

Spring 2013

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# Newsletter

## *Dedicated geologists not deterred by Podington weather*

By Malcolm Oliver

### Did you miss the Xmas Social?



We had a good turnout on a cold December evening just before Christmas at the Husbourne Crawley Hall. Everyone brought a food contribution to the delicious buffet, washed down with wine provided by committee funds. Having the use of kitchen facilities meant we had hot quiches, sausage rolls and mince pies.

The evening was set into action by a fascinating talk on Geysers and Glaciers by our Open University Geologist Glynda Easterbrook, accompanied by some spectacular slides.

Our quiz devised by Frances was inspired by photos of rocks, fossils and holiday snaps from around the world, received from the BGG and caused much debate amongst the teams. 'Now how can you tell a stalagmite from a stalactite from just a photo?'. We even conducted a survey on future events—see page 2 for results.

The evening was rounded off with the raffle where most people went home with something interesting (geological or not), something festive or just a bottle!

A rather intrepid hardy team of 13 turned up at Podington on Saturday 16<sup>th</sup> March to see the ONLY exposures of Jurassic limestone in Bedfordshire. It wasn't Friday 13<sup>th</sup> but rain, cold and goodness knows what was forecast and still geologists arrived for the event! Adding to this, the main road from the south was closed and the diversion somewhat less than well signposted resulting in 2 of our members unfortunately arrived in time to see us return from the walk!

Nevertheless a good time was had looking at the glacial till landscape and getting some slabs of the underlying rock from the base of the stream and near the waterfall. Some had excellent fossils clearly visible on the bedding plane and our dedicated teams lugged some weighty lumps back to the cars for an event planned to be held by the Estate on Sunday June 9<sup>th</sup>.

*(Details of this to follow—volunteers to man an exhibits table will be most welcome).*

Thankfully it dried up halfway round the walk and was even quite sunny returning to the cars.

We ended with a trip round the church and then a warm drink and eats at the Garden Centre rather than inspect an LGS quarry over the border in Northants – can't be good as it's not in Beds!!



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

[henriettaflynn@btinternet.com](mailto:henriettaflynn@btinternet.com)

## Site clearance work at Local Geology Sites.....

By Peter Lally

Work hard, play hard was the theme for the three LGS (Local Geology Site) visits organised by our new BGG Events Organiser, Frances Maynard on Saturday 16<sup>th</sup> February 2013.

The working bit attended by a dozen or more people commenced at Potten Scout Hut, our first LGS on a cold, sunny frosty morning. Energetic, strong arms began by removing wooden pallets so that the agile, equipped with their trowels, hoes, steps and brushes could remove the vegetation for a clean-up of the Greensand exposure, leaving the face ready for the next visitors to view.

After an hour of exercise, the play began with a drive over to The Pinnacle at Sandy. The Pinnacle is fascinating in both geology, and history; with magnificent views across the Ivel Valley, fine exposures of the Lower Greensand, and an adjacent Iron Age Hill Fort.



The exposed cliff shows good examples of various sandstone types (including pebble beds and nodular horizons), mud flake conglomerates and cross bedding.

The cross bedding can be used to interpret current directions, which indicates here that it was probably a tidal seaway.

The trip was rounded off with a visit to the RSPB cafe. Thanks for a good day out Frances, and well done with the weather!

The Lower Greensand was deposited about 100 million years ago in a warm shallow seaway, with some of the sand coming from as far away as Yorkshire, carried by rivers. Today the exposed Lower Greensand is rapidly eroding and sand is being washed down the steep slopes, exposing many tree roots.

The play continued with a stroll to The Lodge Quarry at Sandy Warren. This was the third and final LGS of the day - an extensive quarried face of Lower Greensand formation (also known as Woburn Sand).

The quarry provided building stone for local use from medieval times to the 18<sup>th</sup> century. Examples include the churches at Sandy and Everton, as well as the packhorse bridge at Sutton.



