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Charlton Field Trip
Book reviews
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Circular 978
Jurassic Churches Part 2
Rockwatch News
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NSGGA Lecture
The First Welsh Rock Star
Local Groups at the Festival of Geology
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The Geologists' Association

The Association, founded in 1858, exists to foster the progress and diffusion of the science of geology, and to encourage research and the development of new methods. It holds meetings for the reading of papers and the delivery of lectures, organises museum demonstrations, publishes Proceedings and Guides, and conducts field meetings.

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LAST Copy dates for the Circular & Magazine
March Issue January 14th June Issue April 22nd September Issue July 22nd December Issue October 21st

Items should be submitted as soon as possible and not targeted on these dates. We welcome contributions from Members and others.

Closing dates for applications to the Curry Fund for 2009
May 20 2009

How do we increase membership so that the GA can continue to flourish? It is not an easy question to answer at a time when most people are tightening their belts but it is something that I and colleagues on Council have been devoting a considerable amount of time to recently. While we continue to collate the results of the recent survey in order to find out what you - our members - value about our society, we have also been drawing up a plan of campaign to promote the GA more widely, including press releases, brightening up the website and targeted articles in magazines. Most importantly, we need our members to spread the word about the GA so please take a look at the notice on page 3 of this issue for ideas on how you can help us. Please tell your friends, colleagues and students about us and be creative - we have recently had one person taking out membership for someone as a birthday present!

While Rockwatch continues to do a great job in enthusing children about the wonderful world of geology and its relevance to our daily lives, we need to attract more student and adult members into the GA. There are lots of things to benefit from and enjoy, from our lectures and fieldtrips to our publications and various grants. It is only through maintaining a healthy membership that the GA can continue to be an active and passionate supporter of geology for all.

On the subject of geology for all, I was delighted to see industry and amateur geology coming together on 6th February, when Eni UK Ltd chose the GA to host their 2008 Eni Challenge Award, see page 10. Eni have offered their award for over a decade as a way of promoting amateur geology in the UK, particularly in the fields of conservation, interpretation or field education. This year’s worthy joint winners were the Forest Of Dean Local History Society, for “GEOMAP”, an exciting project involving the construction of a large-scale geological map of the Forest of Dean using the local rocks, and the Cumberland Geological Society, for their new book “Exploring Lakeland Rocks and Landscapes”. It is enormously gratifying to see these inspiring projects recognised and rewarded in such a way.

Danielle Schreve
Report from Council

This report covers the last two meetings of Council - December and February. All agreed that the Festival of Geology was almost a successful event and everyone involved with the organisation was to be congratulated. Suggested modifications for future Festivals were considered. As reported elsewhere, Rockwatch had a very successful meeting at Burlington House for which they were congratulated.

There is an ongoing report on the Disposal of Radioactive Waste that Council is monitoring with Prof. Cosgrove and Howarth in the lead.

Council continually considers the website and there was considerable discussion on how it should be developed and kept up-to-date. It was agreed that Sarah, in the office, should buy the program ‘Dreamweaver’ so that she is able to alter and update the website. Links between Local Groups and the GA need to be reorganised, with the current web address of the GA incorporated. How one archives a changing feature like the website was raised and needs considering for the future.

The recruitment of new members is always under consideration. It was decided that we should approach the membership for assistance, hence the block below. A variety of ideas were discussed and will be implemented over the coming year.

It was agreed that there should be a Lecture to commemorate Bob Stoneley and that Prof. Dick Selley should be approached for 2010.

Please respond to the box below.

John Crocker
General Secretary

Curry Fund Report

At its last meeting of 2008, the Curry Fund Committee received eight new applications and considered a number of matters arising from previous meetings. Six of these were funded and two were deferred until the next meeting, pending supplementary information.

The Dorking Museum was awarded £2000 towards the cost of information panels updating existing information to go in the new build museum, with its anticipated opening in December 2010. Friends of Lyme Regis Museum were granted £3,400 towards their new website development. £685 was awarded to the Dorset Geologists’ Association Group (DGAG) for a booklet on a “Geological Walk around Weymouth”. The Quaternary Research Association was awarded £800 to facilitate a session at its annual meeting in Oxford in January. Encouraging the mix of geology, landscape and photography, Richard Chivers was granted £700 towards the cost of development of his project “Textures of Time: Landscape and Architecture”. This is a fascinating photographic archive of changes to our environment as natural resources are exploited for human benefit. Our hope is that there will be a number of public exhibitions of this work later in the year. The Geologists’ Association was awarded £4,130 for publication of its forthcoming Field Guide on the Dalradian.

