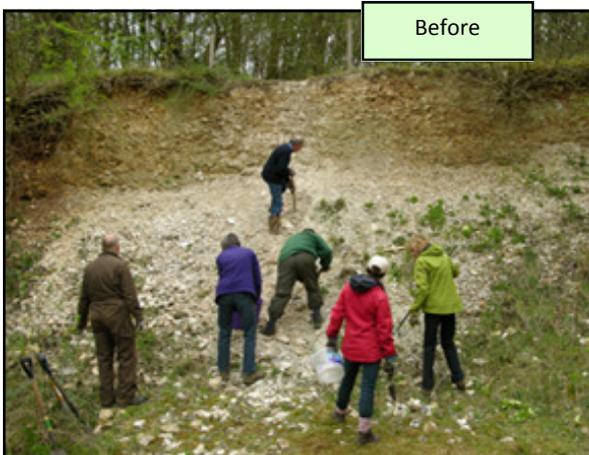


Newsletter

BGG at work in Landpark quarry by Frances Maynard

In March a group of BGG volunteers spent a morning clearing a chalk face at Landpark Quarry. This former chalk quarry is now part of a Wildlife Trust site and is susceptible to considerable erosion. Previous work by our group to ensure a good display of the features at the site had become obscured. The quarry shows an interesting chalk succession that contains flints and fossils. It complements the nearby LGS at Kensworth Nature Reserve and forms part of a network of chalk exposures around Dunstable that illustrate different facets of Upper Cretaceous geology. Fossils found there on previous visits include echinoids and bivalves indicating a likely Upper Turonian – Lower Coniacian age (between 84 – 94 Million years old).

After the clearance it is now possible to see the different layers of chalk and flint nodules first identified in the official designation of the quarry as a LGS in 2011. Although no fossils were found on this clearance, various nodules of flint were found in many varied shapes and sizes. The site is now well worth a visit – further details can be seen on the BGG website: www.bedfordshiregeologygroup.org.uk



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Note for your diary:
AGM on Sunday
September 21st.

See Events on page 8
for details.

BGG joins BNHS event at Jordan's Mill by Jan Munro

On Sunday May 18th we participated in an event at Jordan's Mill, Biggleswade organised by Bedfordshire Natural History Society (BNHS).

The geology table was manned once again by Anne Williams. What would we do without her? The Mill has been extensively re-vamped and there is a nice (if pricey) café/restaurant, a small shop and a very nice exhibition area in a barn round the back. This is where we set up our fossil samples and leaflets.

All the various BNHS representatives were there either with stalls or participating in activities aimed at engaging children with the natural world. I was wearing my pond dipping/bug hunting hat on the day having been drafted in to replenish the specimen trays.

I can think of worse things to do than go fishing with nets in the river or charging maniacally round the meadow with a butterfly net trying to catch Damselflies for the bug boxes. I periodically went back to the geology stall to relieve Anne.

The specialist knowledge on offer included the snail man who brought along his pet African Land Snail, the butterfly man, the moth people and many more. BNHS have a sub-group aimed at youngsters called Youngnats which they are trying to promote.

A quiz was set up on the day using the contents of the display boards as a source of answers. Various specimens representing many different creature categories, both living and dead were set out for people to look at which generated a lot of interest.

Anne and I spoke to some interesting people during the day although the location of the stalls was a little distant from the main arena. It became clear while we were there that BNHS members were under the impression that BGG was a branch of BNHS not a group in its own right!

We were glad to put them right on that score!



Jan captured a beautiful photo of this male Banded Demoiselle damselfly — frequently found along slow-flowing streams and rivers.

Anne talks to Parish Council about the importance of Biddenham Gravel Pit

At the invitation of the parish clerk, Anne Williams was invited to a well attended open meeting of the Biddenham Parish Council on 21st May, to explain what the BGG are doing in Deep Spinney with hammers, spades and trowels.

Her talk was well-received and there was a lot of interest in the nature and significance of the site and in her bags of gravel.

Here, Anne explains the importance of the site.....

In Deep Spinney is a small exposure of glacio-fluvial gravel terrace deposits which is a designated SSSI (Site of Special Scientific Interest) because of its archaeological and geological importance. It is all that remains of a large gravel pit and has been under management by the local Wildlife Trust.

