HEREFORD CITY CENTRE TRAIL

A CITY OF SANDSTONE, LATH & PLASTER & RED BRICK

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Roman mosaics from Kenchester (Magnis) on the stairway of the Museum

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Introduction

The City of Hereford, in the Welsh Marches, nestles in a bowl within the Wye Valley, amid open countryside well away from Motorways. The valley is quite narrow; much narrower than that of the Lugg to the North. A small area of flood plain on the south bank of the river is liable to flooding as the river rushes around the sharp Hereford bend when in spate.

The city is surrounded by iron-age forts; six being recognised. These are at Eaton Bishop to the south west and another on the bank of the Wye opposite; at Dinedor and Aconbury to the south, Sutton Walls to the north, and Caplar Hill to the east. Although a Roman encampment was briefly established on the site of the future city in about AD 75, the Romans sited their small town at "Magnis" (Kenchester), a few miles to the west, where, according to Leland, many coins have been found in ploughing. A Roman road leading to Magnis passed just north of Aylstone Hill, to the north of the City. Another road ran south from Magnis, across the Wye. Magnis was occupied until the end of the 4th Century. There are some mosaics from Magnis on the wall in the stairway at the City Museum.

The City of Hereford was founded in Saxon times and became a see as early as the 7th Century under Bishop Putta. The present street plan of the city centre is believed to be little changed from that of the Saxon city. In mediaeval times, the city assumed an importance outweighing its size because of its role in the defence of the Welsh Marches, and the Bishops of Hereford were marcher magnates. The town received a royal charter in 1189 and by the 15th Century had fourteen trade guilds, a cathedral, five parish churches and the Benedictine priory of St Guthlac. However, trade went into decline after the catastrophe of the Civil War. In 1696, Daniel Defoe described the city as "lying low" with 6000 inhabitants. It had a recorded population in 1963 of 35,000 but has grown considerably since then.

It is still essentially a market town serving the County of Herefordshire, which had the indignity of losing its status as a county in the 1970's but recently had it restored. The county is almost unique in being "all of one piece"; entirely rural and supporting agriculture and pastoral industries (for instance, cider apples, Hereford cattle and hops). The only large industries in the city are Bulmer's Cider and a nickel refinery to the north of the city. The city is also famed as the home of the SAS (Special Air Services).

About 185 hectares (75 acres) of the city lie within the mediaeval walls, begun in 1298 and now preserved in scattered sections. The walls terminated to the south in the steep northern banks of the River Wye, thus forming a semi-circle, not a closed walled area. Within the walls was the castle, one of the largest and strongest in England which was besieged during the Civil War. The city changed hands several times. During the siege, the mediaeval church of St Owen was destroyed and an arch of the bridge deliberately removed by the defenders. The besiegers departed, only to return under Colonel Birch, when the Parliament troops caused great damage in the Cathedral, destroying much that was precious. The castle was "slighted" after the Civil War so nothing remains but the outline of the bailey, part of the moat and a fragment of the gatehouse. This destruction was in revenge for the city's stout defence against Cromwell's troops. Four of the mediaeval churches survived the Civil War, but two were rebuilt by the Victorians, leaving only St Peter's and All Saints relatively intact.

If approached from the railway station to the north, the city may seem, at first sight, unattractive and poorly planned but, despite the destruction of many of its old buildings, the city centre is attractive and full of buildings of interest. There is a blend of mediaeval lath and plaster survivals, Georgian brick houses, and stone religious, public and commercial buildings – the latter ranging from mediaeval to Victorian and twentieth century. There is a complete absence of high rise buildings. The best halftimber building, a remarkably complex and ornate town hall in High Town, possibly designed by John Abel in about 1600, was demolished in the 19th Century to make way for the present terracotta-faced building (if preserved it would have been a major tourist attraction), but a smaller building is preserved as a museum just off High Town in the "Old House", a solitary remnant of "Butchers Row". The handsome Shire Hall, opposite St Peter's Church, was designed by Robert Smirke (of British Museum fame) and contains one of the oldest judicial court rooms in Britain. Overall, the city has preserved much of its mediaeval and Georgian character, in a way that many comparable mediaeval cities have not, and has a prolific store of interesting buildings from those periods.

The Cathedral was founded in the 7thC and housed the remains of St Ethelbert, murdered by Offa who raised a shrine in repentance. The "new" Norman (Romanesque) Cathedral was built in the early 12th C but has suffered much. It had a west tower and a Romanesque west front very like that of Rochester Cathedral. The central tower and western tower were added in the early 14th C in Decorated gothic style, but the western tower collapsed in a storm in 1786, destroying part of the nave, and the spire was removed in later rebuilding by Wyatt, who also removed the clerestory above the Romanesque nave arches instead of rebuilding it in gothic style. In the 19th C, Cottingham rebuilt much of the eastern part of the Cathedral and saved the central tower from collapse. Gilbert Scott restored much of the east end and Oldrid Scott replaced a west front built by Wyatt early in the 20th C, so the present west front is the third version. Recent rebuilding has provided a museum for the Mappa Mundi in the cloisters and smaller chained library from All Saints Church and a new library building added to the west, to house the famous Cathedral chained library. Hereford Cathedral thus consists of a mixture of mediaeval building styles with superimposed 18th C, Victorian and 20th C rebuilding and restoration. Inevitably, this means that a variety of sources have been drawn on for its building stones: local in mediaeval times but from as far away as Staffordshire, Derbyshire and Rutland since the late 18th C. The cathedral nevertheless is of great archaeological, historical and architectural interest and houses the largest mediaeval chained library in Britain; more than 1500 books.

The city provides a remarkable collection of buildings, which illustrate the use of materials for construction and ornamentation, through the ages, and thus it provides and excellent backdrop to studies of urban geology, an increasingly important branch of environmental geology (McCall et al. 1996). But the limited range of local building stone sources constrains the use of building stones of the city for teaching geology. In particular, there are few examples of fossiliferous stones. But stone from further away was introduced when the canal and railway reached the city, in the mid-19th Century and a greater variety of cladding materials has been used during the 20th C, some coming from mainland Europe and other continents and these allow the demonstration of a wider range of geological materials. In preparing this account, the author has drawn heavily on Pevsner's exhaustive architectural account of Hereford City and County (Pevsner 1963).

Herefordshire Bedrock Geology

Bedrock Geology

- TRIASSIC ROCKS (UNDIFFERENTIATED) - MUDSTONE, SILTSTONE AND SANDSTONE
- PERMIAN ROCKS (UNDIFFERENTIATED) - SANDSTONE AND CONGLOMERATE, INTERBEDDED
- SOUTH WALES UPPER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE, SANDSTONE, COAL, IRONSTONE AND FERRICRETE
- WARWICKSHIRE GROUP - MUDSTONE, SILTSTONE, SANDSTONE, COAL, IRONSTONE AND FERRICRETE
- DINANTIAN ROCKS (UNDIFFERENTIATED) - LIMESTONE WITH SUBORDINATE SANDSTONE AND ARGILLACEOUS ROCKS
- UPPER DEVONIAN ROCKS (UNDIFFERENTIATED) - SANDSTONE AND CONGLOMERATE, INTERBEDDED
- LOWER DEVONIAN ROCKS (UNDIFFERENTIATED) - MUDSTONE, SILTSTONE AND SANDSTONE
- LOWER DEVONIAN ROCKS (UNDIFFERENTIATED) - SANDSTONE AND CONGLOMERATE, INTERBEDDED
- PRIDOLI ROCKS (UNDIFFERENTIATED) - MUDSTONE, SILTSTONE AND SANDSTONE
- PRIDOLI ROCKS (UNDIFFERENTIATED) - SANDSTONE AND CONGLOMERATE, INTERBEDDED
- LUDLOW ROCKS (UNDIFFERENTIATED) - MUDSTONE, SILTSTONE AND SANDSTONE
- WENLOCK ROCKS (UNDIFFERENTIATED) - MUDSTONE, SILTSTONE AND SANDSTONE
- LLANDOVERY ROCKS (UNDIFFERENTIATED) - MUDSTONE, SILTSTONE AND SANDSTONE
- SILURIAN ROCKS (UNDIFFERENTIATED) - LIMESTONE, MUDSTONE AND CALCAREOUS MUDSTONE
- TREMADOC ROCKS (UNDIFFERENTIATED) - MUDSTONE, SILTSTONE AND SANDSTONE
- UNNAMED EXTRUSIVE ROCKS, NEOPROTEROZOIC - MAFIC LAVA AND MAFIC TUFF
- UNNAMED IGNEOUS INTRUSION, NEOPROTEROZOIC - FELSIC-ROCK
- UNNAMED IGNEOUS INTRUSION, NEOPROTEROZOIC - MAFIC IGNEOUS-ROCK

Geological Setting

The city of Hereford lies amid a county underlain by extensive areas of late Silurian and Devonian sandstones that weather readily into the rich red soils that can be seen in ploughed fields. These rocks were formerly known as "Old Red Sandstone". However these have been re-mapped by the British Geological Survey and, with the benefit of up-to-date knowledge are now classified into a number of named sub-units. Results were included in a description of the geology of the Hereford and Leominister area (Brandon and others, 1989).

Map 1: Geology of Herefordshire

Silurian

The oldest rocks, regionally, are Silurian limestones and shales of the Woolhope Inlier, 5 kms east of the city but there is no real evidence of the use of these 7 limestones in the fabric of the city or cathedral , but it seems likely that these limestones were burnt in kilns to provide cement for mortar. They were reportedly used in the construction of St Katherine's Hospital at Ledbury.

