

Given the cost of haulage, especially in the past, preference was always given to local building materials, which therefore reflect the local geology. However as transport became more sophisticated, the longer-distance transport, especially of higher value materials, has led to the introduction of 'foreign' products.

Local resources to Ruthin:

Solid Geology:

Carboniferous Limestone (for stone and cement), Formed in a tropical marine environment from the Calcium Carbonate secretions on untold billions on tiny foramanifera, as well as the hard remains of other marine creatures, this hard rock is naturally cemented. 330m. years old. The strata are, however, crossed by horizontal bedding planes and vertical joints which favour quarrying into rough blocks

Four subdivisions: Leete (Ruthin), Llanarmon(Eyarth), Loggerheads and Cefn Mawr limestones,

Permo-Trias Sandstone of the Kinnerton Formation. 250m years old. A desert, fossil-free sandstone. Easily quarried but not resistant to weathering as grains uncemented by other compounds. Used from 13thC (Castle) to 19th. Difficult to date exactly as no fossil content – contemporary with the the Permian Extinction? (96% of marine species and 70% of terrestrial species extinct) (Meteorite strike? Siberian Traps vulcanicity? Catastrophic greenhouse effect – methane?)

Drift deposits: Sands & Clays – alluvial and glacial for bricks and aggregates.

The Silurian rocks bounding the Vale do not make good building materials and are little used, though high quality greywacke for road metal was quarried at Craig Lelo.. At the head of the Vale, on Bwlch Oernant (Horseshoe pass) the schist gives way to slate. This slate is not the same as the Cambrian and Ordovician slates of North-West Wales. The Oernant quarry was producing roof slates (Nantglyn flags) from the 17thC. Its two neighbours produced slab slate (the 'Slab Horizon'). It is likely that the first slates in Ruthin were from these sources, probably carried by pack animals. The later Moelffarna quarry (roof slates, Nantglyn flags) and its neighbours Penarth and Deeside (Slab Horizon), above Glyndyrdwy, were also a likely source of slate for Ruthin, before rail-borne slate from Snowdonia became available.

A smaller slate operation to the north west, at Nantglyn, produced slab, and this was used for fireplaces in Ruthin Gaol in the 1770s..

'Imported' resources include:

Carboniferous Sandstone

Clays/Bricks

Larvikite

Crinoidal Limestone

Marble

1. St. Peter's Church and Buildings, Almshouses

Again, **Carboniferous Limestone** and **Permian/Triassic Sandstone** in various combinations. Some fossils visible. Different stages of weathering. In the almshouses, recent replacement blocks alongside much-weathered originals, most likely to be Runcorn stone. (Same age but a different facies, and more resistant. As in Liverpool Cathedral). The two stones complement each other in an attractive colour combination, and in the architecture - Limestone provides the strength of the walls, sandstone the shaped doorways, window surrounds, and decorations. For 600 years the two stones were used in this way. Is this Ruthin's vernacular architecture?

2. Footpath, Market Street Car Park

Different kinds of **Granite** within Limestone blocks in wall. Some river-rounded pebbles and some sandstone. By last parking space on left – piece of cave deposit – calcite smooth.

3. Bathafarn Chapel, Market Street.

Post-railway, so materials from further afield appearing.

Note the **Yellow Sandstone** around the porch and windows. Not from the Vale, but from the post-Coal Measures sandstones as were quarried in the Wrexham area, especially **Cefn y Fedw Rock** near Ruabon/Minera, (300m. y.o.) which overlies conformably the Carb. Limestone. Use extensively locally but no quarries now active. Current bedding in various directions suggests fluvio-deltaic deposition with shifting water channels.

Brick looks like Ruabon reds, the finials on the roof probably from J C Edwards (Trefor) or Ruabon Brick and Terracotta Company who specialised in ornamental brickwork..

4. County Hall

Reconstituted Stone – this is created from crushed stone, with additives to create a constant colour and texture and as a cementing agent. May be treated with silicate of soda (or similar) to protect from weathering in urban conditions.

Larvikite

Found only at Larvik in southern Norway, and at Thunder Bay in Canada. A form of Syenite, this is an intermediate (ie between basic and acidic) igneous rock which formed in the upper crust – i.e. intrusive sills, dykes and bosses. It has a predominance of alkali (orthoclase, often pink-ish) feldspars (potassium-aluminium silicates), some of thumbnail size which create a shimmering effect (Schillerisation). Fragments found in East Anglian boulder clays are an indication of ice movement in the last Ice Age.

5. Town Hall

Interesting combinations.

Carboniferous Limestone,

with some Brachiopods visible. Brachiopods are bivalves with hinged shell attached above and below the animal, rather than on each side like a mussel. Many are symmetrical, as with Scallops, though the two shell sections differ in size. Also circular fossils – tubular corals – under first window and in block below second window. Calcite veins. Water-deposited in cracks, unlike quartz which crystallises from gas. Note how variations in colour, from the different limestone facies, have been used to 'band' the walls. Also one section of wall uses pinkish limestone.

