

NEWSLETTER NO. 97 FEBRUARY 1993

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 22ND FEBRUARY 1993. 7.45 p.m. ANNUAL GENERAL MEETING. All posts of officials and committee members are up for annual election. Any nominations for election should be given to the Secretary or can be declared at the AGM.

Followed by a talk "The Falkland Islands" by Sheila Pitts.

Sheila Pitts writes: "This illustrated talk is the story of an 18-day journey alone, several months ago, visiting most of the major islands. The islands are wild, beautiful and remote, with an equivalent population to The Scilly Isles in an area the size of Wales. The geology is well shown in the coastal scenery, but most of this is sat upon by penguins, other birds and wildlife, and the slides will show this."

Sheila is, of course, one of our own members. She is much-travelled, and has given several talks to the Society on her overseas trips, including ones on Argentina, New Zealand and Kenya, illustrated with slides and maps. Now we can look forward to hearing (and seeing) about the Falkland Islands.

SATURDAY 27TH FEBRUARY

Birmingham University Day-school "Minerals and gems from the Lapworth Museum" by Dr. Paul Smith and Dr. Rob Ixer.

10.00 a.m. to 5.00 p.m. at Lapworth Museum, School of Earth Sciences, Edgbaston, Birmingham Cost £12, Advance booking essential.

Details and booking: School of Continuing Studies

University of Birmingham

Edgbaston

Birmingham B15 2TT

'phone (021) 414 5606/7/8

Chairman A. Cutler B.Sc., M.CAM., Dip.M., M.CIM. 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.

MONDAY 29TH MARCH. Lecture: "The Geology and Mineralogy of Leicestershire" by Dr. Frank Ince (The Russell Society).

This lecture will describe some of Leicestershire's geology and in particular will deal more extensively with its mineralogy. Leicestershire has a surprising variety

in its geology, and includes the geologically important Charnwood Forest in its area, so there is a wide range of mineral interest. Dr. Ince will also be bringing along a selection of mineral specimens (with labels!) for members to examine.

DR. INCE is a member of the Russell Society, which is the country's leading society specialising in topographical mineralogy. He will also be leading a field meeting for us in the summer to the same areas, so this lecture and the field meeting will complement each other.

<u>SATURDAY 3RD APRIL</u>. Guided visit to Lapworth Geology Museum, Birmingham University. Presented by Dr. Paul Smith, Curator.

Meet 10.00 a.m. at Lapworth Geology Museum, School of Earth Sciences, University of Birmingham, Edgbaston, Birmingham. Use the entrance from the Campus Ring Road. DO NOT use the entrance near the Clock Tower as it may be locked on a Saturday morning.

SEE THE LOCATION MAP IN THIS NEWSLETTER.

The Lapworth Geology Museum at Birmingham University has been nominated by the Government as one of five national geology collections (the others are Cambridge, Oxford, Glasgow and Manchester). This was chiefly because of the excellence of its collection and as a result it has received extra funding for Museum staffing, and for storage and cataloguing facilities.

Dr. Paul Smith was appointed to the academic staff as Curator in 1990 to implement these developments. He will give Society members a guided tour of the collection, and will also bring out specimens not normally on display. The visit will last about two hours.

<u>SATURDAY (note Saturday) 8TH MAY</u> - Field meeting to quarries in the Machen area about 5 miles east of Newport, Monmouthshire, South Wales.

Joint meeting with Cheltenham Mineral and Geological Society. Leader: Neville Hollingworth.

It is planned to visit Machen and Cwmleishon quarries, fuller details and meeting time and place will be in the April newsletter.

The quarries are in the South Wales Carboniferous limestone. Their main interest is in the mineralisation which includes galena, barytes, hemimorphite (calamine) and other minerals.

FRIDAY 11TH - SUNDAY 13TH JUNE. Birmingham University School of Continuing Studies weekend field meeting to Castleton, Derbyshire. Leader: Dr. Derek Gobbett.