A decision on the application from University College Museums & Collections for its micropalaeontology collection update, was deferred until March, pending supplementary information, as was the application from Marble Arch Caves Global Geopark for an Earth Science Education Field Guide.

The application from Herefordshire & Worcestershire Earth Heritage Trust, deferred from the September meeting, was funded with a grant of £1,920 for signage of the Geopark Way long distance footpath. NEWRIGS, also held over from the September meeting, received a grant of £446.50 for geological bookmarks. The final leaflet (4/4) “Rocks on the Shore of Newquay” was received by the committee and the final payment of £525 was made to Central Wales RIGS for the last leaflet of the series.

As ever, an interesting and varied collection of applications, yet again illustrating how important the GA’s Curry Fund is, providing support and funding for geological information at all levels, for dissemination to the wider public.

Susan Brown
Curry Fund Secretary

THE GA NEEDS YOU!

We are aiming to increase our membership by up to 10%.
We are planning to do this through a mixture of promotional and publicity activities.
We have limited funds, so we’re looking to you, our members, to support the campaign.
If you can help the GA by:

SUGGESTING IDEAS FOR PROMOTION
WRITING PRESS RELEASES OR PROMOTIONAL COPY
SUGGESTING ITEMS TO UPDATE OUR WEBSITE
ORGANISING AN EVENT

PUTTING UP A POSTER AT WORK, OR TAKING ONE TO YOUR LOCAL LIBRARY
GIVING ADMIN HELP
please contact Sarah at the GA office

And please all:

Bring your friends
Tell your colleagues
Spread the word!
April Meeting

Tectonic vs Climate response in Sediments

Prof. Lynne Fostick

Friday April 3 2009
Geological Society, Burlington House, Piccadilly, W1V 0JU
at 6.00pm, tea at 5.30pm

The morphology of river systems changes in response to a range of external or exogenic controls. The major formative controls are the climate in their catchment areas and the tectonic setting. These act through hydrology, gradient, sediment supply and ecology to produce the diverse river forms we see today. But when we look at preserved river deposits can we still identify the signs of climatic and tectonic variation, and if so at what scales? This lecture will explore some of the responses of rivers to tectonics and climate and also seek to show how patterns of river sedimentation can be used to infer past changes.

May Meeting - AGM and Presidential Address

Animals, Archaeology and Palaeoenvironments point to a Missing Interglacial

Dr Danielle Schreve
Royal Holloway College

Friday May 1 2009
Geological Society, Burlington House, Piccadilly, W1V 0JU
at 6.00pm, tea at 5.30pm

During the 19th century, the exploitation of large brickyards and the excavation of tramway cuttings in the chalk pits on the north bank of the Thames at Grays brought to light a remarkable series of superbly preserved mammalian fossils. Until recently, these fossils were largely ignored, since they did not fit comfortably into the existing stratigraphical scheme, or were erroneously assigned to established interglacial periods. However, increasing recognition of the complexity of the British Quaternary terrestrial record, together with the discovery of a number of significant new sites, has at last provided a robust context for the historical finds. This lecture discusses the multiproxy evidence for an as-yet unnamed interglacial in the British late Middle Pleistocene, c. 300,000 years ago, drawing on lithostratigraphical, biostratigraphical and palaeoenvironmental data. The evidence for early human activity at this time is also reviewed and suggested correlations with continental European sequences proposed.

June Meeting

Postcards from the Amazing Mud Factory: Multimillion-year underground transformations of fossils and strata in the Welsh Basin

Jan Zalasiewicz
University of Leicester.

