NEWSLETTER NO. 93 JUNE 1992

The Black Country Geological Society

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

MONDAY 1ST JUNE 150TH ANNIVERSARY LECTURE

Lecture: "The past is the key to the future" by Colin Reid, Keeper of Geology, Dudley Museum.

This lecture is one of our events to mark the 150th anniversary of the old Dudley & Midland Geological Society. Its date is close to the anniversary of the Society's first regular meeting, held on 7th June, 1842.

Exactly 150 years ago, Sir Roderick Murchison gave a visionary inaugural speech to the first Dudley and Midland Geological Society. In this he proposed the establishment of a geological museum in the town, to display fossils and artefacts relating to the areas's unique geological heritage. It was the beginning of a rather short-lived 'Golden Age' when both Society and Museum flourished.

After almost a century in the doldrums we are now experiencing something of a renaissance in Black Country geological activity, due in part to the establishment of a permanent geological post at the Museum, to maintain the collection and promote local geology.

In his talk, illustrated by slides, Colin will be looking back to the early days of the museum service in recent years. He will also be looking ahead to exciting developments planned both in this 150th anniversary year, and in the years ahead.

After the lecture, members who are interested can adjourn to Dudley Museum (across the road from the Saracens Head) where Colin will show selected items from the collection not on display, and also the new geological displays in the Museum which have attracted so much attention.

SUNDAY 7TH JUNE

Rowley Rag Revisited. Field meeting to Rowley Regis Quarries to commemorate the first field meeting of the Dudley and Midland Geological Society.

Meet at 10.00 am at Tarmac's Hailstone Quarry (at the junction of Tippity Green and Portway Road, Rowley Regis, Grid Ref: 967879).

The first field meeting was held on 7th June 1842 and started with a lecture regarding the igneous rocks of the South Staffordshire coalfield. After a "cold collation" at the Dudley Arms Hotel, the party visited the Rowley Hills Quarry to inspect operations.

Our field meeting will also be a mixed day, with talks in the conference room at Hailstone Quarry, Rowley Regis, (conference room kindly arranged by Tarmac) including a talk by an ARC/Tarmac representative, by Dr. Brian Glover of the British geological Survey and Mr. Colin Knipe of Johnson Poole & Bloomer, geotechnical engineers. There will also be a description of the quarry and visit to the workings by kind permission of ARC Ltd, and of Tarmac Quarry Products.

SUNDAY 20TH SEPTEMBER
Field meeting to Church Stretton, Shropshire. Joint field meeting organised by Shropshire Geological Society.

Meet 10.00 am at the main car park in Church Stretton (grid ref: 453936). When travelling along the A49 Ludlow-Shrewsbury road, turn into Church Stretton at the traffic lights. After 200 yards turn left into the car park.

This is another of our meetings to mark the 150th anniversary of the Dudley and Midland Geological Society. The society was re-formed in 1862, and one of its first field meetings was held on 19th September 1862 to Church Stretton, so the meeting in our programme will be almost on the anniversary, 130 years later.

It was a joint meeting with other local societies - Woolhope Field Club, Oswestry Field Club and Warwickshire Field Club. The party from Dudley travelled by train to Shrewsbury, met up with the others and visited the Museum; afterwards they went to Church Stretton, where some of the group visited Long Mynd and others Caer Caradoc.

Our friends from the Shropshire Geological Society, who represent some of the same clubs who joined the original field meeting, are kindly organising the joint field meeting, again to Church Stretton, to mark the occasion.

MONDAY 12TH OCTOBER
Lecture: "Blue John fluorspar" by Dr. Trevor Ford.

Flourspar (calcium fluoride) is found widely in the Carboniferous Limestone areas of the Peak District of Derbyshire in association with veins of lead, but around Castleton the special variety, known as "Blue John" or "Derbyshire Spar" is found, and where it used to be mined.