Devonian

The Devonian strata (and uppermost Silurian) were formerly referred to as "Old Red Sandstone" because of the dominance of that material but these have been discriminated into component units through recent mapping and research. A number of constituent units were named by Brandon and others (1989). Essentially, Silurian marine sediments were replaced by non-marine river channel and flood plain sediments which, due to the iron content, are variously red to purple or grey to green in colour depending on iron content and the minerals in which iron occurs. Table 1: Devonian geological strata in Herefordshire and nearby areas (from Brandon et al 1989) The relevant formations are:

Raglan Mudstone Formation

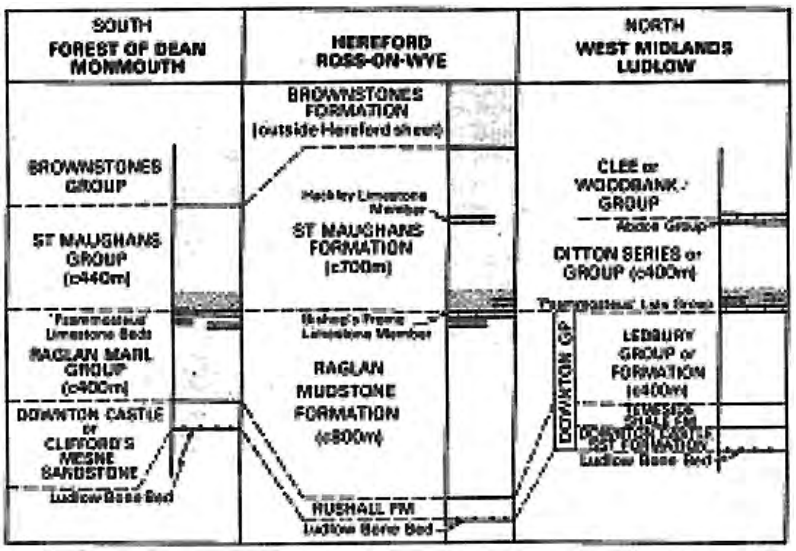
The Raglan Marl Formation, the opening phase of the Devonian System, has a basal sandstone unit up to 20 m thick, which can provide a useful building stone, grey green to brown in colour. This stone outcrops in a strip extending from Fownhope, south east of the City to Kilpeck south of Hereford. This could have provided many of the rough grey stone blocks which form the city walls, and also some rough masonry. Pevsner (1963) states that the lowest strata of the Devonian System, the Downtonian produces the best building stone, a yellow-green freestone. This may well refer to the stone mentioned above, which may also have produced a freestone. The Caplar Quarry which supplied the stone for the Cathedral is just south east of Fownhope, by the River Wye which provided easy of transport, and it is is probable that this stone was in use just before the catastrophic collapse of the west end in the late 18th C. It probably supplied the stone used in Wyatt's reconstruction after that collapse, for the stone the gothic arches built by Wyatt above the Romanesque arches of the nave, resembles the mediaeval stone below.

St Maughan's Formation

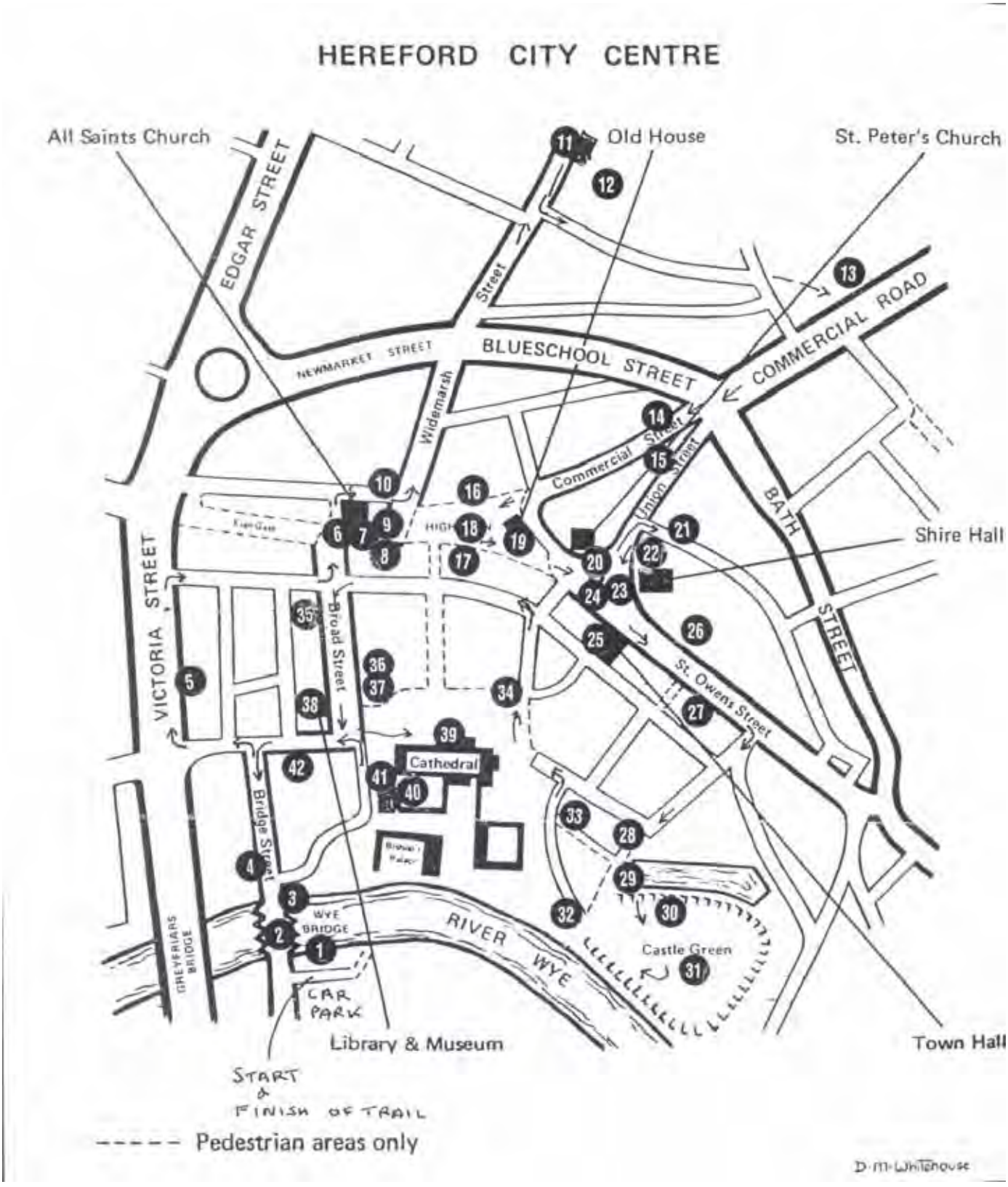
The next 600 m of the succession, of river deposits in repeated cycles 20-30 m thick, contains a higher proportion of sandstones, often in channel-form with down-cutting bases. The sedimentary structures and fining up sequences are closely similar to the modern river Niger system in West Africa. The sedimentary structures and flood pebble deposits (breccias) seen there are recognisable in the 300 million year older rocks of the St Maughan Formation. In general, the Devonian sandstones seen in the buildings are more commonly pinkish-grey rather than red, and may be purplish-grey or greenish. From the St Maughan Group in the Upper Wye Valley, thin sandstones were worked for roofing slates, though these stone slates are appreciably heavier than true Welsh Slates. Sources of these included Brilley and Cusop, close to Hay-on-Wye in Welsh-speaking Herefordshire. Proximity of quarries to the River Wye assisted transport during mediaeval times.

Brownstones Formation

This is the thickest part of the "Old Red Sandstone" at about 100 m. As the name suggests, sandstone predominates. The sedimentation cycles resemble those of the St. Maughan Formation, and may represent pulses of debris coming from erosion of the Welsh Massif: poorly-sorted breccias and conglomerates of sheet-flood derivation (Allen & Tarlo 1963). The Brownstone Formation sandstones are nationally important building stones, but are best seen in border towns such as Ross-on-Wye, Abergavenny, Ledbury and Leominster. These sandstones were non-marine, but subjected to brackish water flooding northwards. They contain the evidence of early fish faunas and early terrestrial plant remains.



HEREFORD CITY CENTRE



The City Centre Trail

This trail commences at the car-park, with toilet facilities, to the east of St Martins Street and to the south of the Wye Bridge. Map 2 Hereford City centre and points of interest on the trail 9 On leaving the car park turn right and walk to the Wye Bridge. Walk about twenty yards east on a footpath along the river bank. Stop and face north, looking across the river.

1 View of Wye Bridge, the Bishop's Palace and Cathedral. The view from here is the best in Hereford. To the left is the Wye Bridge, originally constructed of local "old red sandstone". The structure, essentially of 1490, has been repaired many times and in 1826 was widened. The bridge replaced a ford which was the cause of the development of the city here. Four of the six arches are original. In mediaeval times, local quarries were the only source for major construction, for transport from outside the county was prohibitively costly, even though transport from a distance by river was a possibility. The Bishop's Palace is opposite. The exterior displays Georgian red brick and Victorian work, but the exterior hides a late 12th C hall, with a fine roof – one of the oldest secular timber structures in England. There are traces of a Bishop's Chapel in stone work now forming a wall to the north of the Palace, and this dates from before 1095, and is the oldest fragment of a building in Hereford. Here tufa was used in the construction. The Palace is not open to the public, hence this brief note. To the right, the tower of the Cathedral stands proud. This is the product of rebuilding in the early C14, in the decorated gothic style, but the pinnacles are late 18th C additions (see Figure 68) and the tower was refaced with Hollington Stone (Triassic) from Staffordshire in the 20thC.

Figure 1. Wye Bridge, Bishop's Palace and Cathedral (view)

Go back to the bridge and stand in the nearest safety niche on the eastern pavement.

2 Wye Bridge - The surface of the Wye Bridge pavements has lately been renewed. The stone is a sandstone, but is not local. It is a Carboniferous "Yorkstone" from the Coal Measures south of Leeds. It closely resembles the Pennant Sandstone which forms the northern scarp of the South Wales coalfield basin. This is a marine sandstone: its scaly surfaces compare unfavourably with the more usual smooth surfaced York Stone from the Yorkshire Coal Measures.

Figure 2. The Wye Bridge from the west, south bank.

Walk across the bridge.

3 The "Left Bank". This building, erected at the end of the 20th C, is faced with a yellowish limestone, Jurassic oolite. It is of Bath Stone, a famous building stone quarried on the surface and underground near the city of Bath. The wall displays fine "ashlar" blocks with tight, rectangular joins. This is an oolitic limestone, composed of small ooliths. Below, the footing is of a fine grey limestone. Continue along the pavement and look across to the Black Lion Inn.

