# Newsletter



## Bedfordshire GEOLOGY GROUP

bringing landscape to life

## **Big Green Fun Palace**





### By Bev Fowlston

Two national events, The Great Big Green Week and the Fun Palaces, were brought together by the team at The Higgins Museum in Bedford. We were delighted to be invited along to The Higgins' Big Green Fun Palace event on the 1st October. The theme for the event this year was climate change and how this is affecting present-day habitats and nature in Bedfordshire. We were invited to give some context to past climate change events and how that affected life in the geological past.

Our stand was front and centre in the main entrance foyer. We had several helpers and we must give a massive thanks to those who gave their time and

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ne frost, the soul of th sunbeam. This crisp winter air is full of it.<sup>59</sup> JOHN BURROUGHS

shared their knowledge with people throughout the day. Several visitors came and talked to us and were interested in the variety of rocks and fossils we displayed. We could really tell the story of climate change from the Jurassic to the ice Ages through our samples and specimens.

From the Jurassic limestones of warm, tropical seas to the deepening waters that saw the deposition of the Oxford Clay, we could paint a picture of ever-changing sea-levels and habitats. Many visitors were interesting in the marine life that thrived throughout the Jurassic Period and we were able to show them the fossils of ammonites and belemnites which lived alongside the huge marine reptiles and mega-fish, such as *Leedsichthys*, found at Quest Pit in Stewartby.

Telling the story of climate change during the Cretaceous amazed some of our visitors. As we told the story of how the Woburn Sands Formation was deposited in a dynamic estuarine environment with its amazing sedimentary features and underwater dunes, our visitors wanted to know more. This led, of course, to the next climate change event which saw further deepening of sea levels and fine silts of the Gault Clay being deposited in a less dynamic environment. We then went on to tell them of the dramatic climate changes and temperature rises which lead to the greatest deposit of the Cretaceous when there were probably no ice caps or glaciers. This was, not surprisingly, during the deposition of the very deep water deposit of the chalk oozes that lead to the rock we all know, the Chalk.

Then, onto the lce Ages, visitors explored the fossils that you can find in the gravel of your driveway or garden that were deposited by the retreating glaciers that once covered most of Bedfordshire. We told them of the story of the changing landscape due to the glacial actions during the last 2.6 million years.

All in all a very enjoyable day. And once again a very heartfelt and appreciated thanks to all the volunteers who helped out on the day.

## Leedsichthys

(Information from: http://www.prehistoric-wildlife.com/species/I/leedsichthys.html)

The large size of *Leedsichthys* is probably down to its lifestyle as a filter feeder which requires very little effort other than opening the mouth and cruising near the surface of the water. Such a method of feeding requires only a slow metabolism as it is not actively hunting for prey. Its large size however may mean that it was possibly gigantothermic like many of the large fish we know today.

Due to the fragmentary nature of recovered remains, the exact size has been open to much speculation. Most researchers agree that a size of nine to ten metres long is realistic, but also recognise isolated remains that are larger than they appear in more complete specimens. This has pushed the maximum estimate to a potential sixteen metres long. In contrast, the largest living fish today is the whale shark with a maximum recorded body length being just over twelve and a half metres. Some estimates have further pushed the maximum size of *Leedsichthys* to beyond twenty metres.

*Leedsichthys* has been named after Alfred Nicholson Leeds who first discovered it in 1886. The type species *L. problematicus* was so named because of the difficulty involved in recovering and reconstructing the first specimen.



Name: Leedsichthys (Leed's fish).
Phonetic: Leeds-ick-fiss.
Named By: Arthur Smith Woodward - 1889.
Classification: Chordata, Actinopterygii, Pachycormiformes, Pachycormidae.
Species: L. problematicus (type).
Diet: Filter feeder.
Size: Estimates vary but the larger specimens may have approached up to 16 metres long.
Known locations: England, France, Germany, Chile.
Time period: Oxfordian of the Jurassic.
Fossil representation: Many specimens of over 70 individuals are known.

