

Winter 2014

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Newsletter

Planning the Group's Future

By Chairman Peter Lally & Henrietta Flynn

AS members of BGG, have you thought of what the Group's future could be?

Your committee discussed this at a recent meeting, and whilst it is felt the Group has achieved much in recent years, future growth requires a more proactive approach to promote and develop the geological interests of the Group within Bedfordshire.

We currently maintain our LGS sites, hold events, create leaflets and interpretation boards and are operating a successful projects plan, but maybe now, we should seek other ways to promote the group and lead it into the future.

We would like to involve more young people with fresh ideas to balance and complement our mature membership. To this end, we see a need to promote the BGG to a wider audience.

There are a variety of ways in which this can be done. We can market our group through advertising, education, public relations and improve our relationship with other groups and societies which share our passion for the environment and geodiversity.

We can share more events, promotions and projects which benefit all parties. We can share resources and provide mutual support.

We see better use of our website and social media to improve public communication. We see this newsletter as a means of 2-way internal communication and we would like you all to contribute more with letters, news and views.

Our forward planning task is both short and long term, built on strong foundations of how the Group will operate, making it easy for others to take the Group forward. We will be defining clear Terms of Reference and bench marks so that we don't deviate from our objectives. We hope to better share our project planning with our members so that more of you can get involved.

Planning our future needs to involve the ideas, expertise and energy of our members. In our committee meeting we tossed around various thoughts about our future aspirations, but we would really like to know what you, our members think about our future.

Possibly you have experience or skills that you could contribute. If you would like to become involved, or just want to know more about our planning, then please contact me, or a committee member. Better still let's talk at the Xmas Social on December 12th.

Peter Lally

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BGG Visits University of Oxford

November 20th by Henrietta Flynn

Twelve of our BGG members met up at Oxford's Pear Tree Park & Ride for the bus into Oxford. After refreshments in town we made our way to the University's Earth Sciences Department where we were met by Relations Manager Claire Grainger. The impressive building complete with hi-tech heating & energy saving environment systems is only 4 years old and provides optimal facilities for its students and academic staff.

Our tour of the department began with the teaching labs where we could view the rock, fossil and thin section drawers and the map storage units. Down in the basement we toured the electron scanning microscope rooms, the palaeomagnetism lab and the rock cutting, crushing and thin section prep labs.



Our specialist lecture was given by PhD researcher Chris Day on '*Reconstructing climate through speleothems*' (or cave stalactites & stalagmites if you prefer!). Traditionally climate fluctuations have been studied by measuring oxygen isotope levels within air bubbles in glacial ice cores or benthic marine cores. But other significant methods include dendrology, palynology, and speleothems. Chris explained that increased growth rate indicates an increase in temperature and that the O₂ within gives a good record of climate change with trace elements determining source. Current research indicates significant changes in O₂ isotope levels from speleothems in China, Greenland and Chile to suggest a significant global climatic event occurred around 8,200 years ago.

Leaving the Earth Sciences Dept we turned the corner to see the impressively architected [Oxford University Museum of Natural History](#). Here our guide was the museum archivist Kate Santry.

We were brought into a reading room for a private viewing of the [William Smith workshop](#).

Next year marks the 200 year anniversary of his first geology map. As the 'Father of English Geology', the museum is working on a new collection. We



were given access to his meticulous notebooks, personal letters, diaries and maps. Smith had worked extensively in Bedfordshire so Claire laid out an early Bedfordshire map which he had annotated with hand written scribbles

and notes. Our group then spent time viewing the other highlights of the museum which included the large T. Rex skeleton and wonderful collections of minerals, fossils, insects, birds etc.

Dinner at The Kings Head provided much needed sustenance before our evening lecture back at the Earth Science Dept. This lecture by Prof Tamsin Mather, '*Volcanoes: agents for global change?*' was hosted by The Oxford Geology Group. Tamsin discussed how some short lived explosive eruptions had triggered glaciation and volcanic winters and explained the relationship between the large igneous province of Deccan and the dinosaur mass extinction. She went on to discuss gaseous emissions, the aerosol factor and carbon recycling. She concluded that her research so far had shown that short eruptions do perturb global systems but their effects last only a few decades and evidence indicates that large scale volcanic activity is responsible for significant climatic change but the mechanisms are still debatable. further research is needed - so much food for thought here.