Friday June 5 2009
Geological Society, Burlington House, Piccadilly, W1V 0JU
at 6.00pm, tea at 5.30pm

During late Ordovician to Silurian time, the Welsh Basin filled with mud-dominated sediment, slow hemipelagic deposition being punctuated by turbidites. The hemipelagites show evidence of a series of oceanographic alternations between anoxic sea floors on which accumulated plankton-derived organic matter (including graptolites), and oxygenated sea floors with a burrowing biota (though with few or no preserved shelled animals). These alternations help define the stratigraphy of these rocks, and may also have acted as climate feedbacks, in which greater or lesser amounts of carbon were buried and hence sequestered in the muddy deposits. Subsequent burial of the deposits saw a succession of diagenetic and then low grade metamorphic transformations. Very soon (decades or less) after deposition, pyrite began precipitating within graptolite rhabdosomes in the ‘anoxic’ muds, while during ‘oxic’ intervals apatite precipitated as a cement at redox horizons just below the sea floor. Both of these diagenetic phases were later instrumental in shielding fossil and mineral matter respectively from the deformation associated with Acadian mountain-building. A few million years later, with burial to a few kilometres depth, the deposits passed through the oil window and like- ly generated substantial amounts of oil and gas, that have long since disappeared. The (hydrocarbon-related?) fluid release caused wholesale redistribution of rare earth elements such as lanthanum, cerium and neodymium, creating billions of tiny monazite nodules within the strata; around this time, fluid release also comprehensive- ly reshuffled strontium isotopes within the rock. Both these events created ‘atonic clocks’ capable of dating these subterranean events. Yet later, tectonic compression associated with the building of the Welsh Mountains caused further changes: in tandem with slate formation, detrital micas were transformed into distinctive ‘chlorite-mica stacks’, while new micas grew around graptolites in clay-organic interactions. The latter phenomenon provides a further atomic clock – one that both dates the Acadian orogeny and suggests that it took a complex course. Now, as the rocks are eroded, the characteristic phases so produced are being washed downriver into the Irish Sea to produce characteristic markers in the strata of the future.
Behind the scenes at the Museum fur Naturkunde (Natural History Museum), Berlin, Monday 27 October

The present main building and museum were opened in 1889, bringing together three major private collections which had been acquired over the previous 200 years. The museum buildings and the various collections were located in what was formerly East Germany so that there has been less than 20 years since the reunification of Germany in 1991 for the development and rearrangements of the present day establishment. The museum is currently part of the Humboldt University of Berlin with state funding but next year the museum will be independent of the University and will be funded by the City of Berlin and the Federal Government.

The original intention was that the public would be able to access the whole building to view both the displays and the collections with research in progress. The latter proved impractical but the beautiful iron decorated stairs to the upper floors still stand and many of the collections are housed in the high-ceilinged rooms with large windows (many now covered to keep the light out). The rooms all show the lack of attention and money in the latter half of the 20th century, although building work is now under way on some projects.

After being welcomed by Dr Stephan Shultzik, Head Curator of Palaeobotany, the party split into two groups to tour the public exhibitions with the help of two English-speaking guides. The central atrium has the character of both birds and dinosaurs. At the side of the atrium, there is an excellent display of Solnhofen fossils with their amazing state of preservation. Here and elsewhere, in the newly restored galleries, the display boards were in both English and German. Parts of the text are underlined, and when these were pressed a very impressive and informative display appeared on the adjacent screen.

The next room, 'System Earth' has a huge globe around which a large television screen rotated in an equatorial plane. The effects of plate movements are shown, for example the collision of India with Asia and the formation of the Himalayas. Satellite pictures and cross sectional diagrams are also included. In addition, this room contains many excellent, huge rock specimens which show the effects of meteorite impact, magmatic extrusion and volcanism, and folding of rocks. Another area explains the interdependence of evolution of grass and plants on the evolution on animals, particularly the horse.

The real Archaeopteryx lithographica and a model of its skeleton

The room 'Evolution in Action' shows animal diversity. There are displays of a whole variety of life forms, from beetles to lions and our guide discussed how the zebra's stripes protect it from the tsetse fly whose compound eye can only distinguish a maze of patches and thus not the animal.

Of course, there is the usual fossil display of specimens of the high quality to be expected in national status museum, although the display is housed in an older style gallery and the displays look somewhat dated. However, it was good to see a lot of real specimens in the displays.

In the afternoon and early evening, the group toured 'behind the scenes' to those areas not open to the public.
the public, including the research laboratories and preparation rooms. We spent much time walking through a labyrinth of tunnels, corridors, cellars and stairs that connect the various collections.

