The Black Country Geological Society

NEWSLETTER NO. 88 AUGUST 1991

Lecture meetings are held at the Saracens Head, Stone Street, Dudley, 7.30pm for 8 o'clock start

The Society does not provide personal accident cover for members or visitors on field trips. You are strongly 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.

FUTURE PROGRAMME

SUNDAY 22ND SEPTEMBER

Field meeting to Cross Hands Quarry and Sharps Hill Quarry, near Chipping Norton, Oxfordshire.
Leader: John Crossling, Keeper of Geology, Warwickshire Museum

Meet 11.00am at Cross Hands Quarry next to Cross Hands pub (grid ref: 269290). The quarry is on the A44 road, about 4 miles west of Chipping Norton.

Cross Hands quarry is in the Middle Jurassic and shows the Clypeus Grit and Hook Norton limestone. Bivalve molluscs and brachiopods are the most common fossils. No hammering, but collecting is possible from loose or fallen material.

Sharps Hill quarry is in the Great Oolite of the Middle Jurassic. It is a classic site, being the type locality of the Sharps Hill beds.

Hard hats are required - bring your own is you have one, otherwise the Society's stock of hats will be available.

MONDAY 14TH OCTOBER

Lecture: The mass extinctions controversy
by Professor A. Hallam of Birmingham University.

Professor Hallam is an authority on the subject of mass extinction and will outline the present controversy between different points of view.

Mass extinction events have always interested geologists. Why did dinosaurs die out at the end of the Cretaceous? What is the explanation for the other well-documented mass extinctions in the late Devonian, at the end of the Permian, at the end of the Triassic, and so on? Various theories have been put forward, but none have been completely accepted.

Professor Hallam is Lapworth Professor with the School of Earth Sciences, Birmingham Univeristy. His main research interests are in mass extinctions, sea-level changes and evolution.

SUNDAY 27TH OCTOBER

Field meeting to study Upper Carboniferous Rocks in the Black Country.
Leaders: The British Geological Survey Team.
Dr John Powell - team leader
Dr Brian Glover
Dr Colin Waters

Meet 10.00am in the main car park at Baggeridge Country Park (grid ref 898931). This is midway between Sedgley and Wombourne.

Itinerary
The excursion will examine the controversial stratigraphical and lithofacies relationships of the Upper Carboniferous and Permian rocks of the South Staffordshire coalfield. The party will visit selected exposures in the Keele, Enville and Clent formations, starting in the Baggeridge area, and finishing in the Clent Hills.

MONDAY 2ND DECEMBER

Lecture: Geology in South Africa by Malcolm Callow.

The lecture will describe the pre-Cambrian gold deposits in southern Afri..., and their importance for gold mining. It will also cover the greenstone belts and other sedimentary deposits.

Malcom Callow, who is a member of this Society, studied geology at London University, taking his MSc in structural geology and rock mechanics. This was followed by several years in South Africa - with the Geological Survey, then at the University of Witwatersrand carrying out research on gold mining, and finally as lecturer at the Vaal Triangle Technikon.

WEDNESDAY/THURSDAY 4-5TH DECEMBER

eological Curators Group AGM and Conference in Dudley.

SATURDAY 7TH DECEMBER

Geological open-day in Dudley Museum.

MONDAY 13TH JANUARY 1992

Lecture: W.J. Harrison (1845-1908). Birmingham geologist and photographer. A historical lecture illustrated by Harrison's own photographs.

Lecturer: Peter James, local studies archivist, Birmingham Central Library.

FRIDAY 17TH JANUARY - 150TH ANNIVERSARY

This date marks the 150th anniversary of the Dudley and Midland Geological Society. The BCGS will be marking this event during 1992 - watch this space.

MONDAY 24TH FEBRUARY

Annual General meeting followed by a talk "Mount St. Helens - ten years on" by Paul Shilston.

MONDAY 23RD MARCH

Lecture: "Geology and the nuclear industry" by Nigel Monckton, UK Nirex Ltd.

