NEWSLETTER No. 171
June 2005

The Black Country Geological Society

The Society provides limited personal accident cover for members attending meetings or field trips. Details can be obtained from the Secretary. Non-members attending society field trips are advised to take out your own personal accident insurance to the level you feel appropriate. Schools and other bodies should arrange their own insurance as a matter of course.

Leaders provide their services on a purely voluntary basis and may not be professionally qualified in this capacity.

The Society does not provide hard hats for use of members or visitors at field meetings. It is your responsibility to provide your own hard hat and other safety equipment *(such as safety boots and goggles/glasses) and to use it when you feel it is necessary or when a site owner makes it a condition of entry.

Hammering is seldom necessary. It is the responsibility of the hammerer to ensure that other people are at a safe distance before doing so.

FUTURE PROGRAMME

Lecture meetings are held at Dudley Museum, St James's Road, Dudley. Phone (01384 815575)
7.30 for 8 o' clock start unless stated otherwise.

SATURDAY 16TH JULY 2005 *(Field visit)*

Joint meeting with the Woolhope group to the Wren's Nest and Dudley Canal Tunnels. Leader: *Graham Worton*

Meet at 10.30am at the Wren's Nest car park in Priory Road, just off its junction with the (A4123) Birmingham New Road, opposite the King Arthur public house. GR 394291. Graham Worton will describe the geology, industrial heritage and future developments for the area.

Lunch at about 12.30pm

In the afternoon, at about 1.00pm, we will leave from the Todds End car park on the A4123, by canal barge into the singing cavern, where more limestone geology and wonderful canal engineering can be seen. There will be a small charge for the canal trip of about £5.

SATURDAY 17TH SEPTEMBER 2005 *(Field visit)*

North Wales day out by coach to Snowdonia, studying some geology and geomorphology, and visit the Slate Museum and the Pump Storage HEP scheme at Llanberis. This is an all day trip leaving at about 8am; the coach will make various stops to meet participants, including a stop in Wolverhampton. After a very full day it is planned to stop on the way home for a pub meal and arrive back at about 10pm.

This is a similar event to the very popular coach trip last year which was enjoyed by all those who took part. However, before we can book the coach and make other arrangements, we need some indication of likely numbers. If you are *interested* in attending, please telephone *Andrew Rochelle. (01952 299136)*

MONDAY 26TH SEPTEMBER 2005 *(indoor Meeting)*

PROVISIONAL AND TO BE CONFIRMED

Professor Andy Saunders, Dept. of Geology, University of Leicester.
"Global Mass Extinctions: Volcanoes versus Impacts."

Professor Saunders was born in the West Midlands and educated at High Arcal Grammar School in Sedgley, and so he is familiar with the Wren's Nest and the Baggeridge spoil heaps! He read geology at Sheffield and took his PhD in Birmingham. His research has been mostly into igneous petrology and geochemistry, and he is now working on mantle plumes and their relationships to volcanism and mass extinctions.

SATURDAY 1st OCTOBER 2005 *(Field visit)*

Proposed field visit to Barrow Hill Nature Reserve, 'The Dudley Volcano'.

MONDAY 31ST 0CTOBER *(Indoor Meeting)*

Liam Herringshaw. "Wenlock Limestone."
This is the talk that was transferred from the cancelled meeting of June 6th.

MONDAY 28TH NOVEMBER *(Indoor Meeting)*

Members' Evening.

Members are invited to think about any contribution they feel they may be able to make – no matter how slight – for the 3rd Members' Evening. These have proved to be so enjoyable in the past. Refreshments are provided.

APOLOGY

Our apologies to those members who came to the Museum on the evening of June 6th only to find that the meeting had been cancelled. We did inform those members on the email list and made an announcement at the meeting of May 9th, but this did not reach every member. We will devise a more reliable system so that this does not reoccur, and to those who did waste an evening we are very sorry.

EDITORIAL

Graham Worton steps down as BCGS Chairman.

