The Black Country Geological Society

NEWSLETTER NO. 123

JUNE 1997

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: (01384 ) 458070. 7.30 p.m. for 8 o'clock start.

SUNDAY 8th JUNE. Field meeting. *"The Malvern Hills - A Geological Viewpoint"* to the southern section of the Malvern Hills. Leader: Eddie Bailey (Society Member/ Tarmac Quarry Products).

Meet 10.30 a.m. at the main Pay-and-Display car park on the A449 Malvern-Ledbury road at the foot of Herefordshire Beacon (grid ref: 763403). This is near the old "British Camp" hotel, now the Malvern Hills Hotel.

The meeting will be leisurely but will involve some walking and hill-climbing - bring stout footwear/boots and suitable outdoor clothing. NO HAMMERS ! There will be a pub stop at lunchtime, probably at Castlemorton or Birts Street.

The Malvern Hills are a special area for people in the Midlands and for geologists everywhere. This field meeting will visit some dramatic scenery and see some impressive geology, visiting Herefordshire Beacon, Midsummer Hill and Chase End Hill, finishing around 5.30 p.m. It will be a story from the Precambrian onwards, explaining how the rocks we will walk over, and those we will see at a distance, came to be, and putting these rocks and their structures into a global plate tectonic setting using the most up to date readily available data.

EDDIE BAILEY is a Society member who now lives at Wootton Bassett, Wiltshire. He studied geology at Worcester Technical College, then gained an honours degree in geology at Exeter University. He worked for Tarmac Quarry Products in the Midlands and is now Company Geologist for Tarmac Quarry Products, Southern Division. Eddie was born in Worcester and has always had a special regard for the Malvern Hills, their scenery and their geology.

FRIDAY 20th - SUNDAY 22nd JUNE. Weekend field meeting 'The Western Margins of the Peak District' organised by the Geologists Association. Leader: Judy Rigby.

The meeting will be based at Buxton, Derbyshire, starting on Friday evening and finishing on Sunday afternoon. On Saturday the party will study the Carboniferous Limestone areas of the 'White Peak' around Castleton, and on Sunday the River Manifold area and Brown End Quarry at Waterhouses.

As the BCGS is affiliated to the Geologists Association there is no leader's fee or tuition charge but members must provide their own transport and arrange their own accommodation. The meeting will be based at the Buckingham Hotel (half-board £45 per night) and the Leader can also provide some B&B addresses. Members intending to join the meeting should inform the Leader (Judy Rigby). Her phone number is (0115) 926 7699.

MONDAY 23rd JUNE. Evening field meeting (5.30 p.m. - 8.30 p.m.) to Snailbeach Historic Site and Old Mine looking at the surface features with an underground visit to the mine. Snailbeach (grid ref: 372022) is about 16km (10 miles) southwest of Shrewsbury. Leader: Peter Sheldrake (Shropshire County Council, Environmental Dept.)

Meet 5.30 p.m. at the Village Hall car park at Snailbeach. To get there from the Shrewsbury by-pass, turn off the by-pass on to the A488 signed to Bishops Castle, then after 8 miles turn left at Plox Green and continue to Snailbeach. The village hall car park is on the right just after entering the village.

The visit will comprise a one and a half hour tour around the surface features and a one and a half hour underground trip. Those who wish to go UNDERGROUND will need wellingtons, hard hat, a powerful torch and clothes that DO NOT MATTER. The adit is about 5ft high therefore no crawling is necessary. We will go into a large stope with plenty of headroom and up a fairly steep scree slope.

Mining at Snailbeach dates back to Roman times and lasted until the 1950s. The mine produced principally galena (lead sulphide) and some sphalerite (zinc sulphide) and barytes (barium sulphate) and there was smelting activity on the site. The mine site has been restored from a derelict state to provide a fascinating historic display. The visible surface features include a spoil heap of ore and rock, a chimney with a brick flue some hundreds of metres long running from the smelting plant, mine adits, and a range of buildings for the mining activity, including the locomotive shed for the mineral railway which ran to join the main line at Pontesbury.

PETER SHELDRAKE has been closely involved with the restoration of the mine and the surface features by Shropshire County Council. He will conduct the tour, both above and below ground.

HARD HATS are required for this field meeting - MEMBERS MUST PROVIDE THEIR OWN.

SUNDAY 6th JULY. Afternoon field meeting to the Ironbridge area (meeting at 2.00 p.m.). Leader: Adrian Collings (Ove Arup/Society member).

Meet at 2.00 p.m. at the White Horse pub, Church Road, Ironbridge (grid ref: 672040). This is about half a mile north of the historic iron bridge.