Carboniferous Sandstone – Cefn y Fedw sandstone. (Minera/Ruabon area) -sculptures. Also some greyish sandstone, unknown source, round Market Hall doorway. Notice how in doorways inner part is grime-stained but outer is cleaned by rain water (carbonic acid). A few small pebbles included.

Mudstone? Above and to the side of circular window.

6. War Memorial

Igneous, sedimentary and metamorphic rocks at one site.

Slate Grey Ordovician slate – i.e. Ffestiniog or Dee Valley rather than Cambrian slate from Dinorwic or Penrhyn (which has a hint of bluish or reddish colour.).

Permian/Triassic Sandstone . Possibly from Hirwaun, or from Cheshire/Wirral ?

Granite – a light grey fine-grained type, Aberdeen. Grey, rather than pink, due to plagioclase feldspar, a Sodium/calcium) -aluminium silicate. Note different types of granite on wall-mounted slabs – differing crystal size reflects rate of cooling of the magma.(Slower cooling=larger crystals).

7. Picture House

Steps of Marble – possibly Carrara marble from Tuscany (very white).
The coloured bands are melted/solidified grains of impurities in the original limestone – sand etc.

8. Library and Police Station

More **Cefn y Fedw sandstone with local limestone**. . Some current bedding visible

The classic portico of the Record Office (now the Library) is from 1855 - pre-railway. It would be interesting to know how these superb columns (one-piece, and in excellent condition) were transported over the Llandegla moors! There ia also early use of this stone at the Gaol.

9. Castle Street

Opposite the Wine Vaults, lower courses of the building in dark **brick**. These are similar to Staffordshire Blues, from reddish Etruria marl. More likely from the The Ruabon marl which is similar and, when fired at a high temperature in a low-oxygen reducing atmosphere, takes on a deep blue colour and attains a very hard, impervious surface with high crushing strength and low water absorption. Therefore good for foundations, bridges etc. Produced by Monk & Newell, E Parry, and other Flintshire/Wrexham companies..

Plas yn Dre – more Brachiopods in the limestone..

10. Castle Gateway

Permian/Triassic Sandstone.

Colomendy – Ruthin brick.

11. Maen Huail

A **limestone** of unknown origin, not thought to be from the immediate area. Possibly a glacial erratic – which gave it special significance as being an oddity, giving rise to the absurd myth. (Is it displayed upside down?)

12. St. Peter's Square

A similar combination on the Peers memorial, but the pink sandstone is from the **Llys Cadw quarry**, Gwespyr. Fine grained and hard but easily worked. (Basingwerk, St Winifred's, St Asaph Cath., Denbigh and Rhuddlan castles).

Kerbs of **crinoidal limestone**. Of early Carboniferous age, either from Steeplehouse Quarry or Hopton Wood quarry, Wirksworth, near Matlock, or from a small production on Halkyn Mountain.

Yorkstone paving - a group of durable river-deposited sandstone, within the Carboniferous (Millstone Grit group or Yoredale beds.) of Yorkshire – quarried near Halifax. . 335 m y.o. Fine bands of Mica crystals (characteristically thin and flat) add to the strength in one direction, while enabling easy splitting along flat bedding planes.

13. Tom Pryce memorial

Slate plinth is from Berwyn quarry.

Main stone is a very hard Limestone – dolomite? Leicestershire? If so, Permian – 280m y.o.

14. Fineline

Brick of local origin as the building pre-dates the railway. Owner of building believes it to be Ruthin brick. Also seen in Castle Hotel and other buildings. The colour suggests the clay was from alluvial or glacial drift containing a quantity of local sandstone fragments. Appear to be hand-made - 'rough and ready'. Often rendered as susceptible to weathering..

