Geology Group Newsletter – December 2020

There are 2 votes of thanks this month. Firstly, to Dr Chris Davies from Leeds University who gave a talk entitled "Powering the Earth's Field over Geological Time" detailing current thinking at the cutting edge of the subject. I suspect that few of us watching were aware that originally there was no solid core as we know it today, it was all liquid. Also, that the solid part of the core will continue to grow until there is no liquid core and no electric field – fortunately, this will be far enough in the future to not worry any of us!

The second thanks goes to Alan Hughes, Peter Bridges and Jan Szymanski who provided an update on the progress to date of the Malvern Hills Geology (MHG) project. For those of us who may not have been involved very much in the project to date, this was a timely reminder of the huge amount of work that has already gone into this project, the professionalism involved and the contributions provided by many of our members. This is high quality work which will have a lasting impact on geological and natural history knowledge of our area. See below for a message from Alan as to how you could help and be involved in the project.

Our next guest speaker on 9th December is Dr Joseph Botting talking on Chinese Sponges/Fossils.

In addition, we continue the series called "The Origin and Evolution of Earth: From the Big Bang to the Future of Human Existence". These lectures are shown every week except when there is a monthly meeting. Details of the series and copies of the lectures shown to date will be published on the Talks page of our website. For those interested on follow up study – there is a free Future Learn course on the Moons in our solar system.

MHG Project – Message from Alan Hughes

First of all I'd like to thank you all for the interest that was shown in the project at last Wednesday's presentation. We have had a number of offers of help and we are actively following up those offers.

As Peter Bridges said, all of the walks and locations in the GA guide will require rigorous checking and re-checking before publication. We also expect that many more sites will need to be visited as we have expanded our study area and will be extracting reference locations from Dave Bullard's thesis too.
If you would like to be involved in these checking activities, I'm compiling a list of volunteers now so just contact me by my email below.

I said on Wednesday that I wanted to expand the list of sites and exposures in the study area and that during your walks on the hills and in the surrounding area you might like to fill in a site report form and take a photo or two and send in to me for inclusion in our database. You may think that the area has been photographed to death, but we want to produce our own, organised, comprehensive archive with very specific GPS locations and we're well on the way already from our Gazetteer checking. It doesn't matter if we already have a particular site listed because we want to build up a history of the changing condition of sites over the years and we have a lot of storage space on our server.

Below are links to a site inspection report form and guidance notes for you to use if you would like to join in:

- Site Inspection Form
- Site Condition Notes

Thank you all again for your support. Contact details for key team members are shown below.

Alan Hughes amhmerlyn@gmail.com
Peter Bridges ptrbrdgs@gmail.com
Jan Szymanski jan_szy@outlook.com

If you would like to see the quarry histories that Cheryl Stewart has been producing, then as they are completed they will be posted on our website.

Miscellaneous

Tim Carter's history offering

Harvey Holl, the first Malvern Archean

There was a new focus for Malvern geologists in the latter part of the nineteenth century. Fossil based stratigraphy had done wonders in explaining the younger rocks, but the question increasingly being posed was how to investigate rock formations that preceded the Cambrian with its many new forms of fossil life.

Dr Harvey Holl came from Worcester, one of the Holl family who had been newspaper and general publishers and printers there for several generations. He was a practising medical doctor in the area, However, he also had training in geology. He had worked in North America where he gained new insights on ancient rocks: rocks from before the Cambrian formed a large part of the surface of USA and Canada, notably the huge area of gneisses found in the Canadian Shield, which were termed Laurentian. Holl looked at Malvern with his thoughts informed by this experience. His technical competence in field geology had previously been honed by a period working with Henry De la Beche on the Geological Survey's mapping of Devon and Cornwall.

Holl was among the first investigators characterised by the late David Oldroyd, one of the doyens of the history of geology, as 'the archeans'. In the 1860s, most academic and survey work in Britain focused on fossiliferous rocks, but an eclectic band of serious amateurs were keen to explore the earlier ones.

Holl's studies in the Malverns concentrated on the relationships between the oldest fossil-bearing rocks present, the Hollybush sandstone, and the underlying formations. He noted an unconformity between the two in quarries on the southern hills and, based on this, placed the rocks at the core of the hills in a much earlier period and at the base of the stratigraphic column. He also studied the lithology of the older rocks and came to the conclusion, based on his North American experience, that like the Laurentian rocks, most were metamorphic. This was a major departure from the earlier received view that they were plutonic and igneous, but with some signs of layering in them. To Holl, the igneous elements were later intrusions into the main body of rocks, most of which were metamorphosed sediments.

These views led him to make analogies with the Laurentian rocks he was familiar with as well as with the Lewisian gneisses of north-west Scotland, which had already been considered to be of similar antiquity. At this time data from around the world suggested that there could be a single formation, fundamental gneiss, which was the basement for all the other more recent rock formations. Holl published his findings in 1865. He also gave a detailed presentation to local field clubs in 1866. Prominent local figures like Rev. Symonds were quick to accept his interpretation, perhaps in part because of the special cachet for Malvern from the presence of such old rocks, maybe even dating from the very dawn of creation! Other strong-minded geologists like Murchison were more sceptical when Holl presented his findings at the Geological Society.

Holl brought the Archean to Malvern. Later investigators developed and refined knowledge about the era that had recently also been christened 'Pre-Cambrian'. They brought new refinements in study methods with them, including the use of geochemical analysis and observations of rocks and minerals and their orientations and deformations as seen in thin sections under the polarising microscope. But that is for next month!

The latest invite from the West Midlands Region of the Geological Society is a lecture combining geology and wine growing. This is now a Zoom meeting - to reserve a place e-mail the committee.

Finally, as this is the last Newsletter of 2020, may I speed this year on its miserable way and hope that 2021 will eventually bring us a life much closer to what we might consider to be normal! With very best wishes for the festive season and however you choose to celebrate it, just stay safe.

What's New on the Website this Month

- Latest versions of the Newsletter & Geology Matters
- Updated Calendar
- Recording of Dr Chris Davies' talk and the MHG briefing, latest from the lecture series
- Quarry histories – Wynds Point quarry

Calendar

September on	Weekly	Lecture series: The Origin & Evolution of Earth
December	9	Lecture; Chinese Sponges/Fossils
January	13	Lecture: Geology of Mars
February	10	Lecture: Luminescence
March	10	Lecture: Tsunamis
April	14	Lecture: The 5MY That Saw the Birth of Modern Britain **Note: at 2.00pm**

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