



## NEWSLETTER NO. 106 AUGUST 1994

# The Black Country Geological Society

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.

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.

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### FUTURE PROGRAMME

Lecture meetings are held in the Banquet Room (Dudley Suite) at the Ward Arms Hotel, Birmingham Road, Dudley. Phone: (0384) 458070. 7.30 p.m. for 8 o'clock start.

5TH - 9TH SEPTEMBER. British Association for the Advancement of Science. 1994 Annual Conference - Loughborough.

SATURDAY/SUNDAY 24/25TH SEPTEMBER 1994.

### **ROCK AND FOSSIL FAIR**

Held in Dudley Town Hall, St. James's Street, Dudley.  
Opening hours: 10.00 am - 5.00 pm (both days)  
Admission: Adults £1, children under 12 50p.

There will be stands and displays on geological themes from many public bodies, private companies and local and national societies, an 'Experts' stand to identify your specimens, as well as commercial dealers selling mineral specimens, fossils and fossil replicas, maps, books etc.

#### Outdoor events

In conjunction with the Fair there will also be a range of outdoor events including town and churchyard walks, field visits and narrowboat excursions.

SUNDAY 2ND OCTOBER. Field meeting to the Bridgnorth area. Leader: Dr. David Thompson (Keele University). Meet: 10.30 am at the bridge where the A442 road crosses the River Worfe, about two miles north of Bridgnorth (grid Ref: 732958).

*Chairman*  
A. Cutler B.Sc., M.C.A.M.,  
Dip.M., M.C.I.M.  
*Vice Chairman*  
G. J. Worton B.Sc., F.G.S.,  
A.M.I.Geol., M.I.Env.Sci.  
*Hon. Treasurer*  
Mrs J. Shilston  
*Hon. Secretary*  
P.D. Shilston M.A., C.Eng.,  
F.I.E.E., M.I. Mech.E.

The meeting will also visit exposures at Station Road Bridgnorth, Castle Hill Bridgnorth, the road cutting at Quatford, road cuttings on the A454 east of Bridgnorth and other sites.

The purposes of the field meeting are:

(1) to salute the early efforts of Birmingham geologists in describing and interpreting the Bridgnorth Sandstone formation in terms of the winds and desert conditions prevailing at the time.

(2) to investigate revised interpretations of the Bridgnorth Sandstone formation (wind deposits) and the overlying Lower Triassic Kidderminster Conglomerate (fluvial braided stream gravel bars).

DAVID THOMPSON is Senior Lecturer in Science Education at Keele University. He led a field meeting for this Society some years ago to Grinshill in Shropshire.

MONDAY 24TH OCTOBER. Lecture: The Geology of the Isle of Man. By Dr. Trevor Ford (Leicester University).

The geology of the Isle of Man will be an unknown subject to many members, so we can look forward with particular interest to Dr. Trevor Ford's lecture. The structure of the island has some similarity to that of the Lake District, while its main mass is of Manx slates of Cambrian age and similar to the Skiddaw slates on the mainland. In addition there are horizons of Carboniferous limestone resting unconformably on the slates and considerable evidence of igneous activity.

DR. TREVOR FORD has a very wide range of geological interests and has given several lectures to the Society most recently on the Grand Canyon and on Blue John Fluorspar. With his extensive knowledge of the island he has recently completed a geological guide to the Isle of Man published by the Geologists Association.

MONDAY 14TH NOVEMBER. Lecture: "Geology - without a rock hammer?" By Kathie Bowden (National Remote Sensing Centre, Farnborough).

The National Remote Sensing Centre at Farnborough uses Landsat Thematic Mapper satellite imaging for a wide variety of applications, in particular for environmental studies of vegetation cover and land use. For geological studies the large land areas that can be surveyed by satellite have enabled scientists to look at landforms on a much broader scale, not possible with ground-based surveys.

This lecture will describe the techniques of geological exploration using satellite data giving a new dimension to the traditional geological mapping.

KATHIE BOWDEN is and Applications Consultant with the NRSC at Farnborough.

MONDAY 28TH NOVEMBER. Lecture: Pleistocene geology of the loess plateau of China. By Dr. David Keen (Coventry University).

Dr. David Keen writes: "The loess windblown silt deposit of north-central China is the most extensive and uniform body of terrestrial sediment on Earth. It is up to 350m thick and has been continuously deposited for at least the last 2.5 million years. Its stratigraphy and its included soils and fossils have potentially the most complete record of the climatic changes of the Quaternary anywhere on land.