Curators of each department showed off their specimens. Dr Jason Dunlop, Curator of spiders and millipedes, showed us the spider collection comprising rows upon rows of small bottles containing spiders in alcohol. Another gallery contained fish specimens, another had bottles of snakes, and there was much more we didn’t look at. We were told how the alcohol collection serves an important part in not only modern comparative work but is also useful in reconstructing organisms from their fossil remains. The collection narrowly escaped destruction during World War II when a bomb fell through the roof of the stores but failed to explode. Dr. Shultka, the Curator who welcomed us in the morning, then showed us the fossil collections which are arranged in different rooms for invertebrates, vertebrates, etc. One of the collections is of coal fossils. He explained how specimens had been taken to Russia in the 1950s but had been returned, probably by mistake, in 1968! In one of the rooms we were shown one of the pride and joys of the museum, the skull of Brachiosaurus brancai, which, very unusually, is almost complete and undeformed. This is too fragile to display on the reconstructed skeleton in the public gallery, so a plastic replica has been used instead.

One interesting feature that the museum has is that one can sponsor a fossil - the larger the donation, the better the fossil! Finally we went down to the basement to see the large-specimen collection with rack upon rack of mammoth teeth, large bones, etc. like a charnel house!

We had a very rewarding, if exhausting, day, thanks to the hospitality of the museum staff who had taken a lot of time and effort to make our day so interesting.

Most members of the group had come to Berlin for a long weekend. Some visited museums and art galleries, and a group went on an organised walk around central Berlin. Every evening we went out to dinner as a group to sample some excellent Berlin delicacies and continued to enjoy ourselves.

Thanks should be given to David and Anne Bone and Roger Dixon for all their efforts in making this event so memorable and to the staff of the museum for their generous effort and time they spent on our behalf.

John & Jo Crocker
(with help from Roger Dixon and David & Anne Bone)
October 2008 GA Lecture Report
From the Depths: How Stalagmites reveal Quaternary climatic history.

Professor Ian Fairchild of the University of Birmingham

Deep ocean deposits and ice cores are well-established fossiclimate indicators. Professor Fairchild showed North Atlantic records, with clear 100k-year cycle patterns. South Atlantic results are similar, but several factors combine to produce a spikier profile.

Interglacials generally last around 20k years, but global warming is now so pronounced that the next predicted ice age might not actually happen.

The quest for land-based climate proxies - in the absence of oceans or ice cores - is now more urgent. Any new methods must be proved directly against the established systems.

Investigation into Speleothems (calcareous cave deposits, comprising Stalactites, Stalagmites and Flowstones) began in the 1970s, and made major advances in the last decade. Prof. Fairchild showed examples from the impressive recent work in China, as well as some from Europe.

Speleothems match ice cores, and are easier to use, corresponding closely with tree-ring dating. Limestone caves have codified how such caves are created, filled and eventually destroyed: when the water table drops, the streams cut down to a lower level.

Some caves may give rogue readings, due to chemical adulterations within feeder joints. Vegetation at the surface can cause marked differences in cave deposition, when carbon dioxide is dissolved in the soil.

Calcium carbonate is relatively easy to use for climatic proxies, and development sequences have been established in the karst system. Chinese work has codified how such caves are created, filled and eventually destroyed: when the water table drops, the streams cut down to a lower level.

Water passing through cave systems can leave scalloped surfaces on the flowstones of inclined surfaces, sometimes forming shallow basins where water turbulence creates "pearls". Ventilation is necessary for deposition, so that the seasonal fluctuations in quality of air, and in quantity of water can provide seasonal registers. The most useful caves are those where one factor dominates. Evidence of seasonality is more important than speed of deposition.

Growth rate variations offer direct indications of past Climates. Wider stalagmites indicate wetter conditions.

Vertical "candles" indicate variable precipitation, while "cones" suggest a reducing supply. "Soda Straws" are narrow hollow stalactites, which show annual banding down the vertical length of the tube, with the wall thickening at the lower (later deposited) part.

In Australia, the trees mostly take the current sparse rainfall, with very little reaching the caves, so speleothem development is on stand-still. Conversely, in China’s Dongge Cave, deposition has been constant for 10k years, with no physical variation - but with clear seasonal rhythms defined by isotope patterns. Oxygen and carbon occur as heavier and lighter isotopes, and their relative proportions provide basic palaeoclimatic indicators. Associated trace elements can reveal subtle differences that are consistent in caves thousands of km apart. Impurities such as uranium and thorium can seriously upset the dating evidence.

