The rocks on Hilbre

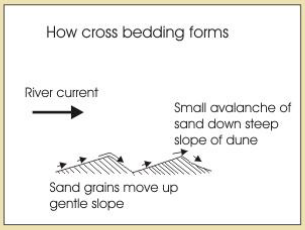
By Dr. ME Williams and TJP Williams

This desert view shows how Hilbre may have looked 230 million years ago. The rocks are sandstones and mudstones. They formed when this area was a sub-tropical desert. This area had a hot and dry climate, but sudden, heavy rainfalls caused periods of flooding in the desert. The map shows where you can find some of these rocks on Hilbre.

Rigs, such as those you can see as you look out from Hilbre, extract gas from sandstone, which is found 800 to 1100 metres below Liverpool Bay. Sandstone is the reservoir rock for this gas field. It is a good reservoir rock because it is porous and so oil and gas can collect in spaces between the sand grains in the rock.

Crossbedding in Sandstone

Sandstones are the remains of fast-flowing rivers that spread cross the desert plain. Sand grains were moved by the river currents and piled up in underwater dunes. The rocks show cross bedding where sloping layers of sand built up as the dune moved downstream.

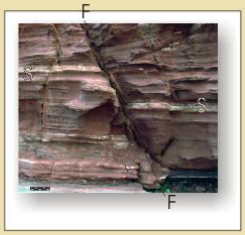


Flash Floods

A pebbly layer can be seen in the sandstones. This layer is made up of sand and angular pebbles of different rocks. This mixture was moved very quickly and dumped after a short distance as a result of a river flash flood.

Faults

After the layers of rock formed earth movements affected them. This happened as the European and African tectonic plates collided. The layers were tilted by 10 degrees towards the northeast. Rocks were then cracked and faults formed as the layers slipped along these cracks. These faults are shown by step-like patterns in the layers of sandstone and mudstone.



F — F Fault
S Pale sandstone layer

Mudstones

Mudstones are the fine muds left behind at the end of periods of flooding. Dinosaurs, such as Chirotherium (literally "hand animal"), roamed the muddy desert surface, perhaps looking for fresh water to drink in pools left after a flood. They left footprints where they walked on the soft mud. Sand washed into these tracks made copies of the footprints. Small burrowing animals also left vertical and horizontal burrows in these muds.

Chirotherium track

What a Chirotherium may have looked like.

Map of Hilbre

Further information

- The Department of Earth, Ocean & Ecological Sciences at the University of Liverpool offers degrees in Geology, Ocean Sciences, Ecology & Marine Science. More details at: www.liverpool.ac.uk/earth-ocean-and-ecological-sciences/
- GeohubLiverpool provides free Geoscience resources for teachers and students. More details at www.geohubliverpool.org.uk
- The Liverpool Geological Society aims to promote an understanding of geological themes for all with an interest in Geology. It runs a varied programme of talks, practicals and field trips. More details at: www.liverpoolgeologicalsociety.org