Figure 3. Showing the weathered sandstone of the bridge walls and the new sandstone paving

4 Black Lion. This is of mediaeval lath and plaster construction; the standard method in Herefordshire in the middle ages where timber was plentiful. Only the religious, and some public, buildings used the more expensive quarried stone or brick. This building illustrates the fact that many such mediaeval buildings hide fine rooms. This building has a 17th C room upstairs preserved with its ceiling of stucco reliefs and an overmantel decorated with caryatids. Proceed to the T-junction with King Street and turn left: you will come out on quite lengthy preserved sections of the city walls.

Figure 4. The 'Black Lion Inn', a lath and plaster construction of the 17th Century. An upstairs room has rustic wall paintings of the 10 commandments

5 City Walls. The best preserved section runs north and south here on the east side of Victoria Street., the main thoroughfare, to the 20th C Greyfriars Bridge. The walls date from the twelfth or thirteenth centuries and consist of large and rough-hewn blocks of local sandstone. It is reported that in some cases naturally worn boulders from glacial deposits were utilised. The walls had semicircular bastions of which traces are preserved. Proceed northward down the wall and turn right into West St. It is worth making a detour into Berrington Street to look at Aubrey's Almshouses, an excellent timber framed building dating from 1630. Then continue along West St, turning left into Broad St. Facing you is the tower and crooked spire of All Saints Church.

Figure 5. The city wall to the east of Victoria Street

6 All Saints Church. One of the two surviving mediaeval churches, it dates from the 13th C. The rough original walls are of weathered local "old red sandstone" rubblestone, but they have been much repaired, with red and yellowish-cream ashlar blocks. Walk round to the left, and you will see that the west window has been repaired with a whitish sandstone (some of the Carboniferous sandstone, lately used for Cathedral repairs). It will weather darker in time. Note the two doorways facing west and north: The first is transitional Norman, marking the first appearance of the gothic pointed arch, whereas the second is in the Norman (Romanesque) round-arched style. The interior of the church has been partly converted very sympathetically to a restaurant: note the light-coloured sandstone pillars, which are completely unweathered.

Figure 6. Close-up view of the roughly shaped stonework of the city walls. Local Old red Sandstone is mainly used, nut other lithologies were also used, for example the white and yellow blocks in the centre of the picture

Figure 7. Stone work near the south doorway of All Saints Church, in roughly shaped Old Red Sandstone, the mediaeval walling being patched with ashlar blocks of Triassic Hollington Stone from Staffordshire

Figure 8. Romanesque north doorway of All Saints Church, in roughly shaped "old red sandstone" blocks

Figure 9. Transitional west doorway of the tower of All Saints Church, with pointed arch, in the same material, but with recent restoration above of the west window in sandstone from Derbyshire, now white but it will darken rapidly on exposure

Exit by the south door and turn right. Immediately you will see Boots on the north side of the street.

7 Boots. This is an example of cladding of modern buildings (see Glossary). In this case thin slices of a Scandinavian syenite ("larvikite") have been polished and placed on the shop front. This rock is very popular for such ornamentation because the anorthoclase feldspars have small inclusions called "schiller" inclusions which produce iridescence – flashing with rainbow colours. Continue on to the HSBC Bank building on the corner of High Town (we shall return to High Town later).

Figure 10. A pillar in the nave of All Saints Church. Lack of exposure to city fumes and possibly centuries of scrubbing has left the Old Red Sandstone almost white, though patches of reddish colour can be seen.

8 HSBC Bank. This is a good 20th C building in Portland Stone, an uppermost Jurassic limestone famously quarried for centuries at Portland, Dorset. This is a premier English building stone: a freestone which weathers to a white colour. It contains some small rounded ooliths, but also bivalve shells, a few centimetres in maximum dimension. See if you can find these. This building has a form of rustication (see Glossary) on the round arches and between pilasters. Blocks up to about a metre from the ground are roughened; an unusual form of rustication. There is a keystone between the arches and also carved wreaths. Portland stone is excellent for such sculptured features.

Figure 11. The HSBC Bank in Portland Limestone. Note the deliberate roughening of the lower four stone courses, a type of rustication. Rustication is also evident in bevelling of the smooth blocks above. The arch has a keystone.

Walk across the road to look at Marks & Spencer's cladding.

9 Marks & Spencer. Here another igneous rock has been utilised for the cladding. There are panels of a medium-grained, non-porphyritic granite. This stone is also almost black; a very unusual rock. The source of these granites is not known. The granite consists of feldspar, quartz and a dark, ferromagnesian, mineral; the mica biotite. See if you can recognise all three. It has what we call an allotriomorphic granular texture, the grains being irregular and without the crystallographic shapes of the minerals. This is developed when all minerals crystallise together from the melt and interfere with one another.

Now walk north down Widemarsh Street on the western pavement.

Figure 12. Cladding of sandstone in the façade of Primark in Widemarsh Street. This displays cross-bedding produced by water currents: it ranges from quite large foresets to smaller, ripple-scale foresets.

10 Primark. This shop has been re-fronted in the late 20th C with sandstone cladding. It closely resembles the sandstone used for recent Cathedral restoration and the New Library. On the

north-facing corner there is cross-bedding from sand-ripple scale upwards. The blocks have been erected as quarried (the correct thing with sandstone), all facing upwards. From this sedimentary structure you can tell which way the current flowed? Which do you think it was? These structures probably represent an ancient deltaic environment.

Walk on northwards. See if you can see a shop front with serpentinite, a greenish ultramafic igneous rock, familiar because it is used in making those little lighthouses sold at the Lizard, Cornwall. At the traffic lights, cross Widemarsh St and Blueschool St. Look back and you will see a public house which has "stolen" a piece of the city wall, which is visible to the east, for its lower storey. There was much re-use of the material of the city wall for later buildings and walls. Walk northwards along the eastern pavement of Widemarsh St and you will come to the Coningsby Hospital.

11 Coningsby Hospital. This was founded in 1614, but used the house of a friary of the Order of St John of Jerusalem dating from 1322, the opening of which was reportedly attended by the Black Prince. Though much patched and restored, it is one of the finest preservations in Hereford. A white limestone shield with the Coningsby arms is set in a wall of "old red sandstone" sandstone of a pleasing purplish-brown colour, though patchings on the pillars are a deep red sandstone. The roof is of stone "slates", which come from the St Maughan's section of the local "old red sandstone". Like Cotswold stone "slates", they are larger at the eaves reducing in size towards the ridge because the larger slates are better able to carry the build up of water without leaking. They come from Brilley, Cusop and Trelandon. Through the courtyard there is a beautifully preserved mediaeval hall and chapel. The hospital was founded by Sir Thomas Coningsby for "two of the most valuable characters in society (although generally the most neglected), the worn-out soldier and superannuated faithful servant".

Figure 13. Courtyard of the Coningsby Hospital. The size grading on the stone tiles on the roof, small at the ridge and bigger towards the eaves is well seen

12 Blackfriars Preaching Cross. Behind the hospital is a very rare survival from the 14th C. This has a stone roof and is constructed of local "old red sandstone" sandstone, with much use of cross-bedded pebble-bed blocks. This is a continental sandstone, probably from a river (fluviatile) deposit. The building must have been very uncomfortable to enter as there is no doorway! To the northeast are the ruins of the friary cloisters.

Figure 14. Blackfriars preaching cross.

Figure 15. Close-up of Old Red Sandstone pebble beds with large-scale cross bedding foresets, used in the cross.

Leave the hospital and walk back to turn left into Coningsby Street. Walk along it to the junction with Canal Street. A strange name for there is no canal! Hereford did, in fact, have a canal and the area of warehouses up Canal Street to the north occupies the site of the Canal basin. Started in the 1790's amid the canal craze, it ran from Gloucester via Ledbury but only reached Hereford through a tunnel under Ayelstone Hill to the north in 1845, at much the same time as the coming of the railway, which heralded its doom. Within about twenty years it was closed and part of its course was occupied by the Ross and Ledbury Railway, now also long closed up. Walk on through the garden lined with gravestones and you will come to the Venn Arch, by Commercial Road.

13 Venn Arch. This monument to John Venn of 1890 is built of bright red sandstone, now deeply weathered, with coarse cross bedding. This is not the common character of the local "old red sandstone". The character of the sandstone and crossbedding foresets suggests a continental desert sandstone, deposited by wind action (aeolian action). The red colour is due to high iron oxide content and such iron-rich sandstones weather extremely rapidly – all this in 100 years. Compare this stone with the city walls and cathedral built of "old red sandstone". This sandstone

is very similar to that used in the construction of Holme Lacy House, a 17th C mansion of the Scudamore family east of Hereford.

Figure 16. The John Venn memorial arch.

Figure 17. Close-up of the stonework of the arch, showing the 'hot' red colour of the Old Red Sandstone used, the cross bedding and the weathering produced by a century of exposure to city fumes. The sandstone displays channelling features, typical of fluvial (river) deposits. Now turn right and walk to the traffic lights at Blueschool Street. Note more sections of the city wall. Cross over and walk up the west side of Commercial Street opposite. Here we will see some interesting claddings.

Figure 18. The granite cladding on the Yorkshire Bank. The sub-circular feldspar aggregates are less perfect here than on the cladding facing Chadds.

14 Chadds. The cladding is a Rapakiwi orbicular granite from Finland, of Precambrian age. Granite is an igneous rock, very rich in silica and thus carrying free silica as quartz. Notice the concentric spheres. The stone is composed of feldspars with a series of concentric zones of slightly different composition. After the original solidification the granite from the original melt, it was partly re-melted and then recrystallised. It is really a metamorphic rock. A similar rock fronts the Yorkshire Bank opposite. Cross over and walk on.

Figure 19. Cladding on the front of MacDonald's, travertine with the banding vertically arranged on the shop facing.

15 McDonald's. McDonald's restaurants often select this cladding stone from Tivoli, Italy. It is a cream coloured, banded travertine (see Glossary)

Now walk on and you enter a large open space, pedestrianised (High Town). On the north side in the centre you will see an archway in a stone building, the entry to the Butter Market.

Figure 20. Façade of Butter Market in High Town showing the striped architectural effect achieved by alternating smooth (light) and rusticated (dark) limestone blocks.

The bank on the left is of Portland Limestone.

Figure 21. Close-up of the Butter Market stone blocks, which are very stained but could be Cotswold Limestone.