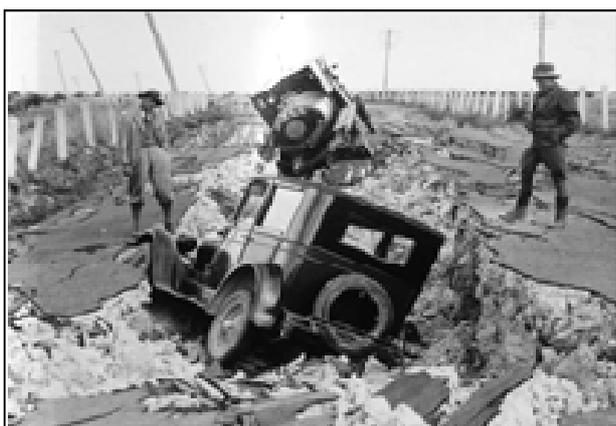
## 1931 Hawke's Bay earthquake, Napier, New Zealand

By Glynda Easterbrook

*Recently returned from cruising around New Zealand, Glynda gives us a geological insight on an earthquake that affected a town lying on an active plate boundary.*

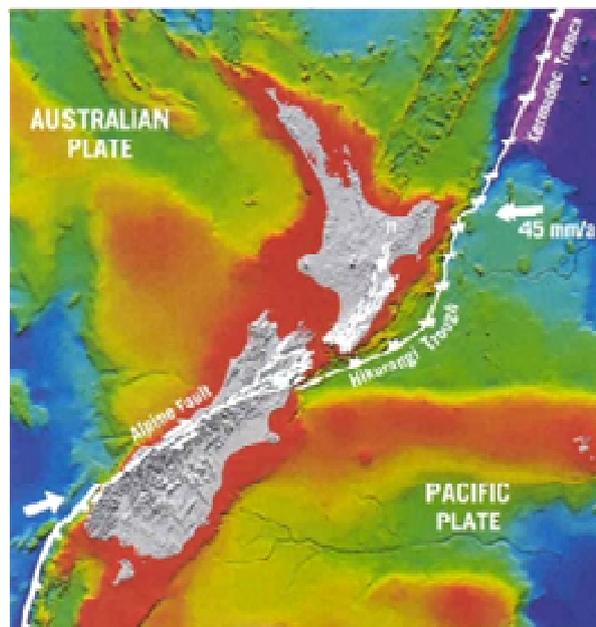
On my recent trip to New Zealand I visited the wonderful Art Deco town of Napier, on the eastern coast of North Island. On Tuesday 3 February 1931 the centre of Napier was destroyed by a devastating earthquake which lasted for two and a half minutes, with a magnitude of 7.8 on the Richter scale. Over 500 aftershocks were also recorded in the following two weeks. The main shock was felt over much of the southern half of the North Island.

New Zealand lies along the boundary between the Indo-Australian Plate and Pacific Plates. In the South Island, most of the relative displacement between these plates is taken up along the Alpine Fault, a large strike-slip fault whose position is denoted by the Southern Alps. In the North Island the displacement is mainly taken up along the Hikurangi Subduction Zone, with the remaining strike-slip component accommodated by the North Island Fault System. The earthquake is thought to have occurred on one of the larger thrust faults within the accretionary wedge, between ~5-25 km depth (the approximate depth of subducted Pacific plate at this location).



Nearly all buildings in the central area of Napier were destroyed, many of them by fire rather than the earthquake itself. The fires started in a chemist shop, then a hotel. The wind picked up strength and began to push the fires back over the city. As the water mains were broken, the fire brigade was unable to save many buildings, and only a few in the central Napier area survived.

Trapped people had to be left to burn as people were unable to free them in time. 160 people were killed, over 400 hospitalised and thousands more injured. The death toll might have been much higher had the Royal Navy ship HMS *Veronica* not been in port at the time.



The coastal area strip around Napier was lifted by around two metres, with ~ 40 km<sup>2</sup> of seabed becoming dry land. This included Ahuriri Lagoon which today is the location of Hawkes Bay Airport, housing and industrial developments and farmland.