Professor Fairchild closed with certain useful rules of thumb. Increased rainfall produces higher isotopic content. The carbon dioxide pressure plots well against the calcium concentration, and when the soil absorbs a lot of CO2, more CaCO3 may be precipitated in the cave below. When calcium is taken out of the system, magnesia and strontium may take its place. With less ventilation Radon gas levels will be high, and stalactites will be very strongly influenced.

January 2009 GA Lecture Report
William Whitaker - Giant of the GA

Professor Peter Worsley, of Reading University

Professor Worsley chose the title to assert, in our Sesquicentennial year, what good value William Whitaker was for the GA. He served two separate terms as President,(1900-1902 and 1920-1922) and he had led more than 50 field excursions - the last one when aged 84.

He was clearly a rugged individualist, with fierce loyalties both to organisations and to his scientific ideas - which were often well ahead of their time. He worked for the Geological Survey throughout his career, and typically he urged amateur geologists to play their part.

From 1874 to 1879 he was Editor in Chief of the Geological Record. By 1882 he had become the Senior Survey Geologist for SE England, and he was appointed District Surveyor. In 1896 he retired, but became active in Hydrogeology, conducting pioneering work in two wells in Brentford, using lithium tracer.

He was a family man, having three children - though he was eventually separated from his wife. Perhaps his strong-mindedness and his total absorption with his work may have contributed. Some anecdotes suggest that his determination might sometimes have made him a difficult colleague. Murchison had suggested to Ramsay (Whittaker’s superior) that he should move him to the North West - evidently mainly to get him further away. Sir Archibald Geikie, a close friend during their Scandinavian project, had later demanded that he should be sacked! Nothing seemed to divert William Whittaker, however.

In the course of his working career he produced a very significant body of work, covering the Cretaceous, Tertiary and Quaternary of the South East of England.

His GA Presidential lecture in his second term was concerned with “Water Supply and Sanitation”. Evidently he had shifted his focus to Public Health, rather than the Wealth of the Nation.

He was active in the Geologists Association throughout his career, and typically he urged amateur geologists to play their part by recording temporary exposures.

Tony Iles

GA Magazine of the Geologists’ Association Vol. 8, No. 1, 2009
To honour its 150th anniversary, the GA respected tradition and visited once again the former sand pits at Charlton in south-east London. Having formed some twenty months earlier on 17 December 1858, Charlton was the destination of the third ever field excursion made by the GA. The 1860 field season was the GA’s first that also included excursions to Folkestone on 9 April and Maidstone on 19 June. Charlton has always remained a very popular destination for excursions by the GA; the Proceedings record visits made in 1881, 1885, 1887, 1895, 1901, 1907, 1915, 1919, 1920, 1929, 1933, 1939, 1948, 1950 and 1956. Its popularity is due to the fact that it is within easy reach from London’s railway termini, a wide variety of lithologies are exposed, the contact between the ‘Secondaries’ and the ‘Tertiaries’ could be inspected and there is the opportunity for collecting fossils.

Charlton was included in the Geologists’ Association Guide for London (South of the Thames) by W. S. Pitcher in 1967 (Edited by Hester). Gilbert’s Pit at Maryon Park, the destination of this field trip, became a park in 1938 and was designated an SSSI in 1953 (1985 under the current Act) on geological grounds.

At the specified hour, some 24 members and guests (Fig 1) met at Charlton railway station and proceeded to walk to Gilbert’s Pit, via The Valley, the home of Charlton Athletic FC located in one of the former sand pits originally visited by the GA. Behind houses located on the western side of the former pit (Valley Grove), vertical faces cut in the Chalk could be seen though the Palaeogene contact and the Thanet Sand Formation are now obscured by vegetation and inaccessible due to fencing. This exposure of the Chalk is the closest to central London.

Before entering Gilbert’s Pit, the party climbed the promontory above Maryon Park alongside and above the existing railway tunnel to take in a ‘very fine view’ of London (Fig 2). How this view has changed in 150 years! The viewpoint provided the opportunity to review the location of the pit in its geological context and to explain the effect of the ‘Greenwich Fault Zone’ on the relative elevation of the strata seen.