The village of Biddenham sits on the core of a large meander of the Gt. Ouse where the river has cut down through the bedrock of Jurassic Oxford Clay and currently flows on the Jurassic limestone that has been used to build many of the villages and bridges along the Ouse valley in North Bedfordshire.

Three terrace deposits overlie the bedrock, representing former floodplains of the Gt. Ouse when it was a much larger braided river fed by seasonal meltwater. The Biddenham Terrace is the highest and oldest, laid down soon after the retreat of the Anglian ice sheet, and is up to 4m thick; it is coarse gravel and contains human and animal remains at the base.



There was an important archaeological dig in the Biddenham loop in the 19th century when Palaeolithic remains were found; the records and remains are held in the Higgins Museum in Bedford.

The gravel itself is typically uncemented, poorly-sorted and sub-rounded, and contains both local rocks such as oolitic limestone and erratics from the glacial till (a lot of flint from the East Anglian Chalk, Bunter Sandstone from the Midlands and also more exotic igneous rocks from Scandinavia). There are also possible fossil ice-wedge features formed in a periglacial environment. Deeper layers were found to vary in character with a fluctuating climate after the retreat of the Anglian ice.

Various investigations have also recorded a Mollusc fauna and bones of elephant, rhinoceros, horse, ox and deer, unfortunately now deep below the surface. The gravels are of great interest to geologists as an accessible exposure of such Ice Age deposits is rare in the county.



This particular exposure will enable the BGG to provide education in Geology for local students: a dissertation has already been written by a student at Northampton University and the site is valuable for A-Level Geology coursework by small groups of students.

New fencing and an information board describing the geology and archaeology of the site for the general public will soon be erected and in October the BGG will clear the face to make the structures more evident. Although such clean-ups will need to be an annual task!

So come along on 11th October and lend a hand with face clearance at this important site.

Cruise Corner....

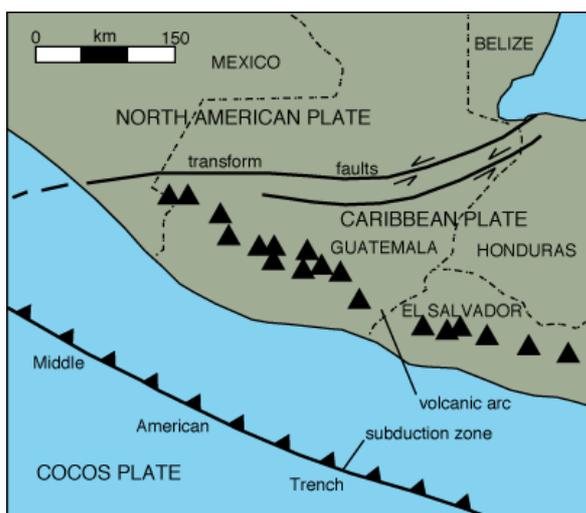
So where has Glynda been cruising to this time?
- a geological report on Guatemala

by Glynda Easterbrook



In January, I was lucky enough to be given to opportunity to lecture on board the P and O ship 'Arcadia'. Starting in Curacao, we cruised through the Panama Canal, to Guatemala, San Diego and Los Angeles.

Of the places we visited, Guatemala was by far the most interesting from a geological perspective. Docking at Puerto Quetzal, the largest Pacific Ocean port in Guatemala (but with nothing much going for it), we could see no fewer than 5 classically-shaped stratovolcanoes on the inland horizon! These were formed as a result of subduction of the Cocos Plate beneath the Caribbean Plate (upon which Guatemala is situated), producing a line of stratovolcanoes that stretches along much of the Pacific coast of Central America. Guatemala itself has a total of 29 volcanoes, 9 of which have erupted in historic times.



La Antigua with the Fuego volcano overlooking the city



A short trip inland found us in La Antigua, a UNESCO World Heritage Site and the former capital of Guatemala. La Antigua was badly damaged by a 7.4 magnitude earthquake in 1717, followed by further earthquakes in 1773, which destroyed much of the city. Fuego, one of Central America's most active volcanoes, is one of three large stratovolcanoes overlooking the city.

Fuego has erupted more than 60 times since 1524. Frequent vigorous historical eruptions have been recorded at Fuego, with violent vulcanian eruptions producing major ashfalls, along with occasional pyroclastic flows and lava flows.

The most recent large eruptions at Fuego occurred in October 1974. Atmospheric effects were reported for months following the eruption. Growth of the modern Fuego volcano followed the southward migration of volcanism that began at its sister volcano Acatenango. In contrast to the mostly andesitic Acatenango, eruptions at Fuego have become steadily more mafic with time, and most historical activity has produced basaltic rocks.