Graham Worton had completed five years as BCGS Chairman when he retired from the post at the AGM. He had been an active committee member at the heart of most of our activities for many years previously, but it was only after some prolonged cajoling that he had been persuaded to take over from myself. He was the obvious choice and I marvel at how he kept (and still keeps) his enthusiasm for the day job so alive in leisure time too.

With Graham already in post as Dudley Museum Geologist when he took up the reins, members have benefited from special viewings of new displays or visiting exhibitions, and the Society's use of the Museum as its primary indoor venue was made easier.

Graham led from the front and has always more than pulled his weight in leading field meetings or giving talks, and remember, as the museum receives a constant stream of requests, he was also giving talks to other organisations in between.

All members share the kudos that the BCGS reputation for geoconservation brings. Graham has always been fully immersed in those activities and he has brought even greater influence to bear especially within Dudley MBC in voicing concerns or progressing initiatives, which keep geology at the forefront.

Mounting responsibilities and the associated pressures, like the impending 50th Anniversary year of Wren's Nest and the Rock and Fossil Fair, to name but two, are making demands that would adversely affect the Chairmanship, and he was unwilling to accept these, and it would be unfair and unreasonable of us to expect him to continue.

Although now divested of BCGS responsibilities, Graham remains an enthusiastic and loyal member and we thank him wholeheartedly for his tenure in office.

Alan Cutler

MEETINGS REPORTS

Annual General Meeting; MONDAY 4th April 2005

The thirtieth annual general meeting of the Society was held on 4th April 2005 at Dudley Museum and Art Gallery. Twenty-two members were present with apologies for absence received from Bob Bucki.

Minutes of the 2004 AGM had been distributed, taken as read and approved, proposed by Joy Duckworth and seconded by Barbara Russell. Mike Williams presented a statement of the accounts and treasurer's report. In this year the income stream to the society had reduced due to a decline in membership levels, which amounted to a reduction in income of some £150. In addition, costs of room hire, insurance and administration had all risen. For these reasons the committee are proposing to increase subscription levels from 2006 onwards by £5, for all categories except students. This was considered essential if we are to continue to provide events such as the subsidised field trip, which proved so popular in 2004. Two subsidised field trips, to Matlock and North Wales are planned for this year. The accounts and report were proposed by Alan Cutler and seconded by Alf Cole.

The chairman, Graham Worton, then presented his Annual Report. Graham reported on another successful year for the society. The committee had arranged and delivered a very varied and exciting programme with particular thanks going to Andrew and Gordon. The subsidised coach trip had proved a popular new initiative and it was hoped that many more members would take part in this year's trip. Membership levels had fallen slightly but the society was still very much solvent. Society members had, once again, been involved in various conservation activities. This year these had been particularly exciting with the society working in partnership with Dudley MBC and its Dudley Museum and Art Gallery to successfully bid for grant monies from the Aggregates Sustainability Levy Funds (ASLF) and from English Nature's Environmental Impacts team. Both of these successes have made possible some really important projects which simply would never have happened without it, but which will make the future for geoconservation in our area much more secure and with access to many more opportunities and resources as a result. The English Nature funding in particular has enabled a Black Country wide Geodiversity Action Planning Team to be formed that includes heritage and planning representatives of each local authority, the Wildlife Trust and the Black Country Consortium. This work involved BCGS dedication and initiative driving in quite a series of high-level meetings. These have made it possible to raise the profile of geological heritage in all formal heritage, development control and conservation agendas and policy frameworks, putting the possibility of a Black Country Geopark as a tangible and desirable ambition for the Black Country within the vision of those who can make it happen. The ASLF monies have delivered a number of projects. As part of this work we have carried out

a survey of aggregates sites in the Black Country (180 sites identified with priority actions for development of a selected few). This has also included the production of an audit of access issues, engineering and safety issues for one particular site - Barrow Hill (The Dudley Volcano site) and has given independent assessment of priorities for the management and use of the site. This project also allowed us to produce of a very good glossy interpretive leaflet about the site. This will be formally launched and released to coincide with the establishment of the area as a Local Nature Reserve later in the year. The society also hosted the UKRIGS conference with the museum, which was very well received, and our BCGS collection increased with donations of historic material from a few sites that are no longer accessible. The society committee responded to an outline planning application for the development proposals for Castle Hill as a consultee for matters of geological heritage. We have also been significantly involved in the planning for Wren's Nest celebrations in 2006. All in all a very exciting and busy year for the society's conservation efforts and Graham thanked all those who had contributed to these important works.

