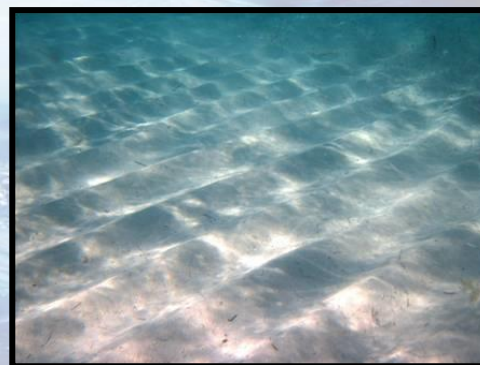


RIPPLE MARKS

Ripple marks are the fossilised remains of ancient water or wind currents acting on the sediment beneath them. Just like the ripples you find on modern beaches - these marks, preserved in the sediment are ancient records of the movement of water and wind against the sand.

The profile of the ripple, and whether it leans more one way than the other, allows geologists to determine palaeocurrent directions - in other words, which direction the wind or water was flowing from when the ripples were formed. This sample is a cast of a wave-ripple marked surface on some sandstone that was deposited in very shallow water. These ripple marks were formed in sedimentary Carboniferous sandstone that outcrops in Ramsbottom, Lancashire.

Caution – please don't pick the sample up, it's very heavy!



DESERT ROSE GYPSUM

Gypsum is a sulfate mineral which is precipitated during the evaporation of bodies of water. It can be deposited through evaporation of water from freshwater, sea water, hot springs and volcanic vapours.

'Desert Rose Gypsum' is the name given to a rose-like cluster of gypsum crystals which include abundant sand grains. This tends to happen in arid sandy conditions such as the evaporation of a shallow salt basin. When ambient sand is incorporated into the crystal structure, it causes the crystals to form in an array of flat plates which make the rock look like rose blossom. When iron oxides are incorporated into the mineral then the formation can take on a pinkish tone.



BRIMSTONE

Brimstone is an alternative name for elemental sulfur, a bright yellow mineral. The word 'brimstone' appears in the bible (as in 'Fire and Brimstone'), a reference to the acrid odour of sulfurous volcanic activity. Brimstone can be found near hot springs and in volcanic regions, particularly along the Pacific Ring of Fire.

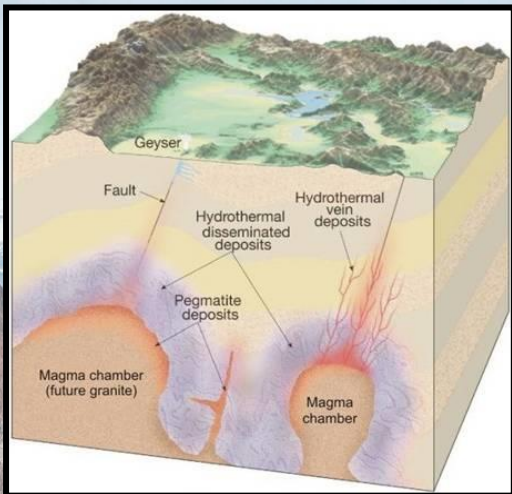
Brimstone is formed by the breaking down of other sulfate minerals such as mineral salts by anaerobic bacteria (bacteria living in the absence of oxygen, such as around volcanic hot springs). One of the more famous places that you can find Brimstone is at Yellowstone National Park in the US around the stunning Grand Prismatic Spring. Early travellers to this area described the site as a 'hot spring brimstone' and 'the place where Hell bubbled up'.



BORNITE / PEACOCK ORE

Bornite is named after Ignatius von Born, an Austrian mineralogist and palaeontologist. It is an ore mineral of copper, meaning that it contains sufficient amounts of copper for the metal to be extracted profitably. It is nick-named "Peacock Ore" because of its pretty, iridescent, tarnish to purple, blue and red.

Bornite is found in mineral veins that run through copper-containing ore rock. Copper ore minerals are often formed in hydrothermal replacement deposits. This is where hot fluids rich in water (hydrothermal fluids), which may be acidic, move through veins in a rock and are able to remove, change and replace minerals in the surrounding rock. The mineral chalcopyrite, a copper iron sulfide mineral, readily alters to form bornite in the presence of hydrothermal water.



CHALK

Chalk is one of the UK's most iconic rock formations, particularly in south-east England where it is visible at the famous cliffs of Dover and Seven Sisters. In London, important drinking water reserves are held in the chalk aquifer of the Thames Basin. Chalk is often highly fractured and so forms a natural subsurface reservoir for groundwater. A type of limestone, chalk is a white, porous, sedimentary rock. It forms under marine conditions from the slow accumulation of tiny calcite shells (coccoliths) that are shed from micro-organisms called coccolithophores. Chalk is more resistant to weathering than some other sedimentary rocks which means it can form the steep cliffs and ridges that we see along the south coast. Most chalk was formed during the Cretaceous period 100-60 million years ago when global temperatures and sea levels were higher than they are today.



TALC

Talc, just like the talc you use after a bath or shower, is most often found in the metamorphic rocks of plate boundaries that are moving towards each other (convergent plate boundaries). As the softest mineral in the world, Talc can be scratched with just a fingernail.

Water is required to make these deposits because it helps to dissolve and transport away chemical compounds. Talc is a hydrothermal mineral that forms at depth by hot fluids under pressure by altering other minerals. Heat is required because these chemical reactions take place much more easily if the temperature is higher. It also helps the water to move and rise through the crust, helping the alteration and formation of these minerals. This water can come from a variety of sources. It can come from magma, rain water that has become groundwater, it could be seawater that been subducted, or it could come from the minerals or rocks themselves.



MAGNESIAN LIMESTONE

Magnesian limestone, similar to chalk, is another carbonate rock which is prevalent in the UK. The most extensive outcrop stretches from Nottingham and into County Durham. The majority of the magnesian limestone in the UK is dolomite - which is a calcium magnesium carbonate, or reef limestone. Magnesian limestones are commonly formed in clear, warm, shallow marine waters from the accumulation of shell, coral and algal debris.

In the UK, magnesian limestone is one of the UK's principal aquifer rocks (a body of rock that can contain and transmit groundwater) and is of particular importance in the north east of England, where it is used for public water consumption.

