**Geology Group Newsletter – April 2020**

Looking back 3 weeks, may I thank Stephen Lay, who becomes the third speaker in a row associated at some time with the Camborne School of Mines, for his talk on his life as a mining engineer. Unfortunately, I was away, but understand that his talk was very different from the norm but gave a fascinating insight into his experiences in many different parts of the world.

Looking back a month and reading my last newsletter, life appeared to be moving forward as normal with us all looking forward to summer! It hardly seems credible now that there was no mention of the word Coronavirus or Covid-19! How things have changed!

**Coronavirus**

You will already know that, like everywhere else, we have cancelled all face to face group activity for the foreseeable future. We will start things up again once the Govt advice allows us to do so. The only planned activity with financial implications is the proposed trip to Antrim. Peter has discussed options with Easytravel and will be discussing with those involved about a way forward.

I have begun collecting ideas on possible things to do during this period of isolation. These have been published on the website (go to the Coronavirus menu button). I am open to any other ideas that we might include – please let me know. I am delighted to say the Geoff Carver will continue to produce Geology Matters as usual.

You may be aware that I am working with others to try and provide access to the Zoom video conferencing technology for all groups in the Malvern U3A who think that it may allow them to continue to meet virtually. For our group, we have already carried out one meeting of the Plate Tectonics group and I hope that we can do something for the whole group in due course. Ideas include arranging for talks to be given online and possibly the transmission of other videos and lecture courses. Zoom is easy to use as a meeting member; we just need to sort out the hosting arrangements.

In light of the above, may I put a challenge to you to do some research on any relevant subject with a view to sharing it with the whole group. This could take the form of a book review included in the Newsletter to a short presentation on a subject of your choosing. This is very easy to do on Zoom and you don't even have to see your audience!

**Miscellaneous**

With nothing else to report, please find below a variety of serious and not so serious items.

Try Alan Hughes' geology problem – answers next month!

Meteor Crater .... look how close it came to hitting the visitor's centre.

Tim Carter has offered to provide some short passages on the history of geology in Malvern. His first is below.

**Malvern Geology in the nineteenth century 1**
Leonard Horner walks the hills

Leonard Horner (1785-1864) was one of the founding members of the Geological Society of London and arguably the first geologist to study the Malvern Hills. In 1811 he published a paper in the first volume of the Society's transactions 'On the Mineralogy of the Malvern Hills' after staying a while in the town, walking the length of the hills, observing and collecting rock samples as he went along. The paper is free to download at https://trn.lyellcollection.org/content/transgsl/S1-1/1/281.full.pdf

It contains a few mistakes such as stating that the Herefordshire Beacon is the highest point but is mainly a detailed description of rocks and minerals, using the terminology of the time. The emphasis on fieldwork and detailed description was in line with the ethos of British geology of that time. But it does contain some interesting footnotes that go further and can be seen as a reflection of the education Horner received.

Horner was very much a product of the Scottish enlightenment. The son of a well to do Scottish linen manufacturer, he studied mineralogy and chemistry at Edinburgh and would have been familiar with the intense intellectual life of the city. As a geologist he was very much a bridge between the large canvas speculations on earth history of the previous century and the later approach of detailed field mapping and the sequencing of strata. Thus, his main text is about detail, while the footnotes indicate that his observations in Malvern aligned with the theories of William Hutton. Hutton was also grounded in the Scottish enlightenment and held the controversial view that earth was, in effect, without detectable beginning or end. These views were at odds with those then prevalent in the repressive 'post-enlightenment' church and state of Napoleonic wartime.

Horner was more than just a recorder of the geology of Malvern. He later went on to found the Edinburgh Academy (now Herriot-Watt University), spent four years as warden of what is now University College, London, did two spells managing the family linen business and then spent the latter years of his working life as one of the first four Inspectors of Factories. Here he was a major force in improving working conditions in the mills and factories of Britain.

But mineralogy and geology were lifelong interests of this polymath. He spent time in Bonn studying developments in Germany and even returned to Malvern at least once to take part in a meeting addressed by Roderick Murchison and also attended by Charles Lyell. But that is a story for another month!