Our Chinese work arose out of a three-week visit to the loess plateau in September 1992. In the lecture I will give a brief resume of the work done by Chinese and foreign workers to unravel this climatic sequence and will also show some of the work done by the combined University of London/Coventry/Liverpool team since 1990."

DR. DAVID KEEN is Reader in Palaeontology at Coventry University with special interests in Quaternary geology and Palaeontology, in particular Quaternary Mollusca. He is also Proceedings Editor for the Geologists Association.

MONDAY 16TH JANUARY 1995. Lecture: Tales of teeth and tails - the origin of fish". By Dr. Paul Smith (Birmingham University).

MONDAY 20TH FEBRUARY. AGM followed by a talk "Geology of Iceland" by Alf Cole (Society Member).

MONDAY 6TH MARCH. Lecture on mineral exploration by Clyde Leys (RTZ Mining & Exploration Ltd)

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### EDITORIAL

Observations of the collision of comet Shoemaker-Levy with the planet Jupiter will provide research material for years to come and cause us to re-assess our understanding of geological processes.

Judaic and medieval ideas of catastrophism surface at intervals and have, in modern times, usually been treated with derision.

But catastrophic events can reshape the earth. Do folk memories of actual events lie behind the biblical myths of the parting of the Red Sea and Noah's Flood?

Research suggests that a comet or asteroid collision in the mid 530s AD may have triggered the Dark Ages. Professor Mike Baillie of Queens, Belfast finds evidence in tree ring data and the search for the results of impact is on.

Evolution is less regular and steady than had been thought. It would seem that the present that is the key to the past is more exciting than James Hutton imagined.

I hope to see you ALL at the Rock and Fossil Fair.

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### REPORTS

Field excursion to Mam Tor ('the shivering mountain') and Dirlow Rake, Derbyshire - 8th May 1994.

This was a combined meeting of the BCGS, Manchester Geological Association and The Geological Society (Yorkshire branch). Some 55 persons attended in ideal weather conditions, sunny and dry underfoot, to study the landslip under the guidance of Dr. John Cripps of Sheffield University.

The Mam Tor area is comprised of Lower Carboniferous limestone (not involved in the landslip) unconformably overlain by Upper Carboniferous Edale Shale, which is overlain by the Mam Tor beds, a series of shale and sandstone beds.

The Edale Shale is a dark grey thinly bedded and laminated marine shale which is highly susceptible to chemical weathering following exposure and precipitation, leading to a reduction in strength. Erosion of the shale resulted in the landslide.

Following abandonment of the A625 Manchester-Sheffield road in 1978/9, little work has been done to stabilise the slip which is still active. The toe continues to extend over the surrounding fields and since the toe has not been removed by erosion, as happens in coastal landslips, it is readily accessible and is likely to remain so, and it provides a model of landslide activity.

Radio carbon dating of material beneath the slip indicates a start date of 8000 years ago, with the toe moving about 1 ft a year. The most obvious evidence of movement is destruction of the road, with lateral movement and subsidence of several metres since abandonment in 1979. One section reveals several thick layers of limestone and tarmac laid down by the council over the years, in an effort to save the road.

The toe is a wall of bracken and grass-covered spoil about 5 metres high and its movement is well documented by photographs, whilst fences are distorted and a row of telegraph posts is misaligned.

Streams emanating from the landslide show discoloured beds due to iron salts resulting from chemical changes to the shale, whilst plants at the stream edge are partially coated with gypsum and appear 'frosted'. It is said that the ponds in the marshy area have firm bases due to the accumulation of chemicals deposited, but nobody was prepared to walk on the water.

The northern side of Mam Tor is a steep cliff with frequent rock falls. Many sandstone blocks have fallen and rolled down the slopes where they can be safely examined; many show sole markings and ripples.

After lunch the party, under the guidance of Dr. Dick Ineson of Sheffield University, visited Dirlow Rake, an old lead vein said to be 5 miles long with records of working since 1630. The only evidence of the old working is a long, irregular excavation resulting from surface extraction with numerous shafts alongside, in the sound rock, leading to workings some 200 ft underground. The old pounding circles remained, where the ore was crushed. In addition to the geology we were treated to a potted history of mining and mining law.