The meeting will look at some of the old mining sites described in last October's lecture "Underground ~~limestone mining in Shropshire". There was mining in the area for coal, fireclay, ironstone and limestone,~~ sometimes even from a single shaft as it penetrated through the Coal Measures to the underlying limestone. This mining activity lasted for several centuries and today there are outcrops and remains of workings which indicate where all this took place.

The first part of the afternoon will visit the steeply dipping Wenlock Limestone at Lincoln Hill, with its long history of mining and quarrying. As a result of faulting the limestone was mined near the surface on one side of the fault and beneath 30 metres of Coal Measures on the other side.

The second part will look at the Coal Measure sequence at Ironbridge, visiting still visible mining features on the outcrops of the coal and ironstone horizons.

SATURDAY 13th
~~FRIDAY 12th~~ SEPTEMBER to SUNDAY 14th SEPTEMBER. Rock and Fossil Fair at Dudley Town Hall. Each day 10.00 a.m. to 5.00 p.m.

The fair will be held over three days and will have stands and displays on geological themes from public bodies, private companies and local and national societies, an 'Experts' stand to identify specimens, as well as commercial dealers selling mineral specimens, fossils and fossil replicas, maps, books etc.

The BCGS has again been asked to provide helpers to act as cashiers, stewards etc. - see the separate announcement CALL FOR VOLUNTEERS - with this newsletter. Anyone willing to help - or to donate specimens for sale on our stand - should contact Paul & Judith Shilston at 16 St. Nicolas Gardens, Kings Norton, Birmingham B38 8TW, phone 0121 459 3603.

SUNDAY 12th OCTOBER. Field meeting to Aust Cliff (near the Severn Bridge) and Hock Cliff near Frampton-on-Severn. Leader: Andrew Mathieson (Bristol City Museum).

MONDAY 27th OCTOBER Lecture by Dominic McCormack (Shell Exploration, Aberdeen).

MONDAY 24th NOVEMBER. Lecture by Dr. R.J. Kennedy (Birmingham City Museum).

MONDAY 19th JANUARY 1988. Lecture on Greenland Geology by Dr. Paul Smith (Birmingham University).

MONDAY 23rd FEBRUARY Annual General Meeting followed by lecture 'Laterites can be fun' by Dr. Des Bowden, Society member/Newman College, Birmingham.

## EDITORIAL

The Rock and Fossil Fair is coming round again. We missed it last year! This time it is to be organised over an extra day to encourage a greater schools' presence. Can we beat all previous efforts in our willingness to offer help? The tasks are anything but onerous, no geological expertise is required and it is great fun. DON'T MISS IT!

Where are you going on holiday? The Scottish Highlands and Islands? The Lake District? Dorset, Sussex or Kent? Iceland, Tenerife, Southern Cyprus, Mallorca, the Costa Blanca or even Jamaica are all described in the field guides published by the Geologists' Association and contain itineraries, maps and photographs. For further details contact the G.A.Office, 0171-4349298 or the Geological Society Publishing House, 01225-445046

## REPORTS

Monday March 17th. Mineral Exploration in Europe by Dr. Colin Harris, Principal Geologist, Western Europe, RTZ Mining and Exploration Ltd.

Europe has a long history of mining for metals and minerals, copper was mined in Turkey 5-6000 years BC and more gold was produced during the Iron Age than in the last 500 years. Europe, as defined by Dr. Harris, covered an area of 19 million square Km from Greenland to Turkey and Iran. It has a population of 770m in over 50 countries. While European Countries are some of the largest users of metals such as iron, copper, zinc and aluminium, less than a third of the tonnage of the metals used is actually mined in Europe. Geologically there are strong incentives for mineral exploration in Europe, but problems varying from political restrictions, complexities of land ownership and the fact that much of the European base rock is overlain with a thick covering of glacial till have restricted exploration. There has also been a mental perception that little more was to be found in Europe.

In recent years, new geographic areas have opened up such as Eastern Europe and Sweden (which, before its entry into the European Union, restricted exploration by International Companies). This, with the availability of new technology, has encouraged renewed interest in mineral exploration in Europe. Dr. Harris predicted that a number of significant discoveries will be made in the next 20 years. RTZ is interested only in "world class" ore deposits, which are defined as having potential of $200m sales/year.

The technology used by RTZ was illustrated with excellent slides. A wide variety of techniques were used including geophysics, geochemistry, remote sensing, geology and geography.

Magnetic surveys allow bedrock to be mapped from the air. Gravity surveys can now be done using automatic devices lowered to the ground from helicopters with GPS to record position within 10-15cm. 200-300 readings per day can be obtained at a quarter of the cost of traditional methods. Electrical conductivity, seismic and radioactivity data is used.

Geochemistry is used with stream sediment samples, channel sampling and even (in the Arctic) sampling lateral moraines, where a glacier has provided a ready-made section through a mountain side.