It has a deep blue or purple colour, or can be banded purple-and-white, and it has been prized as a semi-precious ornamental stone, from which vases and ornaments have been seen in Chatsworth House and other places in Derbyshire - so Blue John combines art and history with geological interest.

Dr. Trevor Ford, of Leicester University, has made a special study of Blue John and will describe its occurrence and its history. He is well known for his geological lectures, and addressed the Society some years ago on another of his specialities - precambrian fossils.

SUNDAY 18TH OCTOBER
Field meeting to Walsall, Hayhead limestone mines and quarry, and Barr Beacon.
Leader: Peter Whitehead, Head of Earth Sciences, Bluecoat Comprehensive School, Walsall.

Meet: 10.30am at Hayhead Nature Trail car park, Longwood Lane, Walsall (grid ref: 042986). This is about 2 miles ENE of the centre of Walsall. Longwood Lane is off the A454 road from Walsall to Aldridge.

This area of Walsall has much geological interest, as it has inliers of Silurian limestone - the Barr Limestone - and shale, as well as extensive Triassic deposits. Limestone has been mined and quarried in the area for centuries, and the Hayhead trail has been designed to show some of the best exposures.

Barr Beacon, which forms a prominent feature of the scenery north of Birmingham, is in the Triassic, Sherwood Sandstone group. It has a large quarry face giving an extensive view of the strata.

PETER WHITEHEAD has been associated with this Society since its formation in 1975. He is very active in the field of geology teaching, and also runs Rocky Rex Enterprises, which produces geological teaching material for schools.

OCTOBER/NOVEMBER (date to be decided). Canal barge trip through the newly re-opened Dudley Canal. With geological and historical commentary.

MONDAY 16TH NOVEMBER
Lecture: "Silurian geology from the Pentlands to Pembroke" by Dr. Derek Siviter, University Museum, Oxford.

SATURDAY/SUNDAY 28-29TH NOVEMBER. GEOLOGY FAIR in Dudley Town Hall to celebrate 150 years of the Dudley Museum geological collection.

MONDAY 7TH DECEMBER.
Lecture: "Lessons from the fossil record" by Dr. Alan Thomas of Birmingham University.

JANUARY 1993 (Date to be decided) Lecture.

MONDAY 22ND FEBRUARY 1993. AGM followed by a talk "The Falkland Islands" by Sheila Pitts.

EDITORIAL

Our membership is so active and alert that there is no dearth of material for the newsletter, almost a superabundance, but I would welcome offers of book reviews, items on geology in education (Earth Science in the National Curriculum ?) and careers in Geology. I've been told that the average age of members of Natural History Societies is over seventy. I'm not aware that our membership is ageing (but that is probably because I, too, am growing old gracefully) but I would welcome articles likely to be of interest to younger members.

REPORTS

Lecture: 'Geology and the Nuclear Industry' by Nigel Monckton, UK Nirex Ltd.

The first slide to be shown by Nigel Monckton from UK Nirex Ltd held the title 'Then Nirex came - and blight fell on the earth' The talk then went on to reassure us that they were doing their very best to ensure that things would not end in this way.

UK Nirex is responsible for the safe disposal of solid low-level and intermediate-level raidoactive wastes. Everything is to some degree radioactive and radiation is all around us even in the food we eat. The level above which radioactive material becomes 'waste' is measured at 400Bq/Kg. Around 75% of this radioactive waste arises from the manufacture, use and reprocessing of nuclear fuel in the British nuclear power programme, 20% from military operations including nuclear submarines and the weapons programme plus research, and the latter 5% is represented through the use of radioactive materials in, for instance, medicine and industries such as agriculture. Overall, just 1.1% from the 4 million cubic meters of toxic waste produced each year is classified as radioactive.

It is important that this waste is managed safely in a socially acceptable way. Nirex works within government policy where it is seen that disposal of waste is better that storing it. Reasons for this are that simply storing the waste first puts off a final decision as to what to do with it, and once nuclear operations are ended on sites, this material would then have to be moved and monitored, possibly causing greater unnecessary worker exposure to radiation. Disposal in a deep site would be less susceptible to damage and if damage occurred, it would not release material directly into the environment. It is estmated that only 1 more site will be needed to take the UK's production of low to intermediate nuclear waste until about the year 2055.