The Chairman's report was proposed by Sarah Worton and seconded by Andrew Harrison.

The following changes were made to the offices and the committee of the society. Graham Worton stood down as chairman and was replaced by Alf Cole, proposed by Barbara Russell and seconded by Sarah Worton. Bob Bucki joined the committee, proposed by Mike Williams and seconded by Andrew Rochelle. The remaining members of the committee agreed to continue in their posts and were proposed 'on-block' by Margaret Collins, seconded by Peter Parkes. The 2005 members are currently:

Chairman:	Alf Cole	Vice-chairman:	Alan Cutler
Treasurer:	Mike Williams	Secretary:	Sarah Worton
Meetings:	Gordon Hensman	Field Meetings:	Andrew Rochelle
Members:	Barbara Russell	Andrew Harrison	Bob Bucki
Auditor:	Martin Normanton		

During 'Any Other Business' Adrian Collins (Chairman of West Midlands Group of the Geological Society of London (GS)) briefly highlighted that the bicentennial of the GS is in 2007 and he looked forward to working with the committee to organise some joint events in that year which will benefit both the GS and the BCGS.

Finally Mike Williams proposed a big vote of thanks on behalf of the society to our retiring chairman Graham Worton for all his hard work and commitment to the society over the last 5 years as chairman, and 21 years on the committee.

Sarah Worton

The fascinating minerals of Northwest Scotland – Spencer Mather

Most of us in the Society could be described as enthusiastic amateurs, and this is certainly the case with Spencer. However, the word amateur is a bit misleading, for this talk revealed a complete expert on minerals. We were taken on a tour of the North West Highlands where Spencer once lived, and he brought some spectacular specimens for us to look at.

The underlying rock types of the area are the Torridonian Sandstone, mostly a conglomerate; Durness Limestone and Eribol Quartzite. The structure is complex involving the Moine Thrust. The Lewisian Gneiss is also present, "containing the largest crystal of Titanite in the world". We also saw Nepheline Syenite, Brucite Marble, "they use it for road fill but it's a beautiful gemstone when cut and polished", and Serpentine.

However, it is with minerals that Spencer is most knowledgeable, Epidote, Beryl, Corundum, Sapphire, Uxinite and many others that I could not record. Also, his favourites, Garnets, many different varieties of various colours. This lecture was peppered with asides and anecdotes that made it all the more entertaining. We heard how Spencer found some garnets when walking through a graveyard when drunk, for a bet; how he panned for gold with a frying pan, and how he broke his tooth on a pearl when eating local mussels, or to be more precise, mussels, mayonnaise and whisky sauce.

The most remarkable thing is that Spencer is completely self-taught, mainly from Dana's Manual of Mineralogy, all 530 pages of it. He has used his photographic memory to build up this fantastic encyclopaedic knowledge of the mineral world. His love for travel and his enthusiasm was conveyed to us all, he ended his talk by telling us; "Don't hang about – get up there!"

Bill Groves

Parys Mount; Anglesey

Snowdonia is the nearest mountainous area to the Black Country. It really is a little compact gem of a district, and it was on the rugged cliffs and crags that several members of the successful 1950's Everest Expedition trained. Anyone who has visited Snowdonia will know how suddenly the craggy mountainous terrain appears once Betyws Coed has been passed. The effect is dramatic, despite the mountains' modest altitude. The effect they have on the climate is even more dramatic with mist, clouds and pouring rain on many days when the coastal fringe basks in bright sunshine.

