



TRESAYES QUARRY

Every rock tells a story! Or two or three



Cornwall

A tall story....

set in a hot soup millions of years ago

Long ago all this rock was deep underground, about 2 km down. Molten magma came up from deep in the Earth's crust and cooled to form granite. But a little was left over as a rock 'soup', full of super-hot water and rich in rare elements. This soup crystallised in a special way to form these enormous tall crystals of creamy white and flesh-coloured feldspar. In between the giant crystals the rest of the 'soup' crystallised: more feldspar (*redder, too*), grey quartz, shiny flakes of mica, long glistening black crystals of tourmaline and a few dull black crystals of cordierite. For geologists, it's still a granite, but a rather special one.

But this story was written long before men and women, long before even the dinosaurs, when Cornwall was near the Equator (*but that's another story!*).

Feldspar crystals

tourmaline

A detective story...

Can you work out which is the youngest rock?



Is it these crystals?



Maybe these?



Or this blob of quartz and other minerals?

A gritty, human story....

of miners and bal maidens

About 270 million years later all the rock covering this special granite had been worn away by erosion and people found these crystals. A hundred years ago this area was a hive of activity. Men and boys dug out the rock, and women hammered the blocks to leave only the creamy feldspar, the rest was waste. The feldspar was taken up-country for making glass or for glazing pottery. This quarry became known as **Roche Glass Mine**. A mine? **Yes**, the vein was worked underground as well. But right here you can see the steps the men stood on as they worked the rock-face. Then the blocks were taken to the women, the '*bal maidens*' (*below*), to get their hands on.

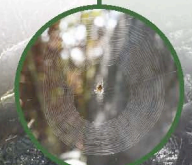


A caring, sharing story ...

in a nature reserve

Mining and quarrying ended. We don't know why. The quarry is now owned by Goonvean which extracts china clay from Wheal Prosper nearby. In 1995 the quarry was designated as a County Geology Site because of its importance. In 2001 the company leased the site - for one peppercorn a year - to the Cornwall Wildlife Trust for 25 years as a nature reserve. The Trust manages it so everyone can come to see the spectacular rock, *but it's also a haven for wildlife*. So we have only cleared the moss off two bits of the rock-face, and we've only cut a few trees to make a path and to let in light if you want to take photos.

The next story is up to you! so please don't hammer the rock face, or damage plants.



Want another puzzle? How did the miners work the rock? Why did they stop? Walk a bit further and look! We don't know why they stopped, but in places they certainly seem to have run out of the big crystals.

This project has received support from ALSF Partnership Grants through Delta's Aggregated Levy Sustainability Fund



In partnership with Goonvean Ltd., Cornwall Wildlife Trust,

and Cornwall RIGS Group.



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TRESAYES QUARRY

The plot thickens!



Cornwall

A tall story....

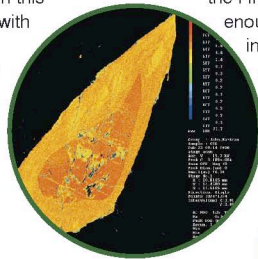
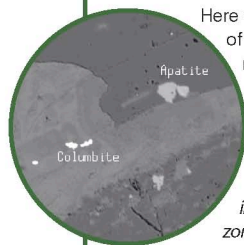
"Waiter, there's an exotic mineral in my soup"



But we need to follow the story from the beginning. The first crystals to grow from the geological soup were the enormous blades of feldspar **1**, up to 80cm long. Then followed the smaller, darker feldspar crystals **2** growing from the sides of the blades. In between the feldspar, crystals of quartz, mica, tourmaline and cordierite **3** grew. In places this is all cut by later veins of finer grained granite – and even this is cut by a speckly grey rock **4**, made of quartz and tourmaline, just like Roche Rock. This is the youngest rock in the quarry – and was worked for roadstone in an area now buried by clay waste.

These granites with very large crystals are called pegmatites by geologists. Pegmatites normally crystallise after the main granite mass and contain all the elements which did not crystallise earlier. Some pegmatites contain gem stones, others have minerals with rare metals.

Here we have tiny crystals of columbite, a source of niobium which is used in mobile phones. Far more exotic and valuable than tin! But you would not get rich on the amount in this rock: the image was taken with an electron microscope at Cambridge School of Mines (University of Exeter). *The image on the right shows the zoned distribution of iron in a single tourmaline crystal. Research is continuing.*



A gritty, human story....

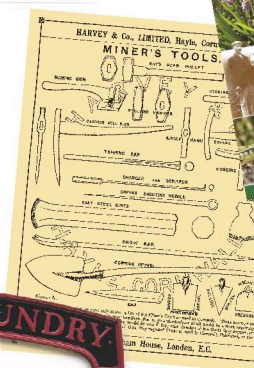
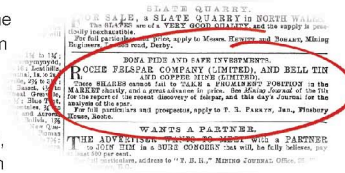
honest toil and speculators, boom and bust



There are two quarries here: an earlier one for feldspar and a later one for the dark, speckly rock, known to the quarrymen as 'blue elvan'. This was extracted until sometime in the 1930/40s.

It's impossible to sort out exactly the history of how, and where, the quarried rock was processed. At some stage a tramway was built on a ledge beside the stream and the broken feldspar rock removed to bal-maidens to separate out the valuable feldspar from the worthless materials. Later a tramway was also used to take blue elvan to the rock-crushers.

But we do know something of the history of the feldspar works from articles in the Mining Journal in 1879-80. In February 1879 shareholders were expected to "reap a rich and lasting harvest", and in August the journal had an advertisement offering a **bona fide and safe investment** in the Roche Feldspar Co. Ltd. The following February the mine was up for auction. In the First World War Britain could no longer import enough Scandinavian feldspar for porcelain insulators, so in 1917 Tresayes was re-opened and at one stage had a hundred workers. The earlier workers would have used hand tools like those in Harvey's of Hayle's catalogue, but maybe they got them from the nearer St Austell Foundry?



A caring, sharing story....

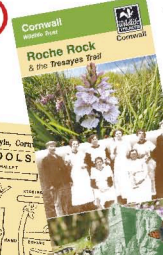
caring by killing? sharing everyone else's rubbish?

Left to itself this quarry would become impenetrable so just to maintain access we need to cut down some trees and shrubs. But we also need to decide why we are caring for this quarry as a reserve. In this case the geology is most important so we need to keep some of the rock-face clear - and give the crystals a wash and brush up every so often. The rest of the wetland is left alone. The path to the quarry is also cut back above the stream where the heather is growing.



But which plants, or habitats, do we value and want to encourage?

You can pick up a leaflet and follow the trail to Roche Rock.



We value this site for its geology and wildlife, but others see it as a good place to dump rubbish for free. What can we do about this?

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