After a full day drenched in geology, we reflected on what an excellent event this had been. Many thanks to Ron Elverson, an alumnus of the University, who helped arrange the day and was an excellent guide around the City adding the odd personal undergrad memory! Thanks also to Frances for organising this outstanding event.



Houghton Regis Quarry & AGM

September 21st by Frances Maynard

What would you expect from a chalk quarry in September? That white, sticky mud and wet, slippery walking conditions? Well, we were pleasantly surprised when we visited Houghton Regis in September for the AGM. The weather was fine and dry and September had been unusually dry so no difficulty with the conditions. Nearly 20 of us took the opportunity to explore this old quarry which is now a Nature Reserve managed by the Wildlife Trust. Houghton Regis quarry is a beautiful example of how these former 'industrial' sites can become valuable oases of biodiversity and opportunities for education.

Historically the quarry was worked for cement by Blue Circle Cement. It features about 30 m of the Lower Chalk representing about 90 to 110 million years ago. The chalk here is classified as the West Melbury Marly Beds and the Zig Zag Chalk Formation or Lower Grey Chalk, interspersed with a bed of Totternhoe Stone.

These are rocks familiar to members of the Group as we have seen them on Field Trips to both Totternhoe Stone Pits and Sharpenhoe Clappers; they represent considerable topographic features where not quarried out.



The quarry still contains some prominent outcrops (see picture above) which the group identified as Totternhoe due to its fossil content (small orbirhynchia or brachiopods). Unlike the exposures at Totternhoe Stone Pits no sharks' teeth have been recorded. The base of the marly chalk was seen to have *Inoceramus*, *Plicatula inflatus* (bivalves) and *Pycnodonte* (oysters) in varying degrees of 'wholeness'. One member found a tubular marcasite (FeS_2) nodule showing radial development of the pyritic material. (See picture and description on the Members Page 6).



Being a chalk site the calcicole flora (which was still abundant) gave us insights into the growing conditions – a classic example of the geology influencing the flora. We spotted wild thyme, common centaury, carline thistles plus some pale toadflax; also some pupae cases of the marbled white butterfly (*Melanargia galathea*) on the knapweed.

Following the walk the group were able to sit by the marl lake for a picnic lunch – the weather was very pleasant for mid-September. The only disappointment (from a personal point of view) was that no

buzzards or red kites flew overhead as they had on previous visits.

Overall the walk was a sociable 'warm-up' for a successful AGM. Many thanks to all who attended and made it a very enjoyable afternoon.

Site clearance at Biddenham Gravel Pit

October 11th

by Anne Williams

The exposure of terrace gravels at The Spinney in Biddenham was not in a very good state when we arrived, having collapsed and covered the old badger sett, and become very overgrown. But with wonderful work of Colin and his strimmer and the clever spadework of the two Tony's and Janet, we cleared a good workspace and exposed the main features of the site. And Tony Britten found a fossil of course, even where none should exist! John Buxton provided transport for Colin and the equipment and as usual, the tea-making facilities... for which many thanks, John.



The Tony double act hard at work

There have been two visits since the clearance, a group of mature students from the Bedford Retirement Education Centre and an A-level Geology group from the Bedford Sixth Form (on the wettest and windiest day I can remember, so they will have to re-visit to do their field sketches). Unfortunately there have already been two small landslips, and I think this may be an on-going problem in such loose sediment. Let's hope it does not retreat as far as Bromham Road!

A resident in Fleming Close has kindly offered to keep an eye on the site as an unofficial warden, so thank you very much to her as we need to have the goodwill of the people living so close to it. An information board is in preparation by the Wildlife Trust and the BGG and should be erected by Christmas or soon after.



The cleared face



Thank you John Pitt for sharing this poetry from your 9 year old grandson. He is clearly talented and shows great observational skills— a geologist of the future perhaps?