One of our members, Bob Duncan, kindly arranged with the West Bromwich Climbing Club for members of the B.C.G.S. to stay for a long weekend in their hut at Plas Gwynant in May, with the main objective a visit to Parys Mountain in Anglesey. About eight or so members made the journey, some with their own mobile accommodation. Saturday saw us off to Anglesey.

Parys Mountain was the largest copper mine in the world in the 19th century, and much of this was exported through the tiny port of Amlwch on the north coast. The copper ore was discovered only a few feet below the surface in 1768, about a mile and a half south of Amlwch. The ores were quarried at first, and then later mined.

The mines also produced rock sulphur to make gunpowder, and yellow ochre to make paint. Imported into the quarry and mine complex was scrap iron to precipitate the copper from the waters that seeped from the underground, and thousands of tons of coal were imported to fire the smelters.

Miraculously the weather was mainly sunny and fine when we were conducted around the huge surface workings. We can now all claim to have stood on a "black smoker" – admittedly at the bottom of a large hole in the ground rather than the bottom of the ocean, and not exactly in its active phase, which took place over 400 million years ago! However, it's not something one can do every day!

I can thoroughly recommend field trips such as this. As much for the "bonding" which occurs as the geology. I look forward to the next one.

Gordon Hensman

There will other reports of this superb trip in the August Newsletter.

Global Mass Extinctions: Volcanism vs Impacts
&
Barrow Hill - the Dudley volcano

MONDAY FEBRUARY 28th 2005 Lecture: 'Global Mass Extinctions: Volcanism vs Impacts' by Prof A.D. Saunders, Geology Department, University of Leicester and 'The Dudley Volcano, Barrow Hill' by Graham Worton, Keeper of Geology, Dudley Museum and Art Gallery.

A slight technical hitch on the night meant that Professor Saunders gave a slightly shorter talk than intended. As a result Graham Worton stepped in to follow up Professor Saunders' talk with one about the Dudley Volcano, Barrow Hill.

Global Mass Extinctions: Volcanism vs Impacts

INTRODUCTION

Professor Saunders' talk centred around the increasingly popular view that the eruption of flood basalts, such as those in Siberia and the Deccan Traps, play a much bigger role in global mass extinction than has been attributed. Since 1980 this view has been largely 'kidnapped' by the theory of bolide impact, especially since the discovery of a large crater at the Yucatan Peninsular in America in 1991. The duration of global mass extinction events is unknown because current resolution techniques are insufficient to resolve time frames of tens, hundreds or thousands of years.

From the Geological Record a total of five global mass extinction events have been identified the largest of which occurred in the Permo-Triassic and at the end of the Cretaceous. The Geological Record also indicates that on average bolide impacts have occurred every 13 million years whilst flood basalt eruptions have occurred every 20 million years. These figures are too frequent to account for the small number of global mass extinction events recorded. So what could the likely cause be?

LIKELY SMOKING GUNS

Professor Saunders went on to explain the evidence and current popular views surrounding the causes of global mass extinctions especially those concerned with the Permo-Triassic and Late Cretaceous events.

Strong correlations exist between the timing of major volcanic events and the timing of mass extinction events. Studies of the Siberian flood basalts, erupted between the Carboniferous and the Triassic, indicate that these were erupted within 1000 to 2000 years of the Permo-Triassic mass extinction event. Similarly the Deccan Traps in India were erupted between the Cretaceous and the Eocene, which coincides with the mass extinction event at the end of the Cretaceous, 65 million years ago.

Fossils encountered above the K/T boundary, at the Yucatan Peninsular, suggest that this event may not be responsible for the Cretaceous mass extinction event. This has fuelled the argument for volcanic activity playing as an important role as bolide impacts.

