Fforwm Cerrig Cymru Welsh Stone Forum

NEWSLETTER

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This ninth Newsletter appears as the Forum celebrates its tenth birthday. Originating from the highly successful Welsh Stone Conference, held in Cardiff at the National Museum of Wales in April 2002, the Forum has gradually developed and evolved its purpose over the intervening years to cover all things stone within Wales. The Forum has responded to both national and local consultation papers on environmental and geological topics. It has tried to raise the profile and emphasise the importance of the widespread and varied stone resource in Wales, not only looking at how it has produced the varied local character of our cities, towns and villages but also its future importance for providing a valuable local resource and maintaining a reservoir of craft skills needed to work with stone.

Our regular field meetings have once again proved extremely popular and successful and have broadened the knowledge of all who have attended. They provide an interesting and informal venue for sharing knowledge. The success of these meetings has been noticed by our equivalent in Scotland, the Scottish Stone Liaison Group, who currently do not run such meetings. In the following pages you will find reports from all of last year's field meetings, mostly writen by John Shipton (who also provided most of the photographic illustrations), which provide a flavour of what was seen for those who missed them. My sincere thanks to John for being so diligent in recording all of the excursions and writing them up for the Newsletter.

We also have a wide ranging series of articles that illustrate the broad range of interests that members of the Forum hold. Dyfed Elis Grufydd looks at the use of the Presceli 'Bluestones' as a building stone (a rock type rarely out of the news at the moment), as well as the use of Caerbwdi sandstone beyond St David's Cathedral. Lynda Garfield and Dave Wellings report on the geological terrace at Bournemouth University while Robin Sheldrake looks at the former port of Nolton Haven and its now lost trade. Maddy Gray talks about further survey work on seven-sided fonts in Cardiganshire, collaborating with Tim Palmer to provide accurate lithological information for the first time. John Davies and Jana Horák explore the northernmost use of the Tilestones in Medieval Wales while Martin McNamara gives us an architect's eye view of the use of stone in modern house builds.
Finally, you will also find this year's programme, which once again offers you a great range of field meetings across Wales, starting with the AGM in Cardiff on 28th April. Many thanks to all of this year's contributors and to Jana for once again laying out and producing the Newsletter.

Stephen Howe

Programme 2012

Saturday 28th April th AGM, National Museum, Cardiff

11.00 AGM . Following the formal business of the AGM there will be a discussion regarding the future activity of the Forum.

12.45. After a lunch break Joanie Speers, (Executive Director, Adfer Ban a Chwm) will give a lecture entitled 'As easy as ABC'. Adfer Ban a Chwm is a building preservation trust addressing the issues of derelict/ redundant vernacular buildings in rural Wales. Non-members welcome.

Saturday 9th June: Building stones of Carmarthen.

Leader: Dr John Davies.
Meet 11.00am, John's Street car park in the centre of Carmarthen (at the entrance by the back of M&S). There is alternative parking in Peters St. if this car park is full. We will have lunch in Carmarthen.

Saturday 14th July: Flatholm (provisional)

At the request of the Flatholm Society we will undertake a survey the building stones. Co-ordinator Dr Chris Lee

(University of Glamorgan). All wishing to attend must confirm a place with the field secretary (Dr Tim Palmer). Meet at Penarth Marina, 11.15am, Boat departs 11.45, and leaves the island at 17.15 (returning to Penarth c. 18.05). Adult fare £22.00.

Saturday 8th September: Building stones of Tenby.

Leader: Dr Tim Palmer.
Meet 11.30 am at the Five Arches Gate, Tenby.

Saturday 6th October: Building stones of Welshpool.

Leader: Dr John Davies
Meet 11.00am in the municipal car park on Berriew Road, Welshpool. John contributed to the new building stone guide to Welshpool (see page 22). This trip will explore the use of stone in an area not well endowed with building stone.

People wishing to attend trips please inform Tim Palmer (Meeting Secretary, tjp@abet.ac.uk or tel. 01970 627107). More detailed information on the meeting points will be posted on the website (http://www.museumwales.ac.uk/en/welshstoneforum).

House Building with Stone

Martin McNamara

For a small country Wales has some of the most diverse geology and possibly the oldest stone housing stock in Europe. Of the current estimated 1,340,000 dwellings in Wales, 442,000 are solid built houses constructed before 1918 and of these about 215,000 are solid stone built dwellings[1].

As we know, up to and including the 19th Century stone was the nation's predominant building material. With early industrialisation in Wales came construction on a scale to match. Welsh stone in all its variety and application was generally abundant and well understood. Quarrying to construct industrial and manufacturing works, the winning of ores and the skills of the quarrymen were used to meet the demand for the production of stone to build houses for the arriving workforce. For example, in 1841 the population of the Rhondda valley totaled 748 people but by 1921 was 162,727[2].

The extraction and shaping of stone building material continued despite the coming of the railways and the resulting lowered freight costs of brick and stone from further away. Solid stone dwellings, built from local accessible material, remained available and competitively priced. Where imported materials were used, regional Welsh quarries continued to supply masonry for dressed or rubble stone walls for the main body of the building and of course slates for roofing. Increasingly as time went on imported stone or brick was used for quoins and window and door reveals. Bath Stone, Portland Stone or Scottish and Cornish granite was often used, in part at least, for banks, offices and houses. As a rule during this period, the further away the source of the building material came the higher the status of the building.

The 20th Century saw increasing labour costs and the growing mechanisation of material handling and freight movement resulting in a slow- down in the demand for building stone from smaller quarries. The expansion of hydrated Portland Cement production for war works and the corollary of decreased lime production, made concrete products such as blocks and roof tiles, an increasingly attractive construction material.

Rendered cement- based blocks are an affordable and effective means of building. Today, as a general rule building material from further afield, such as machine made bricks and mass produced concrete roof tiles, implies lower status. The use of local stone, no longer a staple material and relatively expensive, makes it increasingly available only to those who can afford the premium cost. Natural stone's qualities of permanence, history, beauty and strength means that it is an increasing high status and desirable building material. However, due to cost its use in general house building continues to decline.

We know that walling styles and building techniques reflect and adapt to the local geology and gives the singular character and distinctiveness to Welsh towns, landscapes and settlements. Building new houses from standard manufactured building materials, without reference to regional and communal value, has gradually led to a recognition that something meaningful and authentic was being lost; that the character of the landscapes, towns, villages and settlements was being diluted and needed protection.

Policy makers eventually responded to pressure and required Local Authorities and National Park Authorities to produce residential design guidance to encourage designers and developers to incorporate stone and other traditional materials into new dwellings. Close to my home the Brecon Beacons National Park Authority development guidance explains: "Dwellings will be required to be of a high quality of design. Proposals should take account of local and traditional elements of design and materials and,

where appropriate, be in keeping with any surrounding buildings of merit." [3]. However, house builders' and their agents' interpretation of policy is to continue to build concrete block houses with the fronts faced in stone to comply (Fig. 1). This form of facadism has almost become the norm for new housing developments. The well meaning guidelines are being lost in translation with the stone face on new buildings being essentially an add-on.

Cropped stone facings have little or no structural meaning, usually being attached to the concrete or aerated blocks with wall ties and bedded in cement mortar by bricklayers. The stone is by and large laid without regard to bedding, coursing or what a stone-mason would consider good practice (Fig. 2). Sometimes large stones with vertical bedding planes and facing front, known as jumpers or leapers (or other names depending where one lives) are placed here and there, to speed up the work to the stone/bricklayer's advantage. More often than not the stone is chosen without regard for local lithology or colour. It is stone, and the planning application requires stone.

Today, as a fairly typical example, in Hay on Wye a new housing development is being faced with cropped blocks of Coal Measures Pennant Sandstone from Gloucestershire while the indigenous stone is a pale grey-green Devonian sandstone, which can be obtained from small local quarries.

According to Llywodraeth Cymru, Housing Statistics for Wales 5,700 new homes were built in 2011[4]. It is suggested that that 244,000 additional homes are required in Wales by 2026[5].

One accepts that change is inevitable and future house building must be affordable, practical and meets with

Fig. 1. Typical stone front-faced new build.

Fig. 2. Uncoursed stone work in new build.

modern expectations, building regulations and energy conservation. However, changes in perception and sensibilities can translate into pressure, momentum and policy change. This could mean that one day cement render over concrete block is no longer considered acceptable compared to the characteristics of lime render over stone. Perhaps house fronts in cropped stones from distant quarries will also no longer be an acceptable metaphor for Welsh stone buildings.

