



Newsletter

Minute samples come to life at a microscope session



Richard (standing) provides guidance as Dave Willis examines the contents of a slide.

(Image: Derek Turner)

By Derek Turner

Many of us had our first close-up view of microfossils at the September meeting where BGG member, Richard Hogg, brought along his microscope and several slides he'd prepared earlier. Using samples he'd obtained from the chalk at Kensworth quarry and the Shenley limestone from sandpits around Heath and Reach, he showed us a variety of fossils varying in size between 0.001 mm and 1 mm that are too small to study with the naked eye.

The diminutive size of microfossils belies their scientific importance as they can be used to track the development of life on earth, climate change and acidification of the seas which reduces the thickness of the shells of marine creatures. To prove their value and versatility, they have also provided forensic evidence in criminal cases.

Included in this issue:

Pg 1. Minute samples at a microscope session

Pg 2. AGM Update

Pg 3. Extracting Microfossils / Committee News

Pg 4. Broom Quarry South return visit

Pg 5. Geology Walk at Harrold Country Park

Pg 6. LGS Update / Focus on Deepdale Quarry, Pottton

Pg 7. Moroccan Earthquake

Pg 8. We finally get to Dunstable

Pg 9. Membership Info / Geology Wordsearch

Pg 10. Upcoming Events

Pg 11. Committee Info / Contact us

*Autumn shows us
how beautiful it is
to let things go.*

With BGG's microscope also in action, we were all able to examine many different examples of foraminifera, bryozoans from Kensworth Nature Reserve LGS, ostracods, Shenley Limestone brachiopods and even shark's teeth and dermal denticles, the 'scales' of a shark.



Paul and Diane get their eyes in.
(Image: Derek Turner)

Fact File: Microfossils

- ⇒ Every kingdom of organisms is represented in the microfossil record.
- ⇒ Microfossils are most common in sediment that forms beneath water.
- ⇒ Study of pollen and spores is called palynology.

AGM Update

By Derek Turner

The 19th AGM of Bedfordshire Geology Group took place in September in what must be Bedfordshire's most historic village hall in the village of Chalton. Occupying what was a once a tithe barn built in 1561, the hall has a structure of fine oak beams that are visible on the inside. The venue was suggested and booked for us by Tom Hose of the Geologists Association who lives nearby and attended by 9 members and 2 non-members.

After a short resume of activities from the last 12 months and reports by officers, the meeting elected a committee for the year ahead that is comprised of previously-serving officers Glynda Easterbrook, Paul Hughes, Diane Sutherland, Bev Fowlston and Derek Turner. Also elected was Em Fowlston, who will take over from Bev as Digital and Communications Officer. There is a list of committee members on page 11.

The agenda included an item that modified the constitution to ensure that the Group could continue to function with a smaller committee than was envisaged when the group was formed when it had a larger and more active membership. In future, the committee will be able to meet if it has as few as three members rather than the seven specified previously.

Looking ahead, we have events organised until the end of the year and Tom suggested a joint event with the Geologists Association and helping with a Student Conference taking place in May. Bev pointed out that this will be the Group's 20th year and we should consider doing something special.

Extracting Microfossils

By Bev Fowlston

Richard Hogg, our speaker, and demonstrator for the evening, is a self-taught micropalaeontologist who specialises in microfossils. He first discovered and collected microfossils in the 1970s from a local quarry near to where he lived. Richard gave us a fabulous presentation on how he extracts the microfossils from the Chalk and other sedimentary formations across Bedfordshire. He has examples of microfossils from Shenley Limestone, a rare outcrop near Heath and Reach that represents a condensed ferruginous phosphatic deposit rich in brachiopod fauna, as well as some Gault Clay and Chalk specimens.

Samples are obtained from various sources including directly from a face or outcrop, sandy beaches, or spoil heaps. The samples are then sieved through graded sieves using clean water. Further cleaning using an ultrasonic tank is often needed. This shakes off any clay particles that are left attached to the microfossil. The microfossils are then put into a drying tray before being mounted onto glass slides or stuck with weak PVA glue to gridded slides. These can then be examined under a microscope. The microscope to use needs a x5 or x50 objective with good lighting to see the 3D fossil in detail.

Photographing the microfossils can be complicated but Richard has been able to set up a camera to take images but emphasises this is a difficult and expensive process.



An example of graded sieves.