Flood basalt eruptions release very large volumes of carbon dioxide into the atmosphere, which results in global warming. The carbon dioxide generally results from the breakdown of carbonate rich rocks within the mantle. The oceans act as a good buffer to carbon dioxide levels, absorbing most of it and trapping it as calcium carbonate in animal skeletons, shells and limestone deposits.

Volcanic eruptions and bolide impacts both release large volumes of dust, ash and sulphur dioxide into the atmosphere, which results in global cooling and the archetypal 'Nuclear Winter'. This in turn influences the life cycle of plants, which will absorb less carbon dioxide from the atmosphere. However, sulphur dioxide does not travel far, from its source, and only lasts a matter of days in the atmosphere before it is washed out by rain.

Recently the release of carbon dioxide and methane from gas hydrate deposits on the ocean floor has been proposed as a potential cause of climate change which bought about the Permo-Triassic mass extinction some 200 / 250 million years ago.

Carbon dioxide and sulphur dioxide can also have the affect of increasing the pH value of seawater making it more acidic. However, very large volumes of carbon dioxide and sulphur dioxide are required to cause any real harm and it would be the micro-organisms that would most likely be affected first.

CONCLUSIONS

Today the cause of past global mass extinctions is commonly viewed as the result of events such as the eruption of the Siberian Plateau Basalts and the Deccan Traps in India, and not only bolide impacts. Many geologists now believe that by the Late Cretaceous the Dinosaurs were already dying out. This was a result of climatic change due to massive volcanic activity followed by the

bolide impact at the Yucatan Peninsular which acted as a 'double whammy' that finish the Dinosaurs off.

Could this have been the case 200 / 250 million years ago during the Permo-Triassic extinction event? It is believed possible and would fit with the more modern popular belief that global mass extinctions are not the cause of just one incident or another but the result of a series of catastrophic events.

Barrow Hill and Tansey Green clay pit – The Dudley Volcano

Following on from Professor Saunders' talk, a short account was given by Graham Worton of a volcano much closer to home. Graham started his talk by introducing some basic terms and phrases to explain what volcanoes are, where they occur and how they form.

Volcanoes occur anywhere on the Earth's surface where gases feed vents in the crust and molten magma rises to the surface from beneath. For example where the crust is being actively pulled apart fissure eruptions classically result. The word 'Volcano' originates from the Roman God of Fire Vulcan and the igneous rocks that form from the molten magma are derived from the Greek word 'Ignis' meaning fire. Today Mexico, Hawaii, Tonga and Samoa are typical of volcanically active places where fire god legends and volcanic myths can be found.

The Barrow Hill volcano and the Tansey Green clay pit are situated to the west of Rowley Regis near to Dudley in the Black Country. Barrow Hill represents a magma chamber from which olivine rich basalt was intruded in to local country rocks, along localised faults, fractures, during the Carboniferous. Typical temperatures of the basaltic lava coming from the magma chamber would have reached around 1100 to 1250 °C, which would have been rapidly cooled by the wet sediments of the surrounding country rocks.

Approximately 370 million years ago, during the early Carboniferous, England was landlocked and formed part of the Laurasian Continent close to the equator. The climate of this time was one of tropical swamps, mires and coal seams into which the Barrow Hill basaltic lava was intruded from approximately 80m depth. As Laurasia drifted northwards on the Euro-American Plate rifting resulted in localised faulting and fracturing along which the Barrow Hill basaltic lava could migrate. The continued migration northwards, of Laurasia, also resulted in the tropical swamps and mires of the Carboniferous drying up, as the climate warmed, to be replaced by mudflats and lakes where Mercia Mudstone was deposited, during the Permian, and into which the Barrow Hill basaltic lavas continued to intrude.

Today around Barrow Hill sheets of basaltic magma can be seen running within old coal seams and volcanic deposits can be seen surrounding Barrow Hill itself. Conifers that once flanked the slopes of the volcano have been found preserved, through the process of silicification, from falling and flowing hot ashes. The oldest and most anatomically complete conifers have been encountered in the Tansey Green clay pit that lies close to Barrow Hill.

