



The  
Black  
Country  
Geological  
Society

# NEWSLETTER No. 152 APRIL 2002

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 at Dudley Museum, St James's Road, Dudley. Phone (01384 815575)  
7.30 for 8 o' clock start.**

### MONDAY 29<sup>th</sup> APRIL 2002.

Lecture: Professor Aftab Khan, Department of Geology, University of Leicester. "Lithospheric Structure and Dynamics of the Kenya Rift."

Professor Khan will speak about the Kenya Rift International Seismic Project and in particular the experiments carried out between 1985 and 1994. These show that there are abrupt changes in the depths to the Moho (the interface between the crust and the mantle where the composition and consistency of the rocks change dramatically).

Beneath the rift valley itself, there are major differences in the thickness of the African continental crust due to stretching and extension of the crust by events along the rift. There are also differences between the upper mantle structure from the north and the south.

He will explain the seismic methods used to look at the deep geology of the rift valley and how they can be used to interpret the earth's structure. He will talk about the seismic methods used and how they can be used to interpret the earth's structure.

**SATURDAY 4<sup>th</sup> MAY 2002.** Field Meeting: Ice Features in Shropshire. Leader: Andrew Rochelle. Meet at the Canal Warehouse Newport (GR SJ 744 194) on the A 518 at 11.00 am.

The trip will view meadows and subsidence along the road towards Meretown and provide views across moors to look at a glacial landscape.

*Chairman*  
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*Field Secretary*  
A. Rochelle B.A. Hons.  
Tech.RICS.

Glacial deposits near the roadside, including a number of glacial boulders, will be examined. A pub stop will be available if required. The party will then go on to view Gnosall Overflow Channel and a saucer shaped area representing a relict glacial lake. Weaver's Hill kame will be visited in order to study till fabric. The final stop will be at the Guild of Monks in order to study eskers and a relict lakeshore.

**WEDNESDAY 8<sup>TH</sup> MAY** The BCGS members have been invited to attend the Palaeontological Association AGM and lecture by Professor Hugh Torrens entitled "The life and work of S.S. Buckman (1860-1929) geobiochronologist, and the problems of assessing the work of past palaeontologists" The lecture is in the Barber Institute of Fine Art at 3.00pm and is followed by a wine reception in the Lapworth Museum. The talk is open to anyone and there is no admission charge.

**AT 18<sup>TH</sup> and SUN 19<sup>TH</sup> MAY 2002 CANALSIDE ROCK AND FOSSIL FESTIVAL** This show is to be held at the headquarters of the Dudley Canal Trust (DCT), the Pumphouse opposite the entrance to Narrowboat Way, Peartree Lane, Dudley. It will feature many displays and dealers stands with lots of activities including caving demonstrations, dinosaur model making and remote controlled bug trials as well as competitions and guided narrowboat geology trips to Saltwells Local Nature Reserve. Event jointly organised by Dudley Canal Trust and Dudley Museum. The festival opens at 10am on each day and runs until 5.00pm admission is £1 for adults and 50p for under 11's. Free admission will be available to those helping on the BCGS stand over the weekend.

**MONDAY 27<sup>th</sup> MAY 2002.** Lecture: John S Harris. "Ground Freezing in Civil and Mining Engineering." This talk will use real life examples of projects to look at the ways in which deliberately freezing the ground can help us to construct tunnels and structures where groundwater makes working conditions treacherous and unstable. [note that Dr Sutton's talk on Yellowstone which had been advertised for May has had to be re-scheduled for October]

**SUNDAY 7<sup>th</sup> JULY 2002.** Field meeting: Snailbeach lead and zinc mining area near Shelve, Shropshire. Meet at Snailbeach car park at 11.00 am (GR SJ 373 023, OS 1:50 000 sheet 126)

The trip will examine the mines at Snailbeach and provide views of the Shropshire landscape. At the mine there are interpretive boards and information explaining the structures and life in the mining industry of the area. There is the possibility of underground visits here. A short walk will include many mining features and take in the Lord's Hill Baptist Chapel (1833). At the spoil heaps, samples of the minerals mined and their host rocks can be obtained.