This weekend will study "tropical reefs and deltas" of the Carboniferous period. One day will be spent on the Carboniferous Limestone (limestone shoals and reefs, with the added interest of some volcanicity). The other day will be on the deltaic deposits of the Millstone Grit, which now outcrop as spectacular gritstone edges.

Accommodation at Peak National Park Centre, Losehill Hall, Castleton, Derbyshire. Cost (tuition and full board) £129.

This is NOT a BCGS event, but is organised by Birmingham University, School of Continuing Studies. It is led by Dr. Derek Gobbett, who is a Society member.

Details and bookings:

The Enrolment Secretary,

Residential Courses and Study Tours

School of Continuing Studies University of Birmingham

Edgbaston

Birmingham B15 2TT

'phone: (021) 414 5605.

MONDAY 14TH JUNE. Lecture: "The Grand Canyon" by Dr. Trevor Ford of Leicester University.

Dr. Trevor Ford lectured to the Society last October on 'Blue John' and now his subject will be one of his other special interests - the Grand Canyon. Dr. Ford has made several visits to the Grand Canyon and has led a number of white-water rafting trips down the Colorado River through the Grand Canyon - so we will see the canyon from above and below!

*SUNDAY 18TH JULY. Field meeting to Clee Hills. Leader: David Gossage.

* SEE EXTRA SHEET.

<u>SATURDAY 17TH - SATURDAY 24TH JULY</u>. International Conference on Geological and Landscape Conservation. At Malvern.

The conference will offer lectures, discussion and poster sessions, and exhibitions by sponsors. Also a wide choice of field trips in England and Wales is planned.

Details from: Margaret Phillips, The Company, St. Johns Innovation Centre, Cowley Road, Cambridge CB4 4WS. 'phone: 0223 421124.

<u>29TH AUGUST - 3RD SEPTEMBER</u>. British Association for the Advancement of Science. 1993 annual meeting entitled "SCIENCE FOR LIFE '93". To be held at Keele University.

Details from: Sue Bramley

Science for Life '93 Office

The Darwin Building Keele University Staffs. ST5 5BG 'phone: 0782 583373

SUNDAY 26TH SEPTEMBER

Field meeting to quarries at Nuneaton and Bedworth.

Leader: John Crossling (Warwickshire Museum).

EDITORIAL

No doubt we are all saddened by the sinking of the oil tanker Braer in the Shetlands, whether the environmental damage has been over or under estimated. It is ironic that an island which housed what was, when built in 1970, Europe's largest oil terminal should have met disaster not from its indigenous industry but from a tanker travelling from Norway to Canada. A large contributory factor to the accident would appear to be costs being pared to the bone, whether through the route taken by the tanker, tanker design, the freedom permitted by Liberian registration or the actions of the crew. Market forces allow little space for environmental protection.

REPORTS

'<u>Fossils as Living Animals</u>'. Dr. Phil Lane of Keele University. Monday 16th November.

Thank you to Phil Lane for stepping in to replace Derek Siviter who was ill.

Did the Brontosaurus evolve a long neck because its food could only be found in tall trees or in deep water?; or even merely as a counterweight to balance its tail?

Why are some trilobites very smooth? (1), or have heads of an "unusual shape" (2), or possess enormous outsize eyes which are 30% its bodysize (3)? Answers on another page.

This was a novel and stimulating presentation which posed more questions about palaeo-lifeforms and lifestyles - many perhaps to be discarded at first sight as of no consequence - than it actually answered. However as the story unfolded it became more and more fascinating.

Total fossilisation (of both hard and all soft parts) is quite rare. Occasionally, in the most gentle of depositional conditions, whole structures with external ornamentation and appendages as well as internal structures have been preserved with negligible distortion. In these cases careful analysis may lead to fairly detailed inferences about individual trilobite lifestyles and functionality, which in turn may be combined to give good insights into what certain trilobites "did for a living" as well as about environments in which they lived.

In cases where fossils have become pyritised it is possible to build 3D internal structures by means of scanning Xray photography. Phosphatisation in conjunction with SEM may in some cases yield similar information.