Andrew Harrison

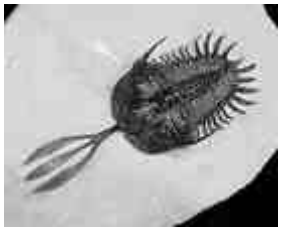
OTHER NEWS

It was with great relish, that a female palaeontology lecturer, told a group of predominately male students, of which I was one, that mature ammonites often occur in two sizes, and that the larger is likely to be the female, and the smaller, more 'puny' form is the male. It was a novel way to introduce the topic of *sexual dimorphism.* It means that if you saw a male and female lion, or mallards for the first time, on looks you may decide that they are different species. With fossils, knowing little of their sexual habits, we decide species on their morphology, and many that are given different specific names may in fact be the male and female of the same species. Obvious differences are usually preserved in soft and not hard tissue.

Some researchers have proposed the Dinosaurs may show differences in skeleton shape or ornamentation on the head according to their sex, but this has never been proved. However, a recent study of bone tissue from the back leg of *Tyrannosaurus rex* has found layers of *medullary bone.* This tissue is rich in calcium with many small blood vessels, and it is also found in some modern birds such as ostriches and emus. It is a ready source of calcium, only found in females, and it can be quickly released to form eggshell. This is significant for two reasons, not only does it

indicate the likely sex of the fossil but it strengthens the evolutionary link between dinosaurs and birds.

Another recent study has investigated the possible sex of fossils, and this time closer to home in that it looks at trilobites. To be precise, it is of one particular trilobite, *Walliserops trifurcates,* a Devonian form that has many horns including a long one at the front with three prongs, rather like a trident. What was its purpose? Protection, a swimming aid, camouflage or a sensory feeler have all been suggested, but it now seems likely that it was a form of male adornment used in fighting over access to the female. The analogy is with modern beetles that use their horns in the same way. Many other horned trilobites may use them in a similar fashion. However, you can make up your own mind as in the Dudley Unearthed gallery of Dudley Museum is a trilobite display with many bizarre forms, including *Walliserops.* You may have a better idea.



References:

- BBC news website, follow links to science and nature. (dinosaur)
- *Science* (vol 308, p 1456) (dinosaur)
- *New Scientist* Vol 186 No 2501, 28th May 2005, p 16 (trilobite)

Bill Groves

WREN'S NEST PHOTOGRAPHIC COMPETITION

2006 is the 50th anniversary of the Wren's Nest being a geological National Nature Reserve. As part of the celebrations a commemorative calendar is being produced and there is a competition to identify suitable photographs. The subject is "Wren's Nest Through the Seasons" If you are a photographer, however amateur, why not take part. Professional photographers cannot enter. You can submit up to four photographs, colour or black and white, as a print, slide or on CD. The closing date is 31st August 2005 and entries should be sent to *Kevin Clements, Countryside Manager, Dudley MBC, Culture and Community Services, Blowers Green Road, Dudley. DY2 8UZ.* Full details can be found on www.discoverdudley.org.uk/attractions_park.asp

MEMBERS'EVENING 2004

Although it was originally planned to put all the presentations of this pleasant evening into a separate document, we are now putting them in Newsletters throughout the coming months. This edition we summarise *Graham Worton's* view of recent developments in Dudley generally, and the museum in particular.

In the past year we have reopened the downstairs geological gallery after major structural work following an attack of wood rot. The UnEarthed Gallery was first time that we had ever built a whole gallery and designed everything within it ourselves, with the first ever use of DVD and Surround Sound Technology, the first steps in interpretative film making. Ultimately it was a fantastic team effort, with consultation on everything; even the colour scheme. Many members of the Society were voluntary members of this team, as were A-level geology students. It was a unique occasion in the life of the museum and it showed just what we could achieve ourselves.

