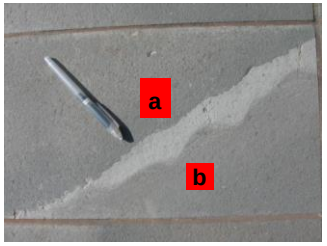
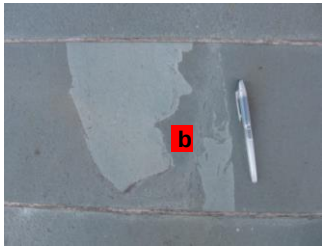
9. The World Museum forecourt, entrance hall and atrium are floored with cut slabs of rock formed by violently explosive volcanic eruptions. The grains thrown out from ancient volcanoes to form these fragmental *ashes* and *tuffs* from the Elterwater region of the Lake District. In many cases they were moved around by flowing or wave disturbed water to produce ripples on the top of layers (a), best seen in cross section by the giant spider crab in the corner of the atrium. On occasions, the force of the water washed away some of the earlier underlying volcanic material producing uneven bottoms to the layers. In many cases these were accentuated by the weight of the coarser sediment causing it to sink into the underlying rather sloppy mud, to form load casts (b)





To explore and learn more about minerals rocks and fossils go to the Clore Natural History Centre on the second floor of the World Museum, William Brown St.

www.liverpoolmuseums.org.uk/wml/earth/

The Liverpool Geological Society

In December 1859, a small group of ordinary men met and agreed to form the Liverpool Geological Society. Today the Society flourishes, still composed overwhelmingly of ordinary people who have an interest in geology in all its many aspects—from volcanoes to floods, deserts and seas, mountains and glaciers, minerals, rocks and fossils.

The Liverpool Geological Society, ever since its first open meeting on 10th January 1860, has invited the knowledgeable and famous to come and tell all those interested in the wonders of the world and its even more amazing history, beginning some 4,600,000,000 years ago

Trips to sites of particular geological interest have also been a long standing feature of the Society. Much more recently, practical sessions in the laboratories of Liverpool John Moores University have enabled those wishing to gain hands-on experience, to apply a range of fascinating techniques to a wide variety of specimens and samples.

For more information about the Society please visit the web site

Joe Crossley spent his 42 year career as a Geology teacher and lecturer, latterly at LJMU. He has been the Honorary Secretary of the Liverpool Geological Society since 1969 and was President of the Society between 1983 and 1985

Hazel Clark works in Earth Sciences at LJMU and teaches night school classes for Continuing Education at the University of Liverpool. Hazel was President of the Society from 1997-1999

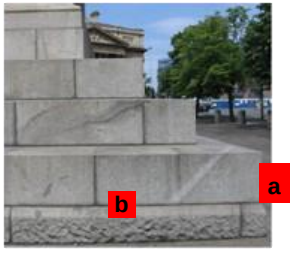
Liverpool Geological Society

www.liverpoolgeologicalsociety.org

ROCK AROUND LIVERPOOL

William Brown St

1. The rock forming the plinth of Wellington's Column was a very hot molten mixture (*magma*) which cooled deep in the Earth's crust. It has only been exposed at the surface after hundreds of millions of years of weathering and erosion. Containing a high proportion of silica (SiO_2) this granite from Aberdeenshire is made mainly of crystals of white feldspar (the commonest mineral in the continental crust), grey, glassy quartz and black biotite. Thin sheets or veins of aplite (a) and quartz occupy former cracks in the granite mass and represent the last part of the cooling fluid. The dark inclusions (b) in the granite (*xenoliths*) maybe inclusions of either the surrounding country rock into which the fluid magma was intruded or earlier solidified parts of the magma itself



2. On the surface of the steps a series of very narrow and shallow ridges and furrows, called *primary current lineation*, are formed in fast flowing water, parallel with the ancient current direction.

3. The bollards surrounding Wellington's Column are composed of a nodular limestone of Lower Carboniferous age (about 350 Million years old) from North Wales. **On the fountain side of the 5th bollard on the right of the steps (2)** is a large, *solitary coral.* Such corals grew vertically towards the light in clear, shallow, tropical seas; being unable to fix themselves to the bottom of the sea they tended to gradually fall over. The corals always resumed growing upwards and are therefore curved

4. On the fountain side of the 5th bollard on the left of the steps (2) *Colonial corals* originated from a single corallite which then branched over and over again to produce a small, tree-like mass

5. On the fountain side of the 5th bollard on the left of the steps (2) *Brachiopods* consist of two shells (valves) one of which in this case is strongly convex and in juveniles, sat on the muddy sea floor. Then as the brachiopod grew, the convex valve was gradually buried by accumulating sediment; the other valve formed a concave 'lid' on top of the animal. One end of both valves grew much more quickly to remain above the accumulating sediment.

6. Contrasting with the light coloured granite of **1,** much darker crystalline rocks are formed by the partial melting of rock below the crust of the earth. They contain much denser elements (such as iron and magnesium) than the granitic rocks of the continental crust. *Basalt* is black, *dolerite* is grey with very small (<2mm) crystals while *gabbro* is a mixture of coarse black and grey crystals. These rocks can be seen in the **cobbles and kerbstones outside the Walker Art Gallery**

7. Adjacent to St Georges Hall *Rhizocorallium* is the name given to horizontal U-shaped feeding burrows formed within the sediment, parallel with the sea floor, by shrimp-like creatures. As no body part of the animal is preserved, these are trace fossils.

8. The trace fossil *Arenicolites* is a vertical U-shaped living burrow produced by filter feeding, ragworm-like animals. These are preserved as pairs of rounded lumps on the surface of paving stones, as seen on the **pavement outside the Central Library**.