Members Page

- ◆ ***Do you have a story to tell?***
- ◆ ***A question for the committee or the whole group?***
- ◆ ***Do you need something to be identified?***
- ◆ ***Have an interesting photo? Please share it with us.***

We had an enquiry from a member regarding an interesting find in a piece of flint. It was examined and concluded to be a fossil sea urchin in flint. The owner wondered how this had come about.?

Over to Glynda for an explanation.....

Some limestones, particularly chalk contain nodular chert (or 'flint'), often concentrated along certain bedding planes, commonly nucleated within burrow-fills.

They are formed by the dissolution and reprecipitation of biogenic silica skeletons within the carbonate sediment.

Organisms with siliceous skeletons include radiolarians (marine zooplankton), diatoms (marine or freshwater phytoplankton) and siliceous sponges (marine and freshwater). This silica will often also replace the carbonate-rich skeletons of other organisms such as echinoids (sea-urchins) as shown in this case.



Here is a photo of a similar echinoid in flint found on the Isle of Wight by Lindsay Hiles—note the spines just about visible.

A reminder from Lindsay, Membership Secretary:

There are still a few people who have not yet renewed their membership subscriptions for this current year.

Membership remains at £7.50 pa, with cheques payable to 'BGG'

Alternatively payment can be made online to:
 Bedfordshire Geology Group
 HSBC, Leighton Buzzard
 Sort code: 40-28-12
 Account number: 21507427

Please pay your membership before the end of the month otherwise I will assume that you no longer wish to remain in the Group and I shall remove your name from the membership list.

Many thanks, Lindsay

Santorini – a live volcano in the Mediterranean

by Frances Maynard

After visiting Santorini, Frances describes the geology of this live volcanic Mediterranean island. Santorini, one of the Cyclades Islands of southern Greece, is situated on the Aegean Volcanic arc (figure 1).

It has been active since approximately 1 million years ago and the current form of the island is that of a caldera (a collapsed volcanic crater) on a large scale (more than 25 Kms across). It is evidence of the continuous volcanic activity on the arc which is associated with the subduction in the Hellenic Trench south of Crete (where the African Plate being subducted beneath the Aegean Plate). The volcanic types have ranged from pyroclastic flows to ignimbrite and scoria plus shield volcanoes and currently small scale lava flows and effusions.



Figure 1 – Santorini's tectonic location

The island now featured cliffs of about 300m in height (the crater walls) and the depth of the central caldera or 'harbour' is 400m. The fabric of the cliffs record at least nine major eruptions including 'tuff' from over 1 million years ago (figure 3 – a schematic stratigraphic log of the cliffs from Santorini Museum).

The last major eruption was about 1,600 years ago and is linked to the loss of the Minoan civilisation – possibly by a tsunami. The eruption involved c1,500 billion tonnes of rock creating the caldera that now forms a natural harbour for cruise ships. The island also features some remnants of pre-volcanic base rock – mostly Triassic and Cretaceous limestone metamorphosed to carbonate and calcite. These are to be found at the highest point of the island.

The volcanic activity is on-going and has formed the two islets in the middle of the caldera – Nea and Palea Kameni – which began to accumulate around 2,600 years ago and are still 'smoking'. The last major eruption was in 1950 as shown in the photo – figure 2 . (Continued on page 7)

Figure 2 – the eruption of the 1950s forming the islet of Nea Kameni (New Island)



The island is well worth a visit to see the volcanic activity in action (including the opportunity to bathe in hot springs). It can tell us much about how magma chambers change leading to changes in the composition of the material erupted. The base shield volcanoes erupted basalt and andesite while the more recent eruptions featured rhyolite and dacite. Recent studies of the locations of the different sources of eruptions suggest that faulting may be influential – the trend being from NE to SW. The major eruption of 1,600 BC featured pyroclastics and left layers of tephra and ash on the surface. The Plinian column associated with the 1,600 BC eruption was estimated to be 23 miles high – hence the large size of the current caldera which represents the collapsed crater from the period of activity. The recent activity has involved the build-up of the central domes once more and the 1950s eruption was described as phreatic (involving the explosive impact of water on the magma) although the continuing eruptions are effusive so produce SO₂.

