NEWSLETTER NO. 119

OCTOBER 1996

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

MONDAY 21st OCTOBER. Lecture: Conserving marine reptiles at Whitby Museum by Kate Andrew (Ludlow Museum).

Whitby Museum has a useful collection of Jurassic marine reptiles but over the years their quality had deteriorated. Several specimens were suffering pyrite decay, all were filthy with the grime of ages, and many were coated with varnish which had become virtually black. Most of the specimens were wall-mounted; they included 5 ichthyosaurs, a plesiosaur, 3 slabs with marine reptile vertebrae, 3 slabs of reptile parts and also 2 slabs with dinosaur footprints.

Kate Andrew's lecture will outline the conservation work she carried out on these specimens during visits to Whitby in May 1995 and March-May 1996 to restore them to something like their original glory. She will describe some of the problems and solutions involved in this type of conservation work.

KATE ANDREW is now curator of geology at Ludlow Museum but for most of her career she has been a geological conservator, restoring and cataloguing specimens of all types at many locations at home and abroad. Institutions that have benefited from her efforts include The Museum of Nature at Ottawa in Canada, Whitby Museum, Bromley Museum in Kent, the Sedgwick Museum in Cambridge and the Horniman Museum in London. While based at Birmingham City Museum & Art Gallery she acted as a free-lance conservator for several years and during this time worked on the Dudley Museum collection entering 9500 items onto its computer. She was also Runner-up for the prize of the National Award for Conservation 1994.

SATURDAY 2nd NOVEMBER. Birmingham University Dayschool. 10.00a.m. to 5.00 p.m. 'The Early History of Life'. Lecturers Dr. Alan Thomas and Dr. Paul Smith. At Lapworth Museum, School of Earth Sciences, University of Birmingham, Edgbaston, Birmingham. Fee £15 (concessions £10). Details and booking: Admissions Office, School of Continuing Studies, University of Birmingham, Edgbaston, Birmingham B15 2TT. Telephone: 0121 414 5606/7/8.

MONDAY 25th NOVEMBER. Lecture: Ancient miners; modern collections by Dr. R. Ixer (Birmingham University).

This lecture will look at the evidence for copper mining in the Bronze Age from a mineralogist's point of view and will have a link with our Alderley Edge field meeting in the previous September.

*Dr. Rob Ixer writes:* In the last decade there has been a gradual realisation that copper mining during the Bronze Age was widespread in the British Isles and included such famous mineral localities as Alderley Edge near Manchester, Parys Mountain in Anglesey, Great Orme near Llandudno and Ross Island off the southwest coast of Ireland.

In the absence of run-of-the-mill ore from these mine sites archaeologists have used material from Museum collections as a basis for their studies. A number of resulting false trails and red herrings will be followed and good but representative mineralogy will be shown to be the key in determining Bronze Age mining and metallurgy.

I will be showing a number of slides - mainly of Ross Island and Great Orme - and will discuss mineralogy and ore generation to show how non-discriminating archaeologists are!

DR. ROB IXER is the senior mineralogist at Birmingham University's Earth Sciences Department with an impressive track record in his field. He has been a good friend of the BCGS for many years and we are very pleased that he will be speaking to us again.

SATURDAY 11th JANUARY 1997. Birmingham University Dayschool. 10.00a.m. to 5.00 p.m. 'Sea Shells: Ancient and Modern'. Lecturers Dr. Alan Thomas and Dr. Paul Smith. At Lapworth Museum, School of Earth Sciences, University of Birmingham, Edgbaston, Birmingham. Fee £15 (concessions £10). Details and booking as for Dayschool on 2nd November.

MONDAY 20th JANUARY 1997. Lecture: Environmental Geology - examples from Finland and the U.K. by Dr. Roger Dackombe (Wolverhampton University).

This lecture will examine the role of geology - and in particular 'environmental geology' in determining courses of action when environmentally sensitive activities are being planned. These can include mineral extraction and development of water supply sources and geologists can point to the most suitable strategies to minimise disturbance and make the best use of available resources.

Dr. Dackombe has considerable experience of the geology of Finland and will contrast geological environmental problems there with those in the UK. The two areas have significantly different geology: there are great differences in climate, in the countries' latitude and in the surface terrain and these lead to different solutions to their environmental problems.