Satellite imagery shows geological features. Geobotany can be used, i.e the presence of *viscaria* plant in Sweden indicated the presence of copper.

All the data is collated using computers to provide a Digital Terrain Model which then allows the most promising drilling sites to be identified. In spite of all the technology, the ultimate test is drilling and examining core samples by traditional methods.

Among the illustrations that Dr. Harris showed was an example of a dark, circular formation in Greenland called a Minturn circle. When first seen from the air, these appeared like kimberlite outcrops and caused great excitement. They were not and no explanation has yet been found for the almost perfectly round features.

A technique used by mineral explorers is to examine an old mineral-rich area using new technology. This has paid off for RTZ, the Neves Corva in southern Iberia was originally mined by the Romans and a massive pyrite belt, one of the largest in the world, has been exploited there for many years. Recent gravity surveys by RTZ identified an anomaly in the greater pyrite belt near Sevilla, covered by 130m of Tertiary deposits. 200 holes were drilled and a large primary and secondary copper zone was discovered with Cu concentration as high as 8%. Pb, Zn and gold are also present. A decision how to mine it has not yet been made. This may be the first of a number of such "world class" deposits to be found in Europe.

RTZ is not exploring in Great Britain. There are too many different landowners, the Queen owns rights over precious metals and environmental issues are too restrictive.

John R. Brown

Monday 7th April Evolution and Extinction of Trilobites by Dr. Bob Owens (National Museum of Wales)

Dr Owens began by stressing the distribution of the 'Dudley bug' in museums world wide. Trilobites are characterised by their jointed bodies, calcified eyes, their exoskeleton, head suture, and doublure on the underparts. The facets on the pleurae allow them to roll up to protect the soft tissues. They moult to allow for growth. The compound eye has many individual lenses to give all round visibility. Each lens has its c axis normal to the surface. The lenses may be contiguous or may be separated by cuticle. Many trilobites would have had a good field of view, being able to see above, below and behind them. These would be active animals.

From deposits of the Burgess shales excellently preserved specimens allow the limbs to be studied. Each segment has a pair of feathery gills and a pair of walking legs with spines. There is no differentiation of limbs. They developed from larvae and the growth sequences are known for a large number of trilobites now. The thoracic segments develop from the back of the tail shield.

Trilobites show much diversity of form. Paradoxides was two feet long. Spines afforded protection from large cephalopods, arthropods or even other trilobites and some might be used as skis on soft surfaces. Evolution smoothed out features: some have tail shields as smooth as pebbles. Trilobites with large eyes tend to be pelagic and are independent of facies. Shallow marine specimens have well developed eyes while for some, evolution meant loss of eyes. The trinucleids pitted fringe remains a mystery.

Classification is a problem. One attempt at classification uses the characteristics of the hyperstoma: attached, detached or secondarily attached. Other studies consider the onset of mature characteristics as some species become mature at immature stages of other species.

The earliest trilobites are Cambrian and their history begins with several discrete groups, different in different parts of the world. The shores of Iapetus can be determined from trilobite distributions as N.W. Scotland and the Welsh borders had very different populations. Not all trilobites had calcified exoskeletons up till the end of the Ordovician. At the end of the Cambrian many trilobites disappeared and rapid diversification followed, probably as widespread flooding provided new ecological niches. Many disappeared at the end of the

Ordovician. (There was an Ice age in Saharan Africa and the glacial effect could have destroyed the phytoplanktonic larvae while benthonic larvae might survive.) The Silurian shallow seas provided a large range of ecological niches and 50 species have been found at Dudley. A crisis occurred in the Upper Devonian while the last great radiation occurred in the Late Carboniferous. The last trilobite specimen comes from Late Permian rocks. The last reefs disappeared as marine recession led to the loss of ecological environments.

Thus a 250 million year record gives great variety and throws up many problems. An animated question session followed a very lively lecture.

K. M. Ashcroft

## CONSERVATION COLUMN

As I write we are in the throws of the glorious British spring. Conservation activities are emerging from the dormant rocks like bulbs from the soil, in a manner befitting the season. Green shoots are showing which will blossom into a good geological harvest later in the year.

Fieldwork

On the canalside in autumn we can expect to see a good crop of geologists gently clearing away previous season's growth from the Brewin's Bridge canal section at Netherton. Negotiations are proceeding with the Dudley Canal Trust and British Waterways Board to sort out the practicalities of another working party like the one that so successfully restored the Silurian/Carboniferous junction to its former glory a few years ago. Dates are likely to be set for a weekend in October for this particularly late flowering crop.

Rock and Fossil Fair

A particularly fine and decorative display of blooming geologists, both staple and exotic varieties, can be expected from 14th to 16th September in Dudley. A coalescence of colour and form celebrating the depth and fascination of the full lithoculture can be expected.