1. Llywodraeth Cymru Welsh Government housing statistics (2009-2010)
2. John, Arthur H. (1980). Glamorgan County History, Volume V, Industrial Glamorgan from 1700 to 1970. Cardiff: University of Wales Press.
3. Brecon Beacons National Park Authority Approved UDP Guidance Note: Policies ES26 & ES27 *Replacement of Dwellings & Extensions to Dwellings in the Countryside*
4. Welsh Assembly National Statistics for Wales
5. The Holmans Report 2 *Housing Need and Demand in Wales,* published 2010 for the Welsh Assembly

Caerbwdi sandstone: its use beyond St Davids Cathedral and the Bishop's Palace

Dyfed Elis-Grufydd

Whilst there is no evidence to support the claim that St Davids Cathedral is largely built of purple Lower Cambrian sandstone, named after Caerbwdy (sic) Bay [1], the fine- to medium-grained, dull purple micaceous and felspathic Caerbwdi sandstone was used for almost all the dressed exterior stonework of the cathedral (including St Mary's College and Porth Tŷr) and the adjoing Bishop's Palace. Indeed, despite the fact that it is only barely adequate for carving and prone to granular disintegration

and spalling, it can lay claim to being the only local freestone that was available to the masons responsible for the construction of all the buildings within the boundaries of the Cathedral Close. However, given the dearth of better quality freestones elsewhere in southwest and west Wales, it is somewhat surprising that its use beyond St Davids in medieval times would appear to be confined to three locations, viz. the Cistercian abbey at Ystrad-fflur (Strata Florida), the Augustinian Priory at Haverfordwest, and Llawhaden Castle, situated approximately 11km east of Haverfordwest and 3km north-northeast of the highest tidal reach of the Cleddau Ddu.

At Ystrad-fflur, for example, David M. Robinson and Colin Platt, authors of Strata Florida Abbey: Talley Abbey (Cadw, 1998, p. 49) refer to the fact that the north and south arches of the crossing, 'constructed as they were in alternate bands or purple Caerbwdy (sic) stone and pale cream limestone', were a particularly attractive feature of the Monks' Choir. At Haverfordwest Priory, which stands on the banks of the Cleddau Wen, Siân Rees records that Caerbwdi stone, in conjuction with 'a contrasting coarser-grained sandstone' was used in the construction of the cloister arcade and that 'the capitals and bases (of the slender Caerbwdi shafts) had been turned on a lathe (Fig. 1).

Unlike its use at Ystrad-fflur and Haverfordwest, the appearance of Caerbwdi sandstone at Llawhaden Castle, is easier to explain for it was built to protect the possessions of the bishops of St Davids. During the time of Thomas Beck, bishop from 1280 to 1293, the castle was remodelled as 'a splendid manorial residence' and one hundred years later a 'large and luxuriant southern range of apartments' was added during the time of Adam Houghton, bishop from 1361 to 1389 and founder of St Mary's College, St Davids, in 1377. The first-floor chapel, part and parcel of the southern range, built c.1380, is noteworthy for its 'three large cinque-foiled lancets' of Caerbwdi sandstone[3] (Lloyd, 2004), quarried in all probability at Caerfai (Fig.

Fig. 1. The bases of two of the slender shafts of Caerbwdi sandstone, Haverfordwest Priory.

Fig. 2: The three cinque-foiled landcets of purple Caerbwdi sandstone, Llawhaden Castle.

2). The quarry is known to have been active at this time for it was being worked by 'Four men, working on a windlass to raise stones to the top of the cliff at Caerfai for the building of (St Mary's College) . .', [4] for which they received 6d. a day between them!

1. Owen, T.R., 1973. *Geology Explained in South Wales,* David & Charles, p. 25.
   W.B. Jones and E.A. Freeman Owen, authors of The History and Antiquities of St Davids (1856; republished in 1998 by Pembrokeshire County Council) made a similar claim.
2. Rees, Siân, 1999. *The Augustinian Priory*, p. 68, in Miles, Dillwyn, *A History of Haverfordwest*, Gomer Press.
3. Lloyd, T. *et al*., 2004, *The Buildings of Wales: Pembrokeshire,* Yale University Press, pp. 263-5.
4. Miles, Dillwyn, 1984. Portrait of Pembrokeshire, Robert Hale, p. 98.

Evidence for the northern-most use of 'Tilestones' in Medieval Wales

John Davies & Jana Horák

During 2011 Professor David Austin (University of Wales, Trinity St David's) lead an excavation at the site of the great gatehouse at Strata Florida. A number of roofing materials were collected from the excavations by the team of archaeologists. The main focus of the excavation was to the west of the abbey and in the field east of the present mansion house (Fig. 1). Work was also undertaken to clear the garden between the mansion and the present interpretation center. It was from these two latter areas that samples of flaggy sandstones were collected.

In addition to these flags, local slates used for roofing at the abbey or for later buildings on the site were also found. These are generally composed of turbiditic, cleaved, silty-mudstones varying to fine-grained sandstones with the cleavage making a low angle with the bedding (Fig.

2). This results in a slightly lozenge-shaped slate. The third roofing material, to be seen in the present mansion house, is higher quality grey slate from the 'north Wales slate belt' and its appearance in the area must date from after the arrival of the railways in the 1860s. It would appear that the turbiditic mudstones-sandstones and flaggy sandstones were replaced by the grey slates and then discarded into tips on site or incorporated into local walls.

Examination of the sandstones (Fig. 3) showed that this lithology does not belong to the local Silurian slates, or thinly-bedded sandstones of the Blaen Mherin, Devil's Bridge or Rhayader Mudstone Formations, but is typical of the pale greenish and reddish, micaceous, upper Silurian 'Tilestones' of eastern Carmarthenshire and Breconshire. These flaggy, quartz-rich sandstones have a large number of white mica flakes on the bedding-planes, which facilitates them splitting readily along these surfaces into very thin, but strong flags. It was this property made them very suitable for use as a roofing material.

The Tilestones Formation is a thin sequence of flaggy sandstones which forms a very long, narrow outcrop, stretching from the river Cennen gorge, between Llandeilo and Llandybie in Carmarthenshire in the west, to Mynydd Eppynt near Builth Wells in the east, a total distance of 50 km (Fig. 4). Because the bedding in the flags is oriented vertically, the workings themselves form an almost continuous, straight scar cutting across the countryside, but in no place is it more than 10 m wide. The workings even cut across the corner of the Roman marching camp at Y Pigwn near Llandovery and so obviously post dates 70AD. It is worth looking at this site on Google Earth, it is quite impressive.

The Tilestones were used extensively on local churches and prosperous farm roofs, across a relatively large area of south-central Wales but, in comparatively recent times they have been replaced almost entirely by modern slates. This occurred at Llandulas church in Tirabad, Breconshire as late as the 1950s. However, there are examples where Tilestone roofs still exist, such as at Llandyfan near Trap, Carmarthenshire (Fig. 5). Strata Florida Abbey belonged to the Cistercian order and its sister house of Abbey Cwm Hir lies north of Llandrindod, in Radnorshire. This was stormed and destroyed as a home for the Fowler family by the Parliamentary army in 1644. The Fowlers built a new home with the materials from the abbey in 1649 at Devannor, one mile east of the

Fig. 1 (top left) Excavation of the great abbey gateway, June 2011, Strata Florida.(botton left) excavation east of the mansion. Fig.2. (right) Slates from the Blaen Myherin, Devil's Bridge or Rhayder Mudstone formation found in tips east of the mansion.

abbey. Tilestones have been found amongst discarded roofing materials in the garden of Devannor (Fig. 6), but the present roof again uses north Wales slate.

There are several questions raised by the above identifications. Though there is no doubting the source of the materials it is not certain if they formed part of the roofs of the Cistercian abbeys, or whether they belonged to the successor gentry houses built on their existing religious foundations. The transportation of such materials, a distance of at least 35 km in the case of Strata Florida and 26 km in the case of Abbey Cwm Hir, indicates the status of both establishments and, though there was local slate available at Strata Florida, there was no such material at Abbey Cwm Hir. The hunt must now examine evidence from other ecclesiastical and high status sites across mid Wales in order to ascertain the maximum extent in space and time of the use of Tilestones for roofing. The lands of the Tir Abad grange of Strata Florida extended up onto the Mynydd Eppynt, which was transected by the Tilestone workings. This is probably the nearest area to both Strata Florida and Abbey Cwm Hir.