EDITORIAL

In the sixteen years of the Society's existence, I believe I am only the third editor and I take up the post very conscious of the high standards set by my predecessors, Shiela Pitts and Andrew Rigby. I hope that my time as editor will enable me to widen my circle of friends within the Society and that contributions will be offered freely and in abundance. Please send me press cuttings and other items which you consider may be of interest to our members and I will include them when space permits.

REPORTS

Lecture "Earthquakes" by Dr. I.G. Stimpson. 3rd June 1991

TREMOR TEARS THROUGH HOMES was the headline which started this interesting talk about earthquakes given by Ian Stimpson of the University of Keele.

During the last 20 years some 1.5 million people have been killed as a result of earthquakes, but the point was clearly made that it is not the earthquake which most ofen causes fatalities, but the collapsing man-made structures.

Earthquakes occuring closest to civilisation and those which have most media coverage are the ones which are remembered, and those with greater magnitude do not necesarily cause the most fatalities, for example,

Date	Magnitude	Region	Fatalities	
1906	8.3	San Fransisco	700	known worldwide
	6.0	South America	whole town	not even reported
1976	7.6	Tangshan, China	650,000	
1990	5.0	Wrexham	0	reported extensively

Causes of earthquakes put forward by past civilisations are many and varied and include the supernatural, dragons, cavern collapse and elephants. There has also been a great deal of superstition associated with earthquakes including a method of prediction by the ancient Japanese whereby a catfish was hit on the head with a sledgehammer and if the catfish moved there would be an earthquake! In 1893 however, a Japanese man called Koto associated the casue of earthquakes with faults and in the 1890s a Lancastrian, John Milne, developed an instrument for measuring ground oscillations. In 1895, the first seismic network was set up on the Isle of Wight.

Earthquakes occur when stored strain energy is suddenly released. San Fransisco lies on the San Andreas fault at a conservative plate boundary. The 1906 San Fransisco earthquake gave rise to lateral displacement at the surface of 2 metres and this could easily be seen from the previously straight fences surrounding an orange grove. The main damage however was caused by fire, compounded by the effects of lack of water for fire-fighting due to fracturing of water-mains. The 1989 San Fransisco (Bay Bridge) earthquake led to the collapse of part of the bridge due to differential movement because one end of the bridge was built on solid rock and the other end was on softer material. Lack of funds had led to the disbanding of the safety committee 2 years earlier.

Earthquake waves are amplified when passing through soft sediments such as the Bay mud in San Fransisco Bay. This leads to liquification of the ground. This also occurred in the 1985 Mexico City earthquake, and although Acapulco was nearer to the epicentre, because it is built on solid rock it was hardly affected. It was found in Mexico City that buildings of 6-20 floors high moved from side to side by 10-40cm and the shaking lasted for about a minute. Buildings of this height were the right height to resonate and vibrate

leading to collapse, but lower buildings tended to survive.

Politics and earthquakes

In California the cheapest land is, not surprisingly, next to the San Andreas fault. Most government buildings are exempt from building codes, so these buildings, together with 16 hospitals, are situated adjacent to the fault.

In 1988 the Spitak earthquake in the Soviet Union was indirectly responsible for the death of 80% of its population. It is alleged that corruption led to building codes not being enforced. Surface waves produce the most damage due to their greater amplitude.

Earthquake prediction is still really a 'hit and miss' affair. The Chinese successfully predicted the Haicheng shock (magnitude 7.5) in 1975 where several hundred thousand lives are belived to have been saved but the following year, as previously mentioned, 650 000 people in Tanshan lost their lives.

The best way of avoiding death as a result of earthquake activity is to live well away from the known active seismic zones - the plate margins.