The drops journey

by Jack Cooper

*The glacier
on a hot day
started to melt
like butter in a saucepan*

*A drop dripped
created a stream
and that stream
bowed into a lake*

*and the lake curved into a river
and tripped along the river and*

*suddenly fell down the crashing waterfall
and into the gloomy gorge and the river
carried on...*

*There's lots of tributaries into the river
further down it roughly hammers the
sides*

*eventually over tons of years
the river breaks through and creates an
oxbow lake*

*the drops journey goes down to the delta
and to the shimmering, sparkling sea.*



Dorset's Fossil Forest by Peter Lally



You have possibly visited Lulworth Cove, and Durdle Door, but have you visited the nearby Fossil Forest?

The forest is located a few hundred metres to the east of Lulworth Cove, on the edge of the sea, within the Military Danger Area just off the South West Coast Path (access is variable so check before you visit).

From Lulworth Cove follow the coast path around the top, or if you prefer on the beach, and a short climb up to a path, and then enter the Military Danger Zone gates (these will be closed if Military action is taking place), continue on the path for a few hundred metres, keeping an eye open seaward to look for metal steps which allow access to the lower level where the fossil forest can be found. The tree parts vary from stumps "burrs", to what appears to be tree trunks. Burrs were created by algae that grew around the decaying stumps in a swamp 145 million years ago. The formation of the swamp killed the forest and created conditions that preserved the trees within the rocks. The holes in the middle of the burrs once contained fossil wood (see coin photograph opposite), but were removed many years ago.



The trees that grew here would have been ancient conifers, cedars, and tree ferns. All of this lies in amongst limestone – Portland stone, and the Purbeck beds.

Having come this far and feeling fit, you might wish to continue on the coast path to Kimmeridge Bay to not only see the fascinating geology, but to observe the damaged vehicles used as target practice by the military, and as you approach the bay, the oil extraction plant.

BGG contribution to Education

The BGG together with Groundworks have produced a web based educational resource pack on the Kensworth Nature Reserve and quarry. Several of our committee members provided the geological information to Groundworks for this project, notably, Anne Williams and Jan Munro who have tested this resource by leading field outings with school children and local teachers.

Aimed to encourage and facilitate school field trips, the pack includes photos, fact sheets and activities around the extraction of chalk, and the production and uses of cement.

Take a look at this resource at :

<http://www.groundwork.org.uk/Sites/hertsbedscamps/pages/kensworth-quarry-resources>

Groundworks have circulated this resource to various interested parties including the Geographical Association who have praised its content and will add the link to their website.

Lindsay Hiles has also been involved in education. She had been introducing geology to schoolchildren at Heathwood Lower School in Leighton Buzzard by way of workshops and fieldtrips.

Really good to see our BGG members raising the awareness of geology and its importance in our environment.

Members Page

- ◆ *Do you have something to show the group?*
- ◆ *A specimen you want to identify?*
- ◆ *Have an interesting photo? Please share it with us.*

A friend of Anne Williams insists that she finds out what the specimen below is!

Quite difficult.....yes, the background is granite, that part was easy, as the photo was taken on her granite worktop so you have an idea of scale (approx. 8cm across).

It's a piece of hard sedimentary rock, has been exposed to the air, so the grooves are not necessarily contemporaneous with the sediment. It was found in a forest near Millinocket, East Maine USA.

All identifications gratefully received. Could it be archaeological? Asks Anne.

(It does look suspiciously like Tony's marcasite nodule opposite!!)



Nice find Tony!



As predictable as ever, Tony Britten has a knack of discovering the most interesting of specimens. This excellent example of marcasite was found in the Chalk at Houghton Regis (see report of this trip on page 3).

It shows radiating crystals probably formed by replacement of an original belemnite guard. The marcasite form of pyrite can also form rounded nodules in the Chalk as well. As the nodule was already broken, Tony generously chopped it up and gave pieces to some of the group.

The mineral marcasite, sometimes called white iron pyrite, is iron sulphide (FeS_2) with orthorhombic crystal structure. It is physically and crystallographically distinct from pyrite, which is iron sulfide with cubic crystal structure. Marcasite is lighter and more brittle than pyrite and often crumbles and breaks up due to the unstable crystal structure.

On fresh surfaces it is pale yellow to almost white and has a bright metallic luster but tarnishes to a yellowish or brownish colour with a black streak. It is a brittle material that cannot be scratched with a knife. The thin, flat, tabular crystals, when joined in groups, are called "cockscombs."