16 Butter Market. This was designed by John Clayton in 1861 as an Italianate classical building on the style of Wren or Gibbs, with a coat of arms and two figures in the front. Ceres the goddess of plenty is in a niche: appropriately there are festoons of flowers and horns of plenty. The theme is peace and plenty. It is built of a rather coarse buff coloured shelly limestone, with some blocks of similar material rusticated (see Glossary) into sinuous ridges and hollows, giving a striped appearance to the lower floor. The limestone has a pinkish-grey tinge in some parts, but careful examination reveals fresher, buff coloured faces. It appears to be a shelly oolite, almost a "ragstone", probably from the "Cotswolds". To the right is a shop fronted with polished red granite (Scottish, possibly from Peterhead). To the left there Lloyds Bank in Portland Stone, a handsome early 20th C building, and there is also some polished gabbro, an igneous rock with a medium coarse texture and composed of dark pyroxenes and feldspar in an even fabric. There is no free quartz: this rock is less silica-rich than granite. Behind the Butter Market is a mélange of mediaeval, Georgian and modern buildings.

Now cross over to the south side.

Figure 22. Mediaeval, Georgian and modern buildings behind the Butter Market.

Figure 23. Alban House in High Town, a classical building, perhaps in Bath Stone.

17 W.H.Smith. This is Alban House, a neoclassical building of 1865, with pilasters, window pediments and a balustrade at the top. It is built of Bath Stone, a Jurassic Oolitic Limestone. Now walk to the centre of High Town. Figure 24. The old town hall in High Town: from an old print.

18 Site of Old Town Hall. The site is marked on the pavement. This was a remarkably ornate half-timber building with double jettys, twenty-two roof arches, four corner turrets and a domed turret capping all. It was built about 1600 and is attributed to John Abel, the King's Carpenter: it certainly resembles his Old Town Hall at Leominster in style. It was demolished in 1861, an irreparable loss to the city.

Walk to the east end of High Town.

Figure 25. View of High Town, showing Georgian facades and the half-timbered 'Old House', the only survival of the former 'Butcher's Row', and the spire of St Peter's Church.

19 The Old House. Luckily we do have preserved as an excellent museum one of the lath and timber framed houses that formed the Butcher's Row. It dates from 1621 and the interior has a plaster ceiling with cherubs and caryatids on an overmantel on an upper floor.

Walk east to St Peter's Church.

Figure 26. Mediaeval walling, St. Peter's Church: rough shaped Old Red Sandstone blocks with substantial mortared joints

Figure 27. Restored walling with tightly-fitting ashlar blocks of smooth-faced Hollington Sandstone (Triassic "new red sandstone").

20 St Peter's Church. The exterior is a mixture of roughly shaped, weathered local "Old Red Sandstone" sandstone blocks ('rubble stone') and replacements in deep red sandstone blocks, New Red Sandstone (Hollington Stone) from the Midlands. The church was over restored by Thomas Nicholson in 1880-5. The handsome mediaeval tower and spire rises above the red sandstone at clock height. The interior pillars are of local sandstone of a whitish colour. The chancel is 13th C and the nave 14th C, both gothic. Now walk left a few metres down Union Street and turn right into Gaol Street. You will see the Police Station and Magistrates's Court on the left.

21 Police Station and Gaol, Built in 1842 as the city gaol, the architects were Trehern and Duckham who gave the idiosyncratic building a formidable fortress-like frontage of 'rough' stone, though the remainder was brick built to save expense. The stone facing displays rustication on the cornices and footing, produced by a deep bevelling of the rather rough faced blocks of a coarse green and purplish sandstone which displays quite large cross-bedding foresets. The stone is probably a version of the local OLd Red Sandstone, considering the date of construction, just before canal and railway arrived. The same rock is seen in a massive keystone-arched building off Commercial Road to the east, at the bus station. This building was closed as a prison in 1877 but repurchased by the corporation for £1750 and used as the City Police Station.

Figure 28. View of the tower and spire of St. Peter's Church. The upper part original stonework, the lower part restored. Note the war memorial on the right modelled on the mediaeval Eleanor Crosses.

Figure 29. Rusticated façade of the Gaol and Police Station in Gaol Street: note the brick construction of the remainder of the building.

Walk back and turn left to the front of the Shire Hall.

Figure 30. The classical façade of the Shire Hall faced with light brown sandstone ashlar. Note the bronze statue of Sir George Conrnwallis-Lewis to the right.

22 Shire Hall. A fine stone-fronted building of 1817-19, designed by Sir Robert Smirke, who also designed the British Museum in London to which there is a resemblance. The Greek Doric pillared portico is a copy of the so-called Theseion in Athens. The front of the building is of pale buff-coloured, cross-bedded

sandstone in ashlar blocks, quite unlike any commonly used local stone. The source was apparently Walford, near Ross-on-Wye, so it is an unusual variety of Old Red Sandstone. The dressings, such as window surrounds, are of local sandstone from Bromyard Down and the columns in front are probably of the Walford material but have been repaired and rendered with cement. This practice of rendering columns with lime plaster was rife in the 19th C, the intention being to make them look like Athens. The building was recently restored and it was very difficult to match the colour of the Walford Stone, but the use of Grinshill Stone from Shropshire, north of Shrewsbury was approved by English Heritage.

The transport of stone from Ross-on-Wye may have been carried out by river barge, the only way to bring bulk loads of stone in to Hereford from a distance before 1845. Inside this building is a wood panelled law court which has probably remained unaltered since the building was erected – one of the very few such preservations in England.

Figure 31. Close-up of the cross-bedded sandstone ashlar blocks fronting the Shire Hall. Open cracks show the need for further restoration.

23 Sir George Cornwallis Lewis Monument. In front of the Shire Hall is this statue in green-weathered bronze, an alloy of copper and tin, harder than copper. The plinth is of a medium-grained polished granite block.

24 War Memorial. On a traffic island in the centre of the triangle between the Shire Hall and St. Peter's Church is the war memorial, modelled on the Eleanor Crosses erected wherever the coffin of Eleanor, queen of Edward I rested on her journey to Westminster for burial (a unique tribute). The architect was L W Barnard and the date 1922. It is mainly of Darley Dale Sandstone, Carboniferous from quarries between Buxton and Matlock, Derbyshire. The figures are in Jurassic Portland Limestone and the steps are of the Jurassic Pea Green Grit from the Cotswolds (a stone not usually used in construction of buildings).

Now walk eastwards into St. Owen Street where, on the right you will see the present Town Hall.

25 Town Hall. Built in 1902 to the design of C A Cheers, this is another idiosyncratic building, an extravaganza in terra cotta. There are numerous pinnacles in terra cotta and a green-weathered copper domelet crowning all. The building is of brick and the terra cotta is a facing material. A dedication plaque commemorates the opening by Princess Henry of Battenberg on 13 May 1902. It is of reddish-brown polished granite. Alderman Bosley, named on the stone, actually died the night before the building was opened.

Figure 32. The present town hall between Georgian buildings in St. Owen Street.

The building is open to view for the public and its interior is a splendid example of Edwardian extravagance. There are four black pillars, which are said to be of "Otta Phyllite "from Norway in the guide sheet issued. They are not of phyllite. They are of a very dark igneous rock with 'Schiller' lustre like Larvikite seen at site 7. The pillars at the top of the stairway are of the colour of mushy peas – they appear to be a true Marble, not an artificial terrazzo material.

The building committee of the day demanded an explanation for exceeding the estimate for this building of £18,500. The actual cost was £31,500. It is worth going through the passage on the right of the building to East Street behind: here you will see a delightful small lath and plaster mediaeval building, beautifully preserved, against the wall of the Town Hall. The timber is painted black to achieve the famous Hereford 'magpie' effect, but this is a modern contrivance and the timbers were originally unpainted.

Figure 33. The brick and Welsh slate construction of the Town Halls seen from the rear, contrasting with the terracotta façade; and a small mediaeval lath and plaster building adjoining it in East Street.

Figure 34. Entrance hall to the town hall showing dark pillars of the so-called 'Otta Phyllite' from Norway, which is a dark larvikite with

glistening anorthoclase crystals.

Figure 35. The pillars on the stairway in the entrance hall of the town hall, of a veined grey marble with red patches.

Walk eastward down St. Owen street

26 St. Owen Street. The north side of the street is composed of large Georgian houses, of red brick, many with stone dressings (window surrounds, coigns) and one with a polished granite-pillared portico. These were the residences of the well-to-do at that time. Initially the fashion was for red brick to be used, but later on a fashion for a yellowish brick arose. This brick, so common around London and utilising clay resources nearby, appears rather drab after years of exposure to the fumes of the streets but, fortunately, Hereford avoided this because there was no suitable clay nearby. All the Georgian buildings are of red brick which gives a warm colour to the city streets. Brick was little used., even for filling the walls between the timber framing of the half-timber buildings, until about 1600, when some of the larger and more important timber-framed buildings were so constructed. The red marls from the Raglan Formation of the lower Old Red Sandstone were used for making good, but expensive bricks. There were brickyards at Hereford and Holmer, just north of the city, but now the only active brickyards are at Bromyard. Walk on along St. Owen Street.

Figure 36. The Methodist Church.

27 Methodist Church. Built in 1880, this is in a Victorian gothic revival style, with the front decorated by the use of contrasting tone materials: the building is mostly built rough blocks of dark purplish local "old red sandstone", but the other elements are imported from a distance. The building uses some of the same materials as the museum and is of the same style, and one can guess that the architect was the same, F R Kempson The yellow bands in the surrounds to gothic and round windows and the arch over the doorway are presumably Jurassic Limestone (Camden Stone) from the Cotswolds and the red sandstone bands and pillars are of the same stone from South Wales used in the Museum frontage (see site 38). Walk on and turn right down St Ethelbert Street.

Figure 37. The frontage of St. Ethelbert's hospital, Castle Street

28 St Ethelbert's Hospital. This red sandstone building with gothic windows looks ancient but dates from 1805 when it replaced an older almshouse elsewhere in the town. It is in fact what is known as "Gothick", in the manner associated with Horace Walpole, of the reconstructed church at Shobdon, Herefordshire, which replaced a 12th C. Church comparable with the famous church at Kilpeck, South of Hereford. The 'new' Hospital is a pleasing building. The sandstone of the Raglan Formation, comes from Holmer, just north of the city, and the stone tiles and paving stones come from St. Margarets, south of the City. There are sculptured stones from the much abused Chapter House incorporated, but the seal above the door is in Cotswold oolitic limestone, from Painswick, where some of the best limestone used in Gloucester Cathedral was quarried. Turn south down a narrow passage. You will see the Castle Pool on your left.