The earthquake prompted a thorough review of New Zealand building codes, which were found to be totally inadequate. Many buildings built during the 1930s and 1940s are heavily reinforced, although more recent research has developed other strengthening techniques. Even today there are few tall buildings in Hawke's Bay, and as most of Napier's rebuilding took place in the 1930s when Art Deco was fashionable, Napier architecture is regarded today as being one of the finest collections of Art Deco in the world.

## Forthcoming events .....

### Survey results for future BGG Events

By Frances Maynard, BGG Events Co-ordinator

At the Christmas social we asked you to rank (out of 5, with 5 as the highest preference) the types of events that you preferred to attend or wanted us (the Committee) to try to put on. The sum totals of your ranking are interesting with some clear preferences (although nothing ruled out altogether):

Type of event	Ranking
Visits & talks on Bedfordshire sites	<b>Total = 50</b>
Talks/lectures	<b>Total = 46</b>
Working parties	<b>Total = 42</b>
Visits outside of county	<b>Total = 43</b>
Visits to Museums	<b>Total = 38</b>
Suggestions for future events	Stands at shows, Geology walks Specimen preparation. Removing fossils from samples.

**In response to this survey**, we have planned some interesting visits to BGG sites over the next few months. The first of which is a visit to **Totternhoe Stone Pit**, on **Saturday April 20**, where the famous Totternhoe Clunch is still quarried. A family run quarry and a botanically rich wildlife site – the trip will involve a walk and an opportunity to look for fossils in the rubble/waste heaps. As I write this so it is gently snowing outside – should the inclement weather continue then come dressed for cold and mud underfoot!

**May** will involve a trip to **Mundays Hill Quarry**. This continues to be a working quarry for the extraction of sands. Again there will be an opportunity to find fossils within the sedimentary structures. As this is a working quarry we will need to wear high visibility jackets and hard hats.

**June**. The final quarry visit before the AGM is to **Kensworth and Landpark quarries** to see more of the Cretaceous deposits (same time frame broadly as Potton and Sandy). Another opportunity to get your hands dirty as well – chalk when wet can be very dirty!

In **July** we will be celebrating the reopening of **Bedford Museum** and the work of the BGG volunteers in sorting and cataloguing the geology deposits. We will have display of members' favourite exhibits. If it continues to rain the Museum may well be the best spot to spend your summer!

The **AGM** will be on **22 September** and we hope to look at stones within churches and burial grounds – there are some good specimens of igneous, sedimentary and even metamorphic rocks to be found in Church settings which are not found anywhere else in our county (apart from shop-frontages)!

Do keep your eye on the website: <http://www.bedfordshiregeologygroup.org.uk/events.html> for further details of what is coming up. Finally if you have any ideas for future events (such as interesting sites to visit) do please contact me and I will see if we can arrange it.

Looking forward to meeting as many of you as possible at the events over the next 6 months. Frances

# Photo Caption Page

Why do we get so many amusing photos from our field trips? We had fun at the Xmas Social coming up with captions to this photo taken by Anne Williams on the Barton Springs trip last August.

Apologies to those in the photos!! - it does look like quite a steep climb!

*"Toilets are at the top!"*

*"If I'd known we would be doing the conga I would have stayed at home!"*

*"O the Grand Old Duke of York he had ten thousand men, he marched them up to the top of the hill....."*



*And now we need some witty captions for this photo of Martin Whiteley  
Please send to [henriettaflynn@btinternet.com](mailto:henriettaflynn@btinternet.com)  
The best will be shown in the next newsletter.*

*"....."  
....."*



## Members Pages.....pages 6 & 7

On these pages we hope that members can share their geological interests with other members. Perhaps you have a unique story to tell, a question for the committee, a question for the whole group or a letter to the editor.

Each issue we hope that members will send a picture of an interesting rock or fossil with an accompanying story. Perhaps you still keep an interesting stone found on a beach as a child and this sparked off your interest in geology. Maybe you have a favourite paper weight with a story or need it to be identified?

### **Mole hill fossil find.....**

The specimen below was found by *John Pitts* in alluvial sediments and brought to the surface in a mole hill.