DR. ROGER DACKOMBE is Senior Lecturer in Environmental Science at Wolverhampton University and he is also involved in running post-graduate MSc courses on environmental geology in Finland and Hungary, to which countries he pays regular visits. His geological interests are Quaternary Sediments and Applied Engineering Geology while his particular research interest is in the Isle of Man. He has researched glacial sediments and till sequences in the IOM, he is Geological Consultant to the Manx Government for environmental questions and works with archaeologists from Liverpool University studying Manx archaeology in its geological context.

A SATURDAY MORNING visit to Wolverhampton Museum & Art Gallery is planned for February/March (date to be advised). This will be to see reserve items of the FRASER COLLECTION not normally available to the public. It will be organised by Rosemary Roden, a geological conservator who carried out the work of rescuing the Fraser Collection from the basement of Himley Hall. She set up the children's display 'Dr. Fraser's Fossils' in the Museum as well as curating the rest of the collection which is now in store.

MONDAY 17th FEBRUARY. Annual General Meeting. Followed by two short lectures by Society members who have visited the locations recently:

Easter Island by Sheila Pitts and Geology of Gibraltar by Paul Shilston.

MONDAY 17th MARCH. Lecture: Mineral exploration in Europe by Dr. Christopher Morrissey (RTZ Mining & Exploration Ltd.)

MONDAY 14th APRIL. Lecture: Evolution and extinction of Trilobites by Dr. Bob Owens (National Museum of Wales).

SATURDAY 17th MAY. Birmingham University Dayschool. 10.00a.m. to 5.00 p.m. 'The Geology of Wenlock Edge'. Lecturers Dr. Alan Thomas and Dr. Paul Smith. At Lapworth Museum, School of Earth Sciences, University of Birmingham, Edgbaston, Birmingham. Fee £15 (concessions £10). Details and booking: as for Dayschool on 2nd November.

SUNDAY 18th MAY. Field meeting to Shropshire. Leader: Dr. Paul Smith (Birmingham University).

SUNDAY 8th JUNE. Field meeting to the southern section of the Malvern Hills. Leader: Eddie Bailey (Society Member).

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: 380022) is about 16km (10 miles) southwest of Shrewsbury. Leader: Peter Sheldrake (Shropshire County Council, Environmental Dept.)

## REPORTS

Field visit to North Staffordshire, 14th July 1996. Leader: Don Steward of Stoke-on-Trent Museum.

Members of the Manchester and Black Country Geological Societies met on the car park of The Mermaid Inn, about 4 miles north of Leek. This gave a superb view westward over the Goyt syncline, a north-plunging fold easily traced in the landscape by the outcrop of the Roaches Grit. This coarse sandstone of Middle Carboniferous age was deposited in a delta by a river flowing from the north. Its red colour is due to a high content of orthoclase feldspar, suggesting the source areas was not far distant.

After driving to Roach End, the party walked about a mile through woodland to the narrow defile known as Lud's Church. This chasm lies behind a large landslipped block of Roaches Grit on the side of the valley of the River Dane. It gained its name from being the retreat of Lud Auk and his band of Lollards, who were religious heretics persecuted by King Henry IV. This is also supposed to be the site of the Green Chapel described in the medieval poem 'Sir Gawain and the Green Knight'. Historically, the district has been the abode of felons and the nearby village of Flash was known for 'flash money' meaning ill-gotten wealth.

In the afternoon the party drove to the disused Brown End Quarry, near Waterhouses. This exposes part of the Lower Carboniferous Milldale and Hopedale Limestones, conveniently steeply-dipping so as to allow easy inspection of the whole sequence. Fossils are plentiful, but the beds are very thin compared with the equivalent strata elsewhere, indicating slow sedimentation. There are two small mudmounds or 'reefs', but investigation of the geological cavity infills of one of them has shown it to be inverted, hence not in-situ. Sedimentation probably took place near the foot of a tilted fault block dipping gently westward, downslope from the 'waulsortian reefs' of the Dovedale-Manifold region. The youngest beds are turbidites.

This quarry was the location of a Pleistocene fissure containing woolly mammoth remains. The fissure is now quarried out, and the bones are missing, but our leader expressed the ambition to locate them and give them a home in Stoke Museum.

Brown End Quarry, a designated SSSI, was bought by the Staffordshire Wildlife Trust in 1987. It was made a Geological Nature Reserve under the guidance of the North Staffordshire Group of the Geologists' Association. Out thanks to Don Steward for a most interesting excursion.

Nigel Bradley

The Natural History Museum John Mason Conference. Wednesday 11th September. British Association Annual Festival of Science, Birmingham.

