

# Geology Matters

The newsletter of Malvern U3A geology group  
October 2017

## The leader

Delighted to say that we had a very successful Group's Fair again this year with over 20 new members signed up. My thanks go to the members of the Steering Committee who helped man our stall on the day and of course a big welcome to the new members themselves. We look forward to seeing you at our monthly meetings this winter and of course at the new members' introductory sessions which have already started under the guidance of Hilary Edgeley.

Well, after a false start at the end of September, we finally carried out our last field trip of the summer with the walk along the Hergest ridge. The 5-mile route goes from Kington, on the far side of Leominster, to Gladestry and traverses the border between England and Wales reaching a maximum height of 426 metres. The ridge has spectacular views across Wales in one direction and Hereford in the other. The weather was excellent, so it was possible to see the Malvern Hills to the East and as far as the Brecon Beacons and beyond in the West. The geology of the area is determined by the well know Church Stretton Fault which passes along the base of the ridge. Our group was fortunate to be led by Dr Geoff Steele, a local geologist with an unrivalled knowledge of the area without whom we would have missed so much interesting detail. Offa's Dyke passes along part of the ridge and another unusual feature are the remains of a Victorian racecourse on the very top used around the middle of the 19<sup>th</sup> Century. An area on the ridge was also cultivated during the last war as part of the 'Dig for Victory' campaign. In addition to Geoff, thanks must go to Richard Edwards who set up the walk and arranged for Geoff to lead us, as well as Richard Newton who managed the particularly complicated administrative arrangements for the trip.

Discussing the gabbro erratics on the ridge



It is with some regret that I have to inform you that we have had to postpone our overseas visit planned for next year. After the disappointment over the Barcelona proposal, we have now concluded that the plans to go to Tenerife were just too expensive. The main stumbling block being the cost of employing a commercial field trip leader. All is not lost and we hope to be able

to arrange a viable alternative trip to Fuerteventura in the Spring of 2019. In the meantime, we hope to arrange a UK based residential field trip next year.

So, it's now on to our indoor programme for the winter. The first lecture is on 11<sup>th</sup> October, entitled the Metal Mines of Spain by Robert Vernon who you may remember talked to us last year on the Metal Mines of North Wales. I look forward to seeing you again, usual place, usual time.

**And now for the serious stuff**



Groan. Oh well, just a small moment of levity before we get down to the indoor programme and its interesting and possibly challenging variety. In the newsletter we'll continue looking around for the unusual as well as the latest discoveries, and there are plenty of both around.

The Tour de France is an expression of how keen the French are on cycling, but it is probably something you have to experience in order to fully appreciate. It has even intruded itself into French geomorphology as you can tell from this picture of "The Velodrome of Esclangon".



The Velodrome is a large recumbent fold spilled southward, formed at the end of the Tertiary (23 to 5 MYA) at the Alpine front. It consists of a sedimentary series composed mainly of sand, sandstone and conglomerate (rock composed of pebbles welded by a rocky cement) produced by erosion of the Alps. This material accumulated at the foot of the reliefs in the Alpine sedimentary basin of Valensole, along which the fold of the Velodrome was formed.

### Wave goodby in Arizona



This is one of those places that you are more likely to see photographs of than visit. It is a fragile environment and access is controlled by a lottery permit system – it is also quite a hike too. Those beautifully sculpted rocks consist of intersecting U-shaped troughs that have been eroded into Navajo Sandstone of Jurassic age. Initially, infrequent runoff eroded these troughs along joints within the Sandstone. After their formation, the drainage basin, which fed rainwater, shrank to the point that the runoff became insufficient to contribute to the cutting of these troughs. As a result, they are now almost exclusively eroded by wind, as shown by the orientation of erosional steps and risers cut into the sandstone along their steep walls. These erosional steps and risers are oriented relative to the prevailing wind as it is now naturally funnelled into and through these troughs.

The Wave consists of sets of cross-bedded eolian sandstone composed of rhythmic and cyclic alternating grain flow and wind ripple laminae. The rhythmic and cyclic alternating laminae represent periodic changes in the prevailing winds during the Jurassic period as large sand dunes migrated across a sandy desert. The thin ridges and ribbing seen within the Wave are the result of the differential erosion of rhythmic and cyclic alternating grain flow and wind ripple laminae within the Sandstone. These laminae have

differing resistance to erosion as they have been differentially cemented according to variations in the grain size of the sand composing them.

