



Rock around campus



1 The Quadrangle [Campus map location D7]

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 paving around the campus.

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

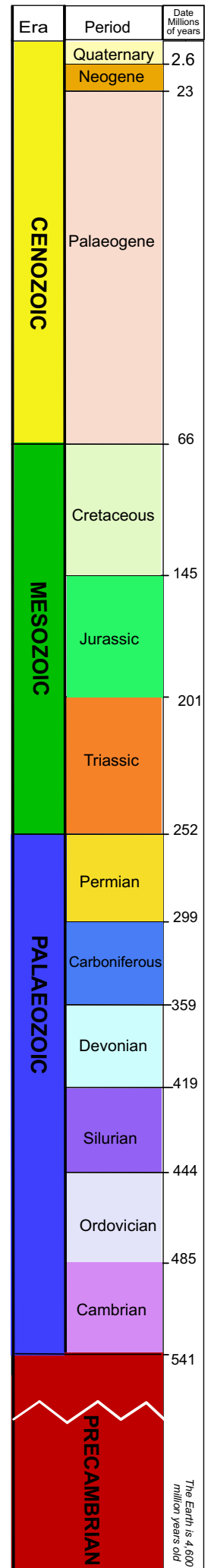
- a map showing the names of buildings in The Quadrangle;
- a glossary of terms;
- a geological timechart.

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.

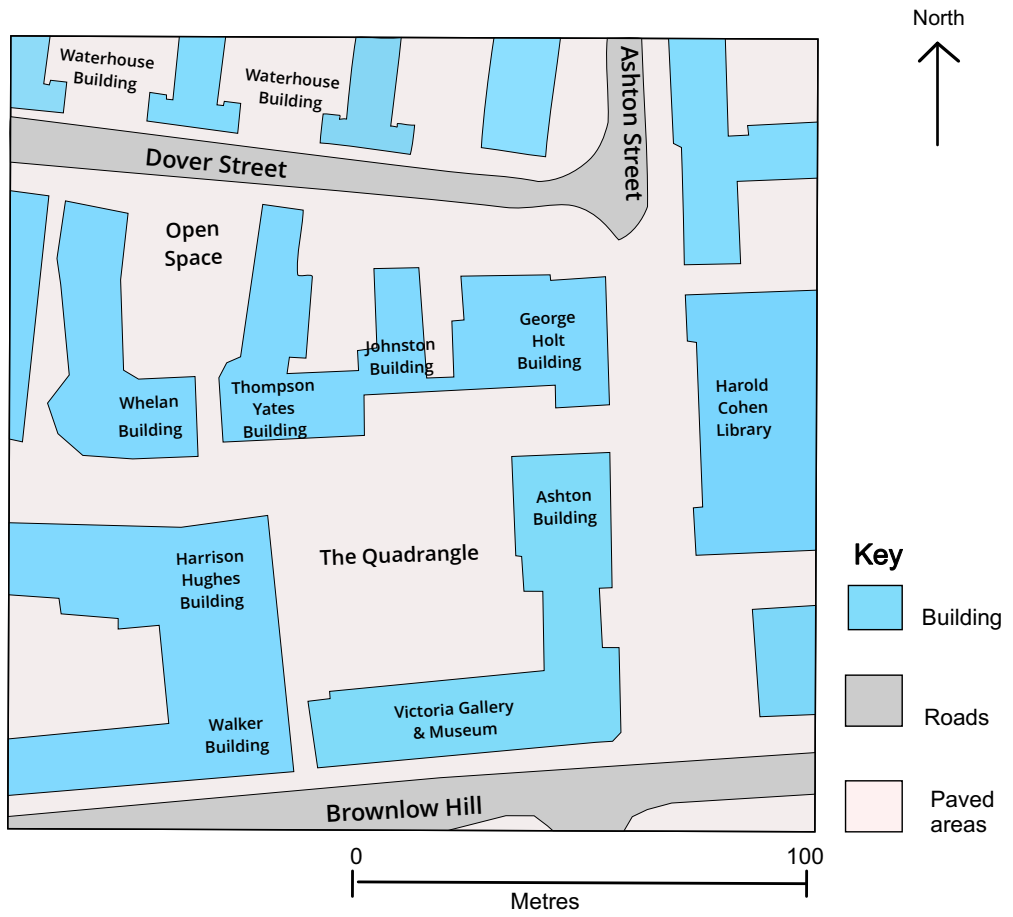
There are three types of rock: **igneous** (crystallized from molten rock); **sedimentary** (derived from the breakdown of other rocks) and **metamorphic** (rocks changed by heat and/or pressure). Man-made materials are also derived from Earth materials. Examples include **bricks** (baked clays); **concrete** (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).



