seen to be micaceous. The plinth course although predominantly of Tintern Stone had interspersed blocks of Dcg. Finally, the Tintern Sandstone was seen again in the buttresses on both the north and south walls, but interbedded with Sudbrook Stone or Dcg (Figs.17).

Arriving at the west façade, the fabric was noted as being much the same as the rest of the nave. Although the main west window was, as with the east one, replaced in Bath by J. Nolton, remnants of Dundry stone were observed in the flanking windows. Dundry was seen again in the west doorway, and arch springers inserted either side of this.

Moving on to the chancel a noticeable observed feature was the windowless north wall and a fabric that contains a slightly more varied lithologies than seen in the nave (Fig. 18). Examination identified this fabric to have a basal course of Dcg and minor Tintern Stone, but to be predominantly of Carboniferous Limestone rubble, with a minor contribution of other lithologies (Dcg, Sudbrook Stone, red Devonian sandstone, Dundry Stone, Bath Stone and a single occurrence of tufa).

The lower quoins are dominantly of Sudbrook Stone or Tintern Sandstone, but those above are of Dundry Stone. In one of the Dundry quoins at the east end of the south wall, incised crosses were found, which it has been suggested are crusader crosses (Fig. 19). Below this stone



Fig. 18. Windowless north chancel wall showing a variety of stone, including squared blocks of ?Dundry Stone. Stone tile roof also well displayed.



Fig. 19. SE corner of chancel showing Dundry quoins with cross marking.



Fig. 20.. Two stones with zig-zag carving at east end of north chancel wall.

and again on the east corner of the north wall, stones with zig-zag carving, were noticed.(Fig. 20). There are heavily covered with algae but were thought to be worked from Sudbrook Stone, although the sharpness of the carving on the south wall stone suggests Dundry Stone. Newman (2000) considers that these originated from an earlier C12 phase of building, and the group observed that these are reminiscent of the stone (C12) at St Mary's Magdelene, Goldcliff, similarly inset into a later (C15) fabric. As with the main porch window, the chancel east window was reconfigured and replaced in Bath Stone by J. Nolton. The only original medieval chancel window, seen was the South wall, early C14 quatrefoil window (Newman, 2000). Examination identified this to be a combination of Dgc and Dundry, with a Dundry sill (Fig. 21). The relieving arch above solicited further discussion, but the composition of the smooth pales stones was not agreed on. Possibly these are Dundry too. Dundry was seen again in the doorway adjacent to this window, although with



Fig. 21. C14 chancel window of Dolomitic Conglomerate and (later replacement?) Dundry Stone.



Fig. 22. Dundry Stone doorway in south wall of chancel with Sudbrook Stone in 1 and 2 o'clock positions.

Sudbrook Stone blocks present in the top right section (Fig. 22).

Moving inside the church, the C14 font was confirmed as being of Dundry Stone (Fig. 23), as is almost all of the interior, with the exception of the three pillars supporting the two eastmost arches. These were replaced, from the presumably original Dundry Stone, during C19 restoration work. As we left, we observed a stoup to the east of the door made from Tintern Sandstone. Also noted were two bosses, presumably from the pre C19 renovation. These are also of Dundry Stone. Finally, after leaving the church the tower was viewed from a distance. The fabric is much as the rest of the church i.e. Carboniferous Limestone dominated, but the window dressings appear (as much is possible to determined) to be Dolomitic Conglomerate.

In summary the church tells a story of building with



Fig. 23. Dundry Stone font with C19 Bath Stone repairs.

dominantly local stone, through all phases of construction for the fabric but also initially for dressings (Sudbrook and Dolomitic Conglomerate). The main difference in the fabric of the C14 phase, is the greater use of Tintern Sandstone. The use of this stone is no co-incidence as the church came under lease to Tintern Abbey by the early C14 and the Abbey initiated the building of the aisles and porch. One other notable change in stone use was the introduction of Dundry Stone as the main dressing, with Bath also present, but subordinate (e.g. porch doorway). This might suggest that the Dundry doorway in the chancel, may have been a later replacement of Dcg. It also poses the possibility that the chancel had some C14 rebuild with Tintern Stone inserted. Examination of the church by WSF clarified and set the record straight on the nature of the fabric, although it is understandable that

the superficial red colouring might suggest red sandstone, close examination confirms that it is mainly limestone with algae red colouration.