'Spotted' dolerite: a 'Sunday-best' building stone

Dyfed Elis-Gruffydd

There is little or no field evidence to suggest that the so-called 'spotted' dolerite or 'bluestone', which outcrops in the vicinity of the Carn Meini–Carn Gyfrwy–Carn Breseb tors at the eastern end of the Presely Hills, was used either extensively or preferentially by late Neolithic-Bronze age and Iron age communities for the construction of burial chambers, stone circles and standing stones in north Pembrokeshire. Indeed, with respect to the Gors Fawr stone circle that lies less than 3.5 km south of Carn Meini (SN 143324), Aubrey Burl, author of *A Guide to the Stone Circles of Britain, Ireland and Brittany* (Yale University Press, 2005), notes that only one 'bluestone' was chosen by the 'Bronze age builders among the fifteen other glacial erratic boulders of the circle'. However, it does appear that somewhat greater use was made of the stone, together with pillars of 'unspotted' dolerite and other locally-sourced intrusive and extrusive igneous rocks, during the

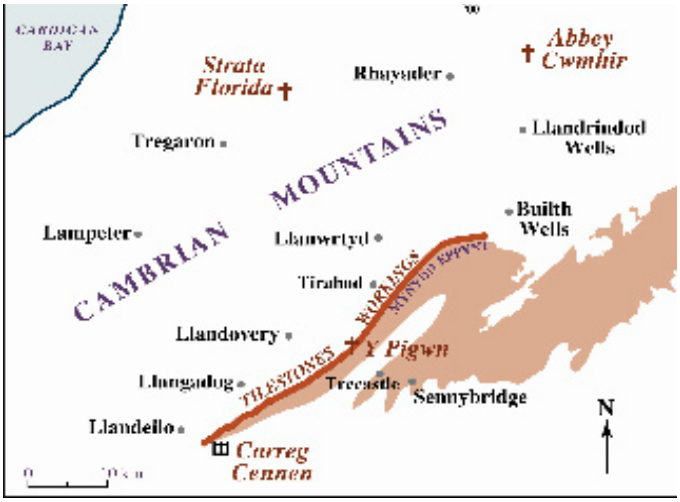


Fig. 3 (top left). Tilestone roofing flag from the June 2011 excavation. Fig. 4. Map of the Tilestone Formation outcrop (Lower Devonian strata in brown). Fig. 5 (top right). Tilestone roof on Llandyfan church near Trap, Carmarthenshire. Fig 6 (bottom right) Tilestone roofing flag from the garden of Devannor House, Radnorshire, showing dowel hole.

medieval period and particularly between the 5th and the 9th century, for several of the ogam and early inscribed stones of the area are of 'spotted' dolerite (see Edwards, Nancy, *A Corpus of Early Medieval Inscribed Stones and Stone Sculpture in Wales, Volume II, South-West Wales,* University of Wales Press, 2007).

Field evidence suggests that the greatest use of 'spotted' dolerite dates from the late C18th and C19th. In his Welsh-language article entitled 'Cerrig Llwydion Carn Meini', published in Y Gwyddonydd in 1966, O.T. Jones (1878–1967) recorded 52 such stones, derived from the vicinity of Carn Meini, in the Cardigan and Y Ferwig area and 'ugeiniau yn rhagor' (scores more) in and around the village of Eglwyswrw. Furthermore, he added that some of the older local inhabitants interviewed were able to confirm that many of the joint-bounded and frost-riven pillars – destined to act as gateposts, in the main – were dragged from Carn Meini within living memory with the aid of a car llusg (drag, sled).

Fig. 1 (top). Cana Independent Chapel, Felindre Farchog. Fig 2 (bottom). Squared, hammer-dressed blocks of 'spotted' dolerite forming Cana's façade. The penny-piece, top left, is for scale.

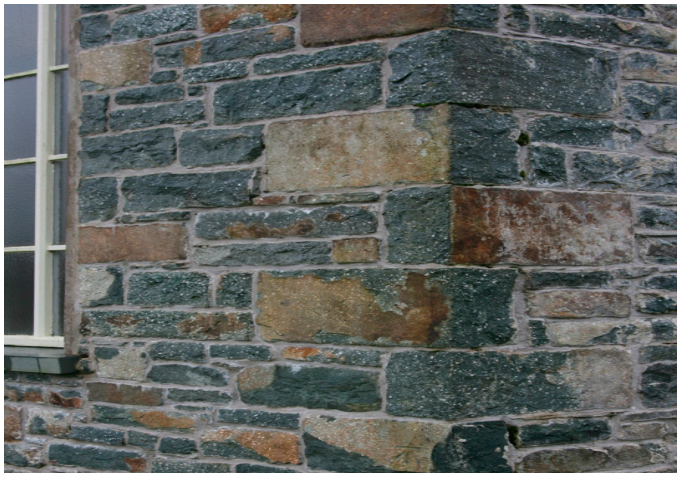


Fig. 3 (top). Bethel Baptist Chapel, Mynachlog-ddu
Fig. 4 (bottom). Squared, hammer-dressed blocks and quoins of 'spotted' dolerite of the gable-fronted Baptist chapel.

Although tors such as Carn Meini and Carn Breseb yield ready-made pillars, 'spotted' dolerite is very difficult to cut and dress on account of its hardness and hence has not been used as a general building stone. Indeed, its only known use in the Presely area is as a facing stone employed to dress – in their 'Sunday best' – the gable front of two Welsh Nonconformist chapels, viz. Cana Independent Chapel (1856–7), Felindre Farchog (SN 100390), and Bethel Baptist Chapel (1875–7), Mynachlog-ddu (SN 145304). In the case of Cana, the squared, hammer-dressed blocks of 'spotted' dolerite of the façade are in marked contrast to the rough-hewn blocks of slaty mudstone of the Ashgill age Nantmel Mudstone Formation (Ordovician), derived from the small defunct quarries of nearby Cwm-gloyn (SN 103394) and used to construct the rubble walls of the remainder of the building (Figs 1 & 2). The contrast is no less marked in the case of Bethel, although the slate-rubble walling – probably derived from Chwarel Dyrch, a

former roadside slate quarry, within the Arenig age Foel Dyrch Formation (Ordovician), about a kilometre south of the chapel – has been cement rendered (Figs 3 & 4). The restriction of the 'Sunday-best' treatment to the façade is a common, money-saving feature of Welsh chapels, which prompted an anonymous rhymester to compose the following apposite doggerel quoted in Welsh Chapels (Alan Sutton Publishing, 1996) by Anthony Jones:

The Trellwyn Methodists have built a church
The front looks like an abbey,
But thinking they could fool the Lord
They've built the back part shabby.

The precise provenance of the 'spotted' dolerite is not known although that used to dress the front elevation of Bethel probably came from nearby Carn Meini.

A bit of serendipity
The Geological Terrace at Bournemouth University

Lynda Garfield & Dave Wellings

Some years ago we acquired a small booklet for 10 or 20 pence at one of the SWGA sale of books. It was a catalogue of rocks in the "Geological Terrace" at the Russell-Cotes Museum in Bournemouth, which we promptly filed away and forgot about! Then, in 2009 we went on a pensioners trip (one of the delights of retirement!) and somehow recollected we had the booklet. Once at Bournemouth we visited the museum, only to be told that the collection had been put in storage some years ago, but had recently been moved to Bournemouth University.

We found the university, asked to see "the rocks", were told they were outside the front entrance, and received an apology from the receptionist because there was no guide to what each rock was. We promptly produced our catalogue, much to the receptionist's delight, whereupon she took a photocopy. We moved outside to find a splendid display alongside the path to the main entrance of the Talbot Campus.

Fig. 1. Close up of the stones in the geological terrace.

Fig. 2. Overview of the geological terrace.

The 'Geological terrace' now comprises over 180 (out of nearly 200 originally) cut blocks of stone, each up to 1m in height (Figs 1 & 2). They were collected in the late 1940s by the then curator, Norman Silvester, who had written to quarries around the UK requesting a sample of their stone. It opened in 1951and was a unique collection of building stones in the UK at that time. Being displayed outside facing the sea, the collection suffered weathering over time with a few of the samples deteriorating quite badly. It was moved to the university in 2005, on long term loan from the museum. Sadly, during its storage and subsequent removal, many of the stones lost their identification numbers and although some can be identified with ease (eg "light" and "dark" Shap granite) others are much more difficult.

Then, a year later, in autumn 2010, the 'Geological Terrace' was featured in an article in the Down to Earth magazine. The Dorset Geologists' Association Group is now tackling the task of identifying the different rocks and seeking help with this project. Two websites feature the collection:
http://bournemouth.ac.uk/cceec/understandingenvironmentandchange/russell_cotes_geological_terrace.html
and http://dorsetgeologistsassociation.com/geoterrace.Index.html although it might be easier to just search on 'geological terrace, Bournemouth'!