The proposal is that waste will be stacked in special vaults, 0.5 mile underground accessed via sloping spiral tunnels. The burial puts barriers between the waste and the environment and the waste itself is encapsulated in steel drums surrounded firstly by a concrete grout and secondly by a concrete lining which is backfilled and sealed. This multi-barrier concept therefore slows down the rate at which waste will escape from the repository, during which time its radioactivity is dying away.

Groundwater is a problem as this could 'soak' into the barriers and disperse the waste. The barriers however, surrounding the waste, ensure that it is very difficult for water to infiltrate. Any water coming into contact with the waste material will, due to having passed through the concrete, be very alkali. Alkali water is much less efficient at dissolving material which is neutral or acidic. However, eventually, as the waste starts to dissolve and moves away from the site, if the geological area is chosen correctly, it will face natural barriers, stopping it from easily getting to the surface. Meanwhile, radioactivity is decreasing all the time.

The best site for selection would therefore have to have primarily low groundwater flow and be geologically stable with suitable rock types and structures for natural barriers. Knowledge would also be needed of their permeability in order to ascertain how the water flows through the rock and the chemistry of the rock, as this can obviously affect the chemistry of the groundwater. The geotechnics of the area dictate the constructability of the repository. Rock strength, the existence of fractures and in situ stress are all factors considered.

Two sites were investigated for the repository: Sellafield and Dounreay. Although similar in their geology, Sellafield was chosen finally for further research as over half the waste was already being produced at this site and so it would mean a reduction in transport of the waste thereby reducing further risk via transportation.

A period of volcanic activity at the end of the Ordovician Era forms the Borrowdale volcanic series. Above these are deposited Carboniferous and Permo-Triassic rocks, the sandstones from which contain many fractures and form a major aquifer making them unsuitable for waste disposal. In surveying the area boreholes and seismic and electromagnetic techniques were used, both inshore and offshore to investigate the area below this aquifer in the

Borrowdale series. It was discovered that a layer of brockram on top of the volcanics acted as a seal and stopped the flow of water from both above and below it. This ideal natural barrier within this geologically stable area is therefore continuing to be investigated as the future safehold for radioactive waste.

An example was given of six natural reactors occurring in Gabon in West Africa which had run for thousands of years producing about 8 tonnes of waste products. These fission products had been left unprotected and the majority had not moved with only some having moved a minimum distance from the source. This was used as evidence that if the conditions were right the waste products could be held safely.

If the repository in this area goes ahead, five miles of spiral tunnels will lead from Sellafield to the underground repository. Waste will be carried by train into the vaults where disposal would enable long term radiological protection. By the end of 1992 UK Nirex Ltd will submit a planning aplication for the development of the repository, providing that an Environmental Impact Assessment and geological investigation continue to give confidence in the site.

UK Nirex are certainly doing their best to achieve a 'safe for all time' nuclear waste policy. A very interesting and informative talk.

LUCY BURGESS

Lecture: Classic landforms of the coast of South West England - Peter Keene

Peter Keene has had a special interest in the interpretation of the coastal landforms of South West England, ever since being brought up in North Devon. He began his talk with the subject's origins in the theories of W.M. Davies. This related geological structure and the weathering processes on it, to the stage these had reached in terms of youth, maturity and old age. Nowadays a more polycyclic approach is accepted, and that processes change when the climate changes.

In South West England the four main rock types were illustrated. We were shown examples of granite tors and cliffs, Permo-triassic red sandstones, Culm measures and Hangman grits. High energy environments such as the wave cut platforms at Hartland were contrasted with the low energy environment of Bideford Bay. Most high energy environments face west, and landslips are usually removed within two years. The geology may well be the same in both environments, but in low energy environments any cliffs will be low, with slumping, often of head deposits which cover the previous landform.

