

CHARNIA



The show went on. Tilton Railway Cutting July 29th

**The newsletter of the Geology Section (C) of the
Leicester Literary & Philosophical Society
www.charnia.org.uk**

September 2009

Editorial

Here we are again in September and it doesn't seem like five minutes since we began the summer programme in April with a visit to Bardon Hill Quarry. As I've said before, one day some clever chrono-physicist will discover that time really does pass faster as one gets older.! Oh well, we've had an excellent summer in the field despite the almost inevitable poor weather that seems to follow predictions of a bar-b-que summer. Bardon wasn't really a field excursion, so we began the programme proper at Clipsham and Castle Bytham in May, a trip I had the pleasure of leading with Professor Jim Rose. We received the most generous reception from the quarry owners at Clipsham and the large group enjoyed a fine perambulation around the quarry, considerably enlivened and informed by Jim's enthusiastic commentary on the glacial deposits. Spring was in full flow and apart from the excellent geology it was a pleasure to see the flowers and observe/listen to the birds in the lovely Rutland countryside and in our next quarry, the disused one at Castle Bytham. We looked for traces of the eponymous Bytham River, but its course was obliterated eons ago.



Lovely Exton

Then I took the rump of the party to see the remarkable Exton church, built of the local limestone, but also famous for its amazing tomb

monuments. We finished the day in appropriate style with a drink in the pub in Exton village.

We really ran head on into the wet summer with the weekend excursion to Llangollen in June. Yes, I know it rains in Wales, but this took the biscuit. Our leader scheduled our first outing to be a 'stroll' up Castell Dinas Bran, which on a fine day would have been most enjoyable, but Saturday the 6th of June was anything but a fine day and we faced the full fury of driving, torrential rain which let up not one jot as we staggered summit-wards. Some of us are a lot fitter than others of course, and my view of it all is coloured by my own less than pristine condition, but we all suffered to some extent or other. That experience might have been deemed sufficient for one field trip, but the weather gods continued to hurl down rain all weekend apart from some respite on the Sunday. Nevertheless, the Midlander is made of stern stuff and we soldiered on and actually really enjoyed our weekend. Oxfordshire in July was a first class trip and Owen Green was as good a leader as might be hoped, again we saw the best of the countryside and some charming villages, as well as the glories of the roads of Oxford city, which we might want to forget sooner than the geology. We had a big itinerary and certainly felt that we'd 'been out' when we arrived back at our homes.

Now as I've already demonstrated, the Geology Section is made of tough stuff, but the evening outing on July 29th proved the limit. Of all the wet days this summer, this one was the worst. It simply pelted down all day, so much so that everyone, yes everyone who put down their names to attend, pulled out during the afternoon, leaving myself as leader and the erstwhile Chairman and Field Secretary holding the baby. We decided we had to turn out anyway, because the Geology Section has yet to cancel a field trip due to weather (to our knowledge) and we didn't want to lose that record. There was the added carrot of the meeting point being the Rose & Crown at Tilton. We thought that at least we could have a drink! When he heard that he wouldn't have to partake of the delights of the cutting, Peter Long joined us at the pub. It was while we were in there that Helen and Joanne decided that they wanted to do the cutting anyway, rain or not. They were quite firm about it, so I concurred and off we went. In the event it wasn't at all bad and we felt very noble when we emerged to rejoin Peter.

An opportunity to ferret around in the Oxford Clay at Bradley Fen at Whittlesey is always guaranteed to generate lots of interest and the trip on August 8th was no exception, and, lo and behold, we had a marvellous summer's day of heat and sun. Sadly my personal quest for a pliosaur

skull again drew a blank, and only the leader Cliff Nicklin, with his long experience of the pit, found anything nice in the vertebrate line. As of writing we have three more dates in the programme to fulfill, Whitman's Hill Quarry near Malvern on September 5th (which may have happened when you read this), Boon's Quarry near Nuneaton (with our friends from the Warwickshire Geological Conservation Group) on September 26th and the National Coal Mining Museum at Overton, near Wakefield on October 10th. So if you haven't joined us on an excursion yet this summer, these will be your last chances. Please do come along, we'd love to see new faces.