The Dorset GA site has a list of all the rocks (including an indication of those that have been identified so far), a copy of the catalogue (which includes a description and the identification of the original quarry), and a site plan of

the stones. There is also a request for small samples (5-10 cm) from the original localities for which the Dorset GA Group would be happy to refund postage. Unfortunately, to date, this appeal for samples has met with limited success so perhaps the Forum could help?

The list identifies eighteen stones as coming from Wales. So far ten of these have been recognised, but one (anthracite) is missing. The Dorset GA has a sample for only one (Trefor "granite"), which is one of the seven still to be recognised. If you would like to know more, and to help, do visit the Dorset GA website. Perhaps you could recognise a stone from the photos?

The stones still awaiting identification include: "quartz breccia" from Amlwch, Anglesey; Trevor "granite"; calcareous grit from the Senni Beds, Craig-y-Neuadd; Carboniferous Limestone, "Zone of Syringothyris", Kenfig Hill; "Mountain Limestone", Newton Nottage, Porthcawl; "Blue Pennant", Craig yr Hesg, Pontypridd; and Aberthaw Limestone, Lias.

Those that have been recognised, but which the Dorset GA would still appreciate a sample of include Penrhyn slate; "andesitic tuff" from the Treffgarne quarries; purple Caerbwdi sandstone; Prescelly green slate, Lower Tyrch; Ffestiniog slate, Oakley slate quarries; "Tonfanau 'granite' dolerite, north of Towyn; greenstone, Penberry, Pembs; spotted dolerite, Carn Meini; Penmaenmawr quartz enstatite diabase; "granite" porphyry, Llangynog, Carms.

Regardless of whether you can help or not, if you are in the Bournemouth area it is well worth stopping off to view the collection, it will keep you engrossed trying to identify the stones for quite a while, apart from being a really good collection.

Seven for the seven sides on the font

Maddy Gray

In a previous issue of the Newsletter Maddy Gray reported on the seven-sided font in the old church at Llanfaglan (Gwynedd), now in the care of the Friends of Friendless Churches, and speculated that it might at one time have been painted with the seven sacraments of the medieval Catholic church. Seven-sided fonts are rare: they are of course difficult to carve with geometrical exactness even with modern geometrical equipment. The Baptisteria Sacra database of medieval fonts and baptisteries records one other in Scotland and only three in England. However, Tim Palmer has now identified another three in Wales – at Llanilar, Tregaron and Pendine. All are recorded in Edmund Tyrrell-Green's *Baptismal Fonts: Classified and Illustrated* (SPCK 1928). Tyrrell-Green was Professor of Hebrew and Theology at Lampeter, and published his studies of Cardiganshire fonts in the Transactions of the Cardiganshire Antiquarian Society (now available online at http://welshjournals.llgc.org.uk) before collecting them into one volume. His drawings of the fonts are excellent but his identification of the stone is often misguided: he described the sedimentary conglomerate of the Llanilar font as concrete.

Tim Palmer and Steve and Maddy Gray have now looked carefully at the Llanilar and Tregaron fonts. Apart from the fact that they are both seven sided and carved with great accuracy, they are almost completely different. The Tregaron font (Fig. 1) is quite small – 70 cm maximum diameter, all the sides approximately 31cm, and the

Fig. 1 . Seven-sided font from Tregaron.

exterior from 20-22 cm tall. The sides are slightly curved and separated by grooved pilasters. The closest parallels are quite early in date: the four-sided Romanesque fonts like the one at Silian, with crudely carved heads at the angles. The stone is a very micaceous sandstone and certainly not local. The mica fragments are particularly noticeable on the rim, and Maddy suggested that the stone might have been deliberately chosen for its ability to reflect light. If the font is indeed 12th Century, that would make it the same date as some of the great Gothic cathedrals of France. Abbot Suger, who was responsible for the magnificent rebuilding of St Denis near Paris, was inspired by the religious symbolism of light, light shining through stained glass windows and reflected from precious stones and metals. The poetry inscribed on the front of his church repeatedly emphasises this:

The noble work is bright, but, being nobly bright, the work
Should brighten the minds, allowing them to travel through the lights
To the true light, where Christ is the true door ...
Bright is that which is brightly coupled with the bright
And which the new light pervades.

(Suger, De Administratione, online at http://www.fordham.edu/halsall/source/sugar.html)

The sides of the font have been scraped and have some very rough tooling marks. There are no traces of paint but the scraping could have been to remove either paint or carving. There is also some cement repair. The font is on its original shaft, though this has suffered some damage and been repaired. It is greywacke, probably local, as the

Fig. 2. (top left). Llanilar font, worked from a similar lithology to the font at St. Dogmael's Abbey.

Fig. 3. (bottom left) . Close up of the base of the Llanilar font worked from Dundry Stone.

Fig. 4. (top right). Llansanffraid font worked from Pwntan stone.

Fig. 5. (bottom right). Close up of the red and yellow paint on the Llansanffraid font.

same stone occurs in the tower. It is characterised by thin horizontal laminations which are easily eroded. The plinth of the font is modern and the same stone as much of the 1878-9 rebuilding of the church.

The Llanilar font is bigger – maximum diameter 82-83 cm, sides between 37-40 cm (Fig. 2). The carving of the bowl is sharp and geometrically accurate but the upper part of the bowl is misaligned on the base. The stone is a sedimentary conglomerate with shaly flakes of Cilgerran slate embedded. Tim noted that a similar stone was used at St Dogmael's Abbey. It is a very coarse and rough stone, not an easy material for decorative carving but good for geometric shapes. There is no evidence of paint, and it is therefore unlikely that the font could have been painted, as the stone is so rough that paint fragments would have been found in the interstices of the grains. However, the design of plain incised panels is unusual and could have been intended to hold decorative panels of wood or some other medium.The base of the font is now stored separately, in the porch. Surprisingly, perhaps, it is Dundry stone (Fig. 3). Why a base in Dundry and a shaft and bowl in the sedimentary conglomerate? We can only speculate.

On the same day we also visited Llansanffraid, just south of Aberystwyth, where Tim had noticed fragments of paint on the font. This is a magnificent Romanesque font, roughly rectangular in shape with a chamfered bowl, decorated with a band of asymmetrical rosettes (Fig. 4). These are all slightly different in size and design but the overall effect is impressive. The whole bowl is also asymmetrical, presumably following the line of the original block of stone. The bowl is made of Pwntan Stone, a pale Upper Ordovician sandstone. In Newsletter 7, Tim Palmer noted the use made of Pwntan Stone from the Upper Yr Allt Formation in the 19th Century church of St Michael and All Angels, Tremain, in southern Ceredigion. The Llansanffraid stone presumably came from a quarry closer at hand, possibly the one at Bwlch-y-Fadfa near Talgarreg, which is still active (see Newsletter 3). The stone used for the bowl exhibits a veining effect from iron staining while that of the base is similar but without the iron veining.

The font has numerous traces of paint, mainly yellow, red and dark blue (Fig. 5). Some of these may relate to the incident mentioned by Tyrrell-Green when a local workman was commissioned to paint the iron pillars of the church in imitation of granite and went on to paint the font as well. However, the red and yellow must be earlier and may suggest that the font was painted in the medieval period. (See Newsletter 5 for some more thoughts on the painting of stone in the Middle Ages.) More work needs to be done, though, on the composition of the paint.

Stone Building in Aberystwyth

Tim Palmer

The varying architectural styles used in buildings of different ages are an important part of the landscape history of any built community, and the current Cadw initiative on chosen Welsh towns pays close attention to changing patterns of stone use throughout the history of the place. Aberystwyth has a long history, and many of its earlier buildings survive, retaining a record from across several periods of changing fashion in stone architecture.

The original town of Aberystwyth grew up as a walled community alongside the late 13th Century castle. There is little surviving evidence of any of the original buildings except for the castle itself, but from the remaining castle walls it seems to have been built of local walling rubble (both shales and slabs of greywacke). The castle had dressings of imported freestone (almost entirely Dundry Stone from Bristol), but it is unlikely that the domestic buildings within the town were so grand. They were probably of undifferentiated local stone with a mud mortar, and early accounts tell of their being whitewashed. Probably some walls were built entirely of mud.