## Vertebra Discovery

### By Bev Fowlston

At our Big Green Fun Palace event one of our young visitors brought in a find for us to try and identify.

Although quite worn and missing some of the rib connecting protrusions, It was clearly a vertebra. It was probably from an ichthyosaur given the dips on both sides



Close up of the probable ichthyosaur vertebra.

(Image: Bev Fowlston)

of the bone fossil.

Harry and his family and a friend were fossil hunting on their walks around Stewartby and discovered it in a ditch. Its location means the fossil was probably not in situ.

The area around Stewartby has been heavily worked due to the brick industry which excavated huge amounts of Oxford Clay from the vicinity. Also, the road works and buildings that have sprung up over the years probably means the fossil vertebra was washed into the ditch during heavy rains or whilst the ditches were being excavated.

But what a find! Well done, Harry.



Harry with his prized find. (İmage: Bev Fowlston)

## An opportunity for you ...

If you feel confident giving talks to some of these lovely groups then please get in contact with Bev Fowlston who can provide you with material for talks and presentations as well as holding our own (rather old!) projector and (enormous!) screen should you need it. Don't forget we also have a huge selection of recently-catalogued rocks and fossils for use in presentations.

### Next Zoom Get-Together

Discover the latest global geological news and catch up with your fellow members

Thurs 19th Jan 2023 at 7.30pm

Email secretary@bedfordshiregeologygroup.org.uk for Zoom link

## **18th AGM Review**

### By Bev Fowlston

For our 18th AGM we decided to try something different - we met in a pub!

Members met at The Flying Horse in Clophill, a central location for Bedfordshire with lots of parking and plenty of space to spread out. We also had a Zoom link for those who didn't want to travel in the Autumn gloom and darkness of an October evening.

Apologies were received from 10 of our members due to various constraints of family and illness.

Reports from officers were received and accepted. Including a summary of the work carried out on BGG's behalf by Paul Hawkes. This involved the responses to the Local Nature Recovery Strategy consultation and The Geology Trusts.

Derek Turner gave an account of all he has contributed to over the year including responding to requests for educational visits and his continued regular emails to members to keep you all informed of what is going on with BGG. He handed over some papers for our archive which is held by Bev Fowlston. More on these papers later.

On behalf of Christian Atkins, Derek gave a summary of the membership numbers and efforts for this year, which are still healthy in number going forward.

Finally, Bev Fowlston donned her many hats and gave accounts of the various roles she has undertaken throughout the year. These included the Treasurer's report, Local Geological Sites Coordinator report, Digital and Communications Officer report, BNHS Recorder report, and Greensand Country Landscape Partnership Representative report.

Thanks were given to all for their time and efforts.

All current members agreed to stand again for the following year. The committee are this year joined by a new member, Diane Sutherland.

### Your new committee is:

Derek Turner	Proposed by: BF	Seconded by: PH
Bev Fowlston	Proposed by: PH	Seconded by: DT
Paul Hawkes	Proposed by: BF	Seconded by: DT
Glynda Easterbrool	<pre>     Proposed by: DT </pre>	Seconded by: BF
Christian Atkins	Proposed by: DT	Seconded by: PH
Diane Sutherland	Proposed by: BF	Seconded by: JB

Following the formal part of the evening, Paul produced a box of fascinating rocks and fossils which he had collected over the years. Many of these we could identify and Paul told some fascinating stories of their discoveries.

Again another huge thank you to all who give their time and expertise to help run our geology group. Here's to another successful year of geologising!







Selection of rocks and fossils from Paul Hawkes.

(İmage by Bev Fowlston)

## Education News! SchoolRocks!

### By Bev Fowlston

Sam Mellonie is still collating the information we need to progress this project and once the data is in we can move forward with this national endeavour to get geology back into schools.

Watch this space for further updates on this project that will help us to fulfil part of our constitutional obligations to help educate the public about Bedfordshire's geology.