Looking forward to the winter, and specifically the Saturday Seminar in March (probably 13th, but watch this space), we've gone for a plate tectonics theme this time around, and very exciting its all beginning to look. Some of Britain's finest geologists are engaged in research which in some way impinges on the broad church of plate tectonics, and we are determined to book some of the best of them to speak to us.

Andrew Swift

Field Excursion Reports

Clipsham and Castle Bytham quarries 9th May 2009

Leaders Andrew Swift & Professor Jim Rose (Royal Holloway College)

On a fine May day Andrew introduced 17 members to the geology of the quarry and its long and notable history, and was also pleased to welcome quarry owner Sue Thomas and her husband Alan, who were very hospitable towards us and joined us for our exploration of their quarry. Andrew explained that the working Clipsham Quarry offers one of the best exposures of the Middle Jurassic (Bajocian) Lincolnshire Limestone in the UK, laid down some 175 million years ago. The quarry contains both the upper and lower units of the Formation and in certain areas the division can be seen as a hardground encrusted by various fauna including bivalves. Essentially it is a shallow water deposit although the energy conditions varied during its formation, the lower unit being generally finer grained and more likely to produce the much sort after freestone.

However, the best building stone was being quarried from deposits infilling channels cut down into the lower beds. One of these was very nicely seen at the far end of the quarry. Due to the extreme paucity of

ammonites and other useful fossils, biostratigraphy is difficult, with various long-ranging gastropods, brachiopods, bivalves and corals making up the bulk of the contained organisms.



Looking over Clipsham Quarry

We then welcomed Professor Jim Rose (and his wife) who has a long-standing interest in the overlying glacial deposits, a problem for the quarrymen but of national interest otherwise to Pleistocene researchers. Clipsham is remarkable for two reasons, the presence of a meltwater channel, and evidence that the area was subjected to two separate glacial advances. The evidence for the latter is the presence of two very different tills separated by an organic layer. The earliest till is chalk free and is the result of ice moving down from the Pennines and effectively creating the Vale of Belvoir. This is overlain by a paleosol containing comminuted vegetation and pollen spores, suggesting Nordic type woodland at that interval. The upper till contains chalk and came from the North Sea and Lincolnshire, scouring the Wash and the Fen Basin. The direction of approach of this latter ice sheet resulted in its deposits lying at a 90 degree angle to those of the earlier one.

At an appropriate point Sue Thomas gave the party a rundown of the commercial aspects of her business in exploiting Clipsham Stone, and it was pleasing to hear that business was good. She referred to the history

of the quarry and the evidence that it was mined in Roman times, possibly as a source for the hardcore required to lay the foundations of the present A1. The Quarry, together with Big Pits, came into Sue's family in the 1870s when they took over Clipsham Hall. Currently run by the Thomases and Sue's 92 year old father the Quarry supplied the stone to build the Houses of Parliament. Under Winston Churchill's auspices the stone was again used to repair the Houses after the second world war. It remains the preferred and original stone for many Oxford and Cambridge Colleges and Cathedrals. When Sue was asked about the durability of the stone she gave as an example Salisbury Cathedral, where the Clipsham Stone spire has stood for 700 years! Business these days is centred on the niche building stone market and stone is extracted traditionally using plugs and feathers. Permission had just been granted to extend and make a new entrance on Bidwell Lane, meaning traffic through Clipsham will be reduced.



The Clipsham party

The group enjoyed a good ramble around the quarry, noting bags of stone for facing and walling, apparently containing 'cocks and hens'. This reference is rather obscure but possibly alludes to how the blocks are mounted on a wall to show lower and higher 'combs'. Close by were a couple of 'guillotine' like machines for small scale dressing of the stone. On the upper bench of the quarry we examined the 'stockyard'

of freestone awaiting sale and collection. Alan Thomas commented on the ease of working this particular variety of stone from the channel infill. Albert Horton then explained the mechanism of freeze/thaw, which created a frost heaved jumble of angular rock, sometimes seen as wedges. We then moved on to look at the tills and study the evidence for the two glaciations. The lower till contained Bunter pebbles and rocks sourced from the Pennines, and the later one contained a Jurassic marine fauna, including *Lopha* and *Gryphaea*, plus chalk. Unfortunately the evidence for the boundary organic layer was hidden. Jim discussed the preglacial landscape and the course of the Bytham River, which was diverted at least twice by ice sheets.