The earliest of the extant buildings date from the turn of the 19th Century, after Wales had started to become fashionable as a picturesque destination, and shortly before the expansion of the town as a tasteful watering place for visiting English. Thus, many of the buildings reflect the prevalent architectural tastes seen in other British towns from the same period, but with distinct local modifications. Smooth and geometric façades were favoured for the best quality architecture in parts of England, and the best stonework was in ashlar where the local building materials were freestones. But this didn't suit the hardness and the workability of many Welsh stones which are not freestones and so are suited to rubble building. So imitation ashlar was widely used instead. A smooth plaster of stucco coating, often with ruled lines to give the appearance of ashlar, was the most common method and this style became something of a Welsh speciality that went on into the 20th Century. Other buildings had facades of stone laid in courses (rangework), with exposed faces dressed flat. The bigger the stones, the better, and some of Aberystwyth's earlier stone buildings (probably from the 4 decades of the 19th century) show that the thickest beds of stone in the local quarries (up to 10 inches or so) were specifically favoured and picked for some of the grander houses in the best parts of town. There is a pseudo version of this seen in Bridge Street, where the façade is built in a variety of small stones, but ribbon pointing is then applied to give the impression that

fewer courses of larger stones were employed.

In the later part of the 19th Century, there is wide use of jumper work (in which some stones rise 2 or 3 courses compared with their neighbours) in facades. This style is well-suited to the greywackes of the Aberystwyth Grits, which come in all thicknesses from about 1 to 8 inches: the jumper-work jigsaw efficiently uses up the full range of material produced by the quarry. Variety could be given to the façade by different styles for dressing to the exposed face – punched dressing or rock dressing are the most common. Most jumper-work buildings show use of other material for dressings, where tidy right-angles were required. Yellow brickwork from northeast Wales is the most familiar, but low-cost Bath Stone and Grinshill Sandstone from north of Shrewsbury were also used widely. After the railways to Aberystwyth were built in the mid 19th Century, it became easier and cheaper to bring in these materials, and some of the most fashionable building projects are largely composed of such imported materials: Bath, Doulting, Grinshill, and Cefn Stones in the Old College, for example, with minor moldings of Portland Stone and Hanam Sandstone from Bristol.

Exotics continued to be used for commercial buildings from the late 19th to the early 20th Centuries: terracotta tiles; Cefn Sandstone; Portland and Bath Limestones; even the exotic Lavikite from Sweden in the Montague Burton's store on the corner of Terrace Road and North Parade.

Nolton Haven.

Robin Sheldrake

Nolton Haven is 9km west of Haverfordwest, on the coast of St. Brides Bay. At the top of the foreshore is a pebble bank (Fig 1), a not unusual feature in this area as most Pembrokeshire beaches have a backing bank of pebbles. Seaward of this, at low tide, is a sandy beach reaching 300m from low water to the high tide line.

Nolton Haven developed as a small port exporting anthracite from the local coal mines (Connop-Price,Martin. 2004) from at least as early as the 16th, Century although the earliest date of exploitation is unknown. Coal was exported from collieries at Black Cliff, Folkestone, Newgale, Eweston and Trefrane Colliery, which in 1896 employed 36 people. It was hauled along the valley from Simpson's Cross to the beach. The track can still be traced from near Nolton Farm, down to the beach head.

At Nolton Haven, between the two streams, a car park on the east side sits on a steep bank of clay. At the top of this bank was a millpond, supplied by a leat emanating from the southern stream. This originally provided power for an overshot wheel that drove a corn mill which was located just a short distance east of the car park. On the south side of the car park, close to the Mariners Inn, was the lime kiln. Remains of metal cleats (Fig. 2) and bollards can still be seen in the rocks at the foot of the cliff that were set to aid the manoeuvring of ships as the sailing ships would have found it difficult getting out of the haven fully laden against the prevailing westerly winds. Ships entered the Haven at high tide, moored until the tide ebbed, allowing the ship to settle on the sandy beach. The ship's cargo, usually Carboniferous Limestone from the Cleddau estuary, was unloaded onto horse-drawn carts whilst the tide was out. The limestone fired in the lime kiln behind the beach. Coal was hauled down from the mines and tipped at the beach head until there was a sufficient load to fill a ship.

Fig. 1. Pebble bank, Norton Haven.

It is likely that the masonry for the church windows in St Madoc's Church (Fig. 3) in Nolton would have been brought by sea. Whether it was brought in already dressed,

Fig 2. Metal cleat

Fig 3. St Madoc's church, Nolton Haven.

or in block form to be dressed on site, I don't know. The Carboniferous sandstone found in the cliffs at Nolton Haven has been used by early masons as it is found in buildings elsewhere in Pembrokeshire that date from the early medieval period. 'Nolton Stone' as it is known, has also been identified in the windows of Haverfordwest Castle, which dates from the time of Queen Eleanor's ownership, and it seems certain that it was quarried locally, possibly even within the Haven itself, possibly by experienced masons.

There are also pebbles of Carboniferous Limestone that may be debris dropped during the deliveries to the kiln. I have also found a piece of brick, containing an inclusion of Nolton stone which has a dressed corner with three flat surfaces, each coming to a right angle. This would have been in the clay from which the green brick was made, before firing. It is well weathered and may have been on the beach for years. However, it is still recognisable for what it is. My conclusion is that bricks were also made in Nolton Haven, probably fired in clamps rather than in a kiln, and possibly in sufficient number to be exported. There was certainly another brick works in St. Brides bay, at Pen y Cwm, just north-west of Newgale, not far above the tide line at the foot of a steep valley, close to the north end of Newgale beach. (Ragget, Paul, 1999).

Connop-Price, Martin; 2004. *Pembrokeshire, The Forgotten Coalfield.* Landmark Publishing Ltd, 288 pages. ISBN 1 84306 094 9.

Ragget, Paul; 1999. *From Roch to Ramsey:* ISBN 13:978 07524 18056.

AGM 9th April, 2011, Llantwit Major St. Illtyd's Church & Grange,

Stephen Howe

Summer seemed to have arrived early as we met at St Illtyd's Church, Llantwit Major, in the Vale of Glamorgan, for our AGM and first field meeting of the year. The greeting inside the church, where the AGM was to be held, was equally warm from our hosts who supplied us with a welcoming coffee and biscuits while we undertook our initial inspections of the fabrics of the church and its monuments.The AGM business was swiftly dealt with and then we were given a very interesting lecture by Gareth Kiddie (Director GKS) on the proposals for the redevelopment of the ruined Galilee Chapel at the west end of the church.

Fig, 1. (top). St Illtyd's Church, Llantwit Major. Fig 2. (bottom). The porch showing dressed Sutton Stone and Quarella Sandstone.

After lunch we returned to the church where we were joined by members of the Geologists' Association, South Wales Group, for a joint field meeting led by Steve and Maddy Gray. St Illtyd's is the largest parish church in Glamorgan (Fig, 1) and was founded by St Illtyd about AD 500. The collection of early medieval monuments and crosses inside suggest that the site was being used by the C9th. The current structure mainly dates from the early C12th to the C15th, before much later restorations in the late C19th and early C20th. The main fabric of the walls is generally regular blocks of the local Blue Lias (Jurassic) limestones, some of which seem unusually thick when compared to most of the beds of Lias that are exposed along the local coast. Most of these larger blocks also tend to occur mainly in the older east end of the church. However, recent excavations in a garden close by exposed blocks of a similar size, indicating that the source of these size blocks in the church could have been very local.

An interesting arch over the southern door into the chancel was pointed out as it is composed of two, thick blocks of dressed tufa. Tufa does occur locally, often on the face of the nearby cliffs, but it is generally thin and nowhere near as thick as these two blocks. This lithology was frequently used by the Romans raising the possibility that these blocks may have come from the site of the former Llantwit Major Roman villa.

The doorway into the late C13th porch is dressed in two other local stones; Sutton Stone (Jurassic limestone), showing its typical pebbly inclusions and, at the base, green Quarella Sandstone from the Triassic of the Bridgend area (Fig, 2). Where either stone had been badly worn the more recent replacements were of Bath Stone (Jurassic) that exhibit the typical 'snail trails' for which this stone is famous. The buttresses along the south side of the church have replaced blocks of Doulting Stone

Fig. 3. (top left). Base of the Tree of Jesse carved in Sutton Stone

Fig. 4. (botton left) Grave slab with added head

Fig. 5. (right) The dovecote.

(Jurassic) that here, from a distance, looks very similar to Ham Hill Stone. Closer viewing shows that, unlike Ham Hill Stone, it has a very sparkling appearance that Tim Palmer explained is due to the presence of masses of tiny comminuted pieces of broken crinoids. In the wall at the west end of the church, that opens into the ruined Galilee Chapel, are two neat doorways on opposite sides of the wall, one dressed in Blue Lias and the other in Quarella Sandstone.