For more information visit: <http://www.ucl.ac.uk/vco2/field-sites/Santorini>

My Highland Fling

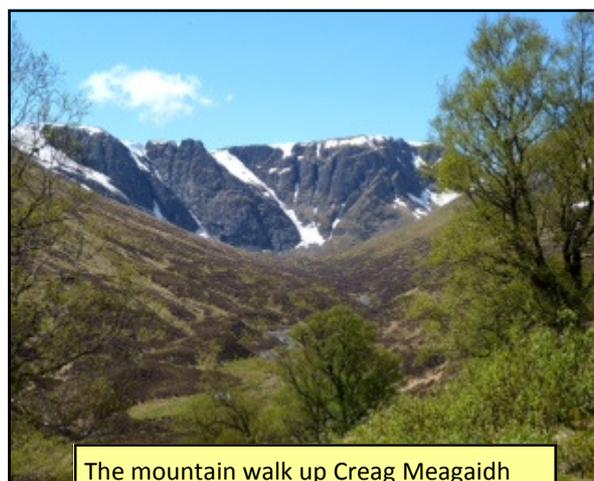
by *Henrietta Flynn*

In early May I went on a walking holiday in the Scottish Highlands. We travelled the length of the Great Glen Fault from Inverness to Fort Williams along Loch Ness and Loch Lochy. The scenery was spectacular and provided many geologically interesting walks. It was so nice to be around 'hard rock' geology, picking up specimens of ancient igneous & metamorphic rocks including interesting mica-schists, gneiss and migmatites—so different from Bedfordshire chinks and clays!

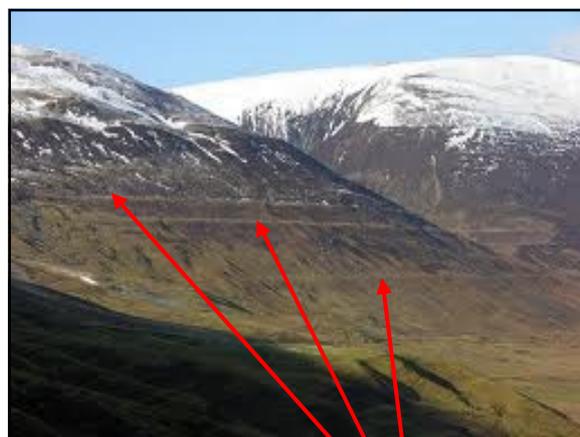
The influence of glaciation was evident all around, from the amazing corrie loch we discovered at Creag Meagaidh, with its text book vertical back-wall, to massive drumlins and moraines.

Our best large scale glacial feature was the so called 'Parallel Roads' at Glen Roy. The cause of these perfectly parallel lines across the valley has been subject to much controversy over the years. The latest explanation is that the lines represent old shorelines of an ice dammed lake around 12,500 years ago. Periodically the glacial plug to the valley melted catastrophically and the level of the lake dropped to create a new shoreline. (*See photo opposite*).

The 'roads' form perfect contour lines snaking in and out of the glen's irregular sides but, like tidemarks on a bath, they maintain the same height throughout.



The mountain walk up Creag Meagaidh



Glen Roy showing the 'Parallel Roads'

Future BGG Events

Sunday 27 July at 11 am

Coming up we have a chance to have a guided tour (by the author) along the **Bradwell to Newport Pagnell Geotrail**. We will be able to see Cornbrash, together with Blisworth Clay and limestone (representing deposits laid about 170 Million years ago in a marine environment). The Victorian railway and canal tunnels revealed these layers – hence the trail is so informative. This will be a walking tour along level paths with the opportunity to have refreshments in a pub afterwards.

Sunday 21 September at 11 am

A visit to **Houghton Regis Quarry**, followed by the group's **AGM**. The quarry is managed as a nature reserve by the BCN Wildlife Trust so features many examples of the influence of geology on the plants and habitats available to the wildlife. You will be notified of AGM start time and the agenda nearer the day.

Saturday 11 October at 10.30 am

Biddenham – walk and face maintenance to preserve the evidence of river terraces from the Great Ouse. We look forward to seeing you there. See the report by Anne Williams on the importance of this site in this newsletter on page 3.

For more information contact Frances Maynard, Events co-ordinator at fmaynard@btinternet.com or through the BGG website: <http://www.bedfordshiregeologygroup.org.uk>

Who's who on the BGG Committee 2013 - 2014

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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. **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
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