If you are willing and able to help out in schools this would be very much appreciated - contact Bev Fowlston for more information. We can provide all the teaching resources we just need bodies to carry out the many school enquiries we receive.

Contact <u>bev.fowlston@gmail.com</u> for more information.

## Monthly get-together - October

### By Bev Fowlston

In our usual slot on the 3rd Thursday of every month we hold our social get-together via Zoom. In October we had a lively conversation about a myriad of topics.

These included one attendee, Rodney Sims, to tell us about the new discovery of an ostrich fossil in America weighing in at a mighty 75kg. We then migrated to discussing the major extinctions and news of a second possible asteroid strike that occurred close to the time of the Chicxulub impact crater that ended the wonderful world of the dinosaurs. There is recent evidence of a massive tsunami that scoured the seabed at a similar time 66 million years ago. This began another discussion on the evidence for the Great Dying back at the end of the Permian 250 million years ago and the possible link with Large Igneous Provinces such as the Siberian Traps. This brought up whether an asteroid strike aided that environmental catastrophe.

There followed another discussion on climate change and sea level rise globally which led to us questioning what would happen to the UK. We looked at some recent images developed by the British Geological Survey and other agencies to see that the fens would disappear, and other areas around large rivers would be permanently flooded. Derek Turner then explained some research he has undertaken into the short lce Age that occurred at 536 CE across the UK. We looked it up and discovered it is called the Late Antique Little lce Age (LALIA). It was a volcanic winter caused by eruptions in Iceland – sound familiar! It lasted



*Deinocheirus* walks across a landscape dotted with ponds. Fossils found recently in eastern North America provide evidence that similar dinosaurs lived on the US continent.

(İmage courtesy of Smithsonian Magazine and Elena Duvernay / Stocktrek İmages)

from 536 to 660 CE and affected most of the northern hemisphere with subsequent famine and crop failures as well as great loss of life due to starvation. While the volcanic eruptions began the freeze, it is thought that increased ocean ice cover, a feedback effect of the eruptions, together with an "exceptional" minimum of solar activity in the 600s, reinforced and extended the cooling.

We ended the evening with a final discussion on the energy crisis and the cost of HS2 along with its damage to local wildlife sites and the chalk aquifer along its route. We discussed new technologies emerging around solar panels and battery storage. We generally put the world to rights following a disastrous few months of the Government being focussed on itself!

### Monthly get-together - November

### The good old days for geologists

### By Derek Turner

A good speaker always oozes enthusiasm for his subject and it was clear from the outset that there was no shortage of it when Dr Tom Hose spoke at our November zoom meeting. His subject was the excursions (later called field trips for tax reasons!) that Geologists Association (GA) members undertook in the early 1900s. As a bonus, we also learnt a lot about the social conditions prevailing at the time.

As many members worked on Saturday mornings, excursions were often on Saturday afternoons. Some of those taking part were professional geologists but others were amateurs. Unusually for the time, women were able to join in too. Most of the participants lived in Greater London and they took the train to stations from which they walked or piled into horse-drawn wagons. After 1900, more members owned bicycles and used them instead. Cycling up to 15 mile along unsurfaced roads when bikes were nearly twice as heavy as they are now was quite a test of stamina. However, they didn't have to go far to find good exposures. Many homes were under construction at the time and with Bedfordshire having an abundance of clay and bricks being heavy to transport, you were never far from a brickyard. Bedfordshire's geology also provided plenty of sand or gravel and in the south, chalk. Life was simpler then with pit owners readily granting access and there was no need to don safety helmets or hi-vis clothing. Visiting guarries as well as railway and road cuttings- many of them unvegetated at the time-gave them the opportunity to examine numerous exposures that we can only dream about seeing today.



The geologists wrote reports about where they'd been and what they saw and Tom told us how he has cycled many of the routes to find out what is still visible. His eagle eyes sometimes spotted a Gravel Pit Road and slight depressions in the ground that proved he was on the right track but that the pit had been filled in. He had the occasional pleasant surprise though such as the brick kiln chimney he found surviving against the odds in the garden of a bungalow near Stewkley.