The Quadrangle



Map showing the names of the buildings in The Quadrangle



Starting in the seating area in the centre of the Quadrangle, look around you at the buildings. Immediately you should notice that the buildings all look different because they are made from different materials. Before you look at the buildings in detail, first observe the seats.



The seats (photo A) are composed of a man-made composite material called terrazzo (photo B) where angular chips of clear, glassy quartz and other rocks and minerals are set in a resin. This is then cut to shape and polished to a smooth surface.



Around the base of the trees there is permeable resin-bound gravel (photo C). The angular gravel is white to grey-coloured and composed of different-sized pieces of the mineral quartz.

Now turn your attention to the buildings. Work clockwise around the quadrangle starting with the *Ashton Building*.



The *Ashton Building* (Photo D) is made from blocks of the white sedimentary rock known as Portland Limestone (Jurassic). This even-textured rock is hard enough to resist weathering but soft enough to be carved by stonemasons. Excellent examples of decorative carving can be seen above the door. "Figures" a sculpture above the window (photo E) was made by William Birnie Rhind.

Another feature of this limestone is the fossils it contains. Most are fragments, but you may spot some whole oyster shells (photo F).





The *Victoria Building* (photo G) is made of different types of brick although blocks of red Triassic sandstone (a sedimentary rock) form the base of the building. Most of the sandstone blocks have been coated by layers of black grime, formed when homes in the city were heated by household coal (a sedimentary rock). Where the blackened surface has worn away you can see the original colour and sand grains in the rock. You can also pick out textural layers which are sedimentary structures called bedding (photo H).



The metal railings at the base of the building (photo H) are made of cast iron. In the main part of the building you should be able to pick out at least two different types of bricks. Most of the building is made from rough, standard brown brick with smooth red terracotta bricks of different sizes around features such as windows. Decorative window surrounds are also made of terracotta bricks (photo I).

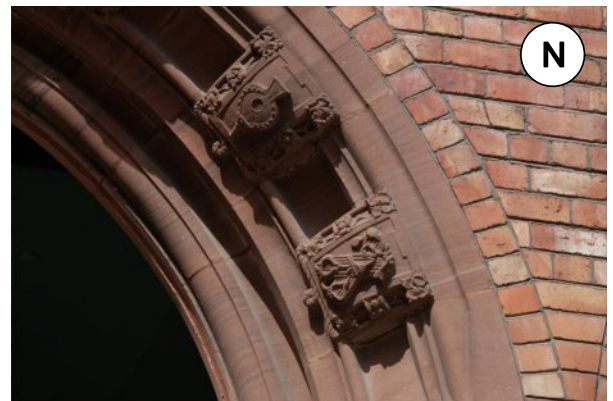
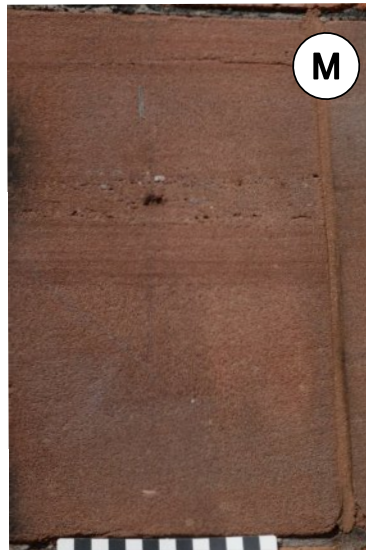
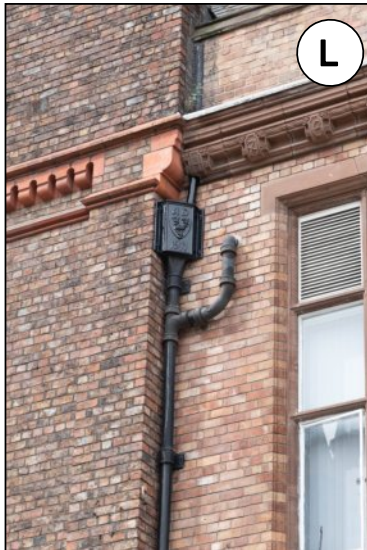
Look up towards the roof and observe how the bricks have been used in decoration. Most of the roof is made of slate (a metamorphic rock), but the roof on the clock tower is covered with metal flashing made of thin sheets of lead (photo J).