The face at Castle Bytham Quarry

The morning excursion had been superb and the only casualty appeared to be the dog belonging to the Thomases, who looked about all in. We thanked the owners and commented upon the interplay between our many experts which made the visit so stimulating.

We then said goodbye to the Thomas's and Rose's and moved on to the long-disused quarry at Castle Bytham where after a pleasant al fresco lunch Andrew led us on an exploration of the Lincolnshire Limestone exposed there. Although a superficial glance might indicate that the sequence lacked variety and interest, Andrew concentrated on the sedimentological features to demonstrate that in fact an awful lot was

happening at the time of deposition, including high energy currents creating cross bedded deposits and subsequent erosive events removing varying amounts of the underlying cycles, leaving innumerable small and large gaps in the rock record. One of the main reasons for going to Castle Bytham was that a fossil hunt was more practicable and safe at this disused site than at Clipsham and the party duly enjoyed a leisurely search amongst the abundant scree.

To end a most satisfactory day about half the party followed Andrew to Exton church to see the amazing suite of tomb monuments contained therein, renowned nationally. As well as the monuments the church itself is built of Lincolnshire Limestone and is a fine example of a Victorian gothic style edifice, rebuilt after the tower fell into the nave in 1843. But that wasn't quite the end of the day, because, being the Geology Section, we managed to hunt down a pub in Exton village for a convivial drink before heading back to our homes.

Helen Jones & Andrew Swift

Weekend Excursion to Llangollen 5th –7th June 2009

Leaders Drs Hilary Davies & Jacqui Malpas, Professor Cynthia Burek

With the sun shining in Leicester, we set off looking forward to a great weekend of Lower Palaeozoic and Carboniferous geology, and a chance to socialise with the other 16 members of the Section attending the excursion. But the sunny morning had turned to rain on our arrival in Llangollen and grey skies and heavy rain were the order of the weekend. Those members able to arrive early on the Friday afternoon partook of a steam train ride up the Dee valley on the Llangollen Steam Railway. Our leader Dr Hilary Davies intended that we collect leaflets* from our base at the Royal Hotel to permit us to 'do' geology from the train, but unfortunately we didn't see these until after we arrived back in Llangollen.

Not too dispirited by the weather, two thirds of the party ventured up Castell Dinas Bran hill on Saturday morning for our first outing, with Hilary leading at a brisk pace. We stopped on the way to look at the Silurian Vivod Beds (thickly bedded greywackes) in the River Dee which form the centre of a syncline. We also viewed a large glacial erratic block of local (i.e. Welsh) origin, and halted to take in the views over the valley and get a feel for how the landscape responds to the changes in geology. At the top of the hill, the search for graptolites in

the overpicked quarry exposing Dinas Bran siltstones was considerably circumscribed by the driving rain, so we made our way back down the hill and into Llangollen for lunch and a change of clothes. The third of the group that stayed at the hotel made a wise choice.



Minas Morgul? No, Castell Dinas Bran in 'inclement' weather (photo Joanne Norris)

Saturday afternoon saw us driving to outcrops of Carboniferous limestone at Trevor Rocks, where large corals were prominent. The party then traversed Eglwysyg Mountain and the moor to visit a fossil forest at Brymbo (Wrexham) on the site of massive iron and steel works, closed in the early 1990's. The preservation of the tree-like lycopods, *Calamites* (similar to modern-day horsetails) and *Stigmaria* (*Lepidodendron* roots) was magnificent, with fine details of the plants anatomy clearly seen. Unfortunately, due to a lack of financial support, much of the site was open to the elements, with only large sheets placed over the prized specimens to provide some sort of protection. The specimens that had been collected were made available for us to view in the North East Wales RIGS workshop. Those interested in industrial archaeology also found much to interest them at the locality. Our grateful thanks were given to Dr Jacqui Malpas for allowing the Section to visit this site and for supervising us.

The annual Section dinner was held on Saturday evening at the Old Corn Mill pub in Llangollen. It had a lovely setting by the Dee, with a nice ambience in which to enjoy a fine meal. The Chairman proposed the customary toast to the Section.