We will stop at Stiperstones Inn for lunch where good food is available. The afternoon session will be spent at The Bog Mine, where another reconstructed and interpreted mining complex and a field study centre are present.

**SUNDAY 21<sup>st</sup> JULY 2002.** Field meeting: Joint meeting with the Shropshire Geological Society. "Geology of the Black Country – Part 2" Leader: Graham Worton. This will start with a view across the south-western Black Country from atop the intrusion at Barrow Hill, Pensnett, and will look at exposures that tell the long story of the Black Country from the Upper Carboniferous to the Ice Age. Further details to follow.

**SAT 21<sup>st</sup> and SUN 22<sup>nd</sup> SEPTEMBER 2002.** Dudley Rock and Fossil Fair. Returning after four years this will be similar to those of the 1990's and will take over both Dudley Museum and Art Gallery and the adjacent Town Hall. It will celebrate the whole sphere of geology and Earth science with many exhibitors, dealers, a children's discovery area, special events and trips. If you would like more information or would like to enjoy the benefits offered to volunteers, please contact Graham Worton at Dudley Museum on 01384 815575.

**MONDAY 30<sup>TH</sup> SEPTEMBER 2002** Lecture: David Brew "Shoreline Movement and Shoreline Management in the Wash, Eastern England" This lecture will examine the processes that change the shape of the coast in the Wash and measures taken to manage that change.

**MONDAY 28<sup>th</sup> OCTOBER 2002.** Lecture: Dr Ian Sutton "Yellowstone, its Evolution and Geology." This lecture will look at one of the world's most famous geological areas. It will explain how it was created, how it has evolved and describe its spectacular geological features.

**NOVEMBER 2002.** Members evening at the Museum. Your chance to have a guided tour of the Museum followed by a series of short talks given by Society members. This will be open to anyone who would like to share something of interest. Date & details to follow.

## **EDITORIAL**

The subject of taxation is never far from anyone's mind these days and in the run up to local elections is a particularly hot topic. Its not often that taxation however can be seen to offer potentially direct benefits to geological heritage at the local level. You may be aware that the introduction of the Finance Act in April 2002 introduces an aggregates levy. This levy stands to impose a £1.60 charge on every tonne of freshly quarried natural stone in order to encourage the use of recycled materials. English Nature, The Countryside Agency and English Heritage will all be charged with the responsibility of administering this fund to worthy environmental projects in the first two years of its life. We understand that up to £5 million will be available to English Nature of which about £1million should be allocated for geological projects. We await with trepidation the rules and regulations that will accompany the application forms but you can be sure that it is something that will be discussed at the next committee meeting and by most environmental organisations across the UK in the months ahead.

## **REPORTS**

MONDAY APRIL 8<sup>TH</sup> 2002 Lecture 'Meteorites and the Search for Life in Space' by John Armitage.

In the early 1970's John Armitage wrote a paper entitled 'The Prospect of Astropalaeontology' in which he suggested that science should examine meteorites more closely for the evidence of extraterrestrial life. In 1996 NASA scientists' claim that a meteorite found in the Antarctic, and labelled ALH 84001, contained structures resembling micro-organisms came as no surprise to John. A topic of considerable controversy and in the context of latest information Johns' talk centred round two issues: meteorites themselves and other structures on nearby planets which are unusual. John began his talk by looking at the variety and abundance of meteorites. The general classification for meteorites depends on their 'stony' and 'metallic' composition. John described four basic types.