Reference was made to satellite monitoring of London and to the very small ground movements measured that have shed new light on the evolution of the River Thames and the London Basin (Fig 3). The party was also shown some results of seismic profiling in the Thames that show the complex faulted and folded structure through Greenwich. Gilbert’s Pit is the finest and scientifically most important Palaeogene site in south London and exposes sediments of the Lambeth Group comprising the Upnor Formation (Fig 4) and ‘Lower Shelly Beds’ (Fig 5) and ‘Laminated Beds’ of the Woolwich Formation, and also the Harwich Formation (Blackheath Beds). The pit also allows the Mid Lambeth Group Hiatus to be examined. This represents a break in sedimentation of the Lambeth Group, caused by uplift and exposure, and is characterised by bioturbation (Fig 6) and the development of duricrusts and widespread pedogenetic processes.

Unfortunately, access to inspect the pit faces remains difficult and prevents the pit from being put to its best use as an invaluable resource for teaching and research. The leaders had previously hewn steps to allow the party to gain access to portions of the face and to allow sampling. For those less surefooted, samples were passed up for the identification of lithologies, fossils and determination of stratigraphy.

Discussion throughout the day focussed on the interpretation of stratigraphy (sequence stratigraphy versus lithostratigraphy), the lithological variation of the Lambeth Group across London, the absence of the Reading Formation and its status as a proper geological unit, the characteristics of the Harwich Formation, the status and use of informal names for...
the units of the Lambeth Group, engineering geology (superb civil engineering structures can be seen from the pit and mention has to be made of Brunel’s Thames Tunnel which was constructed through the very same Lambeth Group strata at Rotherhithe), the educational opportunity offered by the site and its restoration and management, where the leaders see a greater involvement for the GA.

There are a number of photographs of Charlton Sand Pit in the G.A. albums taken when the pit was working (Figs 7 & 8). With their clean cut faces and contrasting colours of the sediments, the pits must have been truly very striking. Whilst the costumes may have changed, the enthusiasm for geology remains.

First visited by the Geologists’ Association on 13 August 1860, the true anniversary of this trip will be in 2010 when it is hoped that at least the leaders will be dressed in full Victorian attire!

Thanks are due to Diana Clements for logistics, the LB Greenwich for access and to Jackie Skipper and Darren Page, the excursion’s leaders.

Darren Page


Jo Thomas has developed her considerable knowledge of Dorset, its geology and building stones over many years and it is extremely important that her knowledge and expertise has been recorded in this well illustrated book. Anyone living in Dorset with an interest in its landscape, geology and architecture will find this book most useful as would anyone visiting the county on holiday or visiting the Jurassic Coast World Heritage Site.

The book is divided into a number of chapters stratigraphically organised so after the introduction, the geology and building stones of the Lias are reviewed and then the Inferior Oolite and so on through to the Tertiary Heathstone. Simple background geology is included to explain the environment in which the rock was deposited to form the building stones and also why they vary spatially over quite small areas. There is also a chapter on brick making, as a number of clay deposits have been used in the past and there is still a brickworks on the outskirts of Swanage making handmade bricks. There is also a very interesting chapter on the stone used in the bridges crossing the River Stour, again with description and research on the history of the structures. Each chapter has many coloured pictures and maps to show distribution on the outcrop of the stone types and where quarries have been developed over the centuries.

The book is full of interesting social history much of which has been derived from Jo’s extensive research for English Heritage. There is also a very useful spreadsheet at the back of the book based on Dorset parishes and the stone that has been used in them, the main type and any other lesser varieties used. There are a few typographical errors and one in the glossary on the nature of brachiopods but I am not sure where this originates from! However, all in all, an excellent book and definitely recommended for residents and visitors to Dorset with an interest in geology and building materials.

Alan Holiday
Dorset Geologists’ Association
Group Chairman

GA Magazine of the Geologists’ Association Vol. 8, No. 1, 2009
The winners of the 2008 Eni Challenge Award were announced at the Geologists’ Association on Friday 6th February 2009 by Mr. Alessandro Gelmetti, Exploration Manager at Eni UK Ltd.

Eni UK Ltd, a major integrated energy company established in 1965, have offered the Challenge Award for over a decade as a way of promoting geology in the UK. Every year, local and amateur geology groups and individuals compete for the award, which is designed to promote geology in the community, particularly in the fields of conservation, interpretation or field education. Typical projects include guide books, trail guides, maps and educational websites. This year, the winners are the Forest Of Dean Local History Society, for “GEOMAP”, an exciting project involving the construction of a large-scale geological map of the Forest of Dean using the local rocks, and the Cumberland Geological Society, for their book “Exploring Lakeland Rocks and Landscapes”, which is aimed at visitors to the Lake District and the wider public.