A bedraggled Geology Section at Brymbo

On Sunday we headed off to the England-Wales border at Farndon, where Professor Cynthia Burek took us on a georamble to examine Triassic cliff exposures along the River Dee, including the Chester Pebble Bed. That was on the English side, then we crossed the bridge into Wales to see structures associated with the Holt-Coddington fault at Holt Castle quarry. Cynthia arranged for us to have lunch at the Sandstone, a pub with a suitably geological name. Unfortunately at this juncture one individual lost touch with the party. Sorry Mike. After lunch, a few hardy souls ventured into Chester to visit the museum and then follow a geological trail viewing some of Chester's building stones. However, most decided to call it a day and head for home after the meal in the Sandstone, especially those with car problems (no names, etc). The feeling amongst the party at the end of the excursion was, as ever, very positive about the weekend despite the most inclement weather.

* NEWRIGS. Steaming through the past, A geological rail trail of the Dee Valley, Llangollen.

Joanne Norris



In the Old Corn Mill, Llangollen, Saturday evening

Middle and Upper Jurassic of Oxfordshire 11th July 2009 Leader Owen Green (Oxford University)

15 members met on a fine day at the quarry near the village of Kirtlington to examine the Bathonian succession there as a starting point for a shelf-basin transect of the Jurassic geology of Oxfordshire. Kirtlington Quarry is an SSSI site and part of the McKerrow trail. During the Bathonian the Oxford area formed part of an emerging land mass and leader Owen Green had designed the day to follow the deposits from a near shore to offshore setting through time. The quarry was very picturesque on this fine summer's day, a day of weather no-one expected after earlier gloom and rain as we drove down.

From Kirtlington we drove five miles east to the village of Islip and the churchyard of St Nicholas. Here we saw the grave of William ('Dean') Buckland (1784-1856), in his time the first Professor of Geology at the University of Oxford, Dean of Westminster and also Rector of the parish of Islip. A blue plaque commemorates his residency in the rectory. We discussed Buckland's famous eccentricities, which

included keeping a Brown Bear and a hyena amongst his menagerie of animals. His wife is also interred in the grave, she was a long-suffering lady who thought nothing of rolling out pastry, in the middle of the night, so that Buckland could allow his tortoise to walk across it in order to make sense of the dinosaur footprints he had seen that day! Our next stop was in the village of Wheatley, where a small old quarry exposure in the playing field allowed us to examine the first of the many facies changes we saw in the day, this being the most distal outcrop of the Coral Rag facies.



Happy now the weather's cleared up! At Kirtlington Quarry

We then moved into Oxford city after doing battle with the incessant heavy traffic, and to Headington Quarry. A geologically-themed open day was in full swing and we were also able to look closely at a reef in the old quarry, one of the many facies variants in the Oxfordian strata. Visitors to the open day could make plaster casts and examine examples of the fauna found locally, including some sponges from the Faringdon beds. We were offered a light refreshments while Owen made available his expertise to the other visitors.

After lunch we walked 'just around the corner' (sic.) to view Magdalen Quarry. Here more facies variations could be seen and clear evidence was observed of deeper water deposits. Our final destination of the day was the village of Churchill, the birthplace of William 'Strata' Smith, to many the 'Father of Geology', although that is a title he would probably not have felt at all comfortable with. His life is celebrated at a small heritage centre, which is in fact the only remaining part (chancel)

of the original village church. Smith was born in 1769 and his early life was spent as a surveyor chiefly involved in the construction of canals and the sinking of mine shafts. Artefacts and details of his charts, maps and other memorabilia are beautifully displayed, along with the work of local medical pioneers. While we were at the centre the Field Secretary thanked Owen for an excellent day's geology and the excursion finished at 4:45pm with a walk to Smith's memorial and a look at Churchill parish church, thought to be modelled on Christ Church, Oxford. Oh, and a last drink at the village pub!



At Buckland's grave in Islip churchyard

That was the end of the 'official' day, but a hardy group of six fans of mysterious Britain went on to the nearby Rollright Stones, which were suitably eerie as the earlier morning gloom returned at the end of the day.