- 1) 'Irons' or 'Metallic' meteorites. Generally composed of 90+ % iron and nickel, the proportion of nickel varying by 6 % - 20 %. This type of meteorite make up around 6 % of the total number collected and are the most well known due to their being well represented in museum exhibits. They tend to be crystalline in structure and indicate that the parent body, they came from, underwent either slow cooling or sudden solidification during formation.
- 2) 'Lithosiderites' or 'Stony Irons'. Make up the smallest group of the total number of meteorites discovered, at around 3 %, and are generally composed of a coarse texture of

overlapping metal and silicates. They can be further subdivided into mesosiderites and pallasites based on their specific compositions

- 3) 'Chondrites' or 'Stony' meteorites. These are numerically the greatest and most important group of meteorites and comprise less than 10 % metal. Their name comes from the presence of small spherical silicate particles, a few millimetres across, known as 'Chondrules' which contain iron, feldspar, olivine and pyroxene making them chemically very similar to terrestrial rocks and so sometimes difficult to identify.

There is an important subset of chondrites containing carbon rich crystals, olivine, pyroxenes, metals, glass and sheets of mica. These are known as the Carbonaceous Chondrites.

- 4) 'Achondrites'. Represent another group of chondrite with just 1 % of the nickel-iron content and an absence of chondrules, as the name suggests. They also show very similar brecciated and igneous textures like terrestrial and lunar rocks. A type of achondrite of particular interest to John is known as an SNC meteorite, after the three main component minerals Shergottite, Nakhilite and Chassignite, to which the so-called Martian meteorite ALH 84001 belongs.

John examined the question of the origin of the meteorites. He stated that the majority of meteorites probably originate from trail debris left behind by comets orbiting the sun. A second source comes from dust and rocks left over from the original formation of the solar nebula some 4.5 billion years ago (4.5 Ga) as confirmed by isotopic data taken from the oldest known meteorites. A third possible source is believed to be the result of a collision between an 'impactor' and a parent body such as an asteroid, moon or planet.

For the second part of his talk John focused on the search for life in space, its survival and the possible evidence for it, in particular on Mars.

The earliest truly modern analytical work on meteorites began with work on the Bokkeveld Carbonaceous chondrite meteorite by Mueller, in 1953, and more detailed spectroscopy by Nagy. He focussed on a report by Claus and Nagy in 1961 that claimed to have made the discovery of microscopic organic crystals in a meteorite that resembled fossil algae. This immediately sparked off a museum contamination 'conspiracy'. Although it is true that terrestrial contaminants, such as bacteria, spores, pollen and other things were to be found in museum specimens it was also clear that microscopic bodies of apparently organised structure are a feature of many meteorites.

Similar structures turned up within terrestrial kimberlite rocks. Later polarisation tests, under more controlled sterile conditions, showed results quite unlike those of terrestrial organic compounds of biogenic origin. Research conducted on a carbonaceous chondrite known as the Murchison Cc2 meteorite which fell in September 1969 in Victoria, Australia has revealed evidence of polyaromatic hydrocarbons, amino acids and other organic compounds. The meteorite was reportedly found to be 4.5 billion years old and implies that these organic compounds were available at this early cosmic date. It was speculated that these materials may have contributed to the origins of life on Earth earlier than geologists previously believed. Further microscopic analysis of this meteorite has identified structures that appear to resemble those of terrestrial cellular aggregates, paedomicrobial organisms and viruses like influenza.

John took a little time to discuss theories of Cambridge professor Fred Hoyle who claimed that many epidemics, such as influenza, may have come from space within a meteorite or comet. Hoyle also suggested the possibility of an organism from space adding to the terrestrial genetic code if not seeding the Earth with life in the first place. On entry through the atmosphere the interior of a meteorite will remain fairly cool because of the formation of a fusion crust on its surface. This means that any delicate structures, like organic ones, could survive entry through the atmosphere.

The final part of Johns' talk concentrated on Mars and in particular meteorites from, and the possibility of life on, the 'Red Planet'. Isotopic, chemical and gaseous inclusion information provide supporting evidence for the origins of certain meteorites on Mars and they provide an insight into prevalent conditions of the planet in the distant past and its formation.