Three of the Bedfordshire routes were from Flitwick to Silsoe, Luton to Stanbridgeford and Bedford to Bromham where James Wyatt found the first palaeolithic flint implements in this country. Another started in Linslade (then in Buckinghamshire) before heading for Soulberry (sic), Stewkley and Wing. You can see Tom's reconstructions of these routes at <u>https://</u> <u>geoconservationuk.org/geotrails</u>

Tom has offered to lead an excursion for us although bicycles won't necessarily be required. He has also pointed out that several GA excursions started in Luton and need investigating once more. There's plenty more mileage left in this subject yet.

A huge thank you to Tom for giving up his time and sharing his extensive knowledge with us all. If you want to learn more, Tom has shared some of his published work with us and if you would like to receive a copy then ask Bev to email you a copy.

## Monthly get-together - December

### A Quiz of Two Halves

### **By Bev Fowlston**

So December saw us celebrating the end of a productive year with a glass or two of wine or beer, depending on your choice! A select group of members joined the Zoom session from the comfort of their own homes, which was a blessing given the several inches of snow blanketing the country on the night!

We began the evening with a 20 question quiz compiled by Paul Hawkes on various geological subjects form Bedfordshire's geology to the geology of the wild coasts and islands of Scotland. Some of the questions really challenged us with talk of extensional environments and cross-sections of the London Basin. A really great quiz, thoroughly enjoyed by all.

There followed a short break to refill our glasses before the onset of Glynda's wonderful picture quiz. She took us on a global tour of all the wonderful geological scenes that most of us could recognise - but not all! From the wonderful Cuillins to the volcanic isles of the Mediterranean and even as far afield as Mars! A wonderful end to a lovely evening shared with friends.

We all wish you a very merry Christmas and a healthy and happy New Year.



## The BGG Archive and Resources

### By Bev Fowlston

Just a quick update on our archive and resources. The physical archive and resources are kept in Wootton at my house. I have all the rock and fossil collection, which has mostly been archived. I also hold all the tools and materials we have purchased over the years for various projects. As well as the remaining leaflets and all posters for our promotional stands along with a gazebo and display equipment for presentations. If you want to know what we have got then please ask for the list and I can forward it onto you.

These resources can be used for educational purposes or for private study. As a member of BGG you have free access to these archives and resources.

The collection is constantly being added to and Derek Turner, as mentioned on Page 4, has passed on the following papers:

Green, C.P., Coope, G.R., Jones, R.L., Keen, D.H., Bowen, D.Q., Currant, A.P., Holyoak, D.T., İvanovich, M., Robinson, J.E., Rogerson, R.J. and Young, R.C. (1996), Pleistocene deposits at Stoke Goldington, in the valley of the Great Ouse, UK. J. Quaternary Sci., 11: 59-87. https://doi.org/10.1002/(SICI)1099-1417(199601/02)11:1<59::AID-JQS218>3.0.CO;2-7

Chapter 4 of The Periglaciation of Great Britain by Colin K Ballantyne.

The Paleoenvironmental Significance of Sand and Gravel Deposits Beneath the low Terrace of the River Great Ouse at Roxton, Bedfordshire. Paul Knight (1995) BSc dissertation.

## **News from the Cruises**

### The mysterious pinnacles of Meteora, Greece

#### By Glynda Easterbrook

Meteora is a UNESCO World Heritage site, close to the town of Kalambaka in central Greece (Fig. 1). It is situated at the north-western end of the Plain of Thessaly, near the Pineios River and the Pindus Mountains. As well as being an amazing natural wonder, it hosts one of the largest and most precipitously constructed monastery complexes of the Eastern Orthodox religion (second in importance only to Mount Athos).

The name Meteora means 'lofty' or 'elevated'. It is a spectacular rock formation with approximately 1000 enormous and unusual rock pillars of differing size (Fig. 2). These are not volcanic in origin (as often seen elsewhere), but are composed of sandstone and conglomerate. They are composed of a mixture of pebbles, cobbles and larger stones packed into natural rock surface (Fig. 3). Where cobbles have fallen out, shallow hand holes are left, which makes the pillars popular for rock climbing because their coarse surface provides a good grip.