After lunch the group made a brief stop in the quarry to the east of the Rock & Fountain pub. This exposes the junction between the Dolomitic Conglomerate and underlying Carboniferous Limestone. However, this locality shows large fragments of limestone in dolomite, far coarser than when seen as a building stone. It may be that the upper layers, now removed were used as a building stone, but the lithology observed certainly would not have been.

Caldicot Castle

The final stop of the day was at Caldicot castle to look at the uses of Sudbrook Sandstone and Dolomitic Conglomerate in the curtain walls. It was also an opportunity to observe the variety of composition of both lithologies represented here. The geological map (BGS, 1967) shows the castle sitting on a bedrock of Sudbrook Sandstone, with outcrop of the underlying Carboniferous Limestone (Hunts Bay Oolite Subgroup) to the north along the Nedern Brook and a small outcrop of Dolomitic Conglomerate overlying this on the northeast bank of the brook.

The castle was mainly developed in three phases of building during the C13 and C14; with much of the curtain wall and tower, gateway and keep on the western side and southeast tower of this phase. The main gatehouse and adjacent wall were added early to mid C14, and the Woodstock Tower on the north side and a small part of the curtain wall in that area added in the late C14 (Newman, 2000).

Although much of the castle is built from Sudbrook Stone (with some Dolomitic Conglomerate,) there are variations in the textures within these stones, which suggest some is derived from the bedrock, whereas the finer ashlar is most likely derived from the main outcrop (and coastal quarry) at Sudbrook Point. There is also the possibility that Sudbrook Stone could have been derived from the Roman ruins at Caewent.

The group first examined the main Gatehouse on the south side of the castle, which was seen to be of fine ashlar, 'typical' Sudbrook Stone (Fig. 24). The curtain wall to the east of the gatehouse is composed of large, coursed blocks. On the basis of the structure of the masonry, there was a discussion as to whether this part of the wall, although included in the same phase of building, may have pre-



Fig. 24. Ashlar blocks of Sudbrook Stone, in main Gatehouse. Fig. 25. Detail of blocks, showing some to be conglomeratic with coarse angular fragments of limestone. Fig. 26. Block in Gatehouse showing rounded and angular clasts. Fig. 27. Small exposure of Dolomitic Conglomerate, to the west of the Gatehouse, containing angular and rounded clasts



Fig. 28. (top left) Banded yellow and red Sudbrook Stone in arch on S curtain wall. Fig. 29. (top right) Curtain wall by SE tower, showing base composed of Sudbrook Stone (yellow) and upper courses in Carboniferous Limestone (grey). Fig. 30. (bottom left) Coursed blockwork of Sudbrook Stone (SW tower), colour variation a product of battered structure of wall catching greater moisture. Scale provided by our new Treasurer, Heather Jackson. Fig. 31. (bottom right) Close up of Sudbrook Stone showing mottling produced by lense of finer red sand.

date the adjacent Gatehouse. The stone in the wall is more varied and distinctly coarse conglomeratic stones were noted (Fig. 25 & 26). Conglomeratic Sudbrook Stone has not been observed in the field. However, examination of exposures on the west edge of the castle, showed these to be of conglomeratic Dolomitic Conglomerate, with large, clasts (Fig. 27). This is somewhat different to the normal coarse conglomerate (Horak & Oliver, unpublished data) with the composition of the carbonate confirmed by carbonate staining techniques (e.g. Dickson, 1966). This suggests that unmapped Dcg may sit below the Sudbrook Stone in this area, and that this had been extracted during the construction of the castle and adjacent ditch. Sometime was also spent examining a shell fragment in the Dcg, with the aim of providing more detail on the nature of the stone. However, no firm conclusion was arrived at. Further to the east, the wall is of Sudbrook Stone, with arches worked in fine-grained red/yellow, thickly bedded variegated Sudbrook Stone (Fig. 28). The eastern part of the wall contains significant component of grey Carboniferous Limestone blocks.

