GeoHubLiverpool

Rock around campus

Liverpool Geological Society
Founded 1859

7 Mount Pleasant [Campus map location C4)

This fully accessible trail is one of a planned series of walks around the University of Liverpool. The aim is to introduce the rocks and man-made materials used in the buildings and p**aving around the campus.**

To help you, in this leaflet you will also find:

- a map showing the names of buildings around University Square;
- a glossary of terms;
- a geological timechart.

This is a self-led guide and you need to get close to the buildings so that you can see the fine details. Allow an hour to complete the trail.

There are three types of rock: **igneous** (crystallized from molten rock); **sedimentary** (derived from the breakdown of other rocks) and **metamorphic** (rocks changed by heat and/or pressure). Man-made materials are also derived from Earth materials. Examples include **bricks** (baked clays); **concrete** (a mixture of sand, gravel and limestone); **glass** (a mixture of sand and limestone); mortar (a mixture of sand and limestone); **metals** (lead used in flashings, copper used in wires and lightening conductors, iron used in drain pipes and railings) and **alloys** (mixtures of metals for example bronze used in statues).

126, Mount Pleasant

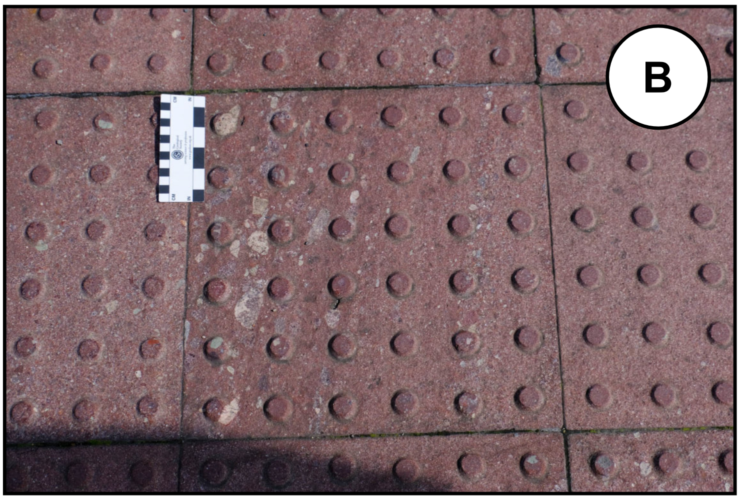
UNIVERSITY OF LIVERPOOL

Era	Period	Date Millions of years
CENOZOIC	Quaternary	2.6
	Neogene	23
	Palaeogene	66
MESOZOIC	Cretaceous	145
	Jurassic	201
	Triassic	252
PALAEOZOIC	Permian	299
	Carboniferous	359
	Devonian	419
	Silurian	444
	Ordovician	485
	Cambrian	541
PRECAMBRIAN		The Earth is 4,600 million years old

Start in University Square near the *Reilly Building*. Take the crossing towards the *Foundation Building* and progress along Mount Pleasant.

Before the entrance to the carpark for the *Metropolitan Cathedral of Christ the King*, look along the length of Mount Pleasant towards *128* and *126 Mount Pleasant* (photo A). You should notice that these two buildings look different because they are of different ages and built with different materials. We will look at one of these buildings in detail shortly.

Proceed to the open area beyond the café. Look at the pink to red-coloured bubble or dimple paving near the road crossing on your left. These paving slabs are made of a sedimentary rock called conglomerate. If you look closely you will see the red-coloured conglomerate includes larger, rounded paler-coloured grains and pebbles (photo B).



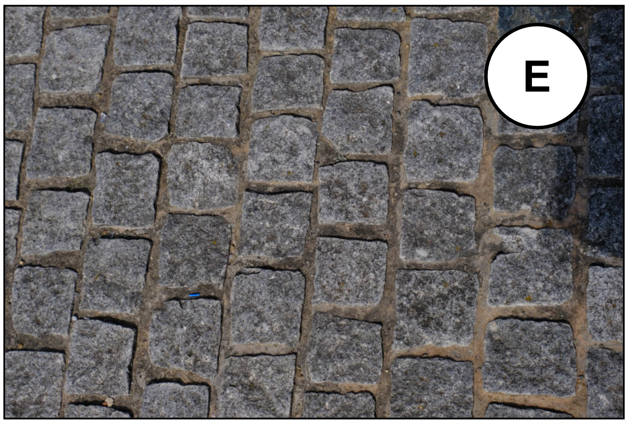
From the bubble paving look towards the main entrance to the cathedral (photo C).