We then turned our attention to the interior of the church, especially the plethora of memorials and medieval wall paintings. Maddy showed us a range of amazing floor mounted memorials and there were lengthy discussions about the origin of some of the stone used. Many of the oldest ones date to the 1600s-1700s and are a mix of very fine, yellow-brown sandstone and black limestones. Examination of the latter showed that they contained a great many fossil oysters, thus confirming their age as Lias (Jurassic). However, the local Lias is generally not this dark colour and the abundance of oysters suggests that the slabs came from the very base of the Lias succession, which in Glamorgan is uppermost Triassic in age.

The sandstones were more of a puzzle but the general conclusion was that they are probably varieties of Quarella Sandstone, a stone which varies in colour across its outcrop. A nicely carved C13th Tree of Jesse took many while the rest of the canopy above appeared to be of a Jurassic limestone from much farther afield.

At the west end of the church is a famous collection of C9th-C10th early medieval crosses, stones and pillars, many of which appear to be of Coal Measures sandstones (Carboniferous). Of most renown is the 'Houelt' Stone, a decorated disc-headed cross, which is thought to be the finest of early medieval carved stones found in Glamorgan. On the floor, are two floor mounted effigies; a C16th effigy of an Elizabethan Lady on the north side and a C10th-C13th decorated Sutton Stone coffin lid on the south side. Maddy pointed out that if you looked closely you could see that the head at the 'head end' of the slab was not part of the original design and had in fact been inserted at a later date (Fig 4). It was good to see that recycling was in vogue so many years ago!

Leaving the church we finished the day's excursion with a walk around the remains of the old monastic buildings of the grange of Tewkesbury Abbey that lie to the west of the church. All the extant buildings are predominately built of the local Lias limestones. Passing the C13th rectangular, gabled gatehouse the lane lead to the sparse remains of what had been an eleven-bay C13th tythe barn alongside which sits a circular dovecote (Fig, 5) also built of Lias limestones.

It had been a wonderful day blessed with superb weather, in fact probably better weather than we were to have for the rest of the year, and a great start to the field meeting programme. Our thanks went out to Maddy and Steve and all those who entered the discussions and supplied supplementary information.

The Brownstones of the West Brecon Beacons, 14th May, 2011

John Shipton

A small but enthusiastic group of members assembled in the Co-operative car park at Cross Hands for the first field trip of 2011 we set off towards the north east passing quarries where, in the past, Basal Grits (Namurian) or Carboniferous Limestone had been quarried.

We stopped at a strategic high point near Carmel, on pebbly rocks of the Brownstones Formation (Lower Devonian), where John Davies explained the topography of the area. In the garden of a nearby bungalow a large outcrop of the stone had been transformed into a rockery. It transpired that the owner of the bungalow had once worked in a local quarry and we were invited in to get a closer look at the Brownstones. On closer inspection the inclusions could be seen to be pebbles from the Ludlow Formation (Silurian) including some with mudstone clasts. John explained that the stone varied in colour from red to maroon and even cream and was ever so slightly dolomitic. The cement varied from calcareous to siliceous and the stone had been used for building churches in Llanelli and the castles at Kidwelly, Dinefwr and Carreg Cennen.

Walking down the lane below the bungalow a number of small workings were seen where the stone had been quarried for local use. In a pigsty built using the local stone, some blocks were flaggy while others were pebbly and some quite gritty.

We followed the outcrop along the ridge to Pant-y-llyn where the houses were mostly built of pebbly Brownstones with brick dressings. Nearby is a turlock (an intermittent lake) which lies on a fault where a wedge of Old Red Sandstone has been brought alongside Carboniferous Limestone. South of Pant-y-llyn a quarry in the Brownstones reveals the lower beds to be pebbly but the upper beds more sandy. This quarry was probably the source of most of the stone used in the C19th buildings in the locality. The quarry contains two big channel sequences of coarse grits, at the base of the quarry and higher up behind the main quarry. Stone on the floor of the quarry showed beds of quartz crystals. We climbed to the top of the quarry where other workings had exposed the upper channel and about 1.5m of mudstone.

Back in our cars we travelled down through the Brownstones, Senni and St Maughan's Formations to the old sandstone quarry at Cilyrychen, which was much overgrown. Later we moved on to look at the impressive Cilyrychen lime kilns. For lunch we stopped in Llandybie, where we saw examples of houses built using the Brownstones and Basal Grits, some of which had Limestone quoins and dressings.

The church at Llandybie was mostly rebuilt in the C19th. The tower is built of blocks of pebbly Brownstones, including some very large pieces, exhibiting a wide variation in colour. There were also some blocks of Basal Grit evident. A two- light window in the tower had replacement mullions that were possibly Forest Pennant Sandstone. The porch had Bath Stone dressings, with very evident veins of calcite. Tim Palmer thought that it was possibly Box Ground Stone, in which many of the oolites had weathered out. The tiles to the porch were Tilestones from the upper Silurian/ lowermost Old Red Sandstone while the wall to the south elevation was a rubble build consisting of Old Red Sandstone, Basal Grits and Carboniferous Limestone, the latter showing evidence of fossil corals.

Travelling north east again we reached Bleangweche on the edge of the Brecon Beacons National Park. Here we saw a fine farm house, built in the year 1780, with walls of Brownstones with Carboniferous Limestone dressings. An adjacent barn was also built in Brownstones and pebbly Brownstones including the quoins. Although the front of the roof was clad with modern slate the rear had a covering of older tilestones. The farm buildings and the local church had both been built using stone from a local quarry located a short distance down the road. Although much overgrown, there was plenty of usable stone still available. Blocks lying on the floor varied from gritty to fine-grained. A brief visit to the nearby church at Llandyfan confirmed that it had been built using stone from the aforementioned quarry, but the tilestones on the roof showed a lot of mica flakes.

The final visit of the day was to Carreg Cennen. The castle is built on up-lifted block of Carboniferous Limestone caught up in movement along the Carreg Cennan Disturbance. To reach it you cross the Brownstones ridge and the youngest beds of the Carboniferous Limestone are visible on the right hand side on the way up to the castle. The pebbly Brownstones to the west of Carreg Cennen disappear here and are replaced by quartz sandstones that continue to the east. The castle is mostly built of Carboniferous Limestone but some sandstones from the Senni Formation and pebbly Brownstones have been used in the window dressings and corbels. And so ended another informative field trip, the group thanked John Davies and set off home.

The Blue Pennant: Gwrhyd Quarry, 16th July, 2011

John Shipton

On what started off as a wet and windy Saturday morning Forum members assembled at Gwrhyd Quarry, Rhiwfawr, near Ystrradgynlais, for the first of two half-day visits to different Pennant Sandstone quarries in south Wales and the Forest of Dean. We assembled at the quarry offices, once the former farm house, and were met by Emyer and Karen, son & daughters of the owners. They informed us that the quarry is situated on the site of their former farm that the family had worked since 1940. In 2000 they obtained planning permission to diversify and opened the quarry. In 2008, after their parents retired, the business was sold to Marshalls but Emyer and Karen's continued to work for the quarry under the new owners.

The quarry works stone from the Pennant Sandstone Formation, the upper division of the Carboniferous Coal Measures in south Wales. At this location the stone contains some carbonaceous material but not enough to form coal seams. The sales literature for the quarry products states that mineralogically, the natural Blue Pennant stone is a sub-greywacke or lithic sandstone that typically consists of 60% quartz grain with the remainder being fragments of schist and quartzite. Feldspar, a mineral common in many sandstones, is largely absent which makes the stone resistant to weathering. Individual beds of sandstone usually represent a single depositional episode and as a result are hard and durable.

Suitable protected with high visibility jackets, hard hats and boots we set off to inspect the quarry workings. The main quarry face is 15m high and exposes a thick sequence of deltaic sandstones with virtually no interbedded shales. The uppermost beds split into the thinnest units and these gradually thicken with depth. Many beds have excellent rippled bedding surfaces. The stone is grey when fresh but weathers to a rusty brown-red colour on the surface over time.

From the edge of the quarry we could see the excavators working on a series of benches along the main face (Fig 1). The beds dip gently to the south, with good jointing

Fig. 1 Excavator working a bench along the main quarry face, Gwrhyd Quarry.

- so the quarry deepens from north to south. The main products are masonry slabs (Fig 2) and walling stone. Roofing tiles used to be produced, with the nail holes added elsewhere. However done incorrectly or carelessly this causes cracking around the nail holes and leads to complaints, consequently, tiles are no longer produced.