29 Castle Pool. This is a survival of the moat of the Castle.

Figure 38. Castle Pool . This is a survival of the moat of the Castle.

30 Castle Green. This is the bailey of the castle, outlined by the earth ridge on two sides and with the River Wye on the Third. The castle stood on the west side, off the area covered by the present green.

Figure 39. The Nelson monument in the centre of Castle Green.

31 Nelson Monument. According to Pevsner, this obelisk is "pre-Grecian in style, and decorated with swags and an urn". The material for this monument was brought up the Wye by barge in 1806-9 piecemeal and erected here. The foundation stone was laid in 1806. The column, made of closely joined and curved-surfaced ashlar blocks, was surveyed in 2000, and it was recorded by an architect that the column and pedestal are constructed from heavily veined Jurassic stone from the Bath Area, most probably Stoke Ground base bed stone. The inscribed panel is of Portland Stone and the plinth is constructed of Carboniferous sandstone from the Forest of Dean.

Figure 40. Castle Cliff, the only surviving building of the castle

32 Castle Cliff. This was the water gate of the castle and is the only piece of the stonework surviving. The western part dates from 14th C. It has been much restored. The building is composed of red and green local "old red sandstone" blocks, appreciably weathered

33 St. Ethelbert's Well. Though this is the site of a mediaeval holy well, the only ancient part is a much defaced Bishop's head in limestone, set into the wall; the rest is quite modern.

Now walk down Quay Street and notice the sections of the City Wall which have been used as property walls. There is also some rounded, water-worn gravel in lieu of pavement, composed of rounded cobbles of white quartz and sandstone. Though both are hard, the quartz more so, the action of river water over long spans of time has abraded them to well-rounded shapes. Turn left in Castle Street, which again has rows of Georgian houses and enter the Cathedral Precinct through metal gates.

Figure 41. Castle Street, looking east: all Georgian buildings.

34 The Cathedral Precinct. We will keep the Cathedral to the last, but here we see, on the south side, two handsome Georgian houses in red brick with stone dressings. Unlike most English cathedrals, Hereford lacks a true 'close', but these are the dwellings of the Precentor and Archdeacon. The arrangement is more like that of continental towns. To the right of them, at the entrance to St. John Street, is an ancient Cathedral Barn building of timber and red brick panels above a rubble-stone wall (this building is not a barn, but was a 13th Century Hall and extended one bay further east, also having side aisles),. It dates from the late 13th C and is one of the oldest surviving buildings in the city. It shows the alternative to lath and plaster of laths with brick panels between them. Beyond is Harley House, a Georgian building of local stone – the house as we see it was built in 1739 (though the interior contains much older parts), and the stone used reportedly came from the pulled-down Cathedral Chapter House of the Cathedral (a remarkable piece of vandalism if true – the fine gothic Chapter House was reportedly pulled down completely in 1769, its lead roof having been removed in the Civil War and not replaced, with consequent dilapidation. It is reported that Bishop Bisse, who held the see from 1712-1721 removed stones from it for his palace).

Figure. 42. The Georgian residences of the Precentor and Archdeacon on the green to the north of the Cathedral.

Figure 43. The 'Cathedral Barn'; a mediaeval 'hall'; stone in the lower part and timber framework with red brick panels above.

Figure 44. Harley House, a Georgian Building in local "old red sandstone", with a roof of Welsh Slates.

Walk down St. John Street and turn left into East Street passing the Booth Hall Hotel which dates from 14th C and has a remarkable timber roof with tie-beams and king posts in its dining room. Walk on and turn left into Broad Street. Cross over and look at the front of the Woolwich Building Society Building

35 Woolwich Building Society. On the west side of Broad Street, on the corner of West Street, is a white painted building with a doorway framed by pillars of polished serpentinite, the product of hydrothermal alteration of an ultrabasic rock such as a peridotite, extremely poor in silica. The rock is now composed of secondary, fibrous serpentine group minerals such as antigorite which typically replaces olivine and forms light coloured veinlets. Magnesite ($MgCO_3$) may also be present. This rock is quite soft. It is found at the Lizard, Cornwall, where this probably comes from, but nowadays most serpentinite used in cladding etc. comes from Italy. To the left is another doorway, pillared with a polished grey shelly limestone, in which simple corals (?) and shell fragments can be detected. Its source is not known.

Figure 45a left. Grey fossiliferous limestone column, Woolwich Building Society doorway, Broad Street.

Figure 45b right. Serpentinite column, Woolwich Building Society doorway, Broad Street.

Walk southwards, down Broad Street

Figure 46. The classical frontage of St. Francis Xavier church.

36 St Francis Xavier Church. On the other side of Broad Street is this classical building which is an imitation of the Treasury of the Athenians at Delphi, Greece, though not with the correct proportions. Built in 1838-9, the architect was Charles Day. It has two immense pillars below a pediment, but all is stucco now painted a canary yellow.

37 The Post Office. This has steps made of a Cornish "Giant Granite", with large feldspar crystals inset within a finer base. The large feldspars have good crystal form, having crystallised early in the melt with nothing to interfere with them. This is the opposite case to the crystallisation of the allotriomorphic granular granite at site 9. Cross the road and notice Broadway House, clad below with a grey unpolished limestone and above with unpolished "new red sandstone (Trias). The same Hollington Stone is used for the West Front of the Cathedral, but is used here as a thin cladding.

Figure 47. The façade of Hereford Museum & Library.

38 Hereford Museum. This is an extraordinary idiosyncratic example of Victorian Gothic. Pevsner (Herefordshire 1963) considers it too tall for its place in the street close to the Cathedral, but it has vitality. The architect was F R Kempson (1872-4). It relates closely to the Natural History Museums at London and Oxford in there being much ornamental carving of animals on a variegated front. The main components are quite rough blocks of a blue-grey Carboniferous sandstone from Pontypridd, South Wales, red sandstone used for the Window Shafts and also from South Wales (Bridgend), cream coloured Campden Stone (Jurassic oolite from the Cotswolds) and red coarse Rodyr Stone from near Cardiff, an orange red conglomerate with clasts up to two or three centimetres across (some rounded. some irregular but noticeably angular: some dark volcanic (?) fragments) forming the ground-floor pillars. There is a symbolism in this design, the latter rock representing the Earth materials above which is the animal and plant life seen in the carvings (very good sculptures in the limestone of monkeys, lizards, and pachyderms). At street level there is a facing of rather ugly green shiny tiles, which like bricks are manufactured from clays. Go inside and look at the Roman mosaics on the wall (see glossary and frontispiece).

Figure 48. Sedimentary breccia with angular clasts including dark volcanic fragments, fronting the Hereford Museum and Library.

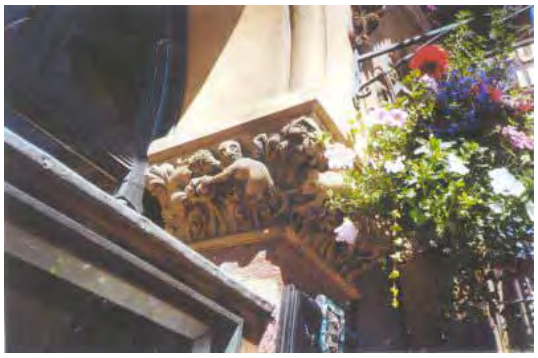


Figure 49. Carvings of animals in limestone on the façade of the Hereford Museum and Library Building

Now cross the road and walk to the Cathedral South Door.

39 Hereford Cathedral. The Cathedral is even more of a mixture of architectural styles of various dates and diverse building materials than other Cathedrals, because the western of the two towers collapsed in a storm in 1786, bringing down much of the upper parts of the nave and its roof together with the west end. The nave was rebuilt by Wyatt in c. 1788 with gothic above the Romanesque rounded arches and pillars, but the west front, rebuilt then by Wyatt in what Pevsner calls a 'noncommittal style' (whatever that means): it has also been referred to as 'Castellated Gothic', but in pictures resembles the rather simple gothic front of Winchester Cathedral), was pulled down, the excuse being instability due to the 1896 Hereford Earthquake, and rebuilt in a rather extreme and poorly proportioned Decorated gothic imitation in the early 20th Century. To add to this, the central tower, in the Decorated style of early 14th C, had a moderately tall spire, probably of timber construction, removed as unsafe late in the 18th C. For a short time, there was apparently a very low conical cap to this tower (according to J M W Turner's picture in 1794), before this was removed and the main pinnacles were added in 1830.

Shortly after this, the original tower was found to be unsafe like the West Tower earlier (it had been made more so by insertion of large windows in the western structure): Cottingham, in 1842, discovered subsidence, cavitation, fissuring and shattering of stonework below the bellchamber – near to tears he reported to the dean of the risk of imminent loss also of the crossing tower. Ingeniously, he rebuilt the piers of the crossing and saved the tower. Cottingham also added to various external parts of the Cathedral at this time and the Lady Chapel was restored, though without much departure from the original design. The Cathedral is essentially a sandstone building but though the mediaeval builders utilised local "old red sandstone", of which the main sources were Caplar Quarry at How Caple to the east of the city and a quarry at Lugwardine to the northeast, architects from the late 18th Century onwards imported other sandstones and this can be seen occurring even now, with the activities in the small masons yard to the east of the North door related to the major repairs now being done on the east end of the Lady Chapel (though there is an intention, at the time of writing, to reopen a local stone source).

Even the older parts of the exterior fabric have been restored here and there with imported stone, for sandstone does suffer from weathering over the centuries, and especially in the modern ambience of vehicle fumes. However as Michael Reardon, the present cathedral architect has pointed out, the decay

of sandstone over the centuries is by no means a simple process.

Interior

Entering by the North Door, turn left. On your right you will see the round Norman columns of the Nave surmounted by Wyatt's gothic replacement. Coming to the North Transept, you are faced with the most renowned architecture in the cathedral, dating from 1250-1287, in the Decorated gothic style and matching Westminster Abbey. Much use is made of Purbeck 'Marble' shafts. This is not a marble but is a dark shelly limestone from the Isle of Purbeck, Dorset, of lowermost Cretaceous age. Polished, it contrasts well with the lighter greyish "old red sandstone" sandstone of the walls. These columns are so polished that shell fragments are difficult to discern. It is reported that some of the columns are polished slate replacements rather than limestone.