(Image: Google Creative Commons)

Committee News!

News from the Committee

By Bev Fowlston

In August the committee held their usual meeting via Zoom. Various points were discussed and minuted including the Zoom account which it was felt we were unlikely to use and would no longer be cost-effective, the need for an updated geology trail of Bedford Town Centre; and a necessity for better and up to date promotional material to be used on our various outreach and publicity events that we attend or hold each year.

Our finances are still healthy, and we will use some of the funds for the Bedford geology trail and the promotional materials mentioned above.

Discussions on our LGS was undertaken and monitoring of these are progressing well.

A review of recent events was undertaken and discussions on the next events was held with ideas for next year in the early stages of planning.

Do get in touch in the normal way if you feel you can help out.

Broom Quarry South return visit

Photos and Article By Derek Turner

It was a local man, Frank from Langford, who was our guide for the BGG visit to Tarmac's Broom South quarry in July. He has worked in many Bedfordshire pits over the years and would have been operating a 60-tonne digger at the quarry face had it not sustained a fault that put it out of action. His experience of working at the site certainly enriched our visit.

Since we last went there in 2020, the quarry has changed considerably with new areas being worked but we were unable to visit them for safety reasons. Places where digging had been completed earlier presented a surreal landscape of 'badlands' that filmmakers might use for a post-apocalypse movie. Areas that were partially flooded though were attractive and seemed to be developing into ideal habitats for ground-nesting birds.



Frank explained that the conical heaps were formed when he dumped some of the reddish-brown clay that contaminated the gravel. If too much of it was put on the 'lines' as he called them- conveyors to you and me- it would gum them up and bring them to a shuddering and expensive halt. Usually, the clay is present in small quantities but in one area we saw a 50cm thick lens of it, around 50m across. It was decided to leave it in place, along with the valuable gravel that lay underneath. Beneath this is 100-million-year-old Gault Clay which is noticeably blue on the rare occasions that Frank uncovers any, but which quickly weathers to grey.



Also left undisturbed was a bank where sand martins were found to be nesting. The one-metre-high vertical face above eroded material proved to be the best place for us to get a close-up of the undisturbed geology. We saw undulating seams of partially-graded material that included rounded and angular pebbles and gravels. Much was composed of flint of a much paler colour than we see in the Chilterns which probably came from Norfolk. Finer sands and silts were also present but cutting vertically into all of this were pipes of clay-rich material that appears to have replaced melting ice wedges. Fossils we found included sea urchins, belemnites and gryphaea.



The site of the quarry has had a turbulent recent history and a tributary of an early version of the Thames probably ran through here leaving deposits on its flood plain before a series of Ice Ages began over 2 million ago. We saw floodwater from melting glaciers further north would have swollen it as it headed for a gap through the chalk hills to the south. At the peak of the Anglian glaciation, ice from Norway covered the area and deposited more material and churned everything up further. Nowadays, the River Ivel flows past the east of the site in a northerly direction but is clearly a misfit in its large valley. In its current form, it is unlikely to have had any influence on the site's development.

As we prepared to head back to the car park, one of our party made the find of the day - a prehistoric flint hand axe that, judging by its patina, had lain buried for at least a quarter of a million years ago. Concentric marks of percussion were clearly visible proving that it had been 'knapped' by breaking flakes off a large flint.

We finished our visit by climbing one of the huge stockpiles that keeps the processing part of the quarry going when Frank's digger is broken. We saw the huge machine that washes and grades the material to make saleable products, surrounded by an array of conveyors that feed its insatiable demand and others that carry the finished products away. It was quite a day to be frank.



Geology Walk at Harrold Country Park

Photos and Article By Paul Hawkes

On Wednesday 9th August, Derek Turner led a geology walk for Bedfordshire Natural History Society. The trip was extremely well attended with 11 members of the BNHS present. Unusually for this year, the weather was also glorious!

The group met at Harrold Country Park, where Derek initially outlined a geological summary of the area. In this northern part of Bedfordshire, Derek explained how the bedrock geology is comprised of limestones deposited in a nearshore/shallow marine environment during the Middle Jurassic, approximately 170 million years ago. These limestone rocks were originally quarried and provide the characteristic building stone for Harrold church and many of the older houses in Harrold and the surrounding north Bedfordshire villages.