For this reporter the most remarkable pearl came towards the end. Apparently, evolution has provided trilobites with calcite lenses in their compound eyes (Clarkson). However calcite is birefringent (gives double images); except along its c-axis, which must therefore correspond with the line of sight to provide a sharp image. Over and above this, advantage is taken of the two differing refractive indices to generate an achromatic doublet - several millions of years before Huyghens! Together these produced a unique high quality optical, and hence visual, system for these trilobites.

Whilst the presentation, which comprised several "case instances" tended to be rather "bitty", the story as a whole far exceeded the sum of the bits. Its message being to treat the limited and necessarily fragmented information which is available with the greatest of care when attempting to correlate morphological structures with body functions and life styles. Very often it is necessary to resort to quite speculative/sophisticated guesswork in order to fit well-known fossil forms into palaeo-ecosystems which were extant during their lifetimes.

ALF COLE

<u>Answers</u>

- (1) To facilitate burrowing, which was probably done in reverse since this particular trilobite had exceptionally long front legs.
- (2) By constructing models it could be shown that these trilobites, uniquely, could roll up into a ball and thereby protect the soft underbelly and hence temporarily suspend feeding and metabolic processes. These are, in consequence, believed to have lived in or near the intertidal zones and were able to survive being stranded.
- (3) Tremendously wide fields of vision. probably swimmers or drifters who could readily locate nutriments etc., floating in currents and tidal flows.

'<u>Lessons from the Fossil Record</u>' by Dr. Alan Thomas of Birmingham University. Monday 7th December.

The first question posed was "what patterns can be observed from the fossil record?" The oldest fossils are 3.5 billion years old and almost as old as the oldest known rocks. They are very small and similar in size to bacteria.

There has been great diversity since the first fossils but the patterns of diversity are difficult to establish as there are biases in the record because certain environments are more conducive to forming fossils than others.

It is popular to view evolution as having a step like increase in diversity on the ladder of life but evolution is an unpredictable sequence of events owing as much to chance as to superior design.

The next question "what is the nature of the record" can be divided into Radiations and Extinctions.

Nature of the record

Trilobites, 430 million years old have skeletons replaced by silica. The limestone can be dissolved to leave the insoluble skeleton. Gastropods of Silurian age have their calcium carbonate skeleton retained. Bones of humans may date from 2 million years.

For fossils to form there must be a rapid burial by natural means and removal from predators. This limits the areas where fossils can be formed. Active sedimentation in marine conditions is best while terrestrial areas under represent the life existing at the time. Fossilisation is highly selective but in particular environments such as the Burgess Shale in British Colombia, which is 530 million years old, arthropods which have fragile exoskeletons have been preserved in great detail. A total of 140 species can be identified compared with rocks of a similar age where only about 20% of the living bio-species are preserved.

In this case the conditions for the preservation of the fossils were a submarine escarpment receiving a deposit of fine mud which occasionally slumped onto a flat plain which had anaerobic conditions. The animals were preserved but did not bear the correct relationship to the bedding.

Another example of an environment which allowed for very good preservation was the Solenhofen Limestone of the Jurassic, 180 million years ago. Here are thinly bedded limestones laid down in hyper-saline lagoons separated from

the sea but during storms plants and animals were washed in from the sea and preserved as there were no scavengers.

From the fossil evidence there is a bias away from the soft bodied and lightly skeletoned animals and also towards the marine environment

Radiations and Diversification

There are two main types of radiation. Evolution of new organisms with total diversity can arise as in the Cambrian with an exponential increase in diversity which has remained fairly constant up to the present time.

Metazoa are a group of animals where the body is composed of many cells each specialising in certain functions to produce more complex animals. Radiation occurred at the end of the Pre Cambrian.

Development of skeletons evolved as oxygen levels increased and this allowed more diversification of species.

The second type of radiation is replacement, for example, the case of the reptiles which dominated the earth for 350 million years and co-existed with the mammals. When conditions changed favouring the mammals the latter became dominant but not through better design.