The cathedral was designed by Sir Frederick Gibberd and the entrance to the building is at the top of a wide flight of concrete steps leading up from Hope Street. Above the entrance is a large wedge-shaped structure which acts as a bell tower for the four bells mounted in rectangular openings towards the top of the tower.

The cathedral is built in concrete with a Portland limestone cladding and an aluminium covering to the roof. [Progress to Rock around Campus 6 Metropolitan Cathedral - if you wish to know more about the cathedral]

Proceed towards the main entrance to the cathedral.

First notice the buff to cream-coloured paving slabs made of sandstone (a sedimentary rock). These slabs (photo D) show thin layers which are a sedimentary structure called bedding.



Nearer the main entrance to the cathedral the sandstone paving slabs are replaced by decorative stone paving known as setts (pieces of regularly-shaped quarried stone). The dark grey-coloured setts (photo E) are composed of the same type of crystalline igneous rock. Igneous rock forms when molten rock crystallizes at depth in the Earth's crust.

Continue to the base of a huge stained-glass artwork near the café on your right-hand side.

This piece of artwork made of hand-cut, mouth-blown glass, is one of several stained-glass columns created by the German artist Raphael Seitz (photo F). Glass is made from sand, limestone and sodium carbonate (soda ash).

Seitz's glass column is mounted on slabs of a crystalline igneous rock called granite (photo G).

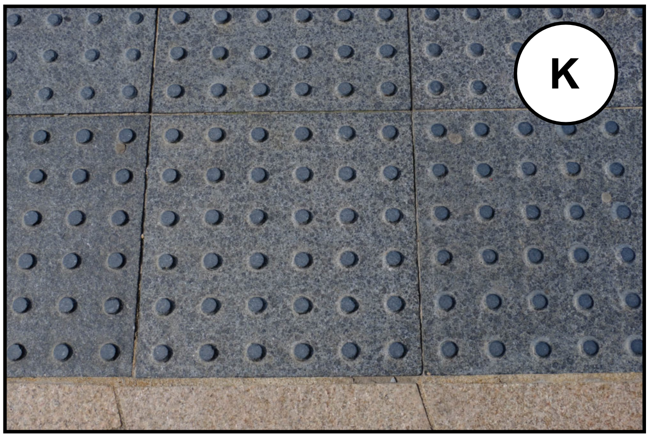
Notice that some of the white crystals in this granite are up to 60mm in length. Many of these larger crystals have a rectangular shape and show sharper faces (flat planes).

From the café proceed along Mount Pleasant until you reach the street name plate.

Look at the building on the opposite side of the road behind the red telephone box (photo 8). The building, named *126 Mount Pleasant* (photo I), is made from bricks and Carboniferous sandstone (a sedimentary rock).

Cross Mount Pleasant to reach *126 Mount Pleasant* (beware of traffic).

When you reach the other side of the road, look back across the road towards the street name plate (photo J). You should notice at least four different types of igneous rocks have been used in the road and pavements. Differences in the overall colours of the igneous rocks you can see is determined by the mineral constituents of the rock.



The road surface is paved with setts. Setts are usually made of hard wearing igneous rocks like granite and basalt and often have rough surfaces, but the setts used on this road have flat surfaces. They are made from igneous rocks that are grey and grey-black in colour. Slight differences in colours are produced by the minerals making the different rocks.