The 'Lockup' at Harrold



Geology Intro above the Great Ouse Valley near Chellington

Derek explained how the bedrock geology becomes progressively younger towards the central and southern parts of Bedfordshire due to a southerly dip of the beds of only a few degrees. In the Bedford area, the Middle Jurassic limestones are overlain by Upper Jurassic marine mudstones which were extracted for brick making. Overlying this, the Early Cretaceous sandstones of the Woburn Sandstone Formation form the prominent Greensand Ridge.

The Chilterns in the southern part of the county are formed by the Chalk, a very pure form of limestone deposited in deep marine conditions.

Following on from this introduction, the Group walked across Harrold Bridge spanning the river Great Ouse and walked eastwards onto a ridge overlooking the Great Ouse floodplain. Derek explained how the river would have been much more extensive and of considerably higher energy following the end of the last glacial period when water from melting glaciers led to the deposition of fluvial-influenced glacial deposits, which are widely developed in this area. Evidence for the wider extent of the river is indicated by the presence of a preserved river terrace along the margins of the current floodplain.



Derek at the lakes, Harrold Country Park

The Group walked towards the village of Harrold. It was shown how Harrold church was built predominantly from Middle Jurassic limestones. It was explained that these limestones were often highly fossiliferous, comprising shell and coral fragments. Commonly, these limestones exhibit an oolitic texture, indicative of calcite secretion from sea water around a sand grain or fossil fragment nucleus.



Group photo at the end of the walk

Further examples of these limestones for building purposes were illustrated at the mill house along the banks of the Great Ouse, and in the centre of Harrold at the village lock-up – historically once used for the temporary detention of drunks and villains awaiting trial in front of local magistrates.

The walk was concluded back in Harrold Country Park, where Derek explained how the lakes in the park were originally quarries, where gravel extraction took place from the end of the 2nd World War, up until 1980.

Many thanks to Derek for providing such an insightful trip – it was very well-received by all the participants – particularly from the members of the Bedfordshire Natural History Society who turned-out in force for this excellent walk.

LGS Update

By Bev Fowlston

As we go to press, the following sites have been monitored over the last couple of years: Barton Hills, Kensworth Nature Reserve, Landpark Wood Quarry and Potton Scout Hut Quarry. We are in the process of completing the paperwork of four other sites that have been monitored recently. These are Ouzel Valley; River Ivel, Biggleswade; Sandy Warren Lodge Quarry and Potton Scout Hut Quarry. Over the next year we need to monitor and complete paperwork for the following sites: Old St Mary's Clophill, Deepdale Quarry, The Pinnacle Sandy and Stockgrove Country Park.

Over the next year, the four sites that still require monitoring will be visited and assessed. Watch out for events related to these monitoring visits and come along to find out how and what we do on a monitoring visit.

Focus on Deepdale Quarry, Potton.

By Bev Fowlston

Deepdale Quarry situated near Potton was first designated in January 2007. BGG first visited the site in December 2007 (Image 1). Since then it has been reassessed a couple of times. Unfortunately it is one of our sites that has declined over the years and is now being considered for de-designation. But let's have a look at some of the reasons this site was designated in the first place.

On the designation form it is clear why this site was chosen: *"The site provides a good exposure of the Lower Cretaceous Woburn Sands Formation in a near-continuous low cliff face that is partially obscured by recent slumping. Vivid orange-brown sands and sandstones arranged in multi-storey, tabular cross-beds predominate. A wide variety of other features are present, such as ripples, clay drapes, channels, slumps, pale leached horizons, pebble beds and 'boxstone' concretions. Spectacular trace fossils are well preserved, as are complex patterns of iron staining caused by the mobilisation of iron-rich fluids. An ecological succession can be demonstrated in various parts of the quarry as the bare rock becomes progressively colonized by plants."*



BGG members admiring the sedimentary features in the cliff face Dec 2007.



Bedford College Students pictured in front of the partially landscape face in 2008.

This site was originally a quarry for sandstone and loose sands but has long been unused for this purpose. In more recent years, it was used as the local tidy tip before being partially infilled. The site had provisional planning to be turned into a camping ground, but this was rejected in 2010-11. Since then the site has been used for different purposes by private owners including a shooting range and a BMX and mountain bike venue. Currently it is unknown who owns the site and what their plans are for it.