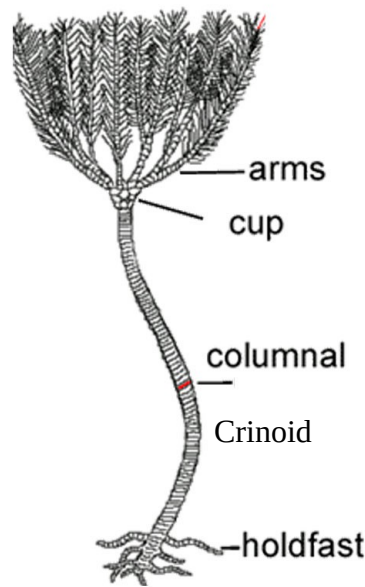
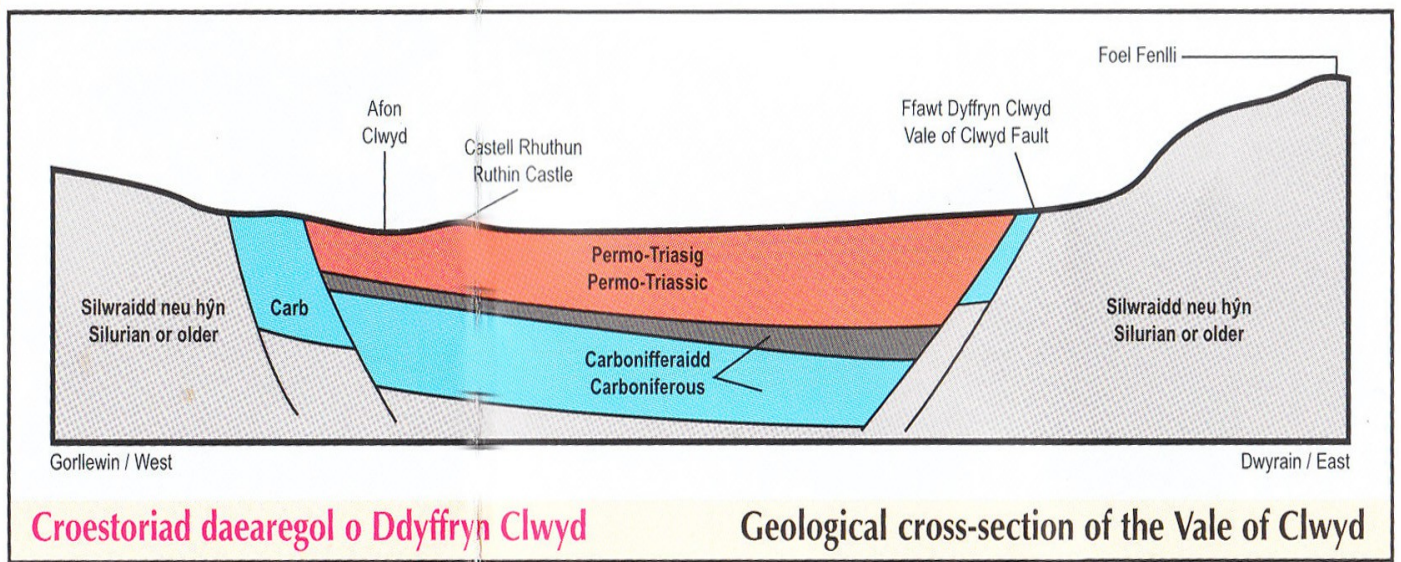
15. Stanley Road

Possible site of sandstone quarry. (info: R. Edwards). Decorative Ruabon Red brick on gateway pillars – possibly made by J.C. Edwards or Ruabon Brick and Terracotta Company.

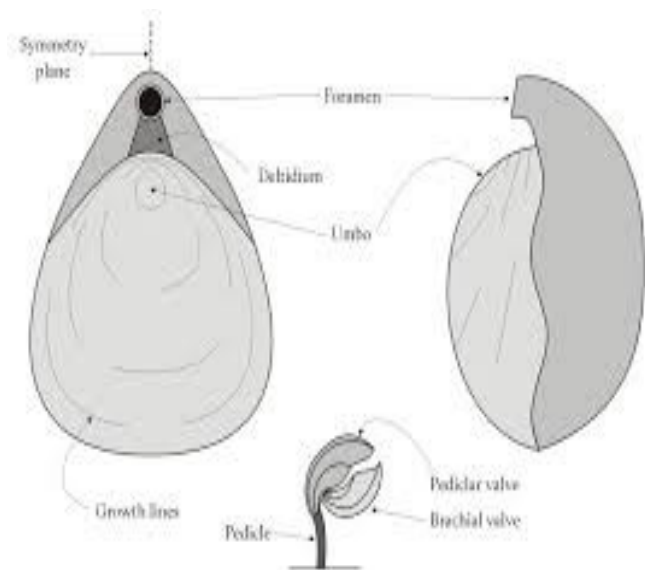
16. Red Rocks

Kinnerton Formation exposure, formerly known as the Lower Mottled Sandstone of the Bunter (upper Permian - lower Triassic series). Part of the 'New Red Sandstone'. A registered geological site. Displays dune bedding. Formed in arid conditions and therefore little mineralisation to cement the grains. 'Hardness' comes from compaction only. Easily weathered at this particular site.

The sandstone at Hirwaun is more resistant than here.



EON	ERA	Date*	PERIOD	
PHANEROZOIC	CENOZOIC	2.6	QUATERNARY	
		23	NEOGENE	
		66	PALAEOGENE	
	MESOZOIC	LATE	145	CRETACEOUS
			201	JURASSIC
			252	TRIASSIC
			299	PERMIAN
			359	CARBONIFEROUS
	PALAEZOIC	EARLY	419	DEVONIAN
			444	SILURIAN
			485	PRE-CAMBRIAN
			541	CAMBRIAN
	PROTEROZOIC (part)	NEOPROTEROZOIC (part)		



Brachiopod

A (very) simple classification of Igneous Rocks.

	Basic	Intermediate	Acid
Extrusive (Lava etc.)	Basalt	Andesite	Rhyolite
Intrusive (Upper Crust)	Dolerite	Syenite	Granophyre
Plutonic (Deep)	Gabbro	Diorite	Granite

**Hirwaun
Quarry**