Stages of equilibrium are revealed especially by wave cut platforms. These exist at about 85m and 210m. Hartland shows excellent examples in the present wave cut platform, and the level top of Warren Cliff which cuts across the dramatic folding. Sea level has been at its present height for about 3000 years. More local examples of processes were shown, such as limpets causing roughening of the rock surface beneath them - "mussel power". A very interesting example of the effect of wetting and drying on clays was shown. Where a stream reached the sea over clays, there was a small headland, because this area was always wet, but the coast either side was easily eroded.

Changes in climate would profoundly affect the erosion of chalk, which would be much more resistant when frozen in the Pleistocene. In the South West, the drowned valleys are another example, because they were graded to a much lower sea level.

Many of us have happy memories of the geology and landscape of South West

England, and the speaker brought them alive again in a wider setting for us. This was especially so for those of us who were on the weekend trip to Hartland last year.

SHEILA PITTS

CONSERVATION NEWS

Part of a letter from Graham Worton:

A number of people approached both myself and Alan Cutler to tell us that someone was doing some earth moving at the *Hayes Cutting at Lye*. This is one of our most important sites for geological conservation and contains the junction between the Silurian and Carboniferous systems.

Naturally, we were quite concerned and I visited the site on a number of occasions to sample and record newly exposed rocks. About two weeks ago myself and Alan met an oficer of Dudley Council on site to discuss their roadworks project and how it would affect the S.I.N.C. On the basis of these site discussions Dudley MBC agreed to help in restoring the cutting to its former status by removing trees from the rockface and top of the embankment, where they were leaning out precariously. We offered at very short notice, to supply a working party to do the conservation work on the rock face itself, as the engineers were sympathetic to the sensitivity of the site and did not wish to "do any damage" through ignorance of the important features. Dudley MBC also provided a skip to take the rubbish we removed from site/rock faces to assist in our clean-up.

We set a provisional date as the weekend of 25/26 April so as not to clash with Easter. It was unfortunate that we had so little time to respond as the meetings and agreements (and working party dates) all fell between formal Society gatherings and we were forced to make personal contact with members and friends to get a party together, and it is this latter issue that I am really writing to you about.

I hope that we can find a little space in the next issue of the BCGS Newsletter to thank the individuals who gave so generously of their time to help in the conservation work at the Hayes. Most were given only a day or so's notice and still they turned out to make a spectacular difference to the well being of the site. Other than myself the working parties consisted of the following individuals and it is fitting that they should be named and praised for the work they put in. These were:-

Saturday 25 April:	John Moore, Simon Weatherly, Bob and Sue Fairclough, Dave Withington, Dave Iddles.
Sunday 26 April:	Simon Weatherly, John Moore, Bill and Ray Foxhall.

Though few in number, their labours were great, and as a result of their work one of our most important sites has once again become a valuable teaching resource.

We should not forget to thank all those others who were contacted and indicated that they would have loved to help but were prevented from doing so by previous commitments. We should also give a very big thank-you to Dudley MBC. They have been very supportive and understanding, providing much of the work effort and resources to dispose of the waste we generated.

Finally, we should apologise for not reaching everyone who might have liked to have come along but were not informed. We should be able to satisfy them in the future however, when we carry out further works at this and other sites where we have more time to respond.

I will send some before, during and after photographs of the work when I get the films developed.

FIELD GUIDE REVIEWS

Geologists' Association Guide No 45.
Onny Valley, Shropshire - Geology Teaching Trail by Peter Toghill - £2.50

Highland Geology Trail by John L Roberts. Published by Strathtongue Press, Tongue by Laing, Sutherland IV27 4XR £4.95

Recent Geologists' Association Guides have become 'thick and costly' but the Association in conjunction with English Nature has recently issued a new Trail Guide to the Onny Valley in a slimmed form and would welcome our comments. It has a mere 20 pages and relates to a 'Classic and famous section' of the shelly facies of the Caradoc Series of the Ordovician in their type area.