The most recent visit that BGG undertook was several years ago when the site had been partially landscaped (Image 2) and many of the interesting features covered up. Features that were still visible were in very poor condition and it is this reason that this site, sadly, may no longer be suitable as an LGS.

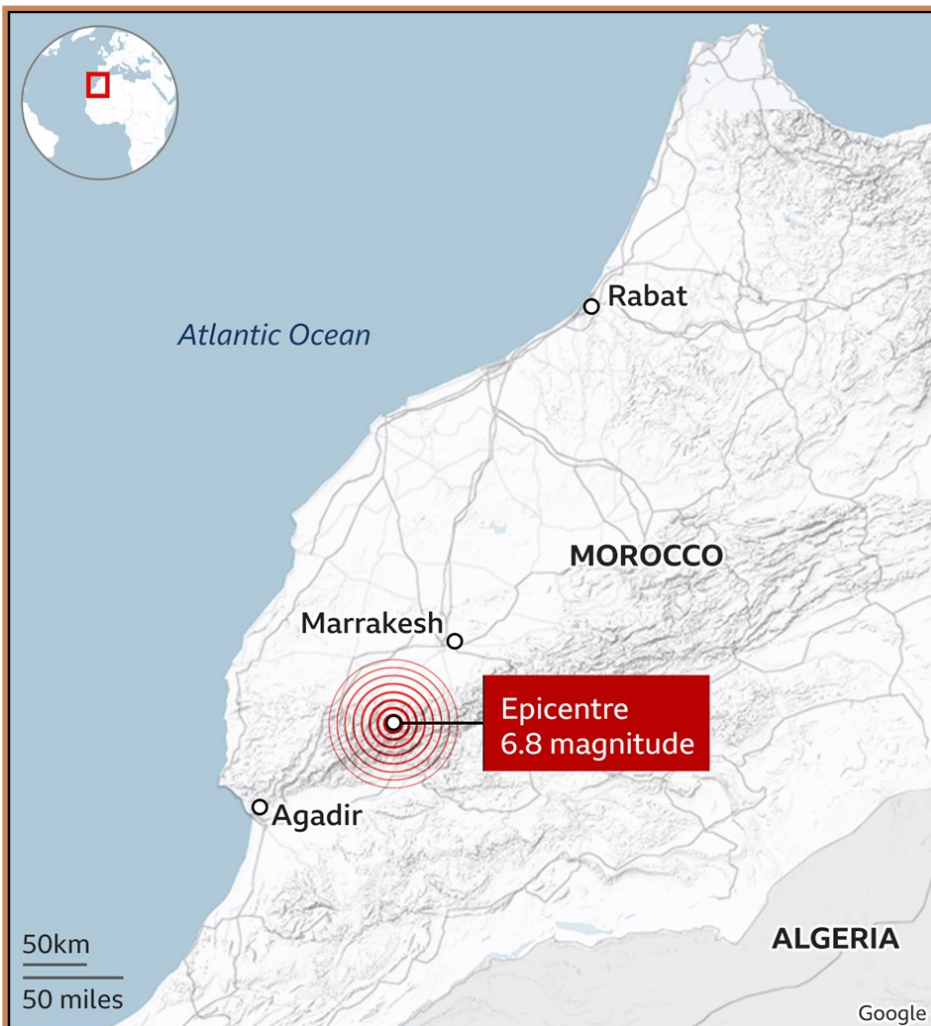
Moroccan Earthquake

By Glynda Easterbrook

Just after 11pm on September 8th, Morocco was struck by a devastating earthquake of magnitude 6.8 in the High Atlas Mountains, shaking homes and causing thousands of deaths and widespread damage. Its epicentre was 44 miles southwest of Marrakech near the town of Adassil, in Al Haouz province. According to the US Geological Survey, the focus of the earthquake occurred at a depth of only 11.2 miles (18 km) below the surface, producing much stronger shaking at the surface than it would have had it been deeper. The main shock was followed by a magnitude 4.9 aftershock about 20 minutes later. Latest figures from the Moroccan government, estimate the disaster to have claimed over 3,000 lives and left thousands injured, but due to the destruction of the local infrastructure, the true toll may be set to rise. The earthquake and its aftershocks heavily damaged parts of the ancient parts of Marrakech and was felt as far away as Casablanca, Morocco's largest city, and in Portugal and Algeria.

