
A GEOLOGICAL WALK AROUND UCL AND BLOOMSBURY



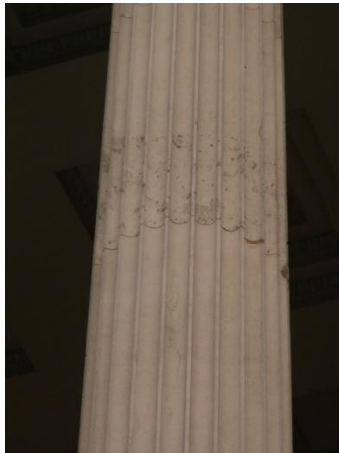
The geological walk starts in the Front Quad of UCL^A. The main College building dates from around 1828; most of the North and South Wings were built in 1881 and 1876 respectively, but the final extension of the wings to their current position (adjacent to Gower Street) was completed in 1983 - 1984. The main buildings are formed of Portland stone, a pale and even grained limestone which was much loved by Christopher Wren and used by him as the specification for many buildings following the Great Fire of London in 1666, including St. Paul's. Look around any cemetery in London, and the early memorials are predominantly Portland Limestone; it is still used by the Ministry of Defence for the graves of Service personnel. Creamy coloured, it is a durable and important freestone, *i.e.* it can be cut in any direction without splitting. The surfaces of the ashlar blocks were originally smooth; however, years of being open to the weather and pollution has led to surface decay, with the limestone receding at a greater rate than the shelly fossils it contains. It is quite possible to make a rough calculation of weathering rate by measuring how far the shells are standing out from the limestone, and knowing the age of the building. This gives us a minimum rate, of course, because the shelly material will itself have weathered away at an unknown rate. If you try this out, you will probably get an answer of around one or 2 mm per century.

The limestone often shows a surface crusting of a different material, presumably formed through a reaction between the limestone and acidic pollutants. This layer tends to flake away contributing to the erosion of the stone. Sometimes the stone is pitted, and it is not uncommon to see rather ugly attempts at plugging them with a different material which,



rather than concealing the flaw, may weather differently over time and make it more obvious.

The Portico columns are made of stacked blocks of limestone, around 1.5 metres, giving an indication of the thickness of the freestone beds. This unit of thickness is close to the maximum obtainable from the so-called "Base Bed" or "Whit Bed" of the quarries in the Isle of Portland in Dorset.



Close inspection of the limestone with a hand lens shows that the grains are sometimes egg-shaped; these are known as ooids, and the limestone as oolitic. Today, such lime muds are forming on the Bahama Banks, with calcite precipitating around bits of shell and other debris, as the grains roll backwards and forwards under current action.

The limestones are bioclastic (shelly), and it is fairly straightforward to find oyster-like bivalves. Sometimes these are aligned and give an indication of bedding direction. For example, in the NW corner of the quad, in the block about 2.5m from the ground to the left of the lightning conductor, the bedding is now positioned vertically. Walk from here towards the main entrance of College, and you will pass the join with the new (1984) extension, which is noticeable because the slabs in the walls are slightly yellower in the newer part. Continue round to the front entrance of the Pearson Building^B where there are some new, smooth slabs of Portland stone. Look at the faint markings on the slabs picked out by slightly different coloured "streaks". These represent cross-bedding, and this is an example of a "way-up" structure we would try to use in the field to determine whether rocks are "right way up" or "upside down" in relation to their original deposition.

Turn to look at the roofing material to the Front Lodges^B. Slate has been used extensively for roofing through the years, but perhaps less so today because it is very heavy and costly; synthetic materials are lighter, cheaper, and more likely to be used as replacement materials for the many Edwardian roofs which are now needing replacement in the suburbs. The property of slaty cleavage means that this fine-grained metamorphic rock splits easily into thin slabs. It may, perhaps, have come from one of the slate quarries in Wales such as Penrhyn Slate Quarry, reputed to be the world's biggest, or the slightly smaller Dinorwic Quarry (now closed).



Walk up the steps to the south Lodge and through the glass doors^C. The floor shows strips of "Purbeck Marble" inlaid into the cream coloured and smoothed Portland Stone. Use of the term marble, whilst common for masons describing a rock that can be smoothed and polished easily, is anathema to a geologist, who would describe this rock as a limestone. The crowding together and nesting of the fossil bivalves and gastropods suggests that they were swept along into piles by current action after death. Go down the steps and walk over the reddish coloured "setts" of granite from Mount Sorrel in Leicestershire towards the southeastern corner of the quad, noticing the granite bollards^D. One of these has the dubious distinction of having been hit by the Queen's

chauffeur during the opening of the extension to the front wings in the mid 1980s. This granite is almost certainly from one of the quarries on Dartmoor.

The flagstones^E around the quad are a yellowish-brown, slightly micaceous fine sandstone known as York stone. This stone came from quarries in the Carboniferous Coal Measures of Yorkshire, and was probably laid during the 1950s. As the slabs have worn down, it is possible to see that they are thinly bedded, and many show lineations across the slab surface. These have probably arisen through an original rippling of the sediment surface.

Once in the South Cloisters, walk towards the octagon^F (beneath the dome). The floor is made from polished Jurassic Portland Stone ("Base Bed") interspersed with black slabs of a very dark Carboniferous limestone from the west of Ireland. It is dark because it has a very high component of mud, together with some pyrite. There is a distinct mottled character to some Portland stone flags where there are patches of differently coloured limestone. These represent the traces of infilled burrows left by organisms as they moved through the soft lime mud on the sea floor. Although similar in appearance, the polished floor in the Octagon (beneath the dome) is subtly different and made from Hopton Wood Stone which was used to replace Portland Stone during WWII. On the floor of the octagon can be seen large shells of *Gigantoproductus*, which is a type of brachiopod. Around the octagon itself is a rather fine white marble with grey flecks and streaks, suggesting that the original sediment contained some traces of impurities prior to metamorphism.

At either end of the octagon are marble statues^G. At the southern end is one of the neo-classical sculptor John Flaxman. It was through the donation of his plaster sculpture models that UCL's Art Collections were founded in 1847. The statue shows the sculptor sitting with his notebook. In the North Cloisters, the statue entitled *L'Innocenza Perduta* (Lost Innocence) is made of the same stone, but the plinth is a brownish coloured marble.



Retrace your steps south, and go through the door into the Roof Garden^H. Diagonally to your right is a striking black monument erected in 1993 to 14 pioneering Japanese students who came to UCL in 1865. Made of a fine-grained gabbro it polishes to a black, mirror-like surface, and sits on contrasting pale granite.

Look now at the low walls surrounding the roof garden^I. This granite is probably from Cornwall, and on close inspection, especially where polished on the sloping surfaces, you may be able to see phenocrysts of white alkali feldspar.

If you have time, it is well worth returning to the front of UCL, crossing Gower Street and walking up to Euston Road. Just around the corner is the front of University College Hospital on the south side of Euston Road, between Euston Square and Warren Street Stations. On the front steps^N is a magnificent large, polished stone, thought to come from Brazil and to be of Precambrian age. This work of art, called *Monolith*, is by John Aiken, and is one of six works commissioned by UCLH for the new hospital and carried out by the Slade School of Art at UCL.



It has been described as a polished granite from Brazil, and is supposed to be Precambrian in age. What do you think it is?

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This walk is based on articles and books by Dr. Eric Robinson, Earth Sciences UCL and Geologists' Association, including *London: Illustrated Geological Walks*