About 20 BCGS members attended this conference in response to the invitation to the Society from the Natural History Museum. It turned out to be a very varied and thought provoking day, all of the subjects leaving scope for much more detailed discussion had time permitted. The theme of the day was Patterns and Predictions and explored the idea of whether patterns in the natural world could be used to predict future events.

1. Introduction

The conference was opened by Dr. Neil Chambers, the Museum's Director, who referred to three types of patterns, i.e. form, space and time. It was difficult to imagine a world without patterns so people see patterns and try to make predictions from them whether they are justified or not. The plant and animal kingdom is not a maze but the patterns that

He referred to human generated changes and the significant effect that these were having on the natural world.

2. Bombarded Earth.

Monica Grady explored the theme of whether patterns could be detected when extra-terrestrial material fell to Earth. There was some 30,000 to 50,000 tons of this each year most of which fell in pieces so small as to cause no problems and mostly went unnoticed. There were however about 1000 meteorites weighing a ton or more and 10,000 weighing a kilogram or so to hit the Earth every year and they could do local damage. There were no known fatalities but in the UK we could expect one such meteorite every 15 years. Statisticians had however proved that the chances of being hit by a meteorite were greater than those of winning the jackpot on the National Lottery!

It was not possible to predict where meteorites would fall but it was possible to predict where they could be found. This was mostly Antarctica and big deserts partly because the dry environment preserved them and because they were easy to spot in such open barren areas.

How often were large meteorites to be expected? Meteor Crater in Arizona was 1.5 kilometres across, caused severe local effects but no lasting damage. Something of this size could be expected once every 100 years. Tunguska, in Siberia, was 15 kilometres from a radiant centre and had flattened 1000 square kilometres of trees but there was no physical crater and no meteorite remains. This could be expected once in 1000 years.

The KT (Cretaceous/Tertiary) impact on the Yucatan Peninsula was 180/300 kilometres in diameter. If centred on London this would annihilate an area from Norfolk to Brighton. Such an event could be expected every 100 million years.

Despite all this study it was still not possible to predict when and where the next meteorite would fall.

3. The Fossil Record and the Changing World

Steve Culver told us that asteroids and comets were only one agent for change although they could be hugely significant. A planet the size of Mars had hit the Earth and formed the Moon. Such an impact would have sterilised the planet, speeded up the Earth's rotation and had a major effect on tides.

The geological record needed to be studied too and the Museum is currently involved in a project to try to reconstruct past environments and the fossil record played a major part in this. the aim was to try to predict the future.

The main factors in environmental change were:- meteor collisions, volcanicity, climate change, sea level change and continental drift.

There were two peaks of marine and terrestrial extinctions, i.e. at the KT boundary when 50% of species were lost and at the Permo Trias boundary when 72% were lost. The meteor impact in Yucactan would certainly have been implicated in the former but borehole studies tended to show that the mass extinctions at that time were spread over a protracted period and were not the simultaneous events generally reported.

Temperature changes tended to come about when there were changes in the tilt of the Earth's axis or orbit and this could be seen in the glacial and inter-glacial periods of the Ice Age. It was said that in such a situation glacial conditions could return within a couple of generations! It seemed that after such cyclical environmental changes the same species were not necessarily restored when similar conditions returned. In this situation species acted as individuals not as communities.

Two examples of the effects of plate tectonics were referred to. 2.5 Mya the isthmus of Panama rose above sea level. This was instrumental in forming the Gulf Stream which brought moist air to northerly latitudes and helped generate the Ice Age. After the split of Pangaea sea surrounded and flooded the smaller continents and changed the climate from severe continental to more temperate.

It was concluded that it was difficult to predict the future from the past partly because the past was complicated but also because man's activities were causing change at such an unprecedented rate that it inhibited our ability to learn from the past.

4. Patterns of Evolution in the Fossil Record.

Scientists often used the terms primitive and advances to describe species but the notion of primitive was subject to change and Richard Fortey illustrated this with two examples.

The first was the evolution of arthropods (jointed legged animals such as spiders, flies, crabs etc.) For a long time trilobites were regarded as primitive arthropods because they were the oldest such creatures in the fossil record. But then more older

arthropods were found, particularly in the Burgess Shales. These had not previously been found because they were soft-bodied and not generally preserved the way trilobites had been and arthropods continued to be discovered in the Cambrian. Although the pre-Cambrian was not now considered to be barren there was no indication of arthropod ancestors in it. This posed the question of whether there had been another explosive event at the base of the Cambrian.