Extinction is important as it makes way for new species as is shown by the fossil record where 99% of all species are now extinct.

One of the ways that this information has been viewed is by using the life tables as used by insurance companies. These are graphs of mortality plotted against age and time and for individuals they produce a curve. When species are plotted on this graph a straight line is formed indicating that the mortality rate is constant and that species are neither more likely or less likely to live longer.

There is a hypothesis called the Red Queen Hypothesis taken from Alice Through the Looking Glass (no matter how quickly the Red Queen ran she stayed in the same place). The reference is to a species adapting to its environment which is not always changing to its advantage and if it cannot adapt quickly enough to the changes it will become extinct.

Dr. Alan Thomas concluded that if the evolutionary tape were to be run again there would be a totally different set of animals in existence.

PETER SMITH

Dudley Rock and Fossil Fair 1992 - 150 Years Remembered

On the weekend of the 28th/29th November 1992 nearly 4000 people of all ages and backgrounds flocked to Dudley to participate in the first ever national Rock and Fossil Fair.

This event was deliberately designed to cover all aspects of geology, providing something for the most casual amateur as well as providing inspiration to the most dedicated professional and was on a scale which required complete occupation of both the Museum and Town Hall for one unique celebratory event.

During the course of the weekend the Town Hall was taken over by an army of geology enthusiasts who transformed it into a geolgical "Aladdin's Cave".

Fifty stands and several exhibition areas offered a staggering array of skills and sights. The stands introduced the visitor to:- dinosaur hunting, fossil collecting, minerals and gemstones, the Earth from space, Black Country Mining, environmental geology, conservation, geology in education, local and national clubs, societies and associations, suppliers of books, hammers, field equipment the list goes on and on.

Demonstrations of gold panning, gemstone cutting, model making and fossil preparation provided a greater insight into the subject and hands-on experience. Activities were further enlarged by opportunities to follow guided walks over and under Dudley and into its graveyards or to sit in on a series of talks covering a wide range of topics.

And, as if all of this was not enough to fill the senses, the fair also coincided with the launch of a new popular geology newspaper called *Down to Earth* and several museum attractions including DINOSAUR MANIA, an exhibition, DINOSAURS - THE TERRIBLE LIZARDS a film, and the official opening of Dudley Museum's innovative geology gallery "THE TIME TRAIL".

All-in-all this was certainly a weekend to remember and will undoubtedly leave its mark in the Annals of Geology as a substantial success in popularising the science of geology.

Success can be measured in many ways. For my part this was certainly the best organised and best attended event of its kind that I have ever witnessed, and my sentiments have been echoed in letters received and in articles written about the event. One apt example from a national journal states "Dudley was an insight into what can happen if the geological world pulls together", in what the author calls "geology unlimited" and goes on "events that are open and free for all to take part in, no matter what their age or competence. Now all we have to do is spread the good news." "Let us hope that the famous 'Dudley Bug' is catching and Dudley '92 will indeed be a weekend to remember in the history of geology in the UK".

The event was certainly successful in drawing people from far and wide, with people in attendance from Scotland, Wales, London, Southampton, Durham and even Holland, and who knows where else? The event also more than justified the confidence of its organisers in economic terms and has raised the profile of Dudley, establishing it in national and international eyes as a centre of excellence in the field of natural science and in particular, geology.

For those romantics among us, just seeing a popular geology event so well supported by the public and witnessing the obvious joy of the younger generation is a rich reward and success indeed.

The Black Country has a remarkable geological heritage which is something to be proud of. It is clear that the 1992 Rock and Fossil Fair has sent a ripple through the geological world and has turned many heads towards Dudley. This status is something that deserves to be maintained, particularly as it marks achievement in these difficult times.

Many people are already enquiring about the next Dudley Rock and Fossil Fair and this is probably the greatest praise and measure of success of all - when people are crying "encore"!