**What's New on the Website this Month**

- Latest versions of the Newsletter & Geology Matters
- Published Coronavirus webpage
- Updated calendar

**Calendar**

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|---|---|---|---|
| July | 1 | Field Trip; Northern Malvern Hills | All subject to Coronavirus related cancellation! |
| July | 15 | Field Trip; Martley area | |
| August | 5 | Field Trip; The Building Stones of Ledbury | |
| August | 26 | Field Trip; TBC | |
| September | 15 - 19 | Field Trip; Antrim Coast – decision on cancellation or postponement pending | |

**Outdoor Programme Details** (Contact Peter Bridges for further details; Tel: 01684 540791)

### Field Trip to the northern Malvern Hills – 1st July

To examine the igneous rocks and structures typical of the hills. This will be based on walks proposed by Dr Dave Bullard.

### Field Trip to the Martley area – 15th July

The geology at Martley Rock is exceptionally varied, puzzling and of great scientific interest. Spanning over 700 million years it includes some of the oldest rocks in England. Walking from the entrance to the far side of the site you pass through five geological time periods. Amazing, in such a short distance! The main feature at the site is an exposure of the most northerly outcrop of the Precambrian aged Malverns Complex (around 700 MY old), some 15 kilometres north of the main Malvern Hills ridgeline. There are also, Silurian

mudstones, Carboniferous mudstones, siltstones and sandstones and Triassic sandstones. Quaternary aged sands, deposited sometime over the last million years, are also visible. Led by John Nicklin

### Field Trip to view the Building Stones of Ledbury – 5th August

A walk around Ledbury followed (if practicable) by a visit to one or more of the quarries that produced the building stone. Number are restricted to 12. Led by Kay and Brian Hughes.

### Field Trip in planning – 26th August

The glacial geomorphology of Shropshire/Northern Herefordshire/Teme Valley (TBC)

### Field Trip to Antrim Coast – 15th to 19th September

This trip is currently fully booked.