The sandstones and conglomerates were deposited about 60 million years ago from streams flowing into a delta at the edge of a coastline at the border of the Thessaly Plain, when prehistoric sea waters, which once covered the plain,



receded. They include fragments of rock, such as schist, derived from Mount Olympos. Delta deposits have sloping bedding surfaces (Fig. 4) and these can be seen in the rocks of the pinnacles today (Fig. 5).



Fig 2. View of Meteora with its approximately 1000 rock pillars.

The seabed was then pushed upwards by tectonic movements, creating a high plateau with many huge, vertical joints and faults (Fig.6). Weathering by water, wind and extreme temperatures along these cracks created the huge rock pillars, which are estimated to be approximately 700,000 years old. Similar formations are found in other places round the world, but Meteora is guite unusual because of the uniformity of the rocks laid down over millions of years, and the localised vertical weathering. Thick vegetation grows out of the vertical walls due to abundant water in cracks. A few hundred years ago Meteora was reported as easily accessible on foot, but it is now impassable. Earthquakes and rock falls also pose a constant threat – an earthquake of magnitude 7 on the Richter Scale shook the rocks in 1954, and in 2005 a rock fall closed the road access for several days.



Fig 3. Conglomerates and sandstone of the rock pillars.



Fig 4. Schematic showing deltaic environments.



Fig 5. View of Meteora's pinnacles.



Fig 6. The high plateau showing vertical joints and faults.

Meteora is actually more famous for its monastic dwellings. The first religious inhabitants were 9th century hermit monks who scaled the pinnacles to live in the cracks and hollows in the rocks. They led a life of solitude, meeting only on Sundays and special religious days in chapel built at the foot of a rock known as Dupiani. From the 11th century monks occupied many of the caves around Meteora (Fig. 7).

By the end of the 14th century, increasing Turkish attacks forced more monks to seek refuge on the top of the pinnacles. Altogether there were 24 monasteries, but there are now only 6 (4 for men and 2 for women), each with fewer than 10 individuals. Only 2 are primarily religious houses (Agios Stefanos and Agia Triada), but the others are essentially tourist sites. Grand Meteora and Varlaam are the largest and most visited. Grand Meteora was founded in the mid-14th century, by a group of monks from Mount Athos (Fig. 8). Its only access was by means of a long rope ladder which could be drawn

up when under threat of attack by Turkish raiders. Until the 17th century, access to all of the monasteries was difficult (deliberately), requiring long ladders lashed together, ropes and large nets to haul up goods and people, including pilgrims. At Varlaam, access is now much easier, via a footbridge (from a neighbouring plateau) across the



Fig 8. View of Grand Meteora.

chasm, and 150 steps carved into the rock face which lead up to the monastery on the top (Fig. 9).



Fig 7. The 11th century monks' caves.



Fig 9. Access bridge to the monastery.



## **GCLP Update**

### By Bev Fowlston

As we go to print, the main deliverable part of GCLP funding has come to an end. It is now up to individual groups to work together to keep Greensand Country alive and kicking. We will continue to support the GCLP through events and promotion as this unique and much-loved landscape through the heart of Bedfordshire deserves to continue growing in exposure and work.

Here are a few reminders of what we have achieved ...



In 2016, we spent a year planning our scheme of works for the original 5 year project. This included 3 new geotrails and a general information leaflet. Opening new or enhancing existing geological sites and engaging the public in the importance of the geological landscape of Greensand Country alongside its heritage and cultural history.

In 2017 through to 2018 we

completed the Eastern Geotrail and enhanced the safety and viewing experience at Sandy Warren Lodge Quarry.