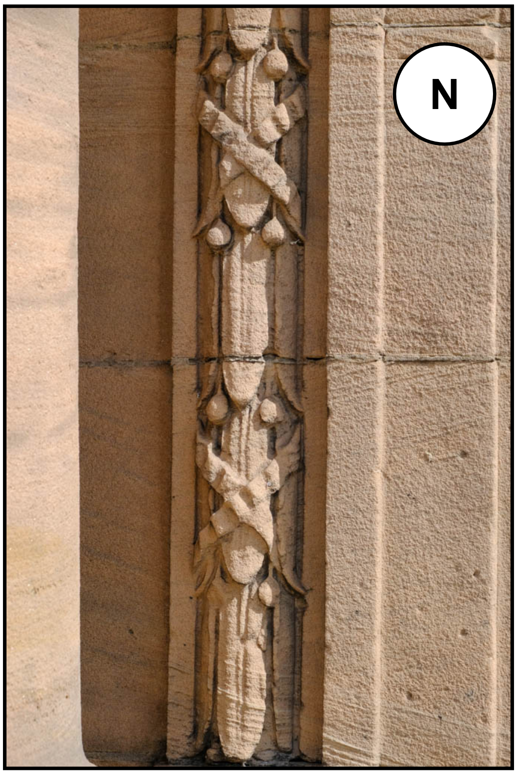
On each side of the road you can see dark grey-coloured bubble (or dimple) paving slabs near the edges of the pavements (photo K). These slabs are cut pieces of igneous rock, which is made of large (easy to see) crystals.

In the pavements the flat paving stones are made of granite. This rock is buff-coloured and has large crystals. Pavement kerbs and gutters are rectangular blocks of another type of granite which has a pale grey in colour and is made of crystals of different sizes (photo L).

Turn around to face *126 Mount Pleasant*.

To the left of the telephone box, look at the original entrance to the building. You will notice two types of Carboniferous sandstone have been used as building stones here.

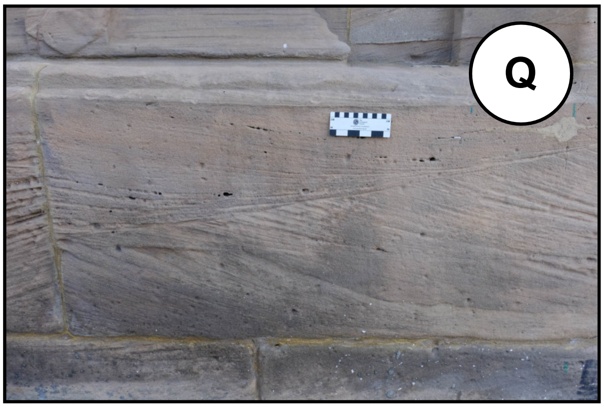
The sandstone in the steps (photo M) is a paler grey-green colour and this even-textured rock shows fine layers. These are sedimentary structures called laminations. Dressed ashlar (shaped stone) blocks of buff-coloured sandstone are also used in the building.



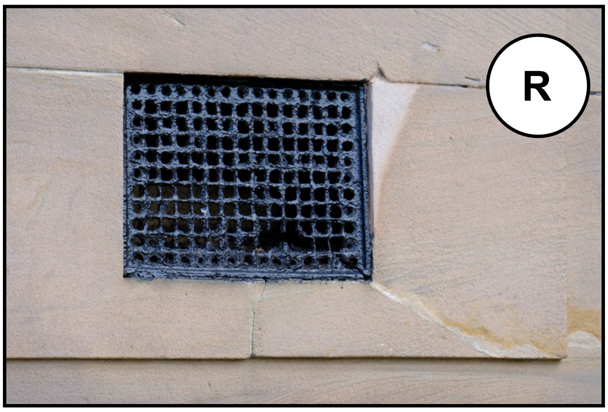
The ashlar blocks were soft enough to be shaped and carved by stonemasons. You will notice details carved on some of the vertical pillars and vertical faces on the building (photo N). These carvings have not lasted well; some of the details have been lost where the sandstone has been weathered and grains have been loosened from the rock surface. (Weathering is the breaking down of rocks through contact with the Earth's atmosphere, water, and organisms)

Look closely at the sandstone ashlar blocks. You will notice that this sandstone is made of angular grains more than 1mm in size (photo O). It also contains some pebbles and you will see holes where pebbles have weathered out of the rock (photo P).