Many Martian meteorites belong to the SNC group of achondrites so called because of the three principle minerals the group contains - named after the places on Earth where they were first identified. Shergottite is typical to basaltic achondrites and characterised by the main mineral, plagioclase (Labradorite) having been shock converted into glass. Nakhilite, calcium rich, and chassignite, calcium poor, are both typical to olivine bearing achondrites again most likely of a basaltic nature. This would suggest Mars to be an undifferentiated body having given rise to fairly basaltic/basic geology and forming around 4,500 million years ago (4.5 Ga) from the solar nebula; followed by heavy bombardment of the surface around 4.0 Ga in the young solar system. Evidence exists of flowing water on the surface of Mars around 3.6 billion years ago (3.6 Ga). This is from the alteration of carbonate and sulphate minerals in meteorites of this age and also from images taken of the Martian surface showing what appear to be ancient rivers and canyons. A second shock event occurred around 13.0 million years ago (13.0 Ma) which ejected debris from the Martian surface, or the impactor, and sent it on a heading in towards the sun.

In 1996 a Martian meteorite identified as ALH 84001 was discovered in Antarctica and grabbed media and public attention with the claim by NASA scientists that structures that it contained what were possibly fossil micro-organisms. The very young age of this meteorite made it uncharacteristic of typical SNC and would suggest that it came from the second Martian impact event. Whether these structures actually represent fossil microorganisms or are a form of mineralisation, as many scientists believe, is still open to debate.

On the Earth life has shown itself able to exist under a variety of extreme conditions including temperature, radiation, vacuum and pressure. John cited examples such as bacteria surviving in nuclear reactors, as contaminants on the surface of space craft sent to the Moon, at the depths of the oceans around 'Black Smokers' and deep within the frozen soils of the poles. Such organisms are known as 'Extremophiles'. John made reference to Professor Russell, from Liverpool University, who claims that light coloured features seen on the Martian surface represent hydromagnesitic stromatolites similar to those found within shallow, warm aquatic terrestrial environments such as Shark Bay on coast of Western Australia. If life does exist on Mars then it is likely to be microbial extremophiles that, like any remaining water, survive well below the Martian surface.

John ended his lecture with a look at images he claims have been leaked by NASA taken, during fly-bys, over the last 30 years by passing space probes. Early pictures from the 1970's show poor resolution images of what look like pyramids, the infamous face, mysterious looking dark patches on sand dunes and possible unnatural tunnel like features in canyons. Were these constructed by intelligent life on Mars? Does NASA have an ulterior motive for leaking such images? More recent better resolution photography indicates that some of these features are mere optical illusions of mountain ranges and structures carved by the weather. A point nicely illustrated by John with a picture taken of the profile of a 'sphinx' naturally produced in a cliff section on a beach here in the UK.

Whether or not such images of Mars and evidence from meteorites suggests there is life in space John's talk showed that the possibility of the right physical and chemical conditions are present out there for life to exist, whether microbial or larger. In the meantime the search for life in space continues.....

Andrew Harrison

## CONSERVATION COLUMN

As noted in the editorial, there are potentially great opportunities for funding all manner of geological 'goodwill' projects on the spring and summer horizon. We will be turning our minds to the possibilities offered by this new resource in the near future. Quite independent of this though many projects are already gathering momentum including work on two sites:

### **Geological Trail News – Hay Head and Barr Beacon, Walsall**

Since the last newsletter local geological consultants Johnson Poole and Bloomer **have** been appointed to undertake a risk assessment at the quarry at Pinfold Lane, Barr Beacon as part of a scheme to extend the Hay Head Trail. This is an important step forward in many ways: it links another professional body into the subject of geological conservation; it further promotes the geoconservation ethic; it strengthens the partnerships involved between the LA, the BCGS and local business and establishes clearer definitions by putting things on a more professional basis. It also demonstrates political support is growing with money beginning to be committed to such work. This can only mean that the years of promotional work by local groups like the BCGS and national bodies like English Nature is now resulting in higher profile changing attitudes which hopefully will open more doors for further work.