With the opening of the 'Dudley UnEarthed' gallery, we now have more of the museum's collections on display than ever before, and members of the society have also participated in other geological heritage projects. The plans for the Seven Sisters Caverns at the Wren's Nest National Nature Reserve are well known, and form part of the DVD presentation in the UnEarthed exhibition. Stabilisation of the Upper Gallery is under way and plans are afoot to realise the full geotourism potential of the site. Dudley hosted the Annual Conference of UKRIGS (Regionally

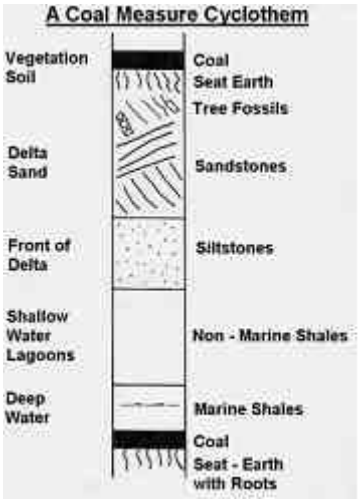
important geological sites) and plans are near completion for the Barrow Hill Trail, at Pensnett, site of the 'Dudley volcano'. There will be a descriptive leaflet and guide, with a map of this important and interesting area.

Dudley and the Black Country have a unique Earth Heritage that should be recognised by a wider audience. The society and its members play an important role in working to realise these ambitions, and we can be proud of these efforts.

Graham Worton

GEOBABBLE

CYCLOTHEM is a well-known and common term in geology. Cyclicity, that is the same situation reoccurring over time, is a common feature whether you are looking at small-scale repetitions in sediments or the bigger picture of climate change and Milankovich cycles. However, if we stay with sediments, and particularly with the Coal Measures of the Black Country, a *cyclothem* is a single sequence of rocks that are repeated in a cyclic way.



Typically, the sequence will start with a marine band or sandstone, to be followed by shale or fireclay and ending up with a coal seam. This represents a shallowing of the water, and has traditionally been interpreted in various ways. Perhaps a delta building out and then switching, or river avulsion – a sudden switching of the channel, or the land could have been raised and lowered tectonically, or the climate was erratic, or the source of sediment supply could have changed, or…….. Here was a geological phenomena waiting for an overarching explanation, and it came towards the end of the last century.

The Carboniferous was a period of 'ice-house' conditions with ice caps over Gondwanaland in the southern hemisphere. Temperatures would not have been completely uniform and when it gets colder the ice builds up slowly, but in warmer intervals the ice melts more rapidly. This affects the worldwide sea level – eustatic sea level. These frequent sea level changes of low amplitude are reflected in our Coal Measure *cyclothems.*

The modern study of these sequences has led to a new appreciation of the significance of these deposits, especially when the drop in sea level leads to a pause in sedimentation and an unconformity. These unconformities are the boundaries of *sequences* and can be recognised seismically, and this has resulted in the important study of *SEQUENCE STRATIGRAPHY,* but that might be a future GEOBABBLE.

As a footnote, when I was a student, I was frequently admonished for spelling cyclothem as *cyclotherm,* a slip of the pen, so I was pleased to find that when I looked it up in 'The Macmillan Encyclopedia', the same spelling mistake had been made – twice!

Image is from website of Huddersfield Geology Group: www.huddersfieldgeology.supanet.com

Bill Groves

HOLIDAY GEOLOGY

Do you pack your hammer when you go on holiday? Are you having a geological break? Whatever you are planning, tell us about an interesting geological site or feature that you saw and we can put it into the Newsletter. Any snippet of information, however short will be most welcome and interesting to the other members. Contact details below. We hope that you all have a very enjoyable and relaxing summer break.

Editorial team

CONTACT US

As ever we would love to hear your news and views so please put pen to paper or fingers to keyboard and give us your thoughts. Notices that appear in this Newsletter will remain in future editions until the date of the related meeting or event has passed. In order to include material in the August Newsletter, please send or give it to one of the Editorial Team by ***Monday 8th August 2005.***

EDITORIAL TEAM

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