Note the tomb figure of Jacobus Atlay in alabaster (see glossary) with a brown veined marble base (see glossary). Bishop Field, 1635-6, is commemorated by a white marble monument in the NE corner, and Bishop John de Aquablanca, died 1320, has a finely carved canopy of fine limestone (perhaps from the Cotswolds or from Caen, Normandy) with Purbeck shafts which echo those of the transept. The most notable monument is that of St. Thomas (Cantalupe) of Hereford, a two story free-standing canopied shrine dating from 1287, in a fine limestone with a Purbeck top.

A pilgrim cult arose related to St. Thomas and he was moved around the Cathedral before finally coming to rest here.

Moving up the ambulatory around the choir, two more alabaster figures of Bishops are on the right (Bennett died 1617 and Stanbury died 1473) and the fan-vaulted Stanbury Chapel is on the left: the fan vaulting and wall carving are excellent. The wall carving is in fine sandstone displaying bedding planes. The roof fan vault cannot be examined closely so the type of stone used is uncertain. It is reported that Ketton Stone from Rutland has been used in the Cathedral Presbytery, possibly here. Pevsner reports carved angels, monsters and mermaids (see if you can find them!). At the east end of the northern ambulatory is the tomb of Dean Richard Dawes: the white marble effigy (by Matthew Noble 1869) rests on a veined black marble slab, above and an alabaster tomb chest ornamented with round insets of semi-precious stones (see if you can identify them). It was designed by Gilbert Scott.

The Crypt is the latest to be built in any mediaeval English cathedral (other than Old St Paul's) and is of Early English Gothic (c. 1220). The simple purplish and reddish "old red sandstone" columns give to it a very peaceful ambience for prayer. It is only relieved by an unobtrusive modern white alabaster reredos by Sir William Goscombe John (1920).

Walk round the Chancel, exiting for a moment at the small wooden door in the NE wall, to look at the College of the Vicars Choral (1473). The passage way to it has a fine oaken tie-beam roof, and there is a remarkable timber "Tudor" door, probably of the same age as the building. Go back into the Cathedral and look at the chancel, which has encaustic tiles on the floor, relieved by a grey fossiliferous limestone and a red, grey and white marble ledge immediately in front of the high altar, all part of Victorian restoration by Gilbert Scott.

Now look at the South Transept. The east wall is the oldest part of the cathedral still existing (though quite why this should be is obscure as it was customary to start with the chancel which, in this building, has later Norman work). The round-arched Norman arcades in a very light coloured "old red sandstone" are not later than 1110.

Walk back to the Nave and in the south Aisle is the tomb of a knight, Sir Richard Pembridge (died 1375), in alabaster, on the right, and then the font, tub-shaped and Norman with defaced figures in an arcade on the side, in a whitish sandstone, set in a brown Victorian base with lions (Pevsner suggests of marble?), and then a quite pleasing colourful mosaic surround (see glossary).

From the south aisle one can exit to the mediaeval, only partly preserved cloister with the site of the Chapter House and a modern well-designed access to the Mappa Mundi (1290-1310) exhibition; also the Dean Leigh and New Libraries, the latter where the renowned Chain Library is now housed: the largest mediaeval chained library collection in Britain. It has a fine oak roof in the Hereford tradition. Figure 50. East wall of the North Transept with decorated gothic architecture: the dark pillars are of Purbeck 'Marble'.

Exterior

Walk round to the east and look in at the small mason's yard, instituted by the present cathedral architect so that carving could be done on site and not elsewhere as previously. The masons are working in fine whitish sandstone from Elton, Derbyshire (Carboniferous, Namurian: Millstone Grit, sometimes referred to as "Dukes Stone").

Walk around to view the east end of the Lady Chapel where it has been installed in the restoration work: the red sandstone pinnacles (probably of the 19th C restoration) have been left in position, in stark contrast, but the new sandstone is already weathering. The likeness of the Cathedral Organist and Choir Master, Dr Roy Massey, has been captured in stone, reportedly without his knowledge! It is admirable, to leave for the future some visages of contemporary people, as the mediaeval masons did for us Now walk to the west front and view the third version of Oldrid Scott. 1902-1908, which is build of Hollington "new red sandstone" (Trias) from Staffordshire, of a rather glaring mottled pink and cream variety.

Figure 50. East wall of the North Transept with decorated gothic architecture: the dark pillars are of Purbeck 'Marble'.

Figure 51. The tomb monument of Bishop Aquablanca, with Purbeck 'Marble' pillars.

Figure 52 Tomb of St. Thomas of Hereford.

Figure 53. The Crypt, Early English Gothic architecture in "old red sandstone.

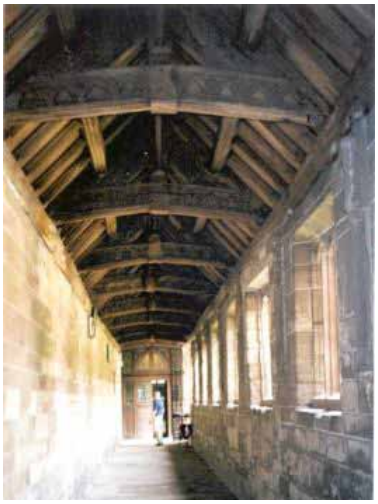


Figure 54 The passage into the Vicar's Choral showing the fine hammer-beam roof.

Figure 55. The fine timber door into the Vicar's Choral.

Figure 56. Romanesque (Norman) capitals from the demolished Chapter House or part of the Nave/West End, stacked in the passage to the Vicars Choral.

Figure 57. Norman arcading in local "old red sandstone", south transept.

Figure 58. Alabaster figure of Sir Richard Pembidge, in the nave

Figure 59. Norman font with Victorian mosaic base in the nave.

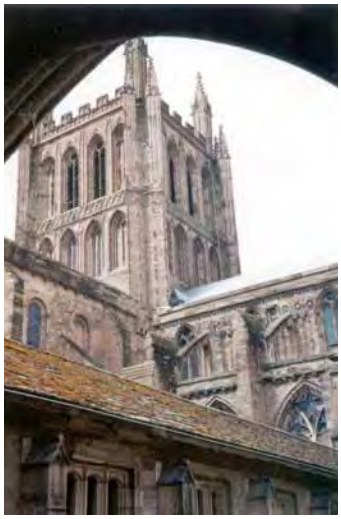


Figure 60. The central tower: the pinnacles were added about 1830. Note the stone tile roofing of the passageway to the Vicars Choral, and the flying buttresses on the chancel clerestory.

Figure 61. The Mason's Yard in front of the North Transept, showing replacement masonry.

Figure 62. The east end of the Cathedral, rebuilt in sandstone from Derbyshire. This is white when installed, but weathers darker to match the local stone.

Figure 63. A carving of a King's head in the Derbyshire sandstone.

Figure 64. A new carving of the head of the Cathedral Organist & Choir Master, Dr Roy Massey, made in 2002 for the Cathedral Exterior. From a newspaper cutting sent to the author, source unknown.

Figure 65. The Romanesque (Norman) and Gothic west end of the cathedral before the west tower fell.

Figure 66. The wreck of the west end after the tower fell, Note the spire: this was taken down shortly afterwards, for there is only an extremely short spiral capping in Turner's picture of 1794 and a view from the headmaster's garden in 1799 shows no spire at all and no pinnacles (see Aylmer et al. 2000)

Figure 67. The rebuilt west end, second version after the Wyatt reconstruction in the late 18th C. A 19th C. drawing.

Figure 68. The present west front of the Cathedral, the third version, by Oldrid Scott in the early 20th Century.

Figure 69. Part of the West Front, as it is now, in Hollington Stone.

40 Dean Leigh Library. The eastern of the two library buildings to the south of the west front was built in Hollington Stone, though a less vividly coloured variety than that used later in the west front. Dean Leigh Library. The eastern of the two library buildings to the south of the west front was built in Hollington Stone, though a less vividly coloured variety than that used later in the west front.

41 New Library. This addition, opened in 1996 to modernise the library and to house the chain library is built of sandstone, of a very pleasing light pinkish colour. The ashlar blocks provide an excellent geological teaching display of Sedimentary Structures.

Walk along the south side of King Street, noting the fine Georgian Houses on the North Side.

42 Taylors House Agents. In the middle of the south side, this building has cladding of white Carrara marble from Italy, north of Pisa. This is a true marble: a metamorphic rock formed from recrystallised limestone. It was the favourite stone of mediaeval sculptors such as Michelangelo. The quarries still operate. Also here is cladding of dark gabbro from Rustenberg, South Africa, the source, incidentally, of most of the World's platinum.

Return to starting point..

Figure 70. The New Library building in sandstone from Derbyshire.

Figure 71. Sedimentary structures in the sandstone front of the New Library. The black lines are a later staining by circulating water after burial. The primary structures, cross- and graded-bedding, were likely formed in a delta.

Concluding remarks

Despite the ubiquity of sandstone in the stone buildings of Hereford, which tends to monotony, the City is full of both interesting buildings and geological variety. It is fortunate in having escaped the ugly additions inflicted by modern planners on many small cities of ancient foundation, such as high rise buildings and freeways. In the city centre it is a cocktail of "magpie" lath and plaster or lath and brick; Georgian brick; together with mediaeval, Victorian and twentieth-Century stone buildings. The later stone buildings tend to be somewhat quixotic, but are inoffensive.

The suburbs of Hereford are in many parts rather ordinary, but there are a few treasures, amongst which are the Rotherwas Chapel, with a splendid hammerbeam timber roof dated 1589 and the 14th C plague Cross (at Whitecross). Bernard Shaw said of Hereford that it was 'at least three glacials behind the rest of England'. Despite a tendency to destroy excellent examples of ancient work (for example the Bishop's Chapel, the Chapter House and Old Town Hall), the City is perhaps fortunate that the despoilers of the 20th Century have left it alone. Hereford by the Wye on a warm evening in early summer, alive with blossom and warm with red brick and stone, is something quite unique in England. Enjoy it!