The epicentre of the earthquake was located within the northwestern part of the African Plate whose boundary with the Eurasian Plate descends beneath the western Mediterranean Sea. The African Plate is moving north at 4–10 mm per year, but at the site of the earthquake, the African Plate is moving in a W-SW direction at about 3.6 mm per year. This complex compressional and shearing environment has produced a tight cluster of faults beneath the High Atlas Mountains. The buildup of compressional stress forced one side of a reverse fault upward with respect to the other. Initial estimates suggest that the upward-moving block was raised up to 1.7 metres along a 30-kilometre section of the fault.

In the aftermath of the earthquake, the Moroccan government was criticized for its management of the disaster recovery, and survivors grew impatient with the perceived lack of effort to bring in relief supplies or search-and-rescue teams to reach those still trapped in the rubble. The Moroccan government faced additional criticism for its decision to accept disaster recovery assistance only from certain countries. The government stated that this decision was made to avoid complicating ongoing relief efforts with traffic bottlenecks on the limited road network within the earthquake zone. The government later clarified their position, stating that all aid was welcome, but it needed to enter the country through proper channels to allow for coordination in the most efficient manner possible.



We finally get to Dunstable

Photos and Article By Derek Turner



After Covid, the risk of lightning and family commitments had conspired to prevent our presence in previous years, Bev, her husband Steve, and I finally got to attend this year's Dunstable Festival of Archaeology at the end of July. Blustery winds swirled around the site and prevented stallholders from erecting mini marquees for safety reasons and battered our pop-up sign. With the Downs towering above the town and our stall situated close to Dunstable's historic, Totternhoe Stone church, our display concentrated on examples of rocks, fossils and prehistoric tools associated with chalk.

As snatches of live renditions of Hungarian, African and Jewish music from the simultaneous Around The World event wafted past in the breeze, a steady stream of visitors stopped at our stand and we enjoyed some lively conversations. We also had some interesting neighbours. On one side were staff from Historic England who have overseen several archaeological surveys and excavations on the adjacent site of the medieval Priory in recent years and were presenting their findings in the form of artefacts, plans, drawings and models of what was once there. On the other side, a lady was making historic snacks and our proximity led to us being the lucky recipients of a range of tasty morsels from ancient Rome and medieval England.



Behind us, men dressed in animal hides posed, chanted and occasionally engaged in mock prehistoric battles. Meanwhile, 'Memma the Cavewoman' was using hammer stones or pieces of antler to strike a large flint and break off chunks to make something useful. I've found pieces of knapped flint during archaeological work in the past and it was fascinating seeing first-hand how sharp or pointed stone tools could be made. There was also a lot of waste material, some of it no doubt due to a fault that ran through the flint but was not visible on the surface. Memma is part of a team called Prehistoric Experiences that visits birthday parties and schools to teach children about Stone Age life and has had many years of experience working with flint. Even so, jagged shards sometimes flew off in unexpected directions and I wondered how many eyes had been lost during similar work in the distant past.

Meeting Memma was one of those fascinating but unexpected things that occur when you take part in occasions like this. It was a day well-spent and a useful reminder of how important it is to take geology to the people. We must look for more events like this to attend in the future.



Membership information

Memberships are due on April 1st each year. They remain at £10 per person per annum or £25 for group membership (organisations with 4 or more employees).

If you wish to pay online directly to the BGG account, contact treasurer@bedfordshiregeologygroup.org.uk for details.

Please email membership.secretary@bedfordshiregeologygroup.org.uk to let us know you have paid.

If you are unable to pay via online banking, cheques can be sent directly to the treasurer at the following address: BGG Treasurer, c/o 9 Latimer Close, Wotton, Beds MK43 9QA.

Please let the membership secretary know, via email, of any changes in address, telephone no, email etc.

Your membership entitles you to 4 newsletters a year, free entry to all BGG events (non-members pay £2 per event to cover insurance), walks & talks and frequent communications.