In 2018-19, we installed a tactile board and accessible ramp at Potton Scout Hut Quarry, where we also held public workshops in geoconservation and basic geological techniques such as graphic logging. In 2019 we were able to complete the "Wall of Geology" at Old St Mary's in Clophill. We also complete the second of the geotrails with one that covers the Central part of Greensand Country around Maulden.





During 2020, with the Covid pandemic upon us, work slowed. However, we didn't stop and by the middle of the year we had completed the Western Geotrail the 3rd of the geotrail leaflets. We had also completed the information booklet. It was with great pleasure that we were awarded a wonderful achievement from The Curry Fund. We were the third recipients of an Excellence in a Curry Fund Sponsored Project Award. This was awarded for the geotrail leaflets and booklets which were deemed to be an excellent introduction to Bedfordshire's geology for the general public.



This spurred us on to continue for the added 2 year of the project given by the Heritage Lottery Fund due to the pandemic. Therefore, into 2021 we went where we completed the waymarking for all the geotrails and continued to clear sites around Greensand Country maintaining the work we had carried out throughout the project. Also, we supported other partners by holding promotional stands and giving talks across the county about Bedfordshire's geology and its importance in all things from landscapes, habitats and livelihoods.



We will continue this work through the Forward Plan and into the next 5 years.

If you want to get involved, please contact any of the committee who will be happy to give you more information.

## LGS Ranger News!

## Focus on Sandy Warren Lodge Quarry

#### By Bev Fowlston

Sandy Warren Lodge Quarry was one of the first sites to be designated by BGG back in August 2005 by Dr Jill Eyers. It was chosen for its large exposure of Woburn Sands Formation (formerly Lower Greensand). It is an extensive quarried face of pristine sandstone which is in a relatively consolidated and stable state. Although, over the years the vegetation above has made it less safe to be near. Hence, with the GCLP funding and help from the RSPB wardens, we were able to install a safe access route via steps and a viewing platform in 2017, at a distance from the face itself to make it safe for visitors to view.

The sedimentary structures preserved in the face allow paleoenvironmental reconstructions to be made, linking this part of the county with other exposures of similar rocks at Woburn and Leighton Buzzard. The quarry itself provided building stone for local use from Medieval times to the 18th century. Examples include the churches at Sandy and Everton, as well as the packhorse bridge at Sutton.

The full description form our designation form states "*This is a good exposure of the Lower Cretaceous Woburn Sands. The former quarry presents a stable 15m-high cliff with several 'windows' along its length that are free of vegetation. The cliff shows good examples of various types of sandstone lincluding pebble beds and nodular horizonsl, mud-flake conglomerates and cross-bedding. The latter can be used to interpret current directions in the depositional environment for this succession, which was probably a tidal seaway. Steps down to a viewing platform* 



Image taken in 2003 showing the vegetation overhanging the site.

(Image by Jill Eyers)

and a new interpretation board have been constructed making it suitable for educational purposes. It is also a site that can be used to show an ecological succession of plants following quarrying activity, and the link between the sandy (acidic) soils and the plants and animal communities that survive there."

Given the most recent work on this site was back in 2017, it is probably about time we paid this site a visit as a monitoring trip. We can look at the viewing platform and steps to ensure they are still in good condition, clean the interpretation board and check for any vegetation encroachment that may need a quick clearance. This is probably need within the next year. Look for an event in 2023.



The viewing area completed in 2017. (Image by Bev Fowlston)

### www.bedfordshiregeologygroup.org.uk

### LGS monitoring

### By Bev Fowlston

There is still time to let us know your availability to help out with LGS Monitoring via this two question survey.

Just click on the link:

https://www.smartsurvey.co.uk/s/1EFU4P/

Remember - many hands make light work!

## **Committee News!**

## **Committee meeting summary**

### By Bev Fowlston

The committee met in October via Zoom, between us we held discussions on the group's normal activities.

Our finances are looking healthy but still need to be audited.

Membership is staying steady with numbers at 35 for individual members and about 20 for our corporate members from The Wildlife Trust, Central Bedfordshire Council and KDK Archaeology.