Our final call was to a working fluorspar mine - a precipitous hole at the side of an old lead vein where mineralisation occurred as a result of metasomatic change. At the south-east edge of the vein the stratified limestone was unaltered, but in the north-west direction massive changes had occurred, resulting in a high proportion of fluorspar, which has been almost completely removed by mining. The spoil remaining contained many interesting specimens including galena, fluorspar, barytes, chert, columnar calcite, brown calcite and traces of Blue John. The sides of the pit scraped clear of the fluorspar are of reef limestone; they show no signs of stratification which contrasts with the stratification evident in the areas of unmineralised limestone.

DENNIS WOOD

12th June 1994 - Field Trip to the Forest of Dean

Roger Vaughan, conservator with Bristol City Museum, led a study of the strata of the wigpool syncline.

We began by examining the north eastern limits of the fold in road cuttings along the A4136 of Plump Hill. At the base of the syncline lie the Brownstones representing Old Red Sandstone type sedimentation, the rocks probably deposited by meandering streams.

The overlying basal quartz conglomerate follows unconformably, there being evidence of erosion at its base. Its poor soils have been left wooded. The impersistant coarser beds represent pebble bars in a braided river channel.

The Tintern Sandstone is micaceous and followed by a marine transgression as evidenced by the crinoids in the Lower Limestone Shale, whose outcrop is marked by a gully resulting from quarrying.

Above, the land opens out into a quarry in the Lower Dolomite and our attention was drawn to the stylolites, where solution has occurred at pressure points and the material has been reprecipitated to produce regular zig zag patterns on bedding and joint planes and cement for sands elsewhere. The limestone is much reduced in volume by solution and replacement, and haematite collects in cavities in the dolomite. The rock has been excavated for building and roadstone.

The Crease limestone has been extracted. The overlying Whitehead limestone is lagoonal and a fine china stone, an exposure being discovered deep in nettles.

The final visit of the morning was to the Drybrook sandstone which represents a return to more terrestrial, deltaic conditions, with sand bars and muddy bio-turbated layers. Enclosed within the Drybrook sandstone, presumably downfaulted, is an extraordinary patch of Coal Measures with plant fragments. It appeared to be folded into a tight syncline and has been identified as Westphalian A or Lower Coal Measures, a division unrepresented elsewhere in the Forest of Dean.

The afternoon proved a revision exercise as well as providing new insights. We visited the secluded Stenders Quarry (SO 659 182) where we saw again the junction between the Old Red Sandstone and Lower Carboniferous up to the Lower Dolomite. Sandy ORS gave way to the oolitic limestone of the agitated shelf seas of the Carboniferous. Honeycomb weathering occurred where pea-size nodular calcite had been dissolved out. Crinoidal limestones gave way upwards to muds and shales. Orchids were an added attraction.

The next visit was to the even more secluded Scully Grove Quarry (SO 655 187) to revisit the Whitehead Limestone in search of algal nets. These textured limestones seemed to require the eye of faith for identification. Chinastones result from lagoonal conditions.

Lastly, to the amazement of the local children, our very large party visited Puddlebrook Sand Quarry for a return to the terrestrial environment of the Drybrook Sandstone. Here there were spectacular stem fossils and stacked channel sequences resulting from a very actively meandering river. Groove casts indicated current direction but obviously have little significance where rivers flow in great loops and constantly change position.

As so often, we were well served by an enthusiastic leader and pleasant summer weather.

Lecture: 'Australian Journey' by Paul Shilston. 20th June 1994.

This lecture described the geological highlights of a recent 6 week visit to Australia. We encountered many geological features of interest, too many to be covered in a single lecture, so only a selection of the best ones were described.

Most of Australia is a very old geological area. It is in the centre of its own plate, not near any 'hot-spots' so it has been stable without much activity since the early Pre-cambrian. The exception is the strip along the east coast (the Tasman Fold Belt) where there has been folding and volcanic activity.

The journey started off in Ballarat in Victoria, where gold was discovered in 1851. At first there was placer gold in the local streams, then when that was exhausted they found a buried 'fossil' placer, and finally they opened a deep reef mine which operated until 1918.

Next to two areas on the east coast where there had been igneous activity:- The Glasshouse Mountains near Brisbane are old volcanic plugs of rhyolite and trachyte which erupted 25 million years ago through the country rock of Landsborough (Jurassic) sandstone. The Atherton Tableland near Cairns is a high altitude volcanic tableland which showed many features including Lake Barrine, a crater lake, Millaa Millaa waterfall which runs over a resistant basalt ledge showing columnar jointing, and the Johnstone River which has cut a deep valley in the strata.