Wrens Nest

As you may be aware there are 'friends' groups for both Dudley Castle and the Black Country Museum. I am particularly delighted to announce a community initiative from the Wrens Nest to set up a 'Friends of Wrens Nest National Nature Reserve' which I believe is long overdue. We will be writing in support of this venture and will report in future newsletters. Wrens Nest has always provided a geological crop of the finest quality and diversity, and we will do our bit to encourage these new shoots.

Advice and Guidance

New life often emerges from disturbed soil. Such opportunities are always present in our urban setting and since the last Conservation column a couple of fine specimens have popped up. Tansey Green Quarry, Dudley (which you may recall was the site of the ashes and conifers from the flanks of the extinct 'Dudley volcano') is the subject of restoration to parkland. BCGS have been involved throughout in negotiations with those involved and we are now in receipt of the final plans for comment. We have been able to get the best for the geological features of this site.

At Ketley Quarry SSSI Alan Cutler has done more stirling work. The quarry operator applied to Dudley MBC to extend his operations. The result of negotiations is that a more extensive rock face which better displays the junction between the Etruria Formation and the Halesowen Formation should be preserved for posterity.

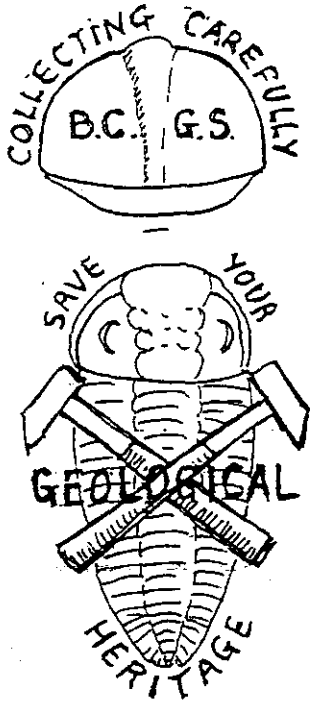
Lapworth Museum

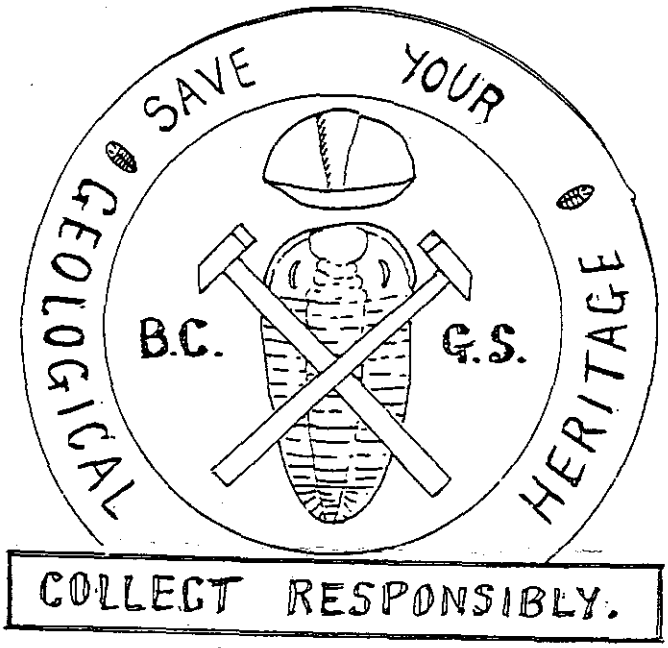
It seems that spring growth in this particular site has been restricted by limited availability of nutrients (funds and time). Paul Smith, the curator, has asked if anyone in the BCGS would be able to help. If you are interested could you please contact Paul at the School of Earth Sciences at the University to find out the kind of things that need to be done.

Artwork

Talent, like spring, is" bursting out all over" Many thanks to Barbara Budd for this edition's visual message concerning our common (and fragile) geological heritage.

Graham Worton




## ITEMS IN BRIEF

Welcome to new member
Bill Hayston of Sutton Coldfield.

Plas Tan Y Bwlch, the Snowdon National Park Centre at Blaenau Ffestiniog offers a 'Rock and Landscape Course' run by Dr. John Conway, F.G.S., F.R.G.S. from 12th -19th September. Day trips are guaranteed to be no longer than 5 miles. The cost is £252-308 and further information is available from the Centre at Plas Tan Y Bwlch, Maentwrog, Blaenau Ffestiniog, Gwynedd, LL41 3YU. Tel 01766 590324.

Rock 'N' Gem Magazine is a new publication and the Society has been sent a complimentary copy of the first edition. Items covered include 'How to cut Tourmaline' and 'Healing with Gemstones'. It is full of information of shows and club news. The spring/summer edition is priced at £1.95 plus 40p post and packing from The Exhibition Team, Wycombe Air Park, Booker, Marlow, Buckinghamshire SL7 3DP.

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