Bedfordshire Walking Festival

Clophill guided walk

September 13th

by Bev Fowlston

Having worked with Clophill Heritage Trust over the past year on a new Geotrail, I was honoured to be asked to lead the first formal guided walk on the morning of September 13th. I led a motley bunch of around 20 walkers on this new and fascinating Geotrail around Clophill. The day was organised by the Clophill Heritage Trust and formed part of the Bedfordshire Walking Festival.

The trail began at the newly restored St Mary's Old Church in Clophill and took in the Fullers' Earth landscape as well as the beautiful Flit valley. Taking a circular route through the village and into Maulden Woods, we explored the Woburn Sands Formation, the geological history of Bedfordshire and also surface erosion, weathering and land use before returning to the church.

As we progressed through the historic village of Clophill, I could point out the many and varied bricks and local building stones that are used in the stunning buildings of this linear village. Upon reaching the Eco Lodges and church complex, we were welcomed with hot drinks and homemade cakes supplied by Clophill Heritage Trust and the enthusiastic villagers, before being offered a guided tour of the tower with its panoramic views of the surrounding area.

A leaflet detailing this new addition to BGG's extensive publication range is currently in print. This continuing partnership project will see the BGG involved in producing a geological interpretation board to be displayed in the viewing tower in the Spring of 2015.

If you missed this guided walk, then please contact Frances Maynard (Events Coordinator) and I am more than happy to take more members on this wonderful walk.



Bev talking to the group in a dry valley in Maulden Woods

*Don't forget the
Xmas Social on
Friday December 12th
7.30 - 9pm, at
the Husbourne Crawley
Reading Rooms.*

- ⇒ *Raffle, prizes*
- ⇒ *Quiz*
- ⇒ *Party food & drinks*

*Please bring a plate of food
(hot or cold, as we have full
kitchen facilities available) or
perhaps a bottle of your fa-
vourite tippie and a prize for
the raffle.*





Visiting the Yorkshire Dales? John Pitts recommends Thornton Force, Ingleton

This is one of the most important waterfalls of the Yorkshire Dales National Park geologically speaking of course. Located on the River Twiss, the waterfall plunges off Carboniferous Great Scar Limestone that was laid down in a sub-tropical sea 330 m years ago. The water bounces onto rocks belonging to the Lower Ordovician (Arenig) Ingleton Group laid down some 500 m years ago. The time gap between the horizontally bedded limestone and the steeply dipping turbidite sandstones is about 170 million years. Although recent research suggests the older rocks could actually be Precambrian!

There are dark greenish-grey cobbles lying on the underside of the limestone outcrop. This is the classic Carboniferous basal conglomerate that marks an ancient land surface; probably representative of an early Carboniferous beach. The significance of this was used in the early 1800's as evidence to prove Hutton's theory that geological processes of the past were the same as those of today and continue over immense periods of time.

Formation of Thornton Force:

The diagrams opposite show how the geological features of Thornton Force were formed.

Fig 1 represents a time when Ordovician (Precambrian?) mud and sand was deposited into a deep ocean. These sediments, were uplifted and folded into mountains and subsequently eroded down over millions of years.

Fig 2 shows how the land was submerged beneath a warm shallow Carboniferous sea and limestone was deposited.

Fig 3 shows uplift of the Limestone and further erosion by glacial ice to form Kingsdale valley.

Fig 4 includes the end moraine at the head of Kingsdale - a major obstruction to the natural drainage. The River Twiss had to cut a new course in order to bypass this.

Figure 1

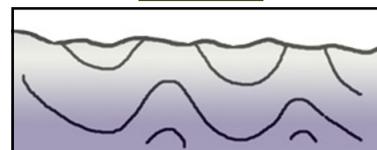


Figure 2

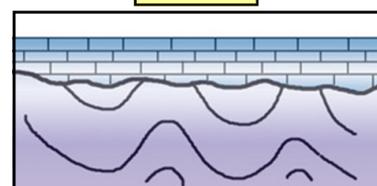


Figure 3

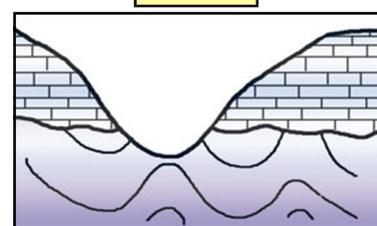
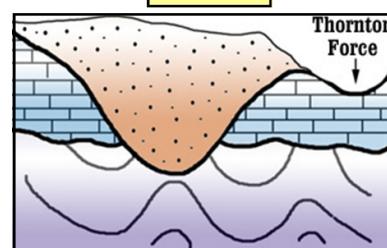


Figure 4



John Pitts' excellent photograph above was taken of the cascading waterfall marked in Fig 4 with an arrow.