The Great Barrier Reef is another outstanding Australian venue. Near the coast there are offshore islands of granite, which are outliers of the mainland mountains and these have fringing coral reefs. Further out, coral forms reefs which just rise to low tide level, do not form dry land and have no vegetation, and so can only be appreciated by snorkelling. The final stage is that fragments of the coral reef are broken up by wave action and these fragments eventually accumulate to form islands; these islands then became vegetated but they are of low elevation and contrast with the rugged scenery of the offshore granite islands with their fringing reefs.

We had a quick look at the Arnhem Land escarpment, near Darwin, with its 1600 million year old sandstone cliff running for over 300 miles. This was the area where the aborigines crossed to Australia from New Guinea some 40,000 years ago. There are many examples of their rock paintings, some of which are very old, but the art is still alive and some paintings were made by living artists.

Finally to the Red Centre. It was particularly interesting to think that the Red Centre today is comparable to the climate of the English Midlands when much of our strata was laid down in Permo-Triassic times - they both show the classic red colour. Kings Canyon is in the Meerenie Sandstone (Devonian age) and shows impressive cliff faces with dune bedding.

The Olga Mountains comprise a series of dome-shaped outcrops (36 in all) formed from an alluvial fan deposit of late Pre-cambrian age. They were fairly close to the source of the material, so the deposit is poorly sorted and includes some very coarse conglomerate. It is likely that the Olga Mountains were originally all one mass and have subsequently been divided up along faults or lines of weakness.

Ayers Rock, perhaps the highlight of the tour, is a single large mass

termed a 'Bornhardt' after the professor who made a special study of this type of formation. Ayers Rock is a large block of arkose (coarse sandstone) typical of sediment from rapidly eroded granite. It was formed as an alluvial fan deposit under similar continental conditions to the Olga Mountains, but further away from the source, so the material is finer. It shows many interesting erosional features, in particular flaking-off of the surface due to solar and chemical weathering and the formation of caves around the base.

So that was our Australian journey - so much to see and so little time to describe it.

PAUL SHILSTON

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NEWS IN BRIEF

1. \*\*\*\*\*  
\* Please send in the completed forms volunteering assistance \*  
\* for the Rock and Fossil Fair as soon as possible. Can we \*  
\* do even better than we did two years ago? \*  
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2. +++++  
+ Your attention is drawn to the revised heading of this and +  
+ future newsletters in respect of hammering at field meetings.+  
+ Flying splinters of rock are a hazard, in particular to the +  
+ eyes and safety precautions should be taken before hammering.+  
+ Safety goggles or glasses can be obtained for around £3 in +  
+ hardware stores. +  
+++++
3. Welcome to new members  
  
Carol Thomas - Wolverhampton  
Maxine Huselbee - Halesowen/Birmingham University
4. Congratulations to Giles Smithson on obtaining a B.SC. in Geology Class II Division 1. Well done! Hope to see you in the Society more often.
5. On 21st July a 'Cemeteries Conservation Training Day' was held for local authority cemetery managers, to make them more aware of the wildlife and conservation aspects of municipal cemeteries, particularly those in urban areas. Organised by Black Country local authorities the morning session involved a series of talks at Sandwell Council House while the afternoon was a 'field meeting' at West Bromwich cemetery.

The BCGS ran an exhibition stand showing the geological interest of gravestones in the cemetery. The display comprised a series of photos of headstones, complemented by samples of commonly used stones including Portland Stone, marble, slate, Balmoral Red granite and Rapakivi granite from Finland, Larvikite from Norway, Bon Accord and Ebony granites from South Africa, Imperial Mahogany from the USA and Sardinian Grey granite.

In addition Paul Shilston gave an illustrated talk on 'Geology in your local cemetery'.

6. Jackie Tromans, Secretary of the Halesowen Archaeological Society asks if one of our more experienced members would go out with the Archaeological Society on one of their field trips so that members can ask questions about the geology. Meetings are usually held on a Saturday and last a couple of hours. Volunteers write to Jackie Tromans at 103 Bassnage Road, Halesowen, West Midlands B63 4HB.
  
7. Southampton Mineral and Fossil Fair. Saturday 10th September from 10.00 am to 4.30 pm. The Avenue Hall, The Avenue, Southampton. Admission 50p. Enquiries 0703 865567.

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