Every second weekend in September English Heritage and the Civic Trust sponsor events all over Britain to celebrate Britain’s history and heritage. These Heritage Weekends are organised by local councils. The Heritage Weekend provides an excellent opportunity for local societies, such as GA Local Groups, to obtain plenty of free publicity and thus to recruit new members. Over the last 4 years the Mole Valley Geologists’ Society has organised Heritage Weekend events. These include giving invited keynote public lectures and arranging special events such as the “Rock Festival” in 2006. This year the theme was “Hidden Treasure”. MVGS Chairman Prof. Dick Selley was invited to give a keynote lecture on this topic and chose as his title “Mole Valleys Hidden Treasures: its caves, tunnels and subterranean river”. This talk was actually about the palaeo-hydrology of the River Mole catchment, only the audience did not realise that.

The MVGS also organised a display entitled ‘Lord Ashcombe’s teeth and other hidden treasures of Dorking Museum’. Dorking Museum holds a fine collection of Wealden, Chalk and Ice Age fossils. The collection was made by George Cubitt, First Lord Ashcombe, squire of Denbies estate and son of Thomas Cubitt the builder. The fossils came from Lord Ashcombe’s chalk quarries and gravel pits. Only a small part of the collection is on public display due to lack of exhibition space. From time to time the GA and other interested groups are allowed to view the museum’s hidden treasures. Dorking Museum Chairman, Professor Dick Selley, kindly agreed to some of these being exhibited by the MVGS in an adjacent church hall. The display included femurs of mammoth and woolly rhinoceros and mammoth teeth.

Mole Valley Geol. Soc. members Chas Cowla and Fanny Lines examine bisected mammoth tooth from Lord Ashcombe’s collection in Dorking Museum. The MVGS has doubled in size from some 30 to 60 members over the last 3 years, due, in no small part, to the publicity of its Heritage Weekend events.
Please note the following information for Field Meetings Enquiries & Bookings:

- Geoff Swann organises day and weekend meetings in the UK. Michael Ridd is responsible for overseas and longer excursions. Sarah Stafford at the GA office is responsible for bookings, payments and general administration.
- You must book through the GA office to confirm attendance. Please do not contact the field meeting leader directly. Meeting times and locations will be confirmed on booking. These are not normally advertised in advance, as there have been problems with members turning up without booking or paying and maximum numbers being exceeded. Field meetings are open to non-members although attendance by non-members is subject to a £5 surcharge on top of the normal administration fee. Some meetings may have restrictions on age (especially for under 16s) or be physically demanding. If you are uncertain, please ask.
- Payments for day and weekend meetings must be made before attending any field meeting. Cheques should be made out to Geologists’ Association. If making multiple bookings, please ensure you send an administration fee for each meeting unless you have first confirmed that all inclusions are available. A stamped addressed envelope is appreciated. Please give a contact telephone number and, if possible, an email address and provide the names of any others that you are inclining your book- ing for. Please also provide an emergency contact name and telephone number at the time of booking.
- There are separate arrangements for overseas meetings. Transport is normally via private car unless otherwise advertised. If you are a rail traveller, it may be possible for the GA office to arrange for another member to provide a lift or collection from the nearest railway station. This service cannot be guaranteed, but please ask before booking.

Public Liability Insurance for field meetings is provided but personal accident cover remains the responsibility of the participant. Further details are available on request from the GA office. Safety is taken very seriously. Should you be unsure about either the risks involved or your ability to participate, you must seek advice from the GA office before booking. Please ensure that you study the risk assessment prepared for all GA field meetings and that you have all the safety equipment specified. You must declare, at the time of booking, any disabilities or medical conditions that may affect your ability to attend a field meeting safely. You may be asked to provide further information on any prescription drugs etc. that you may use whilst attending a field meeting. In order to ensure the safety of all participants, the GA reserves the right to limit or refuse attendance at field meetings.