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- Two trail leaflets "Explore Hereford Cathedral"& "Explore Hereford City Centre" issued by Herefordshire & Worcestershire Earth Heritage Trust in 2003.

Acknowledgments

This database was prepared in December 2001 in the form of a long trail, covering the area enclosed by the mediaeval city walls, now fragmentally preserved, the old Wye Bridge and two other features outside the City Walls, the Coningsby Hospital and the John Venn memorial arch. Hereford provides a very different subject to Gloucester (see trail by McCall 1999); historical and architectural data looms somewhat larger, set against the information about sources and types of stone utilised in the building; other. materials, such as brick, of which Hereford has had local sources of an attractive variety; and timber, of which mediaeval Hereford drew heavily from nearby forests in mediaeval times for its half timber houses and oaken hammer-beam roofs, the latter of which many fine examples are preserved in the city. This was intended as a reference databank, to be drawn on for the production of two leaflets, on the City and Cathedral respectively, and possibly later utilised for a longtrail booklet similar to that published on Gloucester.

Eric Robinson read the original text in 2009-2010 and suggested revision and updating of the Geological Setting and Building Stones paragraphs at the beginning: the text was revised in 2010 following his notes.

Ruth Thornhill collaborated with the author in preparing the database.

Figures 24 & 51-52 are from Pevsner 1963

Figure 69 is from Andere 1974.

Figures 53 and 66-68 are from Aylmer & Tiller 1969

Glossary

- Aeolian: deposited by the agency of wind e.g. desert sand dunes.
- Aisle: part of a church parallel to, and divided by pillars from, the main nave or transept (q.v).
- Alabaster: a form of gypsum (hydrated calcium sulphate $CaSO_4.2H_20$) which occurs in deposits where water has evaporated in arid conditions leading to the crystallising out of various dissolved minerals. It occurs in Permian and Triassic strata of the English Midlands, notably Derbyshire. It is relatively soft and very easy to carve into figures, but its use is restricted to indoor environments because it dissolves fairly readily in rainwater.
- Allotriomorphic granular: a texture of a rock in which the mineral grains do not display their crystal shapes or outlines in thin section because they have crystallised, at more or less the same time, from a molten condition preventing them from forming crystal faces .
- Ambulatory: an arcade or cloister (covered way) in or adjacent to a church or cathedral for walking through.
- Anorthoclase: a mineral of the feldspar group – a sodium potassium aluminium silicate, (Na, K) ($AlSi_3O_8$) which occurs in sodium rich rocks.
- Ashlar: the finest masonry is composed of squared off blocks of freestone with a smooth surface, fitting together very closely together with a minimum amount of mortar between.
- Bastions: a projecting part of a fortification.
- Bedding plane: sedimentary rocks are largely deposited in layers, one above another. Where layers differ in composition they are characterised by horizontal partings known as bedding planes.
- Breccia: a sedimentary rock consisting of angular fragments of pebble size or larger contained in a finer grained matrix, commonly deposited below rock slopes or carried by water to another place nearby.
- Carboniferous: a period of geological time about 290 to 354 million years ago. In England the lower part is dominated by limestone, the mid part includes sand stones such as "Millstone Grit" and the upper part consist largely of the Coal Measures.
- Caryatids: are carved figures that appear to carry architectural features on their heads.
- Chemical formulae: minerals are chemical compounds, consisting of one or more chemical elements that occur naturally in the Earth's crust. Their compositions are expressed in chemical formulae that indicate the proportions of different elements that are present. For instance, salt (sodium chloride, NaCl) has one sodium atom for each chlorine atom while water (H_2O has two hydrogen atoms to each oxygen atom). However many minerals

are chemically complex, with rather daunting formulae, and some of these show transitions from one mineral state to another as certain elements are substituted by other elements (see feldspars). The symbols for elements that are indicted in formulae included in this guide are:

Al - aluminium
Ca - calcium
F - fluorine
Fe - iron
H - hydrogen
K - potassium
Mg - magnesium
Na - sodium
O - oxygen
S - sulphur
Si - silicon

- Cherub: winged head of a child symbolic of an angelic being.
- Cladding: because of the cost, building and construction in natural stone has long been in decline, but during the last twenty years it has made a come back in the form of ornamental cladding. This has become possible because of improvements in cutting technology and automation of the dressing and finishing processes, allowing stone to be cut in thin sheets, making the use of stone affordable and the cladding relatively lightweight. Polished stone is mainly used, but, as on Broadway House next door to the Museum (Site 38), unpolished stone may be used. The use of cladding has given rise to a requirement for testing of the properties of cladding materials. Besides the need to avoid iron staining due to iron oxide minerals present, it is essential to test thermal properties because some rocks in thin slabs buckle due to thermal change and tend to fall off, endangering passers by in the street.
- Coal Measures: is a term applying to strata of upper Carboniferous age that contain coal seams as well as sandstones and mudstones that were deposited primarily in coastal plain environments.
- Cornice: a horizontal moulded projection crowning a building.
- Cretaceous: a period of geological time from about 65 to 142 million years before present.
- Devonian: is a period of geological time from about 354 to 417 million years before present. In England, the strata include reddish non-marine and shallow marginal marine strata containing a variety of sandstones that have been used for building.
- Doric style: a Greek style of architecture characterised by rather simple columns, relatively short, arising from flat pavement, with no base, ornamented with vertical surface grooves, flaring at the top and surmounted by a square slab on which rested an horizontal beam.
- Downtonian: a term used for the lower part of the Devonian Period as represented in the western Midlands of England.
- Fan vaulting: an arched roof consisting of fan shaped elements.
- Feldspars: are a group of mainly potassium, sodium and calcium aluminium silicates. The compositions of these are often gradational and different names are applied to the minerals depending on the proportions of elements that are present. Plagioclase feldspars, for example, range from a calcium dominant form (anorthite – $CaAl_2Si_2O_8$) through an intermediate series (bytownite, labradorite, andesine and then oligoclase) to a sodium dominated form (albite – $NaAlSi_3O_8$). Other types are dominated by potassium (orthoclase – $KAlSi_3O_8$) or potassium with sodium (anorthoclase).
- Fluviatile: deposited by river action.
- Freestone: any well bedded stone that has conveniently spaced natural joints (vertical fractures) allowing fairly regular blocks to be extracted. Commonly applied to certain Jurassic oolitic limestones that have these characteristics.
- Gabbro: a common type of plutonic (formed at depth in the Earth's crust) igneous rock consisting of an intergrowth of calcic plagioclase feldspars (labradorite, bytownite) with iron-magnesium rich alumino-silicate minerals called pyroxenes e.g. FeMg $(SiAl_2)O_8$.
- Glacial deposits: are sediments laid down from melting ice either beneath an ice sheet washed out from the ice front to be deposited on adjacent plains. The composition and textures of deposits are very variable ranging from coarse boulder, cobble and pebble deposits, through sand and silt, to fine clays, or admixtures of these. Cobbles and pebbles from glacial sources have sometimes been used in construction.
- Gothic style: a style of architecture that developed in the 12th C, characterised by ribbed vaults (domed ceilings), pointed arches and flying buttresses (wall supports consisting of a vertical buttress linked to the wall be an arched structure). A Gothic revival occurred in the 18th C and 19th C.
- Granite: a type of igneous rock consisting primarily of crystals of feldspar, quartz and mica.
- Hammerbeam roof: is a timber roof where the main beams are supported on shorter curved braces projecting from the walls and is characteristic of the English Gothic style.
- Igneous rocks: are formed essentially by cooling and crystallisation from a molten condition, sometimes deep within the Earth (plutonic), at shallower levels, or at the surface (volcanic). Their composition is very variable depending on the nature of the materials that melted to form magma and the extent to which various components crystallise out at particular temperatures and leave residual magma of different bulk composition. These rocks are classified and named according to their silica (SiO_2) content e.g.

Silica content	Ultrabasic	Basic	Intermediate	Silicic
Volcanic	-	Basalt	Trachyte	Rhyolite
Plutonic	Peridotite	Gabbro	Syenite	Granite

- Keystone: a trapezoidal stone (voussoir) locking the summit of a masonry or brick arch.
- Larvikite: a variety of syenite rock from Norway containing two types of feldspar, oligoclase and anorthoclase, commonly intergrown as large crystals and displaying a play of colours or rainbow effect (schiller lustre) due to reflection of light from within the mineral.
- Lath and plaster: is a form of wall and ceiling construction whereby horizontal strips of spilt wood are nailed onto uprights and are then plastered over.
- Limestone: a sedimentary rock, very commonly used as a building stone
- (e.g. Portland Stone, Bath Stone, Cotswold Stone), is composed mainly of calcite ($CaCO_3$), with or without some magnesium rich carbonate – CaMg $(CO_3)2$. Many limestones contain, or consist largely of, fossils, having been formed in ancient shell banks or reefs. However, some of the most sought after building stones are oolitic limestones largely made up of small rounded bodies, called ooliths.
- Mappa Mundi: measuring 1.59 x1.30 metres the map may have formed part of a triptych. Though now drab, it was originally brightly coloured. It dates from 1290-1310AD and is of

immense historical importance, as one of the oldest surviving attempts to produce a map of the world. It shows the world within a circular frame, with the east at the top and Jerusalem at the centre. The entire known world at the time occupies the upper part of the circle so there is much imagination in the delineation of the remainder! Outside an irregular circle of continents are the islands in the ocean from Britain to Sri Lanka. The rivers are derived from Roman maps wit some accuracy, but only Sicily is recognised in shape of the land masses. In the extreme east is the island of Paradise with Adam and Eve expelled from it. There are many biblical scenes superimposed on the map and the labyrinth of Greek mythology appears on Crete. Strange creatures of the lands appear, for example on Africa monsters with heads below their shoulders. The information came from Greek, Roman, Spanish and other sources, writings of the first eight centuries AD, some of which are listed on the map. Below the map, the emperor Augustus instructs three men, Nichodoxus, Polyclitus and Theodocus to survey the world. Twelve puffing heads or figures represent the winds in the margins. Christ in judgement and the Virgin Mary interceding are shown. The Mappa Mundi, from the nature of the calligraphy, is now widely thought to have been produced in Hereford, but based on a Lincoln exemplar. (précis from P.D.A. Harvey in Aylmer & Tiller 2000; 557-562). The map surely represents the beginnings of 800 years of map surveying, culminating in modern GPS systems of mind-boggling accuracy.

