Glacial Till – Shankill

Written By Lucy Blennerhassett, 2017

Clay is essentially the product of rock breakdown and movement, which is happening right now all over the world and has done so for billions of years. Clay is what we refer to as the finest fraction contained within sediment, where breakdown of rock has occurred to such a degree that particles become so fine, they are able to stick togther in a cohesive manner, making them suitable for use in sculpture and art. The formation of clay predominantly occurs by processes of chemical weathering, where minerals within rock; when reacted with water, become hydrated and such a mechanism basically allows them to loose their previously less hydrated structure, so they transform into a new mineral; within the clay group. Clay is therefore a generic term referring to many types of very hydrated minerals.

At Shankill Beach in South County Dublin; large, 12m high cliffs dominate the coastal landscape. Mundane, brown coloured masses they may seem to some, yet, they have a story to tell. 'Glacial till' is another generic term used to collectively describe sediments layed down by moving glaciers. These overpowering cliffs are the result of widespread glacial cover over majority of Ireland and Britain during what is known as 'The Last Glacial Maxium', in other words the last period in time before today where ice sheets covered vast expanses of the Earth and dates back to 19,000 years ago. Conditions in the Northern Hemiphere were far colder back then compared to today's warmer temperatures, and these changes from cold to warm climate are cyclical throughout Earth's history and are particularly studied during the most recent period of time; known as 'The Quaternary'. This period dates back to 2.6 Million Years ago, a mere blimp in Earth's existance. These climate changes are primarily controlled by variations in the geometric relationship between the Earth and Sun over predicted timescales of many thousands of years which cause the amount of solar radiation received by the Earth from the Sun to change. Accompanying these variaitons in radiation intake, is the growth and retreat of vast glaciers and ice sheets; referred to as glacial and interglacial periods, respectively. So, the glacial till deposited at Shankill was delivered when the vast ice sheets across Britain and Ireland during a glacial phase some 19,000 years ago, retreated as the Earth began to move into it's new, warmer, interglacial phase of climate. We are currently living within this interglacial period.

Glaciers, as they move from regions of higher ground right down to the coast, take bits and pieces of ground up rocks and minerals with them. They may themselves, break down the bedrock beneath by shear pressure and force and allow chemical alteration by hydration, or they may just act as a way to transport already weathered material from the mountain tops. In this way, glaciers deliver a wide range of

material to the coast; from large boulders to pebbles, sand, silt and of course, clay. They hold much of this material with them as they travel and so when they begin to melt as they reach lower altitudes (and as climate changes) they dump this material in vast expanses, the length of their extent along the coast. So the cliffs at Shankhill represent the point at which these ice sheets shed all the sediment they have brought with them to give a deposit that contains variable types of components. In sedimentological terms we refer to this type of deposit as 'poorly sorted' where the size of sediment grains are highly non-uniform and clay represents the finest fraction, acting as the binding agent, holding all the other components like pebbles and boulders together.

So widespread were these ice sheets during the last glacial maxium that one will find most of ireland's ground cover blanketed by glacial deposits such as those at Shankill, one only needs to look at a cross section of the ground surface to realise it's presence right under our feet. Often the best outcrops however, are found along Ireland's East and South coasts where the ice sheets are predicted to have terminated as they retreated back from the sea.

So, the clay at Shankill within the glacial till cliffs has been on a journey. Some of it may have formed within the mountainous regions and was subsequently carried, although it is more likely that most was formed by the progressive breakdown of minerals within rock fragments as the ice sheets moved across Ireland. Some further clay may have been formed in place where the till was deposited or 'in-situ', where minerals continue to be hydrated and transformed.

As a whole, the cliffs here inform us of past environmental conditions and elude to us the history of glaciation across Ireland and the British Isles during the last phase of global ice extent on Earth. In this way, not only do they provide us with a knowledge of the past, but they also offer up an interesting and transformative material such as clay, suitable for extraction and use in creative industry.