SALLY CROWTON

Weekend field meeting to North Devon, 14-16th June. Leader, Micheal Bamlett, Birkbeck College)

The geology examined during the weekend consisted of rocks of Devonian and Carboniferous age, deformed during the Hercynian orogeny. Although different theories exist, it is probable that two continental plates moved towards each other and compressed the sediments previously deposited to produce a 'fan like' arrangement of folds in Devon, with the rocks to the north being overturned to the north, and those in the south overturned to the south, and good coastal exposures were seen.

On Friday the first two stops were fairly brief, just to look at outcrops of rocks by the roadside. A few kilometres from Barnstaple, in a layby on the A39 road to Lynton, we looked at the Pilton slates of the Upper Devonian, which consist of clay and mud, which have a vertical cleavage. It was difficult to identify the bedding planes due to the presence of joints and faults. These deposits formed in a marine delta or a freshwater lake close to the shore.

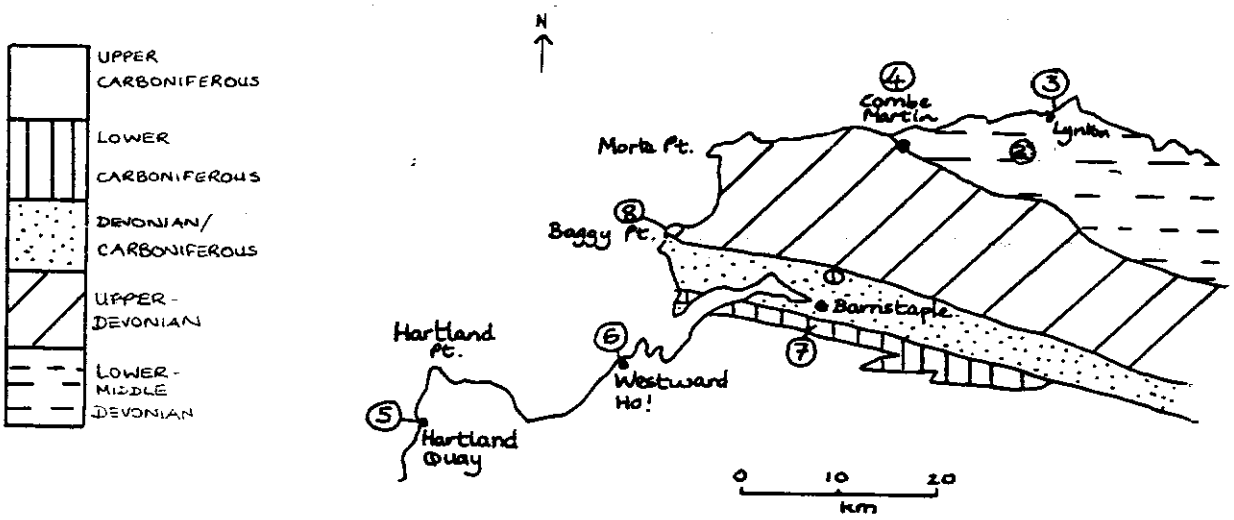
We climbed back into the minibus after this short stop, but alas, it did not want to move, so members following in a car sought assistance while the rest of us enjoyed a short lecture in the bus and after some delay, a replacement vehicle was provided by the hire company.

At the second short stop (GR. 707479) beside the main road, we looked at rocks of the Lynton Group (Lower Devonian). We saw evidence of ripple beds in the bedding planes and there was some debate whether these were top or bottom deposits, but as the ripples are not sharp and the direction of flow could not be seen, it is probable that they are bottom beds. Joints were visible from the de-watering and subsequent shrinakge of the rocks. The folding was measured as 20° to magnetic north.

Stop three was at Lynmouth, where we firstly considered the effects of the flood of August 1952 and saw some of the flood protection work which has been caried out and which is still proceeding today. We then walked down to the beach (GR. 735495) to look at the Lynton beds. These consist of interbedded

mudstones and siltstones and have strongly cleaved slates. Some bioturbation has also taken place, seen mainly as worm tubes. There are some calcite and quartz veins from hydrothermal intrusions of hot water, where silica was carried in solution and as the water cooled, silica was deposited. The rocks have been stained by iron, particularly haematite. The rocks here dip inland, refelcting the overturn, and the cleavage and bedding planes run in the same direction.