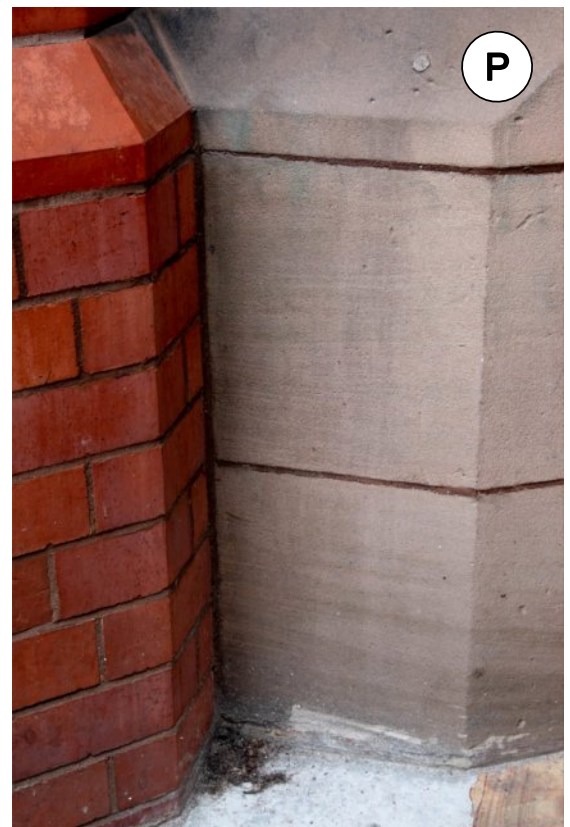
Continuing around the Quadrangle, the *Walker Building* (on the other side of the archway) mirrors the *Victoria Building*.



The *Harrison Hughes Building* (photo K) is next to the *Walker Building*. Immediately you can spot a change in the colour of the bricks (photo L). Part of the aesthetic design is an alternation of bricks and bands of red Triassic sandstone (a sedimentary rock). Look at the lowest layer of sandstone and observe the fine layers within the rock. These are sedimentary structures called laminations (photo M). The arches around the doorway and windows are also made from Triassic sandstone. Look up to see the designs carved on the bosses.



The final side of the Quadrangle is formed by the *George Holt Building* (photo O). This is another brick building which has pale cream sandstone blocks (photo P) used for decoration around the door and window frames. Above the door is a relief made from moulded copper (photo Q) which would originally have been bright, shiny copper but has now tarnished to green (verdigris).





To the left of the *George Holt Building* you can see “Red Between” (photo R), which is a painted steel sculpture by Philip King. Steel is alloy of iron with carbon and usually other elements.



Now continue through the archway into Ashton Street. Under the archway look at the paving slabs (photo T) which are made of granite (an igneous rock) and notice the different colours of the crystals in this rock. In the walls of the archway look for fossils in the white Portland Limestone (photo U).



[Progress to Rock around Campus 2 Ashton Street]

Glossary of terms

Bedding: term that describes the layering that occurs in sedimentary rocks.

Bosses: knobs or protrusions of stone.

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

Flashing: a sheet of thin, impermeable material used to prevent water seeping into a building.

Fossil: any preserved remains, impression, or trace of any once-living thing from a past geological age. Examples include bones, shells, exoskeletons, leaf impressions, tracks and trails.

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

Limestone: a sedimentary rock composed primarily of calcium carbonate (CaCO_3) in the form of the mineral calcite.

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.

Permeable: allowing liquids or gases to pass through it.

Plagioclase: a type of feldspar mineral.

Quartz: a mineral composed of silicon and oxygen atoms.

Slate: a metamorphic rock formed from mudstone and which has small crystals and splits (or cleaves) into thin sheets.

Stonemason: a person who cuts, prepares, and builds with stone.

Terracotta: moulded baked clay. The clay is refined before firing so has a smooth surface after firing and can be used to provide decorative and ornamental shapes.

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.