To the left of the name plate for the building you can see sandstone blocks that show inclined layers (photo Q). These were formed when currents deposited the sand grains in dunes which when cut through show inclined layers which are a sedimentary structure called cross-bedding.

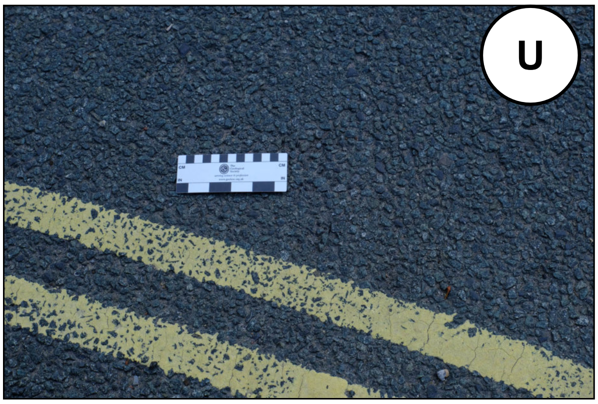


To the right of the telephone box notice that cast iron has been used to make the drain pipes, ventilation grilles (photo R) and balustrades (photo S).



Proceed along the side of 126 Mount Pleasant (keep the building on your left).

Look at the ashlar blocks used to form the boundary wall of the building. These are large rectangular blocks of another type of Carboniferous sandstone which is sometimes alled ‘gritstone’ or ‘grit’. (photo T). It has a rough feel and shows angular sand grains that are easy to see. Most of the grains are made of white material called quartz, which is a hard (resistant) mineral composed of silicon and oxygen. (Gritstone was used for millstones to mill flour, to grind wood into pulp for paper and for grindstones to sharpen blades)



Return to the telephone box and proceed along Mount Pleasant. At the side road leading to the carpark on your right, look at the road surface where you can see the wearing course (the top layer on which the traffic runs). Notice that it is made of crushed rock (aggregate). The angular rock fragments have rough surfaces so that the bitumen (a semi-solid hydrocarbon product formed by refining crude oil) can adhere to them. The aggregate is made of different rocks chosen because they are not porous otherwise frost would shatter it in winter (photo U).

Continue along Mount Pleasant to reach University Square. [Progress to Rock around Campus 5 University Square or to Rock around Campus 6 Metropolitan Cathedral]

Glossary of terms

Ashlar blocks: finely dressed (cut, worked) stone that has been worked until it has smooth surfaces and square edges.

Basalt: dark coloured, crystalline igneous rock made up of small crystals of plagioclase and pyroxene that are difficult to see.

Bubble (or dimple) paving: textured paving that can be felt as you walk over it and so makes it easier for visually impaired people to detect when they are about to leave the pavement.

Cast iron: a hard, relatively brittle alloy of iron and carbon which can be readily cast in a mould. It has a higher carbon content than steel.

Conglomerate:a sedimentary rock that is made up of rounded to subangular grains more than 2mm in diameter (e.g. granules, pebbles, cobbles, and boulders).

Crystal: a mineral solid with a regular atomic structure, often having a regular shape.

Feldspars: rock forming minerals that are common in igneous rocks; includes plagioclase and orthoclase.

Granite: light coloured, crystalline igneous rock with large crystals of quartz, plagioclase, orthoclase and mica.

Mica: a shiny silicate mineral with a layered structure.

Mineral: a natural solid material of fixed chemical composition with an orderly internal atomic structure.

Orthoclase: a type of feldspar mineral rich in potassium.

Paving slabs (or stones): naturally-occurring igneous, sedimentary, or metamorphic rocks which can be cut, shaped, or split into blocks or slabs for use as paving materials.

Plagioclase: type of feldspar mineral.

Quartz: a mineral composed of silicon and oxygen atoms.

Weathering: is the breakdown of rocks at the Earth's surface, by the action of rainwater, extremes of temperature, and biological activity. It does not involve the removal of rock material.