Our commitment to GCLP was discussed and how we can contribute in the coming year. Ideas for the May Festival need to be explored, if you have any ideas do let us know.

Updates on the progress of the LGS monitoring were given with plans to move forward on this in 2023.

Finally, a discussion on past events and what to hold in the future was undertaken. Preliminary details are given later in this newsletter and on our website as we finalise them. Do let us know of any new ideas for events that you may have.

The next committee meeting will be on **Monday 6th February 2023**, if you wish to add anything to the agenda email one of the committee members. Contact details on the back page.

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

# Many hands make light work!



## **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).

Please pay online directly to the BGG account:

Account name: Bedfordshire Geology Group, no 45377413 NatWest, sort code 60-01-16

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 (nonmembers pay £2 per event to cover insurance), walks & talks and frequent communications.

### Quick Geology Brainteaser

Answers from Autumn 2022

### Geochronology Crossword:

### Across:

- 5. Radiometric
- 7. Stratigraphy
- 8. Devonian
- 9. Murchison
- 10. Cretaceous

### Down:

- 1. Sedgwick
- 2. Zircon
- 3. Meghalayan
- 4. Permian
- 6. Triassic



#### Across

4. On average how many kilometres thick is oceanic crust? (5)

- According to plate-tectonic theory, where is new oceanic crust being formed? (9,7)
- 8. What is the process of old crust being pulled down and melted called? (10)
- 9. The upper mantle and crust make up what major tectonic feature of our planet?
- what major tectonic feature of our planet? (13)

11. The San Andreas Fault is which type of plate boundary? (9)

#### Down

 Who penned the theory of continental drift? (7)

- 2. What process in the mantle moves Earth's plates? (10)
- What common rock type is found in continental crust? (7)

continental crust? (7) '' 5. What lies directly beneath the crust?

(11)
Which is a real type is found in

6. Which igneous rock type is found in oceanic crust? (6)

What state is the inner core likely to be in? (5)

## 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 Zoom get-together : Every 3rd Thursday - email for link - Next one 19th January 2023

Thu 19th Jan, 7.30pm: Zoom get-together - email for linkOrganiser: Bev FowlstonSat 14th Jan, 10.30am: Kensworth Quarry Nature Reserve "Faceliff"Organiser: Bev FowlstonSat 11th Feb, 11am: Seasonal Walk and Lunch at The Flying HorsOrganiser: Bev Fowlston and Paul HawkesSat 18th Mar, 10.30am: Spring Walk at RSPBOrganiser: Bev FowlstonWed 17th May, 11am: Greensand Festival Walk around Woob wuOrganiser: Derek TurnerThu 13th Jul, 10.30am: Visit to Broom South QuarryOrganiser: Derek Turner

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



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.

### Other events proposed for next year include, but are not exclusive to:

**EarthCache event:** We will be visiting Greensand Country EarthCache sites. Details will be announced later in the year.

**Ramble at Harrold-Odell Country Park:** A look at the former gravel pit and the landscape of the Ouse valley. We'll also search for fossils in the wonderful stone buildings in the village. Optional pub lunch afterwards.

Joint visit with Cambs Geological Society to visit Upware pits: A chance to look at a rare outlier of Jurassic deposits in Cambridgeshire.

Visit to Stockwood Discovery Centre: Have a look around a wonderful gem of a museum before exploring the area for Puddingstone.

**Fossil Zoom session with Dr Christian Atkins:** Bring along your fossil finds and share them with our very own palaeontologist via link to his African home.

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.

## 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:	Dr Christian Atkins	<u>wyverns4@hotmail.com</u>
Affiliated Groups Liaison Officers:	Paul Hawkes	paulhawkes04@gmail.com
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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.



Come and join us!

Newsletter compiled and edited by Bev Fowlston.

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

### bev.fowlston@gmail.com

Deadline for copy is 21st March 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.

### www.bedfordshiregeologygroup.org.uk

You can also find us on other social media platforms:

www.facebook.com/bedfordshireGeologyGroup/

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