Moving away from the main workings we were able to see quarry workers fashioning various masonry products including workers splitting and cutting the large blocks into smaller slabs. We were then taken for a demonstration of 'flaming'. This is a process where the surfaces and edges of the slabs of sawn slabs are heated by an oxy-acetylene torch, causing the surface to flake off to give a more natural appearance (Fig 3).

Walking around the works we came across a quantity of green/grey sandstone that Emyer explained came from the top of the quarry where some of the beds were that colour. Although coal seams are absent lumps of stone containing coal particles and carbonaceous particles lay around the quarry. There were also some huge blocks of sandstone containing lumps of iron-rich sandstone where the iron oxide has formed a hard lump in the sandstone, around which a box like structure has developed. Despite its interesting appearance this stone is of no use for walling or paving.

The last visit of the day was to the quarry dressing and cutting sheds and then an inspection of the quarry's finished products along with products from other Marshalls sites set out in an area of paving (Fig 5). The visit finished with an excellent lunch provided by the owners to whom we expressed our sincere thanks for an excellent visit.

Fig. 2. (top right). Paving slabs stacked ready for collection. Fig. 3 (left). A slab being 'flamed'. Fig. 4 (bottom right). Inspecting the range of Marshall products

The Building Stones around Old Radnor: 10th September, 2011

John Shipton

A group of intrepid Forum members assembled in the Harp Inn at Old Radnor. The purpose of the trip was to examine the local use of sandstones from the Folly Sandstone Formation of Llandovery (Silurian) age that outcrops across the Powys-Herefordshire border.

The buildings of the Old Radnor - Presteigne area are built of a range of local stone which, where visible, are seen to be dominated by sandstones. Jana Horak explained that initial analysis suggested that these might be derived from the local Llandovery succession and are known locally as the Folly Sandstone Formation and they have been worked for some considerable time in quarries along the B4362 adjacent to the Nash limestone quarry. There is almost no published petrological work on these sandstones, which was the reason for the Forum's interest. Samples have been collected and thin-sectioned and although it is known that it has been used for construction it is now thought that the sandstones used in the Old Radnor area have a different source. This is most likely the Downton Castle Sandstone Formation, which contains both yellow and paler coloured sandstones. This particular Formation is uppermost Silurian (Pridoli) in age, whereas Downtonian is an obsolete term used particularly for the Lower Devonian in south Wales and the Welsh borderland.

Petrographical analysis of the Folly Sandstone and Downton Castle samples show that those of the Downton Castle Sandstone Formation contain more angular grains, less feldspar, lithic grains and also more opaque grains, which are probably iron oxide. The main quarrying of the Downton Castle sandstones occurs in the Ludlow area. Further work remains to be done and the next stage is to locate the nearest quarries and prove the link between the quarries and source (either through archive or petrological work).

Moving outside of the Harp Inn, Jana explained that the marine Folly Sandstone Formation sits unconformably on top of beds of Cambrian conglomerate. The Downton Castle Sandstone Formation, which is not marine, contains softer and better looking sandstones than the Folly Sandstone Formation and it dies out towards the west but thickens to the east. The lower part of the Formation is yellow and the upper part paler and more cross bedded.

From the Inn's car park John Davies described the surrounding local geology. The hill behind the pub was composed of pebbly Cambrian conglomerates while

Fig. 1. The porch St. Stephen's Church, Old Radnor.

the three hills behind that are of Precambrian gabbros and dolerites. The car park sits on rocks of the Much Wenlock Limestone Formation (Silurian), which plunges down under younger Silurian and Old Red Sandstones rocks as you move into the distance. Beyond the hill country is made up of flaggy Ludlow siltstones, while to the south west are probably Downtonian sediments.

The Harp Inn itself is mainly built of blocks of limestone from the Much Wenlock Limestone Formation with additional darker blocks of the local Precambrian stone. The Silurian tilestones on the roof were quite micaceous and John explained that such flaggy tilestones occur at the bottom of the Old Red sandstone.

The nearby church of St. Stephen is built mostly of sandstone, probably from the Downton Castle Sandstone Formation, some of which contains red mudstone inclusions. On closer inspection we also found local limestone containing fossil seaweed and corals as well as red Cambrian conglomerate and green Precambrian rock from behind the Harp Inn. Like the pub roof the tilestones on the church were quite micaceous. On the front of the impressive porch (Fig 1) are a number of carved effigies which Tim Palmer thought were probably of Jurassic Doulting Stone, but this could not be confirmed as they were too high to be properly inspected. Inside the church was an old font made of local altered Stanner-Hanter

Complex gabbro, it was thought to date from about the C8th (Fig 2). The group spent some time inspecting it but a positive identification of its origin was not possible.

During a short visit to the nearby Gladestry Church we saw that the walls were built in either Ludlow siltstones or Downton Castle sandstones. Ripples in the sandstone are evident in some of the door dressings. The window dressings were generally of Old Red Sandstone from the south but many contained replacement stones which were probably Hollington Stone.

Fig. 2. (above). Gabbro font, St Stephen's Church.

Fig. 3 (below). Yellow and grey Downtonian sandstones, Presteigne.

Fig. 4 (top right). Blocked window, with tufa dressings, St. Andrew's church.

Fig. 5. (bottom right). Varigated stone, original and replacement, St Andrew's Church.

After lunch we visited Presteigne where many houses are built with local Ludlow siltstones. Walking through the town we spotted some grey and yellow sandstones in the bottom of a wall (Fig 3) that were thought to be from the Downtonian, as beds of yellow sandstone within this Formation are found below grey beds. Further on, in a wall near St. Andrews Church, we came upon examples from the elusive Folly Sandstone Formation. John Davies explained that the Folly Sandstone Formation sits on top of the Precambrian and below the Much Wenlock Limestone Formation.

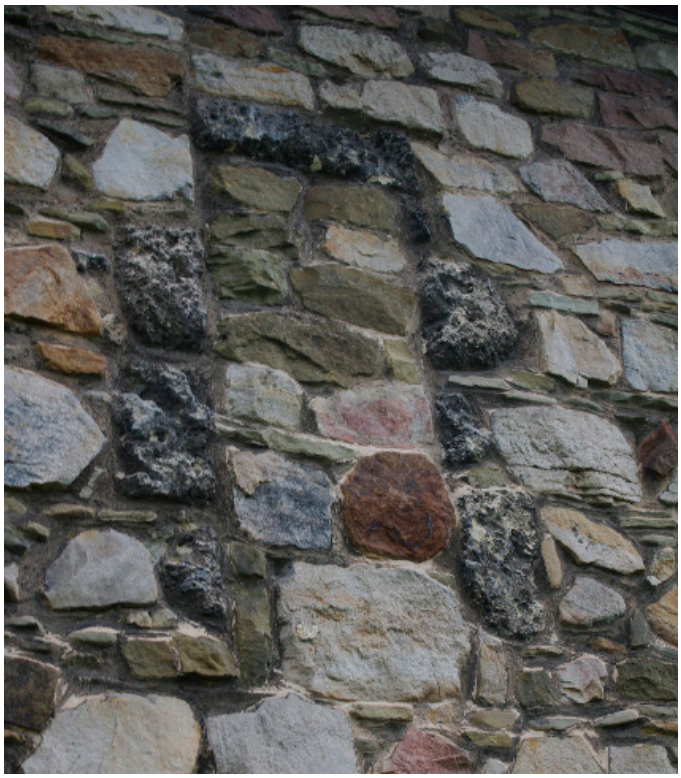


Fig. 6. The author examines the large gabbro block, New Radnor.

Reaching St. Andrew'thought to be Downtonian with some of the stones showing mudstone inclusions. Some evidence of an older building was visible in the form of Tufa window dressings around blocked window openings (Fig 4). This older church had been burned in the C11th but rebuilt, sacked again in 1213 and later rebuilt and extended. Some recent masonry replacements were strikingly obvious, pale sandstone, possibly York Stone, being used as replacement blocks and widow dressings but it could not be confirmed. Other replacements possibly included Old Red Sandstone from the Forest of Dean and mullion replacements of probable Hollington Stone (Triassic). I will leave the reader to decide for them selves on the suitability of these replacements (Fig 5).

A brief visit to Kinnerton, where most of the building was of Lower Ludlow shale, included the C19th church where an unknown red sandstone had been used for the quoins. Being micaceous it was suggested that it was possibly Old Red Sandstone. Internal dressings to the window reveals were probably Bath Stone.