The Guide includes a coloured geological map and outlines the geology of Shropshire, making clear the significance of the features present and explaining carefully the terminology. There follows a description of the rock formation in the Caradocian with their equivalent stages and a page of drawings of the diagnostic fossils.

The final section is a description of the trail and eight localities along it, together with map and section.

On a beautiful spring day we walked the 1.75 Km long trail. It follows the line of the disused Bishop's Castle railway and the south bank of the River Onny, through elegantly landscaped farmland. The birds, flowers and mammals (domestic and wild) competed for our attention. We studied the formations in ascending order and found plenty of interest. We failed to locate locality three and appeared to require waders, if not aqualung equipment, to reach the bentonites at locality seven. The trail terminates where, in the nineteenth century the major unconformity at the junction between Murchison's Upper and Lower Silurian was first recognised, the evidence of which supported the designation of a separate Ordovician system.

The trail guide will be used for 'A' level students but is thoroughly recommended to amateur Black Country Geologists in search of a good day out.

The Highland Geology Trail, a rather less professional production, is very ambitious in its coverage in that it tries to include an area from Oban to the far north and even Staffa, Mull and the Isle of Skye. Obviously written for the motoring tourist it aims to cover the very best geological localities!

The first section attempts an introduction to geology, but it strives to explain too much, is too technical for the layman and does not always define things accurately. Unfortunately its maps are crude.

There follows a description of the geological record of the highlands which suffers from the same problems.

The excursion guide lacks maps and index and much of it tells one less that a geological map would but covering such a wide range of localities it points out local details which the casual observer might well miss. It is best informed when pointing out geological structures, illustrated in a different publication.

At reasonable cost, I would take it with me if only as a reminder at intervals to turn from the magnificent scenery to interesting geological features on a smaller scale.

KATE ASHCROFT

ITEMS IN BRIEF

1. Affiliation to the Geologists' Association

The G.A. has started a scheme for local geological societies to have an affiliation to the G.A. but keep their own identity, the idea being to provide national co-ordination of some of the wider geological issues. We have become affiliated in this way, the aims of our Society closely corresponding to the objectives of affiliation.

(Discounts on the Association's publications will be offered to all members of the affiliated groups).

2. Geologists' Association new publication list

Guides:	2	Geology of the Lake District (1990)	£10
	7	Geology of the Manchester Area (1991)	£ 9
	42	Island of Mallorca (1990)	£ 6.50
	43	Costa Blanca, Spain (1990)	£ 6
	44	The Late Precambrian Geology of the Scottish Highlands and Islands (1991)	£10

Send payment with order to:
The Geologists' Association, Burlington House, Piccadilly, London W1V 9AG.

(As affiliated members we merit a 20% discount)

Cumberland Geological Society are to be congratulated on bringing out a second guide to the Lake District entitled "Lakeland Roacks and Landscapes" £7.95.

3. New Exhibition - Dudley Museum and Art Gallery.
"The Exploration of the Solar System".

4. People in the News

Member Dennis Wood figured prominently in an article in the Evening Mail recently, as President of Solihull Horticultural Society.

Colin Reid figured in a report on Dudley Geology in the Guardian on February 15th and has been invited to speak at an International Conference on Geoscience Education and Training at Southampton University.

5. Welcome to new members

Hugh Jenkins - Stourbridge
Robert Bucki - Dudley
Stuart Williams - Walsall
John Thompson - Wordsley, Stourbridge
Adrian Butterwoth - Lye, Stourbridge

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BIRMINGHAM POST. 5-5-92

At the Black Country Geological Society meeting, held at the Saracens Head, Stone Street, Dudley, were (from left) Mr Paul Shilston, secretary; Mrs Judith Shilston, treasurer; Mr Steve Hughes, committee; Mr Peter Keene, speaker from the Faculty of Environment at Oxford Polytechnic; Mr Adrian Butterworth, assistant warden of Saltwells Nature Reserve.