Lunch was taken in Lynmouth before proceeding to Combe Martin. Here we had time for a short visit to the local museum, which contains information about the history, geology and silver mining in the area. On the west side of the beach is the Combe Martin Formation, where the cleavage planes are dominant. The quartz in the rocks occurs at different angles, and may have been due to earthquake activity. We had time to look for the Limestone member, but did not find it here. On the east side of the beach we saw the cross bedded sandstones and siltstones of the Lester Formation of the Ilfracombe Group. The rain started to fall steadily but we managed to locate the Limestone member (thanks to a bottle of acid belonging to one of the members), which contained calcite deposits and some fossils, mainly corals and crinoids. We also found some chert, ripple marks and worm channels. The bottom beds have been overturned to lie on top, again reflecting the general overturn. As the rain became heavier we retreated to the car park and headed back to Barnstaple at the end of an enjoyable day.



On Saturday more BCGS members unable to take advantage of the additional day joined the group. Our first stop (5) was at Hartland Quay to look at rocks of the Crackington Formation of the Upper Culm Group of Upper Carboniferous period, which are sandstone and shale beds. These rocks have been intensely deformed and we saw some well defined fold structures, which represent some of the best exposed fold structures in Europe. The deposits were laid down in a marine deep water environment but inversion from a basin to a ridge took place before the Hercynian orogeny began. There is evidence to support the theory of a turbidite facies here, where material was deposited in the strong currents of submarine rivers. Material from earth movements produces shattered rocks, which are then deposited on a slope in a fining down sequence. Fossils are few and were washed into the area by the currents. The shales acted as lubricants during the folding and many tension cracks are evident containing calcite and quartz.

There are examples of overturned and tight folds where silica was forced into solution under high pressure and migrated into the limbs of the fold, thus weakening the uncemented rocks at the top which thus become prone to erosion. Other features noted were slickensides, fault breccia, scratching, sigmoidal tension gashes and some fossil plant beds. In places there are bulges in the

beds, explained as load casts, where sandstone sediments pushed down into the wet mud deposits.

As it began to rain we headed for the hotel for lunch and for a brief visit to the museum. In the afternoon the rain grew steadily worse as we explored Warren beach and some members sheltered under the cliffs. Further examples were found of slickensides from bedding planes moving past each other and bottom structures and groove casts, formed as the sediments were scoured by large rocks and subsequently infilled by finer sediments.

We then moved on to Westward Ho! (6), when the sunshine re-appeared. This is a north facing coast and as access to the cliffs was difficult we remained on the beach examining the Abbotsham member of the Crackington Formation, consisting of sandstone and shale turbidites. The strata dip steeply landwards and seawards, being both limbs of an anticline and syncline. The rocks here have a strong cleavage and very tight folding, and are richer in shale than the rocks at Hartland Quay. There is also a large natural pebble ridge on the beach, which was probably rolled onshore by strong wind and wave action. The sand on the beach originates from Cornwall or the Torridge estuary to the north, and has a gentle gradient which floods at high tide.

On Sunday morning we briefly visited two sites. First, the Bishops Tawt[illegible] Quarry (7) which contains Codden Hill Cherts of the Lower Culm Group of the Carboniferous period. There are thin beds of sandstone and shales which have been folded. The clay, formed from sea floor sediments, has been compressed, mildly metamorphosed and in solution has cemented together to form the chert. It is very smooth and no grain size is evident. In some examples it was possible to see the fine bedding of many laminated layers, formed due to these particles being in suspension for long periods of time. Black dendritic patterns of manganese dioxide occurred on some rocks. The quarrying here would have been for sandstone. We then moved swiftly on to Baggy Point (8) to look at the Pilton and Baggy beds of the Upper Devonian, which were deformed in the Hercynian orogeny and where the steep limbs of the asymmetric folds are evident. The Baggy beds lie unconformably on the Pilton beds, which are earlier deposits and which make up most of the beach. Unfortunately this was only a short stop as some of the group had to catch various transport connections from Barnstaple, but some members who had more time to spare were able to walk along Baggy point to enjoy the sunshine and to see examples of ripple beds.