- Marble: True marble is a metamorphic rock derived from a limestone by heating and/or pressure, while buried. Simple burial will not produce marbles, it requires either thermal (contact with an igneous intrusion) or high pressure (regional) metamorphism. The original sedimentary rock re-crystallises to form a fabric of interlocking grains. Confusingly, the stone trade also uses the term marble for certain polished limestones and sometimes even igneous rocks. True marble has been used in many of the tombs of the Cathedral as an ornamental stone (Site 39) and also as a cladding material (Site 42).
- Metamorphic rocks: these are rocks formed by the alteration of pre-existing rocks (whether igneous, sedimentary or metamorphic) by high levels of heat and/or pressure within the Earth's crust. As a result of pressure some become divided by planes of weakness (cleavage) along which they can be split e.g. slates. If slates partly recrystallise due to higher temperatures the resulting rocks are phyllites which have characteristically shiny surfaces.
- Mica: a group of aluminio-silicate minerals that can be split into very thin layers or flakes with very shiny surfaces which can be seen sparkling on surfaces of rocks that contain them. Common types are dark brown to blackish biotite – $K(Mg, Fe)_3AlSi_3O_{10}(F,OH)_2$ -and pale to colourless muscovite – $KAl_2(AlSi_3O_{10})(F,OH)$ - both of which can be seen in granites.
- Mosaics: Mosaics are formed from small blocks of natural stone ('tessera'), or sometimes man-made materials, of different colours and harmonised into often intricate designs. The Romans frequently used mosaics as flooring materials. Sometimes, as at Ostia the ancient port of Rome, the Romans only used black and a light shade, possibly due to the lack of suitable coloured stones in the vicinity. In Britain, white and pale brown limestone, Blue Lias limestone, and dark brown granite, red sandstone or brick, and dark brown granite were used. Roam mosaics displayed on the walls above the staircase in the Hereford Museum (Site 38) have a limited range of colours, but include red. The Victorians obtained brighter hues by using artificially stained materials as in the base to the Hereford font (Site 39).
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- Nave: the part of a church that extends from the west door towards the eastern end.
- New Red Sandstone: this outmoded term was used in the 19thC for the predominantly red strata containing many sandstone units of the Triassic period (q.v.).
- Norman style: a style of architecture characterised by massive thick walls, sturdy piers, large towers and round arches which was prevalent from the 10thC Norman conquest until the 12thC.
- Old Red Sandstone: this outmoded term, although still widely used outside the scientific literature, is applied to the frequently reddish non-marine and shallow marginal marine strata of Devonian age. These include a variety of sandstones that have been used for building.
- Oolitic limestones: consist of small spherical to egg shaped grains consisting of concentric layers of calcium carbonate ($CaCO_3$). These form in great numbers by a mixture of mechanical, chemical and biological accretion on warm sea floors, as is happening now off the Bahamas. Some of the best building stones in the country ("freestones") are oolitic limestones because they consist of even grain sizes and are relatively homogenous so they can be cut evenly in any direction.
- Orbicular granite: is a granite that contains concentrically layered spheroid structures that are thought to have formed by bands of crystals being deposited around a central nucleus during cooling of magma. When cut through these appear as circular structures where the layers are picked out by dark and light coloured minerals.
- Pediments: triangular part crowning the front of a building in Grecian style especially above a portico.
- Pilaster: a rectangular column, particularly engaged in a wall.
- Porphyritic: when igneous rocks form by cooling slowly from a molten condition different minerals often crystallise at different temperatures. Those that crystallise early on can grow to relatively large sizes and form good crystal faces while those that cool later can be smaller and less well formed. Where such larger crystals (phenocrysts) in a finer matrix the texture is described as porphyritic.
- Portico: porch of a building supported by columns at regular intervals.
- Pre-Cambrian: a term coined in the 19thC for all geological formations older than the Cambrian (i.e. older than about 545 million years before present). That period of time has now been divided into a number of formal sub-units but the term Pre-Cambrian is still in popular use.
- Purbeck Marble: a typically dark coloured non-marine limestone from Purbeck in Dorset, often containing numerous shells of gastropods ("snails"), that has often been used for interior decorative work in churches and cathedrals.
- Quartz: a crystalline form of silicon dioxide (SiO2) which commonly constitutes the majority of grains in sandstone because it is fairly hard and insoluble in water.
- Ragstone: a hard stone that breaks readily into coarse slabs and often applied to middle Jurassic limestones from the Cotswold Hills that have that characteristic.
- Reredos: an ornamental screen covering the wall at the back of an altar.
- Romanesque: a European style of architecture often referred to in England as Norman style (q.v.).
- Rustication is an architectural device, to give stonework a 'rustic' or countrified look by working the surfaces of blocks to roughen them. At site 8 (HSBC Bank) two forms are employed: a simple bevelling of the edges of smooth-faced blocks, and below, a deliberate roughening of the block faces. At site 16 (Butter Market) a more complicated type is employed, in addition to

bevelling edges; in the form of a pattern of smooth-faced ridges forming a network with indented areas. Rustication is labour intensive and therefore expensive, and only likely to be utilised on prestige buildings where there is an aim to impress the observer.

- Sandstones: are granular sedimentary rocks deposited in layers from water or by the wind as sand (defined as grains averaging between 0.0625 mm and 2 mm in diameter) and later cemented and hardened by the deposition of minerals in the spaces between the grains. Some sandstone is too soft to be used in construction but others are well and hard while others can be exposed to weathering for several months to toughen the surfaces to make good building stones.
- Sedimentary rocks: these are rocks laid down on land, in lakes or in the sea by the agencies of water, ice or wind. Many sedimentary rocks are granular ranging from fine grained clay/mud, through silt, to sand, pebbles or granules, cobbles and boulders. Coarse pebbly beds are called conglomerates if the pebbles are rounded or breccias if the pebbles are angular. Any of these sediments may be mixed or inter-bedded with materials of biological origin such as fossils and shell debris or carbon rich seams of plant origin such as coal. Some sedimentary successions contain materials that crystallised from water in arid conditions (e.g. rock salt and gypsum). The nature of the sedimentary sequence is closely related to, and contains evidence of, variations in the environments of deposition (see sedimentary structures q.v.). However many sedimentary rocks are altered to some extent following burial in the ground. For instance, minerals crystallise in pore spaces and cement rocks thus mud becomes mudstone, and sand becomes sandstone. The passage of water can also carry minerals through the rock and deposit them elsewhere giving new colour patterns.
- Sedimentary structures: sedimentary rocks contain structures and textures formed at the time of deposition, which reflect depositional conditions, and structures formed after burial often during compaction and consolidation within the Earth's crust and physical and chemical processes associated with this. Examples of depositional structures are cross bedding and graded bedding. Where ripples or dunes are formed from material is rolled forward by a current (water or wind) and these are preserved, they can be seen as cross-bedding when cut through vertically. They characteristically have a flat base curving upwards to a truncated top – truncated because the top tends to get eroded by later currents. Because cross bedding units build by material being rolled up a shallow slope and then slumping down a steeper slope they can also be used to detect which way the current was flowing at the time of deposition. Graded bedding forms where particles settle out vertically from water with the largest and heaviest particles being deposited first and then progressively finer particles being deposited on top given a "fining-upwards" unit. On the wall of the New Library, you can see both of these types of sedimentary structures (site 41). An example of a structure formed after deposition is where a series of dark and light bands cross-cut depositional sedimentary structures. These formed after burial as fluids passed through the rock carrying iron or manganese and then depositing these at times when migration temporarily halted.
- Serpentinite: a rock formed by hydrothermal (hot water) alteration of an ultrabasic igneous rock such as a peridotite and now composed of secondary, fibrous serpentine group minerals (hydrous magnesium iron silicates, $(Mg,Fe)_3Si_2O_5(OH)_4$. For example, the serpentine mineral antigorite is a replacement product of olivine and forms light coloured veinlets. Magnesite ($MgCO_3$) may also be present. Serpentinite has a somewhat greasy appearance and soapy feel.
- Silurian: a geological period from about 417 to 443 million years before present.
- Slate: true slate (as opposed to stone slate q.v.) is a metamorphic rock that can be split into thin tiles along closely spaced planes of weakness known as cleavages.
- Stone slate: some thinly bedded limestones and sandstones, sometimes following weathering just beneath the soil profiles, occur as platy slabs that are sufficiently thin to use for roofing.
- Stucco: a durable finish for exterior walls made usually of cement, sand and lime and applied while wet.
- Syenite: a group of igneous rocks of intermediate silica content and containing sodium and potassium rich feldspars.
- Terracotta: hard brownish red ceramic used as an ornamental building material.
- Terrazzo: flooring material consisting of chips of marble or granite set in concrete and polished.
- Transept: the transverse part of the cross-shaped plan of a church.
- Travertine: this is a very finely crystalline limestone ($CaCO_3$) sometimes with some silica (SiO_2) characterised by undulating banding and irregular cavities. It is formed by rapid precipitation of carbonate minerals in warm or hot springs, accompanied by algal (simple plant) growth. This particular rock from Italy contained reeds and grasses when deposited, and these decomposed and were lost, leaving voids. The holes left behind have to be artificially filled before the rock can be used for cladding purposes as at site 15.
- Triassic: a period of geological time from about 205 to 248 million years before present. In Britain this time was dominated by desert conditions. A number of Triassic sandstones are good for building.
- Tudor style: a style of architecture developed from the Gothic style in which arches became lower and wider, giving a flattened appearance, although retaining a pointed top.
- Tufa: is a porous calcareous ($CaCO_3$) material deposited from springs or groundwater at normal surface temperatures.
- Way up: Sedimentary rocks are deposited in layers, one above another, with the oldest at the base and the youngest at the top. But the crust of the Earth is subject to lateral movements and forces that cause rocks to be folded so the originally essentially horizontal strata may become tilted, vertical or even turned upside down. Geologists who are trying to interpret the geological history of an area have to know whether strata are the right way up. There are a number of tell-tale clues, an important one of which is cross-bedding (q.v.) in sedimentary rocks. Each cross-bedding element has an essentially flat base and an eroded top. In the example below, the first photograph shows a unit the right way up and the second shows the same unit upside down. The same principle can be used to detect whether a block of building stone has been used upside down.