The atmosphere and smooth running of the Fair is testimony to the people who made it all happen. In particular Colin Reid for his vision (and stamina), Alan Cutler for designing and organising the stands in the Town Hall, Paul and Judith Shilston for expertly managing the staff and workload, and all of you the members of this Society who gave so freely and generously of your time to ensure that the weekend was such a great success.

I personally feel that there is no other event which could have been a more fitting climax to the celebration of 150 years of Black Country Geology than the 1992 Rock and Fossil Fair.

GRAHAM WORTON.

Having volunteered to assist in a non technical capacity at the Rock and Fossil weekend at Dudley Town Hall I found a very colourful and well designed arrangement of stalls and exhibitions.

The first public arrivals seemd to be fathers with children, sometimes with mother also, grandparents and children, and how the children enjoyed themselves, leaving bearing model dinosaurs or plaster moulds of trilobites.

Later in the morning more couples arrived some having travelled many miles. Others stayed for long periods determined not to miss a thing. Over three and a half thousand attended, about a third of these being children, and the Town Hall buzzed with an excited happy atmosphere.

Taking a little time off to look around the show myself I found on the ground floor many fascinating stalls full of interest and on the upper floor an "Aladdin's Cave" of rocks of every kind and jewels of every colour, size and hue, some uncut, some set as jewellery. This was where I started the Christmas shopping.

Some of the professional stall holders were telling me how impressed they were with the organisation of the show, the amount of publicity, the size and attractiveness of the areas allocated, and the useful back-up facilities provided. The ones that I spoke to expressed a keenness to come back next year.

I could say the same myself. I thoroughly enjoyed my stint, met new friends in the BCGS, talked to old friends and am delighted that the whole event was a resounding success.

PATRICIA HADLEY.

Thank you and well done

This turned out to be a very enjoyable weekend as most of you will know. I would like to offer my particular thanks to all 39 Society members who came along to help either on our stand, on the door or in the Museum. There were also at least another 6 members involved on other stands which means that 45, or more, of us were actively involved in helping to make the event so successful. This is more than half of the Society's total membership and I feel that we are entitled to congratulate ourselves on how well we rose to the occasion. So well done everyone!

So far as the Society stand was concerned we did a roaring trade in selling the rock specimens so generously donated by Graham Worton. It is well worth remembering that if you have an opportunity to collect saleable material at any time this is a good way of helping the Society funds when events like this take place. It also makes the stand more interesting to the visitors.

JUDITH SHILSTON.

Photographs sought

Colin Reid is urgently seeking photographs taken at the November Rock and Fossil Fair for use in an article in 'Geology Today' late in the year. "Believe it or not I did have an official photographer for the Fair", says Colin. "His pictures were excellent except that he took them all before the doors opened to the public!" If you can help please contact Colin at Dudley Museum, tel. (0384) 453574.

'The Time Trail' The relaunched geological gallery at Dudley Museum.

Opened in November 1992, the 'Time Trail' has brought Dudley's geological gallery into the 21st century a few years early. The display is an outstanding example of what can be done in a limited space, given imagination and talented designers.

The framework of the 'Trail' is the geological succession for the Black Country, which has been replicated on the walls of the gallery to give an effect as if one is walking through a cave. Each main rock unit is demonstrated in time sequence with dioramas of the ancient environments, displays of the fossil content and reconstructions of mines. The modelling is of the highest quality and the academic standard is without fault. The design allows for many of Dudley's collection to be displayed to good effect for the first time.

Colin Reid and his team have produced a gallery worthy of the geological importance of our area. It needs to be used to promote our subject effectively. One way to capitalise on it might be to create a video for schools on the geology of the Black Country, using footage of the 'Time Trail' intercut with field footage of the sites. Any takers for sponsoring such a project?

In conclusion - go to walk the 'Time Trail' and encourage everyone else to go as well. There has never been a better introduction to Black Country Geology, or likely to be one.

PETER WHITEHEAD.