A change of approach by Manton looked at a different means of classifying and analysing arthropods based on muscle structures which concluded that they had descended from several ancestors that were not arthropods and that trilobites were but one limb of arthropod development.

Yet a further computer analysis based on different criteria of dissimilarities rather than similarities concluded that trilobites were well derived arthropods not primitive ones.

So different classifications came up with different answers about where trilobites figured in fossil evolution but under any system they had been displaced from their earlier position as primitive Arthropods.

The second example was Neanderthal man. The notion of a lower level of human life persisted even today. Yet there was evidence of many cultural features which were far from primitive, e.g. proper burials with gifts and flowers at the grave. They also had simple tools. Neanderthals were known from many sites around Europe and they were now increasingly seen as a separate species to sapiens and not its ancestor.

Richard Fortey concluded that the notion of 'primitive' in evolutionary terms was fraught with difficulties when trying to determine the origin of any particular species. Usually the best that could be said about any species was that it was 'early' or 'late'. So once again the use of patterns from the past to try to understand events was proving problematic.

The overall feeling that I was left with from this conference was that we were still trying desperately to make sense of a past in a search to bring some certainties to the future - but without much luck! We were all very pleased however to have been invited to this fascinating occasion.

Judith Shilston

## EDITORIAL

My local Natural History Society recently had a lecture on Bee Orchids. I was amazed to learn how they have evolved so that individual species have a scent and appearance to mimic that of the female of a specific insect pollinator. The insect attempts to mate with the plant and being so duped takes the plant pollen to the next plant with which it attempts a further misalliance. That evolution can be so specific (a very appropriate term in this case) seems amazing. And how can random changes have such precise ends? The late Sylvester Bradley who taught me Palaeontology and whose humorous lectures were so popular with the undergraduate population of the late fifties warned the ladies of the dangers of excessive ornamentation as we looked at the decadent history of the later ammonites. The extremes of evolution seem destined to be dead ends as in the case of the Bee Orchid with its dependence on one species of pollinator and thus doubly subject to rapidly changing weather patterns and habitats.

What has this to do with geology you may ask? The non specialist is more adaptable. New posts at the Society require non geological skills. Can yours benefit the Society?

## CONSERVATION COLUMN

Since the last newsletter a few things have happened on the conservation front. Firstly we've responded to the Staffordshire R.I.G.S. group to provide information about a site in Wombourne. This was a red sandstone quarry exposure which is now a housing estate! We did, however, manage to find alternative exposures close by which ensures that the local school still has a geological amenity.

APPEAL. Is there anyone out there who knows of any exposures of rock at all in the Hereford and Worcester County area? If so can you let us know as this county is trying to locate potential geological sites and will visit and assess all the ones that are suggested. You can make a real contribution here by simply identifying a site. They will do the rest.

Fieldwork. Alan Cutler has been approached by British Waterways to advise on Canal side geological sites, one of which is Brewins Bridge at Netherton. You may recall that I am organising a further clean-up of this section in association with the Dudley Canal Trust and BWB. As yet I don't have any dates, but be assured as soon as I do ..... you'll know!

Artwork Unfortunately our appeal for a symbol/design to illustrate our conservation efforts has as yet received no response from the artists and idea-ists out there. So I've done another sketch in an attempt to inspire someone to put pencil to paper. Don't be shy, have a try!. Until next time.


Graham Worton

## ITEMS IN BRIEF

1. Welcome to new members
   Stephen Haycock - Kingswinford
   John & Margaret Collins - Acocks Green

2. **Member Gordon Giltrap will be performing in the Cliff Richard musical Heathcliffe.** Hilary reports that it will be difficult for them to attend meetings at Dudley over this busy period but that they look forward to the new experience of financial security.

3. Wanted - A new General Secretary and a new Treasurer
   At the last AGM the current General Secretary and Treasurer said that they wished to give up their jobs and would not be standing for re-election at the AGM in February 1997. So we are looking for members to replace them. *Neither job requires geological knowledge.*

   The Secretary's job is chiefly to look after the membership records, to address a set of newsletter envelopes every two months, to record when subs are paid, to chase up outstanding subs, and to respond to people asking about joining the Society.

   The Treasurer's job is to look after the Society's accounts, to receive subscriptions, to pay out fees for room hire, leaders' and lecturers' expenses etc., and to produce the annual report and accounts for the AGM.

   If anyone thinks they might be interested in either job, Paul or Judith Shilston will be happy to discuss this with them.

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