

Geology and Industrial Archaeology of the coast of North Northumberland from Berwick to Holy Island

For those uninitiated in the field of geology, Elizabeth Devon gave a clear explanation, illuminating its links with landscape, soils, vegetation, land use, settlements, industry and climate, to a virtual audience of members and guests of the Glendale Local History Society.

Elizabeth challenged her audience to look around their home and identify anything that did not come from the soil – everything does - e.g. wood from trees with their roots in the soil, wool from sheep which eat grass with roots in the soil, china, pottery and plastics from minerals and petro-chemicals from the earth, mined ore for metal, etc.

Our industrial heritage developed from geological resources exploited by humans for millennia. During the Bronze Age, copper & tin were mined; the Iron Age and Roman periods saw further use of minerals, and our more recent Industrial Revolution made use of coal, lime, iron ore and much more.

How many of us knew that 500 million years ago parts of what now comprises the British Isles once lay south of the Equator only to drift north-east? Indeed it is still doing so! Since then this landscape has been periodically frozen under thick glacial ice – alternating with warmer epochs. Over time, shifting plate tectonics and huge earth movements have caused collision of rocks which became ‘folded’, and ‘faulted’, generally dipping to the south-east in this north-eastern coastal area.

Ice Ages are cyclical, with four having been recorded, the last one being some 12,000 years ago. During these periods of climatic change, sea levels rose and fell. When they fell, resulting deposits of sand and silt were carried by rivers, via deltas, to coastal areas, becoming compressed into sandstone and mudstone. High sea levels caused forests and swamps to become drowned, later compressed to form peat and eventually coal. Evidence of fossilised trees and tree roots systems can be found in local rocks (for example at the southern end of Spittal beach), whilst ancient corals, sea-animals and shells, having fallen to the sea floor, became compressed, creating limestone exposed during times of low sea levels. This historical building of layers of geological matter - predominately limestone, sandstone and mudstone, together with some coal - was all deposited horizontally and compressed into sedimentary rock - as a direct result of cyclical sea-level changes associated with climatic cycles of Glacial and Interglacial periods (ice-age to green-house!). A graphic timeline conveyed the context in terms of mankind’s relatively short existence , with the following discussion focussing on the Carboniferous era, about 320 million years ago, to which the rocks in this area can be dated.

Early examples of local geological influence include building historic Berwick Castle of limestone, and the Berwick Fortification Ramparts made from limestone and sandstone. C19th coastal industry, south from Berwick’s Cocklawburn, reveals evidence of extensive quarrying all the way down the coast. Limestone was not only quarried for building stone but also for making quick-lime, by fuelling lime kilns with layers of coal and limestone. Quarrying sandstone, limestone, aggregates together with coal-mining, extraction of clay and salt-panning, created thousands of jobs for men from a wide area, including from Ireland as a result of the potato famine. The work was hard and dangerous, using sledge-hammers and picks to hack out large pieces of rock by brute force, together with the exposure hazards involved with quick-lime. After centuries of use, these industries declined but remains can be observed as spoil heaps, scars, current settlements, place names, old lime kilns, and pits now made into nature reserves ponds.

Local industrial activities were totally influenced by the local geology, and our speaker gave a well-illustrated, enthusiastic, informative interpretation of this all-encompassing subject which, far from being static, evolves and gives life to all over the millennia.