#### **Any ideas on its identity and origins?**

**Dr Martin Whiteley**, our ex-RIGS Manager took an expert look and said:

*"My initial reaction is that you've found a flint nodule that has been derived from the Upper Chalk and reworked into the modern River Flit sediments. It's strong red-brown colour suggests an association with iron-rich sediments (such as the sandy Head deposits and/or modern river sediments) around Flitton.*



*It looks as if the original nodule might have been roughly spherical but has been broken, naturally or by Man, into two hemispheres; in the latter scenario it's tempting to think that the edges of the fracture have been worked (knapped) because there are a number of similar sized flakes knocked off the circumference.*

*The pitting on the outer hemisphere looks very odd - it may well be organic and represent some kind of fossil (coral or sponge perhaps?) which has been replaced by silica to form the nodule, or it may simply be the result of mechanical and chemical weathering".*

*Martin continued, "With 75 million years to play with, since the time the nodule was liberated from the Chalk, there's plenty of time for a weathered surface to be produced under a wide range of climatic conditions that have varied from sub-tropical to glacial.*

*I'd certainly like to see the specimen at some stage if possible (at which stage I reserve the right to change my mind completely!!), but meantime I look forward to hearing from others, particularly archaeologists and palaeontologists, about this interesting find ..".*

**Janet Munro**, our Chalk area guru also gave her expert examination saying *"I have looked at the images and concur with Martin's view that this is either a coral or sponge - I'd be more inclined to go for the latter as they are commonly preserved in flint. Indeed there is a consensus that the silica*

*content of flint is partly derived from the skeletons of these creatures".*

*"The likelihood is that this has been washed out of the local chalk deposits, perhaps during the melting of the ice at the end of the Ice Age and further carried along by the river, ending up in the alluvial deposits for the moles to unearth. Flint is extremely durable and can withstand this rough treatment better than a lot of other rocks.....".*

Thanks Martin and Jan for your expert opinions.

## My first fossil—the bivalve *Lopha*

By Glynda Easterbrook

Many people have asked me when I first decided that I wanted to be a geologist, and I have to say that my interest stemmed from the time that I found my first fossil. I was nine years old, and we had just moved to a brand new house in Bromham, near Bedford.

I was helping my father to dig over our garden when we found what we thought was a dinosaur's tooth. It was about 10 cms long, slightly curved like a banana, with a very jagged outline. It was clearly a fossil of some kind, but as it was very muddy, we left it on the back step overnight, until we had the chance to clean it up.

Unfortunately (or perhaps fortunately for me!), that night there was a frost, and when we came to look at it the next morning it had broken into two pieces.

My father was upset for me, but when I picked it up I realised that it was in fact not a tooth, but some sort of oyster-like shell that had split along the join of its two valves. Inside it even seemed to have the internal mould of some of its soft body parts.



So determined was I to find out what this strange creature was, that I went along to the library to see whether I could find it in a book about fossils. As I leafed through the pages, I suddenly happened upon a picture, there an almost exact replica of MY fossil!

It was in fact the bivalve *Lopha*, a Jurassic oyster, commonly found in the honey-coloured limestones of the Cornbrash Formation. It may have been up to 180 million years old – even older than some dinosaurs! Of course, after that I was completely hooked, and my future career aspirations totally decided....I have never looked back since.

## Leighton Linlade Townswomen's Guild Geological Talk

By Bev Fowlston

On Monday 7<sup>th</sup> January 2013, I was asked to give a talk to the Leighton Linlade Townswomen's Guild. I was warmly welcomed by around 30 women who showed a growing interest in the geology of Bedfordshire and the local rocks and fossils that I took along to show them. Following my PowerPoint presentation, the women asked some probing questions about the environments in which our rocks were deposited.

I suggested that the BGG could take them along to some of our educational sites if they so wanted, they will be in touch (hopefully!) A lovely evening with a nice group of women.