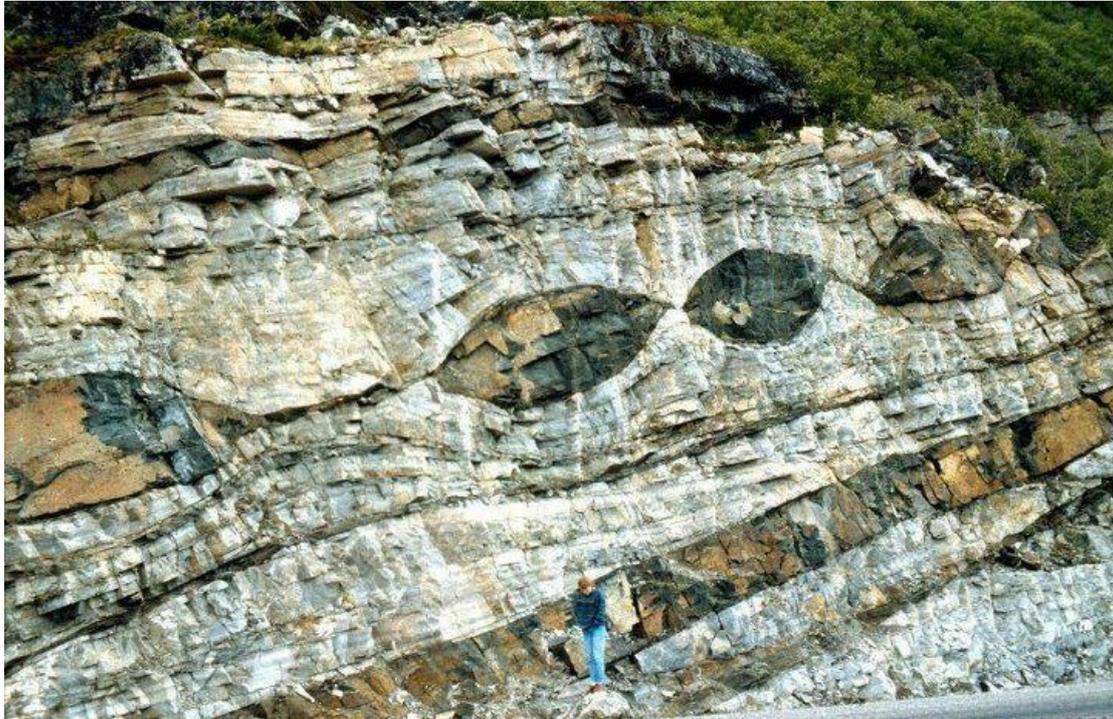
### **And on now to New Mexico**

To see another fabulous example of erosion. These surreal looking rocks are known as The King of Wings rock formation. A visiting photographer reported it like this – “The clayish hills that cover most of the wilderness are composed of thin layers of coal, silt, shale and mudstone with varying hardness and coloration, and are mixed with more resistant sandstone which has eroded into thousands of weird formations – hoodoos, ridges, arches, balanced rocks and small slot canyons. Many ravines created by rainwater erosion cross through the hills, which also harbour occasional caves and narrow fissures several meters deep. Much of the surface is unstable – the layers are often loose, rocks are crumbling and some of the formations are quite delicate, so hikers should take care not to damage the features; there are no established trails, but walking along the ravines and the valley floor is the usual way to explore. Petrified wood is scattered across the surface, especially to the southeast – sometimes entire tree stumps, with the bark and growth rings still clearly recognizable. Fossils may also be found, and the teeth and bones of a variety of large dinosaur species have been discovered embedded in the earthy layers.”



## **Boudin - well French sausages to you**

These curious structures are formed by tectonic forces which have caused the stretching of rocks, sometimes simply ribbon shaped, but on other occasions the more distinctive sausage shapes. These, in the un-attributed photograph, rather fall into the category of mega boudins. For scale, look at the figure at the bottom centre.



## **Rock of the month**



And quite an impressive one too. These are paradoxides trilobites from the mid Cambrian era. They are large to very large as trilobites go and the largest recorded is 37 cm long. Some of those in the picture can't be far short of that. The dealer who was offering this collection for sale was asking for £15,000

### Have you ever wondered

Where all those weird and wonderful names such as Pridoli or Messinian came from and how they fit into the geological time scale? Well your sleepless nights are over – here is the geological time scale and its sub divisions, and its sub sub divisions, oh you get the picture. Follow the link for a pdf file that reveals all in minute detail.

<http://www.stratigraphy.org/ICSchart/ChronostratChart2017-02.pdf>

### The Calendar

|          |    |                                                           |
|----------|----|-----------------------------------------------------------|
| October  | 11 | Monthly Talk: Metal Mines of Spain                        |
| November | 8  | Monthly Talk: Glaciology                                  |
| December | 13 | Monthly Talk: Malvern Hills Geology                       |
| January  | 10 | Monthly Talk: Effects of Meteorites, Asteroids and Comets |
| February | 14 | Monthly Talk: Speleothems                                 |
| March    | 14 | Monthly Talk: Turbidite Flows                             |
| April    | 11 | Monthly Talk: Plate Tectonics of Welsh Geological History |
| May      | 9  | Monthly Talk: The Devonian System                         |

### Who's who

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## Malvern U3A Geology



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