Although the weather was rather wet and windy nevertheless everyone enjoy themselves and evenings were spent in the lounge of the Royal and Fortescue, where topics discussed ranged from global geology to local nightlife and of course the beer, and went on for some late into the night. Many thanks to Mike Bamlett for an interesting and enjoyable weekend.

SUE FAIRCLOUGH

B.C.G.S. NEWS

1. Launch of "English Nature" in the West Midlands

   The Society's Chairman, Alan Cutler, attended the launch of "English Nature" in the West Midlands at Attingham Park, Shrewsbury on 18th April. He was the only representative of a geological interest.

   "English Nature" is England's new conservation body, replacing the former Nature Conservancy Council. Its West Midlands region, with its head office at Attingham Park, has a staff of 60, most of whom are directly involved in giving scientific advice and in managing land for conservation.

Dr. Derek Langslow, English Nature's chief exectutive, speaking at the launch said English Nature's purpose was "To promote directly and through others the conservation of the wildlife and natural features of England" and he emphasised the importance of building partnership and co-operation at local level.

None of the speakers mentioned geology, referring instead to 'natural features'. Alan Cutler queried this with Dr. Langslow after the presentation and Dr. Langslow affirmed that there was nothing significant in this, and that he regarded earth science conservation as important as biological ('wildlife') conservation.

2. Regionally Important Geological Sites
The leaflet enclosed with the newsletter provides us with a strategy for setting up a R.I.G.S. scheme. With so many valuable sites within our area there is obviously much that we can and ought to do to advance conservation.

3. 'Geology World'
Planning permission has been obtained for a Geological Museum in Lilleshall Quarry on Wenlock Edge. It is proposed to form a charitable organisation to raise finance for the project. The first official meeting of 'The Friends of Geology World' is scheduled for 10th January in Much Wenlock. Further details can be obtained from our Secretary.

4. Sale !
A limited number of B.C.G.S. T-shirts and sweat-shirts are available from Chris Jowett at reduced prices:-
Sweat-shirts £4.50, T-shirts £2.50. This is undoubtedly good value but colours and sizes are restricted at these prices.

5. News of members
Douglas and Ivy Warren featured in a double-page article in the Evening Mail in connection with the Sherlock Holmes Society of London's visit to Switzerland to celebrate the centenary of Moriaty's death and Holmes' disappearance. In pursuit of his hobby Douglas spent six months researching the roads used by Holmes. He searched for numbers of buses, details of sewage systems and types of street lighting before presenting a paper to the Society.

6. Dinosaur Postage Stamps
The next issue of British postage stamps (due 20th August) will be a set of pictorial stamps featuring dinosaurs. They are: Iguanadon (22p), Stegosaurus (26p), Tyrannosaurus (31p), Protoceratops (33p) and Triceratops (37p). The stamp issue is to commemorate the 150th anniversary of the introduction of the term DINOSAUR to describe the gigantic fossil reptiles that were being discovered.

The word dinosaur was coined by Richard Owen and introduced by him at the 1841 meeting in Plymouth of the British Association for the Advancement of Science, in his paper "Report on British fossil reptiles". It means 'terrible lizard' (from the Greek *deinos* - terrible and *sauros* - lizard).

Persuading the Post Office to feature dinosaurs on their next issue of stamps is in some ways a personal triumph for Dr. Beverly Halstead, President of the Geologists Association, who championed the cause of dinosaurs, and whose tragic death was mourned in the last newsletter.

7. Welcome to new members:
John Jenkins - Hodge Hill, Birmingham
Giles Smithson - Streetly, Sutton Coldfield

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