If you know of a group in your area that would welcome a presentation like the above, then do not hesitate to contact me via email on [bev.fowlston@gmail.com](mailto:bev.fowlston@gmail.com). There is a small charge of £30 to cover expenses, from which the BGG receive a £10 donation.

***BGG member Bev Fowlston successfully completed her geological Masters Degree on a global warming theme.***

***Here she discusses her project.....***

Having completed my Open University Masters course, I wanted to share my findings with the Bedfordshire Geology Group. Here, I have included just the Abstract of my final project.

The title is a bit lengthy and academic, so I've also added a more layman's title for you! I wanted to do this project because we have Aptian age outcrops in Bedfordshire, namely in the lower Woburn Sands Formation, and I hoped to get a better understanding of our geology. If we go into Mundays Hill Quarry in the summer, then we may be able to interpret where these layers occur.

***The HEATT model: a possible explanation for greenhouse to hothouse transitions during the Cretaceous OAEs, particularly OAE1a, and the potential legacy of anthropogenically induced global warming.***

**OR**

***The HEATT model explains an even hotter period in Earth history than previously thought during the Cretaceous and the potential of human influenced global warming making it happen again!***

Global warming is a major concern for today's climate-mitigation policy writers. Anthropogenic forcing of the climate is a hazard to Earth's planetary state and all its interrelated systems, potentially affecting all inhabitants of Earth. Many researchers are investigating past climate change to understand alterations to Earth's systems, and subsequent effects on planetary cycles.

A new model, the **HEATT** (Haline Euxinic Acidic Thermal Transgression) model for the transition of greenhouse to hothouse climate states, predicts rapid onset of global warming following emplacement of large igneous provinces (LIPs). The **HEATT** model has nine criteria and a five-step development for climate change.

This literature-based project explores the climatic signature left by Aptian age oceanic anoxic event 1a (OAE1a). Investigations of isotope signatures, transgression records, anoxia, euxinia and ocean-atmosphere interactions reveal OAE1a's potential as a **HEATT** episode.

Correlation of OAE1a dating evidence with dates for Ontong Java Plateau (OJP) emplacement adds to the LIP triggering mechanism debate for OAE1a onset and the **HEATT** model hypothesis. Comparison with other OAEs add to the potential for **HEATT** episodes having occurred in the past.

Additionally, examination of modern climate data shows the potential for a future **HEATT** episode being triggered by anthropogenically induced global warming.

Anthropogenic CO<sub>2</sub> emissions are larger than were emitted by OJP emplacement prior to OAE1a onset by a ratio of 1455:1. The anthropogenic potential to force a future **HEATT** episode is likely and mitigation against global warming is required to forestall this event.

Having read this Abstract, and you if are interested in reading further then please email me and I can send you a pdf of the final report.  
[bev.fowlston@gmail.com](mailto:bev.fowlston@gmail.com)

## Membership Renewal !

**Your BGG membership is up for renewal on April 1st.** Your subscription goes towards the annual running costs of the Group and keeps the Group viable. Membership subscriptions for 2013/2014 will remain at **£7.50** per person for the year.

To renew your membership, please send payment to Lindsay at the following address (cheques payable to **BGG**):

**Mrs Lindsay Hiles BGG Membership Secretary,  
4 Phoenix Close  
Leighton Buzzard, Beds, LU7 3YW**

Alternatively, you can make an on-line payment to the Group's bank account. (If you do decide to renew your membership this way, just drop me an email after making payment so that I can keep a look out for it).

**Account name: Bedfordshire Geology Group  
Bank & branch: HSBC, Leighton Buzzard  
Branch sort code: 40.28.12  
Current account no: 21507427**

**Renew your membership now to  
continue to receive the newsletter!**

*Many thanks, Lindsay*

This newsletter is not the only benefit of remaining a member of the BGG; all our events for members are **free of charge**, non-members pay £2.00 to attend.

### BGG Committee Members 2011 - 2012

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*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.*

*Please go to our website for further BGG information* **[www.bedfordshiregeologygroup.org.uk](http://www.bedfordshiregeologygroup.org.uk)**