The final visit of the day was to the old Tudor town of New Radnor. Here we saw the top of an old cross that had been built into the wall of a much later building near the church. It had been carved from a fine, possibly calcareous sandstone and the surface had decayed quite badly, probably due to its current location.

St. Mary's Church in New Radnor was rebuilt between 1843 and 1845 using Downtonian sandstones. It is built on the site of an earlier church and fragments of a medieval screen are incorporated into the communion rail of the current C19th church. Located in a rather incongruous position within the lobby of the church, surrounded by cleaning equipment are two worn effigies thought to be of Welsh Princes. These had been recovered from the churchyard at some time in the past and it appears that nobody has been able to find them a more appropriate home.

We then made our way past the war memorial to a wide grass verge near the church. Located here was a very large piece of stone, provenance unknown, which appeared to be the same as the stone that we saw earlier in the font in St. Stephens Church (fig 6). John Davies decided to 'fly a kite' and suggested that one explanation might be that the stone had been transported here to carve a font for an earlier church It had obviously not been used for that or other purposes and being such a large stone would not have been easy to transport so it was perhaps just abandoned. There is the similarity to the font at St Stephen's and nobody could think of a better suggestion, so any other answers on a post card to John Davies please! Tim Palmer thanked John and Jana for an informative day. Although we had not answered the Folly Sandstone v Downton Castle Sandstone question at least we had a greater understanding of the scope of the study required.

Building Stone in Wales: identification and recording.

Seminar Day 21st October, 2011,
National Museum, Cardiff

Responding to requests for more information on building stones from field day participants, the Forum organised a one-day seminar on 21st October on *Building Stone in Wales: identification and recording.* This was preceded by a visit to the Royal Forest pennant work at Bixslade, Forest of Dean (not in Wales!), on Thursday 20th, to enable comparison of the sandstone worked here with that seen on an earlier trip to Gwrhyd Quarry.

Twenty people registered for the seminar day, which was divided into two sections. In the morning, after a welcome by Dr Richard Bevins (Keeper of Geology, Amgueddfa Cymru – National Museum, Wales) Dr Jana Horák provided an introduction to identifying building stone in Wales. This focussed on the variety of sedimentary rocks used on both a local and a wider scale within Wales, and the features that help to characterise and identify individual building

stones. This was followed by an excellent talk, by Dr Tim Palmer outlining the main limestones used in Wales. In contrast to the sandstone these are mainly imports from England. The individual textural characteristics of these limestones were outlined in great clarity and illustrated with excellent hand specimen and thin section images.

Over lunch participants were provided with a comprehensive display of hand specimens of Welsh building stone, prepared by Andrew Haycock (Collection Access Officer, Department of Geology). This provided the focus for discussion, and hopefully illumination.

The afternoon session started with a lecture by John Shipton (recently retired from Cadw) on the selection of stone for conservation work. John outlined the usefulness of Ewan Hyslop's flow diagram for stone selection (Hyslop, 2006) and provided a wealth of information from his personal experience. This lecture was complemented by that of Emily Tracey (British Geological Survey), who building on John's lecture provided detailed examples of how stone had been recorded and sources found for conservation work, in project both is Edinburgh and more recently in Callander. There was much to be learnt from Emily's talk about the details of recording information relating to the fabric of buildings, in addition to stone information. We were all envious of the tablets used by the Geological Survey for recording information, particularly the GIS access in the field. The day was rounded off by Dr John Davies, who described the building stone survey of the Brecon Beacons National Park, undertaken with Jana Horák. He outlined the concept of mapping building stone 'domains' to indication to dominant stone present within an area and included a well-illustrated Cook's tour of the built environment of the Brecon Beacons. As with all of John's talks an immense amount of additional information was presented and increase the general knowledge of all present.

The final session was followed by a discussion on the ways to develop knowledge of building stone in Wales further. We viewed the day as very successful and hope to run further seminar or workshop sessions in the future. We would welcome suggestions of topics from members, or topics that would be useful to groups who are not members but have a need for information on building stone in Wales.We would like to thank the lecturers for making thsi a successful day and the National Museum, Cardff for hosting this event.

Hyslop, E., 2006. Sourcing and selection of Stone for repair, In: Henry, Alison (Ed.). *Stone Conservation, Principles and Practice*, Donhead. ISBN 978 1 873394 78 6

SHORT NOTES

Building with Stone – just across the border!

The Herefordshire and Worcestershire Earth Heritage Trust has been awarded a grant from the Heritage Lottery Fund to develop a project entitled '1000 years of building with stone – heritage buildings and their lost quarries'. The project aims to look at the use of stone from a range of buildings and structures across the two counties. We want to identify the stone used and if possible, the quarries where it originated. We also want to fill in the story of how the stone was quarried, moved and prepared and the social history connected with stone use. Local people will be involved in the research and relevant training will be provided. This will include themes such as an introduction to local geology; how to recognise local building stones; buildings' archaeology and historical developments in architecture; local history research and use of public records; how to use maps and how to look at landscapes for historical interpretation. The project is intended to be one that promotes the local stone built heritage through public events, talks, walks, tours and demonstrations.

As part of the development of the project, we have created a short survey which is being circulated to as wide a group of people as possible, to help us gauge the current interest and understanding of our Stone Built Heritage. To take place in the survey please go to http://www.earthheritagetrust.org/pub/news-and-events/building-stones-survey-2/.

Guided building stone walk in Bewdley.

We hope that the information gathered through the project will be of practical use to many organisations and individuals, including the Welsh Stone Forum. We anticipate that a raised awareness and understanding of how building stone contributes to the character of an area will help local people to contribute to decisions on local development and conservation in the future. For further information, please contact Tom Richards thomas.richards@worc.ac.uk or 01905 855184.

Powys Pevsener

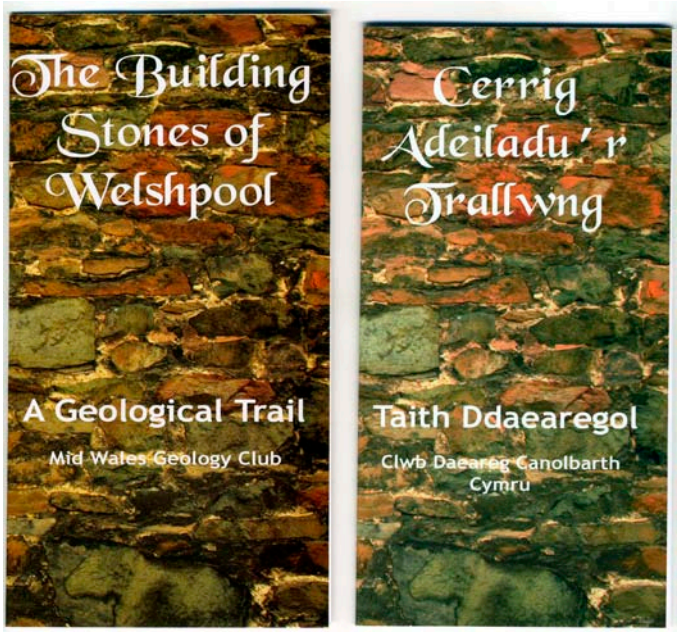
Work is underway on a new addition of the Powys volume of *Pevsner Architectural Guides: Buildings of Wales published* by Yale University Press. Dr John Davies has been asked to contribute to this work. This is excellent news and represents progress. Although members of the Forum have contributed information to other version of these guides for Wales, in many instances we have not been involved from the start of the project, so have not been able to maximise the amount of building stone information included. The first edition of the Powys guide, produced in 1979, includes little on building stone, reflecting the level of published information available. We will hope to produce a review in the next Newsletter.

Understanding Urban Character

Following Judith Alfrey's article *Understanding Urban Character* in Newsletter No.8, we can report that survey work has been undertaken to contribute to this project. Jana Horák and John Davies produced a synopsis of the building stones of Merthyr Tydfil in April 2011, followed by survey work undertaken at Cefn Mawr by John Davies in August. Discussions are on-going to support survey work in Holyhead and at least one other venue in 2012.

Welshpool Building Stones

The Mid Wales Geology Club have produced two very informative leaflets "Cerrig Adeiladu' Trallwng - Taith Ddaearegol" and "The Building Stones of Welshpool - A Geological Trail" obtainable from the Welsh Geology Club, see http://www.midwalesgeology.org.uk



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Please note that the views expressed in this newsletter are those of the individual contributors

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Images from the pre-seminar field visit to the Royal Forest Penannt works (Forest of Dean) in October 2011. For details of this stone see Andrew Haycock's article, WSF Newsletter 7.