Some of the group dispersed at this stage but those

remaining walked the perimeter of the castle. In summary, it was noted that the towers and gateways both C13 towers on the southeast and southwest ‘corners’ of the castle, and the Bohun Gateway (west wall) and Keep (northwest) were also all worked from well-shaped ‘typical’ Sudbrook Stone blocks, as is the Woodstock Tower.

References

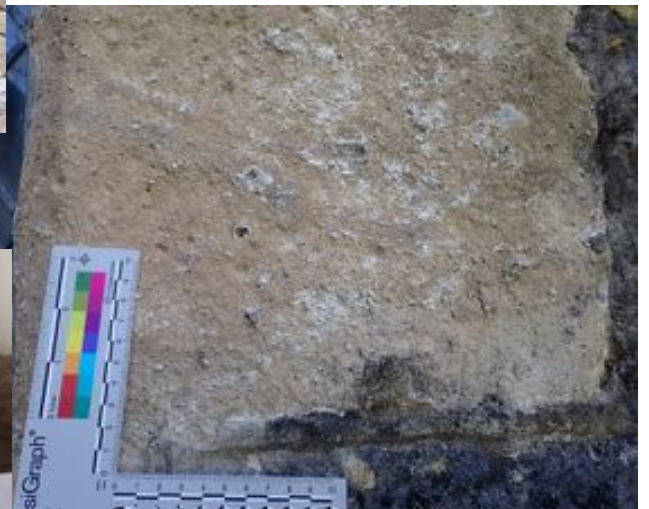
- Allen, J.R.L., 2006. Roman and Medieval-early modern building stone in southeast Wales: Sudbrook Sandstone and Dolomitic Conglomerate (Triassic). *The Monmouthshire Antiquarian*, **21**, 21-44.
- British Geological Survey, 1967. Sheet 250. Geological Survey of England and Wales 1:50,000 geological map series, New Series.
- Cadw, 2052. <https://cadwpublic-api.azurewebsites.net/reports/listedbuilding/FullReport?lang=&id=2052> accessed July 2024
- Cadw 2928. <https://cadwpublic-api.azurewebsites.net/reports/listedbuilding/FullReport?lang=&id=2928> accessed July 2024.
- Dickson, J.A.D., 1966. Carbonate identification and genesis as revealed by staining. *Journal of Sedimentary Research*, **2**, 491–505.
- Newman, J. 2000. *The Buildings of Wales, Gwent/ Monmouthshire*. Penguin Books, Yale University Press.

Places for future visits

*St Illtyd's, Llantrithyd, Vale of Glamorgan
Sutton, Quarella and Dundry stones*



*St Michael & All Angels, Llanfihangel Rogiet, Gwent Levels (a Friends of Friendless Churches site)
Sudbrook Stone, Dolomitic Conglomerate and Dundry Stone*



One last font



*St Gwynno, Llanwonna, Rhondda Cynon Taff.
Medieval (thought to be C14) Sutton Stone font.*

© Mike Statham

Welsh Stone Forum Contact Details

Welsh Stone Forum
c/o Dr Jana Horák
Amgueddfa Cymru - National Museum, Wales
Cardiff CF10 3NP
jana.horak@museumwales.ac.uk

<http://www.museumwales.ac.uk/en/welshstoneforum>
<http://www.amgueddfacymru.ac.uk/en/fforwmcerrigcymru>

ISSN 1759-7609