ITEMS IN BRIEF

1. Proposed trip through the newly opened Dudley Canal tunnel.

Several newsletters ago we included this trip in our programme for October 1992 but for various reasons it did not take place. We still plan to run the trip but members might like to know the position.

The tunnel was planned to re-open in June 1992 on the 200th anniversary of its original opening. The opening did take place as planned, but there were still engineering works to be completed so that the tunnel was not then opened to the general public. In addition the traffic arrangements for the tunnel had to satisfy the Fire Authorities and other bodies concerned with boat traffic, life saving equipment etc., which meant that additionl work had to be carried out.

Because of all this the tunnel is still not fully open to the general public at all times - BUT THE GOOD NEWS IS THAT IT SOON WILL BE.

We still intend to include the trip in our programme and expect it will be later in the year - watch this space!

2. 'Dinosaur Mania' A roaring success

Dudley Museum's latest extravaganza 'Dinosaur Mania' has proved its most successful exhibition ever. Since opening in late November it has attracted over 12,000 people - 5,000 alone during the weekend of the Rock and Fossil Fair. The exhibition features memorabilia from around the world, a full-sized <u>Megalosaurus</u> replica and the finest private collection of dinosaur material in the country, including skulls and bones from the U.S.A., Canada and the Isle of Wight.

The exhibition is complemented by a series of children's interactive displays, including computer games and exhibits in which they can design and construct their own dinosaur.

'Dinosaur Mania' has had an excellent response fromm schools and is heavily booked for visits through until the beginning of February. A teachers' pack produced in conjunction with the exhibition is already into its second print run.

If you've missed 'Dinosaur Mania' so far, dont't despair; its run has been extended until 6th March because of the demand.

3. Courses

University of Bristol.

Details: Dr. P.G. Hardy, Dept for Continuing Education,

Wills Memorial Building, Queens Road, Bristol BS8 1HR.

'phone: (0272) 303624.

- (a) Geology in the Cotswolds. Dayschool on Saturday 13th February. By Dr. Nicholas Chidlaw. At Moreton-in-Marsh. Fee £10.50.
- (b) Ancienct red continental rocks in Gloucestershire and Avon. Day school on Saturday 6th March. By Dr. Nicholas Chidlaw. At Lydney, Glos. Fee £10.50.
- (c) Volcanoes and the origins of magmas. Dayschool on Saturday 13th March. By Dr. Reg Bradshaw. At Cheltenham. fee £11.50.

University of Nottingham.

Details: Dr. I.D. Sutton, Dept of Adult Education

University of Nottingham 14-22 Shakespeare Street Nottingham NG1 4FJ 'phone (0602) 516513

- (a) The South Wales coast. Geological weekend 2-4 April 1993. based at Aberavon. Fee including accommodation £92.
- (b) Geology of the Isle of Mull. Week-long geological courses. Course A: 29 May 4 June 1993, £180. Course B: 5-11 June 1993, £170.
- (c) The southern and western Lake District. Geological weekend 1-3 October 1993. Based Gasmere. £99.

University of Durham.

Details: Mrs B. Athey, Dept of Adult & Continuing Education

University of Durham

Durham DH1 3HN

Ardnamurchan - a geological field week. 29 May - 5 June 1993. £295.

4. Rock and Mineral Fair at Chatterley Whitfield Mining Museum, Stoke obn Trent. Saturday 20th March 1993, 10.00 am to 4.30 pm.

5. News of members

Congratulations to Colin Reid on being appointed to the post of Publicity/Public Relations Officer for the Geological Curators Group with the brief to co-ordinate meetings and to assist in the co-ordination of the first European meeting of Geological Curators to be held in Frankfurt in late 1994 or 1995.

Congratulations to Wendy Hadley who has graduated from Manchester University with an Honours Degree in Geology and is studying to take a Masters Degree in Environmental Geology.

Congratulations to Peter Whitehead whose 'Oxford Book' is now out (see last newsetter).

6. Welcome to new members

Mr. D. Styles and family - Great Barr. Mr and Mrs R. Gibbons - Harborne. John Sunderland - Sedgley.

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