Quick Geology Brainteaser

Answers from Summer 2023

Geological Word Scramble

1. Ochre 2. Catchment 3. Microplate 4. Escarpment 5. Daughter 6. Richness 7. Head 8. Barchan 9. Terrace 10. Gault

Bedfordshire Geology

Q E C A G S A N D S T O N E V L R Q L Y K L Y S
A C S L K M K M W A D Y E M S Z E R E M M B A I
H E G L D D G Z J F B Z N E G F E A N H G X G J
W B E U B H S A R B N R O C T A H A O T S L V D
F O B V E W G H P H Y T X B D V K T T A D K H H
D P B I G J S S E X L Q M I C P X Q S C E S O Q
R K S U E T L A C I O U N Z J G J N E P I Z L J
Q M D M R N G A M F P G C F C L F X M J I L L H
Z J Y Q A N K Z W P B M H R A R J A I B C B I M
C H P X E I S Y S E T R K R J B J W L B W V T C
W N F Q T W K A D N S H E A B F Q V C F O F U C
H V U D O N N S N F O N I E R Z U M I N G T H G
A R I S R M E U D D I R R L A U U X T S Q A P U
Z I F B R M P M M M S P O X L S F X I E L L G O
I M B U H A X T P B R F T Q D C E Z L K Y I X J
D M H S U Z S G B R L H O I D P L V O O Y F M X
Q R D V A J A E S I A B N R R L P A O C O C D F
C T Y A O U R W M T J C D V M L G W Y R C R K Z
A R E V L M G V P T N F S R P A K P D J A W A S
W X D T A F F C I C S R E E M F T C R T E I O G
I Z V O V L U M Y A U I N G U F L I X R Z O K Z
V E D S H P L M S F C D O Z Q A E U O R G G B R
J K Q E N G R E E N S A N D Y V L X H N T O E V
D X Q G E T F Q Y J R V E B Y W E C G P O F A K

Alluvium

Cornbrash

Gault

Oolitic limestone

Sandstone

Amphill Clay

Dry valley

Greensand

Oxford Clay

Till

Chalk

Escarpment

Mineral

Reading Beds

Woburn Sands Formation

www.bedfordshiregeologygroup.org.uk

Upcoming events ...

Please join us for these planned events, details are available on the website or check out the regular emails from Derek.

**Book your place by emailing the event organiser or
secretary@bedfordshiregeologygroup.org.uk**

Monthly get-together : We have stopped monthly zoom get-togethers as we have returned to face-to-face meetings, please email the secretary for further details - Next one **19th October 2023**

Sat 7th Oct, 10am: Leighton Buzzard Annual Fun Palace

Organiser: Bev Fowlston, Diane Sutherland

Sun 19th Nov, 10.30am: Bedford Geology Trail

Organiser: Derek Turner

Thurs 7th Dec, 7.30pm: Annual Social

Organiser: Paul Hawkes

If you can help to plan, organise and run events then please do get in contact.

COVID-19 UPDATE

All events are arranged with risk assessments including Coronavirus. Should Government guidelines change prior to the event and we have to cancel or postpone, we will inform you via email. All face-to-face events must be booked with the event organiser or our secretary.

Please let us know if you have other places or events you'd like to include in this schedule. You will receive an email on each of these events nearer the time with exact details so keep watching your emails and check our website.



Committee members Paul Hawkes and Diane Sutherland teaching young people about Geology, just some of the interesting activities the committee gets up too.



BGG Committee: Join us!

Our current committee members are:

Acting Chairperson:	Derek Turner	derek.turner@phonecoop.coop
Group Secretary:	Derek Turner	derek.turner@phonecoop.coop
Treasurer:	Bev Fowlston	bev.fowlston@gmail.com
LGS Coordinator:	Bev Fowlston	bev.fowlston@gmail.com
Membership Secretary:	Vacant	
Affiliated Groups Liaison Officers:	Paul Hawkes	paulhawkes04@gmail.com
	Glynda Easterbrook	glyndaeasterbrook@gmail.com
GCLP Rep:	Derek Turner	derek.turner@phonecoop.coop
Website/Social media/Newsletter editor:	Em Fowlston	e.c.fowlston@gmail.com
BNHS Recorder:	Bev Fowlston	bev.fowlston@gmail.com
Events Coordinator:	Diane Sutherland	diane_sutherland1@yahoo.co.uk

We are always looking for new members to join the committee and bring fresh ideas.

Please contact any of us if you'd like to join our friendly team.

We meet for quarterly meetings via Zoom.



Newsletter compiled and edited by Em Fowlston.

If you wish to include an article, photo or share your geological interest in the next issue, please contact me by email at

e.c.fowlston@gmail.com

Deadline for copy is 20th December for inclusion in the next issue.

Hope you enjoy the read!

Please look at our website for news of walks, talks and events. It's easy to download flyers & geotrails.

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