Helen Jones & Andrew Swift

Tilton Railway Cutting, evening of July 29th 2009

As alluded to in the editorial, this excursion almost didn't happen because of the appalling wet weather which persisted all day. Around 16 folks had indicated their intention to attend but all felt they had to pull

out during the day. Indeed, it was clear that no pleasure could be gained from getting drenched in the cutting, which is pretty much deep jungle in the summer and most unpleasant when wet. It was terribly disappointing not least because a social was scheduled to take place afterwards in the Rose & Crown in Tilton village. Nevertheless, yours truly and the Chairman, plus the Field Secretary, were determined to make a showing, if only to partake of a drink in the pub, thus preserving the record of the Section (as far as is known) in recent years of not cancelling a trip due to weather. Peter Long also got in touch and joined us in the pub, although keen to point out that he was not going into the cutting!

After a bracing drink, the Chairman and Field Secretary became emboldened to the point of insisting that we carried out the intentions of the evening by visiting the cutting and properly doing the field trip. I was happy to concur and despite the thin audience of one (Joanne had heard it all before), I gave my introduction to the geology of Tilton Railway Cutting and we duly viewed the exposures. In truth, it wasn't all that bad down in the cutting, we were sheltered from the wind and the rain had declined to being only heavy. We felt very pleased with life on emerging, and congratulated ourselves on having maintained the honour of the Section!

We agreed that we'd try again next year when the weather couldn't be as bad again – could it?

Andrew Swift

Bradley Fen Pit, Whittlesey, August 8th 2009

Leader Cliff Nicklin (Chairman, Stamford Geological Society)

In a summer of generally poor weather we fortunately dropped onto one of the few lovely days for our excursion to Whittlesey. After so much rain, it seemed churlish to complain of it being too hot, but it was indeed somewhat tropical in the bowels of the quarry. Before we went down to look at the Oxford Clay and the famous fossils it contains, we heard some bad and then good news from our leader Cliff Nicklin. Bad in that Bradley Fen was probably in its last few months of production and would close sometime next year, robbing the geological community of one of its finest sites, but good in that a new pit was planned for a site nearby. We rapidly asked Cliff to put the Section's name down for a trip to the new pit when it was operational.

A head count revealed that we had an excellent turnout of 19 folks for this trip, including the leader and two members of the Stamford group. We entered the pit with gleams in our eyes and hopes of some good vertebrate finds, after all the pit had already produced many excellent marine reptile remains, but we were to be disappointed except for a few fish scales and a tiny fish jaw, which was declared to be 'very rare' by our leader. However, the leader himself, familiar through years of association with Bradley Fen, found a very nice crocodile vertebrae and other good pieces.



In search of those elusive vertebrates in Bradley Fen

For those like me who tired of the search for showcase fossils, there was always the large showing of butterflies to admire, and some fine wild flowers. Or we could just enjoy the sunshine and fresh air (the chip factory notwithstanding).

Andrew Swift

Summer Programme 2009

Just three excursions remain in the summer programme, please contact Field Secretary Helen Jones on 0116 2392872, e-mail helenjonesx@hotmail.com if you wish to attend any of these.

Saturday September 5th - Whitmans Hill Quarry, Storrridge, Malvern and the Abberley & Malvern European Geopark

Mostly Wenlockian (Silurian). Children welcome. Leader Sue Edwards

Saturday September 26th - Boon's Quarry, Hartshill, Warks

Joint excursion with the Warwickshire Geological Conservation Group to view the Precambrian /Cambrian unconformity. Leaders Martyn Bradley and John Crossling.

Saturday October 10th - National Coal Mining Museum, Wakefield

A chance to descend to depths of 140 metres to explore one of Britain's oldest working mines and also to inspect the restored colliery complex of Hope Pit. Children welcome.

Winter Programme to Christmas 2009

All talks held at 7.30pm in Lecture Theatre 3, Ken Edwards Building, on the main University of Leicester campus, except where stated. Refreshments served from 7.00pm.

Details: Chairman Dr. Joanne E. Norris or Editor Andrew Swift, 0116 2833127, j.e.norris@ntlworld.com

Wednesday October 7th

Dr Lynden Cooper (Dept. of Archaeology, University of Leicester):
Glimpses of the Palaeolithic in the Midlands.