**Steering Committee**

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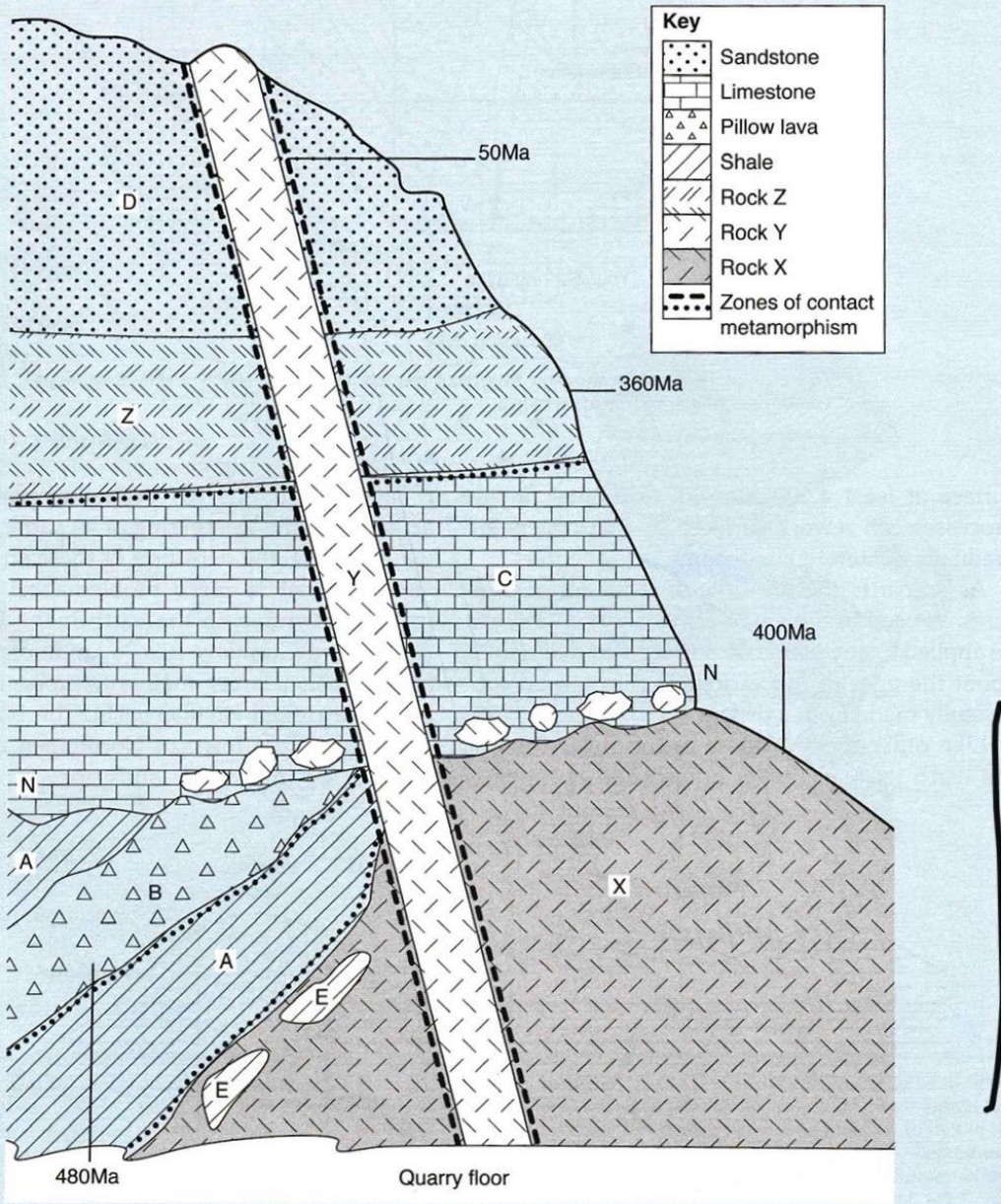
|---|---|---|
| Peter Bridges | 01684 540791 | ptrbridgs@gmail.com |
| Hilary Edgeley | 01386 462725 | hilary.edgeley@btopenworld.com |
| Robert Eveleigh | 01531 632947 | eveleigh.r@gmail.com |
| Mary Geffen | 01684 561890 | mary@geffen.plus.com |
| Jackie Gribble | 01684 565696 | gardeners1@btinternet.com |
| Dick Harris | 01886 880699 | richardlangleyharris@gmail.com |
| Roger Hunt | 01684 565926 | rmrhunt@sky.com |
| Maggie Smith | 01684 567278 | maggietoshsmith@gmail.com |

**Other Contacts**

| | | | |
|---|---|---|---|
| Christopher Wright | Fossils Subgroup | 01905 20920 | cnw48@outlook.com |
| Brian Dawkins | Landscapes Subgroup | 01684 573562 | db.dawkins@hotmail.co.uk |
| Alan Hughes | Malvern Hills Geology | 01886 880130 | alanhughes505@btinternet.com |
| Dick Harris | Plate Tectonics Subgroup | 01886 880699 | richardlangleyharris@gmail.com |
| Geoff Carver | Geology Matters Editor | 01684 560749 | geoffrey.carver@btinternet.com |
| Alison Simms | Library | 01684 565844 | geologylibrary@malvernu3a.org.uk |
| Gina Raitt | Library | 01684 575759 | raittgeorgina@gmail.com |
| Phyl King | Photographic Resources | | photoresources17@gmail.com |

Group Website: https://malvernu3a.org.uk/geology3/

## Questions for Problem 3 – A quarry face

The diagram represents a quarry face that exposes a variety of igneous and sedimentary rocks. By studying the field relationships between the various rock units, answer the following questions.

1. Give, with reasons, the names of the igneous bodies represented by X, Y, Z.
2. Using the radiometric dates determined for the igneous rocks and evidence shown in the quarry face, designate the geological age for sedimentary rocks A, B, C and D.
3. Comment on the evidence for the structural orientation of pillow lava B.
4. Igneous Rock Z shows extensive flow folding and autobrecciation. Comment on its likely composition.
5. Identify the nature of Rock E.
6. State the nature of the boundary N–N, giving two reasons.
7. Outline, in a series of statements, the geological history of the area (oldest first).