Fancy a trip to France with the BGG?

2014 has been a mixed year for our events, some have been well attended, others not. With this in mind the Committee would appreciate more feedback from potential attendees before events are organised in the future.

There has been a thought of having an event organised in France next year, possibly around June time, but before this fairly complex event is organised, an idea of those who may be interested would decide this decision.

The proposal is to visit the Cote d'Opale (Opal Coast) section which lies between Boulogne and Calais, specifically two peninsulas, one chalk, and the other a sedimentary mixture of limestone, sand and clay.

These are known as Cap Blanc-Nez, and Cap Gris-Nez (white and grey). The White Cliffs of Dover can be seen from both.

The outline details would be to make our own way to Calais, either separately or car sharing. Possibly a one day event may not be viable, making it a very long day, so most likely to stay one, or two nights, depending upon individual's personal wishes. Some people may wish to combine this visit to France with a longer stay, take the opportunity to shop, or invite family and friends to come along.



For those who haven't visited this part of France, other than to drive off from Calais to the warmer parts, you might find not only the geology of interest, but also the history, some fairly recent and some older. For instance, WW1 obelisk which commemorates the Dover Patrol who kept the Channel free from U-boats on Blanc-Nez, and scattered WW1 German Bunkers, and holes where shells landed, still exist, and somewhat older, Wissant, a town which lies between the two Caps, has a nice sandy beach, as do quite a few others on this coastal section, this was where Julius Caesar set-off to invade and conquer Britain in 55BC.

For those of you who like to keep fit, there is the coastal path to walk and those not so inclined, plenty of places to eat and drink.

If this is something that you might wish to be organised, please contact Frances Maynard, your Events Organiser (email address at the end of this Newsletter), by the end of December 2014, indicating your interest, including which day(s) in early June might be suitable for you, also include how many people might wish to attend.

From your replies a decision on whether to organise the event can be made.

Peter Lally

Future BGG Events

The geology group is constantly reviewing the events that it puts on. The aim of these are three-fold: to provide the opportunity to visit and learn about the LGS of the county; to carry out maintenance on some of the sites that are in constant need (to maintain their value as educational as well as significant examples within the county); and to put on talks and socials that give a social focus to the group whilst also giving some learning or new insight into the wider field of geology.

The last 11 months has included one talk, two working parties; two field trips 'out of county' and 4 field trips to important examples of Bedfordshire geology. The attendance at these have varied and the Committee would be grateful for any feedback indicating what type of event you want as a BGG member.

The future events will include a talk in January on **the Himalayas** (tectonic processes). Then the field trip season will begin with another walk in **the Pegsdon Hills to see the sinkhole** that appeared last winter. Further walks will visit **Dunstable, Sandy Heath and Totternhoe Stone Pits**. I do hope you will be able to join us.

Further details of all events will be on the website: <http://www.bedfordshiregeologygroup.org.uk>

This is a good opportunity also to publicise our **Christmas Social – Friday 12 December** starting at 7.30 at Husborne Crawley Reading Rooms. Do please join us – the event this year will be very social with a quiz (combining general knowledge and geological knowledge), a raffle and refreshments plus lots of time to chat with friends both old and new!

I look forward to seeing you there – bring along something to eat/drink, a raffle prize and your best 'thinking caps' for the Quiz of the Year.

Frances

Who's who on the BGG Committee 2013 - 2014

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Committee Member	Tony Baker	janetbaker20012001@yahoo.co.uk

We are all volunteers and bring together an assortment of skills, interests, experience and geological knowledge (or not, as the case may be!). If you feel we could benefit from your skills and ideas too, we would love to hear from you. **www.bedfordshiregeologygroup.org.uk**

Newsletter compiled and edited by Henrietta Flynn
If you have any comments or wish to include an article in the next issue, then please contact me by email at
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