Wednesday October 21st

Dr Liz Harper (Dept. of Earth Sciences, University of Cambridge):
What can living brachiopods tell a palaeontologist?

Wednesday November 4th

Professor Mike Petterson (Dept. of Geology, University of Leicester):
Rebuilding Afghanistan through Geoscience.

Wednesday November 18th

Professor Paul Wignall (School of Earth and Environment, University of Leeds): **Permian extinctions.**

Monday November 30th

Parent Body Lecture, **New Walk Museum, Leicester.**

Professor Aubrey Manning (University of Edinburgh): **Life and the Earth: interlocking histories.**

Wednesday December 2nd

Professor Brian Windley (Dept of Geology, Leicester): **West Greenland: arcs and crustal growth in the early Earth.**

Wednesday December 17th

Christmas Meeting, **New Walk Museum, Leicester.**

Abstracts for Winter Programme

Wednesday 7th October

Glimpses of the Palaeolithic in the Midlands

Dr Lynden Cooper, Department of Archaeology, University of Leicester

Recent fieldwork by University of Leicester Archaeological Services has revealed several Palaeolithic sites that have helped filled a lacuna in the prehistory of the region. Brooksby Quarry has yielded artefacts from Cromerian deposits – the lost Bytham river that once drained Wales and the English Midlands. The Bytham valley is now seen as the colonisation route for the first humans (*Homo heidelbergensis*) to reach Britain c 500 – 700,000 years ago. A housing development in Glaston, Rutland led to the discovery of a mid-Pleistocene hunting station and hyaena den. The lithic assemblage included leaf-points, a diagnostic weapon head of the earlier Upper Palaeolithic from c 35,000 years ago. It is suggested that the lithic technology represents the work of the last Neanderthals. The site was preserved in a graben structure on the crest of a hill, and represents a new type of site formation process that might be anticipated at other sites where similar geological and topographical conditions can be found. A Magdalenian (Creswellian) site at Bradgate Park revealed rare evidence for an open-air site, complementing the

better known assemblages from caves sites on the English Karst. The humans were the first to return to the North-west European peninsula at the end of the Last Glacial Maximum, c 15,000 years ago. Finally, a Terminal Palaeolithic site at Launde, Leicestershire represents the people who re-colonised the region following the Younger Dryas stadial at c 11,000 years ago.

Wednesday 21st October

What can living brachiopods tell a palaeontologist?

Dr Liz Harper, Department of Earth Sciences, University of Cambridge

Brachiopods are recognised as important components of shallow marine faunas during the Palaeozoic where they are diverse and abundant. However, following the P/T mass extinction they are often portrayed as 'Nature's losers'; weedy, slow growing, trapped in refugia, so rare that most marine biologists do not encounter them and so unappetising that nothing will even bother to eat them. But is that fair?

Recently I, along with colleagues in New Zealand and the British Antarctic Survey, have been studying the ecology and life history of a range of living brachiopods. Our aim is not just to understand more about these fascinating but little known animals but also to try to shed light on to their evolutionary history and fossil record.

Wednesday 4th November

Rebuilding Afghanistan through Geoscience

Professor Mike Petterson, Department of Geology, University of Leicester

This talk summarises a 5 year experience with Afghanistan between 2003 and 2008. Afghanistan is rarely out of the media and attracts a lot of interest from the general public and politicians alike. Most of the news is about war, death, drugs and poverty. Whilst it is true to say that the Afghan experience since the invasion of Soviet troops in 1979 has been a heart-rending tragedy characterised by invasion, ethnic war and fundamentalism, this is only part of the story. Afghanistan has a very long and rich history and its position at the crossroads of East and West has left indelible strands in its national character. The presenter first visited Kabul in early 2003 working directly with the Afghan Government, including senior Ministers and advisers to President Karzai and generated a collaborative project funded by UK Aid aimed at

strengthening the Afghan Geological Survey, re-modelling a vast array of data and attracting international mining investment with the aim of moving Afghanistan towards a peaceful economy. Afghanistan comprises a number of Precambrian – Recent Laurasian and Gondwanan terranes that finally coalesced in the Mesozoic and Tertiary. It remains at the very heart of the modern Himalayan orogenic event with the western edge of the Indian plate cutting the eastern part of the country. Afghanistan hosts a large number of important mineral deposits including copper, gold, iron, and the famous lapis lazuli that was traded with the Pharaohs of Ancient Egypt. The presentation will attempt to roll together the varying themes of mineralisation, geotectonics, economic development, and post-conflict issues and show how geosciences can help, in a very practical way, to rebuild a shattered country.