### **Geological Trail News – Rubery Cutting and Rubery Hill Local Nature Reserve**

Another example of this interest from outside the geological community is Rubery Cutting. This society and Dudley Museum have been approached by The Urban Wildlife Trust to assist in a project to give a new lease of life to the geological exposures on the roadside cutting and hillside at Rubery near Longbridge, south Birmingham. This area acts as a wonderful 'site' which lies only a 'stones throw from the Lickey Hill Country Park and links to its geological exposures and landscapes very nicely.

The project that I have been discussing with the Wildlife Trust, the senior health and safety officer for Birmingham City Council, the Lapworth Museum at Birmingham University and the wardens at Lickey Hills will improve access and provide security for visiting parties to the site. We are currently thinking about interpretation and educational resources that can be provided for the site and putting together a grant application for this. We are intending to provide a CD Rom for the site which will include all of the basic information about the site, maps and photographs as well as a brief history of the site, its creation and importance to the local area.

***This is a very exciting project indeed and we need your help!*** It offers an opportunity for the society to be involved in both the practical conservation of the site itself and also the literature based research and creation of unique interpretation resources for the site. So if you would like to write a page for the CD Rom or leaflet, or would like to be involved in collecting and photographing fossils from the site or just know something of the areas industrial or natural history that could be included in a leaflet, web page or on the CDRom please let us know.

### **Dudley Museum Update**

I have to report that we were not successful in this round of bidding to the COPUS scheme for money to help us to put back a permanent geological gallery at Dudley Museum. We have however installed phase one of a semi-permanent geology gallery in gallery 4 on the upper floor of the museum. At present it holds about 300 of the very best of Black Country fossils and a selection of minerals in an exhibition called 'Buried Treasures of the Black Country'. For the first time ever we have cases which allow you to get your nose to within a few millimetres of each specimen so that you can enjoy the detail that their beautiful preservation.

The gallery will change its content and displays over time. In particular I want to use it to display new material that is donated to the Dudley Collection, which might otherwise remain in the realm of the researcher, or specialist visit. We will also stage temporary exhibitions here where specialist and local collectors have superb material that we are able to loan for display for short periods. I will also use it to continually run geo-art competitions of one form or another and it will also be a notice board for events and attractions with a geological theme

that you may like to visit. If you have any geological announcements please let me have them and I'll put them up. Please visit the gallery and let me know what you think.

The other positive aspect of the collection side of things is that I have been able to establish a 'geological heritage development fund'. This fund is specifically for purchasing new geological specimens for the collection, any conservation work on specimens within the Dudley Collection that may be needed and improving their display and interpretation. This fund is to be officially launched with a generous jubilee grant of £500 from our colleagues in the Black Country Society and will grow as a result of donations to the dedicated donations box in the new geological gallery. Other fund raising events will be held to ensure that if any significant collections of Black Country material appear on the market, we'll have at least some resources available to bring them back to the area and look after them for future communities to enjoy. I'll keep you informed about progress of the fund and its use.

Don't forget that the BCGS collection is held at the museum. If you have any material that you think should ultimately become part of this please let me know.  
Until next time..... Graham W

## OTHER NEWS ITEMS

### **Letter from the former editor**

Kate Ashcroft writes;

"I would like to record my thanks to BCGS for the book tokens which I was given on my retirement from editing the newsletter. The gift was very generous and I am still seriously considering what I should spend the tokens on. Being Editor was a lot of fun (and a little frustrating) and I wouldn't have missed my years in office for anything."

The editorial team now fully appreciates the extent of Kate's efforts in pulling this newsletter together and the difficulties that sometimes occur with the getting and processing of information for it. Those tokens were very well earned!

### **Hereford and Worcester RIGS Change of name and contact details**

The Hereford and Worcestershire RIGS Group have changed their name and adopted minor changes to their email and web addresses. They will now be known as **Hereford and Worcestershire Earth Heritage Trust**. This is name that they feel better reflects the range of work that they are undertaking.

They can be contacted on 01905 855 184, email at [eht@worc.ac.uk](mailto:eht@worc.ac.uk) website [www.worc.ac.uk/ehf](http://www.worc.ac.uk/ehf)

**Welcome to new member** – Frank Taylor of Shirley, Birmingham

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