Wednesday 18th November

Permian extinctions

Professor Paul Wignall, School of Earth and Environment, University of Leeds

The mass extinction of the dinosaurs is famously associated with a giant meteorite impact. However, it also coincides with a vast outpouring of lava in the Deccan region of India and for other mass extinction events it is this volcanic phenomenon, not impact, that is always contemporaneous. The end-Permian mass extinction is the greatest crisis in the history of life. For the past two decades it has been known to precisely coincide with the eruption of the Siberian Traps – one of the largest of all the giant flood basalt provinces. Extinction models seek to find a link between these two phenomena. Less well known is the fact that the end-Permian mass extinction was preceded by a crisis in the Middle Permian, approximately 8 million years earlier, in which flood basalt volcanism again figures. The flood basalts in this case erupted in SW China and are known as the Emeishan Province. The lavas are interbedded with shallow marine limestones that contain an excellent record of Middle Permian fossils. It has thus been possible to examine both the volcanism and the extinction event in the same locations in SW China. This talk will look at the evidence from SW China, suggest an extinction mechanism involving explosive volcanism and compare this with the latest ideas for the end-Permian (and other) mass extinction events of the fossil record.

Monday 30th November

Life and Earth: interlocking histories.

Professor Aubrey Manning, School of Biological Sciences, University of Edinburgh

Life and the Earth have had interlocking histories for approaching 4 billion years - most of the life of the Solar System. For biologists it was Darwin in 1859 who first provided us with a general theory of life's evolutionary processes although inevitably there were then huge gaps in the detail. Earth Science had to wait about a century more before we had an equivalent general theory of our planet's history and dynamic processes. Now that we have a full picture the interrelationships become clear. As James Lovelock has put it, Earth supports life and life supports Earth, or I would rather say, affects the Earth, although in profound ways. Life has had to withstand several major catastrophes over the past 800 million years (when complex life forms have been in existence) but - so far - has recovered although not always in its original pattern. I shall give a number of examples and use them to discuss the ways in which the earth sciences and biological sciences must be seen as a unity if our species is to survive in a tolerable fashion.

Wednesday 2nd December

West Greenland: arcs and crustal growth in the early Earth

Professor Brian Windley, Department of Geology, University of Leicester

How did the crust develop 3000 million years ago? Did it involve plate tectonic processes or not? Today between the fjords, glaciers and icecaps in west Greenland we see a spectacularly exposed terrane, which reveals several remarkable cross-sections through 3000 my-old crust of the Earth. The evolution started with island arcs, passed to Andean-type, active continental margins, and finished with collisions between crustal blocks. Oh, and the mountains have been eroded down to their roots, so we are looking at deep crust.

Subscription Reminder

Please be aware that subscriptions are due at the beginning of October, please don't make the treasurer have to chase you for these. On the subject of subscriptions and the costs of meetings, etc, I see that many of

our sister societies and other geological groups have recently put up their subscription rates. We're proud to say that we feel we can hold ours at the present trifling sums, and also maintain our practice of not charging visitors to attend our meetings. The latter is very important in fostering a positive and sympathetic attitude to the Section, and actively encourages visitors to join us as full members, long may it continue. Hopefully we will also never go down the path of other groups and start charging our members to attend the Section's own field trips.

Northamptonshire Stone

As most members are aware we are fortunate to have amongst the ranks of our members a number of authors who's contributions to the literature of our local area are much admired. One of these is Dr Diana Sutherland, and we have acquired a small number of copies of her excellent publication, **Northamptonshire Stone**. Originally priced at a competitive £12.95 we are able to offer the book at the greatly reduced price of **£6.95**. But at that price they will go quickly, so act now! Copies can be purchased from Chairman Joanne Norris or Andrew Swift, and we will also bring them to Section meetings.



Two old 'Jarges' we met in Churchill on the Oxfordshire excursion

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