Emergency contact: if you are lost or late for the start of a meeting, an emergency contact is available during UK field meetings by calling the GA mobile phone (07702 332902). Please note this new number. The mobile phone will only be switched on just before and during field meetings. For routine enquiries please call the GA office on 01722 718365. Travel regulations are observed. The GA acts as a retail agent for ATOL holders in respect of flights awarded or included in field meetings. All flights are ATOL protected by the Civil Aviation Authority (see GA Circular No. 942, October 2000 for further details). Field meetings of more than 24 hours duration or including accommodation are subject to the Package Travel Regulations 1992. The information provided does not constitute a brochure under these regulations.

**Field Meetings in 2009**

We are hoping to arrange additional fossil collecting opportunities during the year. This may not be the time to advertise these in the Circular so if you would like details when they become available contact Sarah Stafford at the GA office.

The Chalk of Hope Gap
Leader: Geoff Toye
Saturday 7th March 2009
This is an opportunity to examine the very fossiliferous Chalk succession at Hope Gap. In addition, we will be looking at the coastal geomorphology.

Equipment: Please make sure you have a hard hat.

Cost & booking: Numbers will be limited to 25. Register with Sarah Stafford at the GA office sending an administration fee of £5 to confirm your place.

The Geology of the Forest of Dean
Leader: Dr Bernard Cooper
Saturday 4th April - Sunday 5th April 2009
This is an opportunity to examine the geology of an area long associated with iron and coal mining. We hope to be able to make an underground visit to one of the few remaining “free mines”.

Equipment: Please make sure you have a hard hat.

Cost & booking: Numbers will be limited to 20. Car sharing will probably be necessary. Register with Sarah Stafford at the GA office sending an administration fee of £15 to confirm your place. It will not be possible for the GA to book accommodation.

Puddingstone Foray in Herts and Bucks
Leader: Mike Howgate
Saturday 23rd May 2009
This is an opportunity to examine the geology and natural history of the Gower Peninsula and nearby areas led by local specialists in geology, marine biology, and botany. The weekend will include guided visits to the National Botanic Garden of Wales at Llanarthne (with geological outcrops) and to the Wildfowl and Wetlands Trust National Wetland Centre Wales, Llwynhendy, Llanelli. If there is sufficient interest a communal dinner will be arranged for the party on the Saturday night.

Equipment: Suitable footwear and clothing appropriate to the weather conditions.

Cost & booking: Numbers will be limited to 15 GA members. Register with Sarah Stafford at the GA office sending an administration fee of £20 to confirm your place. Please indicate whether you wish to join the dinner party - this will be an additional (reasonable) cost. It will not be possible for the GA to book accommodation.

Some Somerset Quarries
Leader: Simon Carpenter
Saturday 23rd May 2009
This excursion will examine the Upper Triassic and Lower Jurassic rock of Somerset. Many of the rocks we will be looking at are highly condensed and fossiliferous - so make sure you bring your hammer and collecting bag. Simon will be bringing a selection of fossils from his own collection for participants to handle and view.

Equipment: You must have a hard hat, hi vis vest and suitable footwear.

Cost & booking: Numbers will be limited to 20. Register with Sarah Stafford at the GA office sending an administration fee of £5 to confirm your place.

Northants Churches
Leader: Prof John Potter
Friday 8th May - Monday 11th May 2009
This popular series of annual church stone visits allows participants to discover the importance of geology and rock types to the interpretation of these churches. The weekend will consist of a guided visit at a conventional railway station - other arrangements are still to be confirmed. Car sharing may be necessary.

Equipment: No hammers but bring a quality lens and binoculars. Packed or pub lunch.

Cost & booking: Numbers will be limited to 28. Further details will be available from Sarah Stafford at the GA office. Register with Sarah sending an administration fee of £15 per person to confirm your place.

Fossfest V
Leader: Nev Hollingworth
Saturday 13th June 2009
Location(s) have still to be decided but plenty of fossils can be expected.

Equipment: You must have a hard hat, hi vis vest and suitable footwear.

Cost & booking: Numbers will be limited to 25. Register with Sarah Stafford at the GA office.
the GA office sending an administration fee of £5 to confirm your place.

**IN THE FOOTSTEPS OF CHARLES DARWIN - NW MIDLANDS AND NORTH WALES**

**JOINT MEETING WITH THE GEOLOGICAL SOCIETY**

Leader: Prof Peter Worsley
Friday 19th June - Wednesday 24th June 2009

To commemorate the 200th anniversary of Charles Darwin’s birth in 2009, this field excursion will visit a number of localities in his home area of Shropshire - Staffordshire and also North Wales. Besides the general Darwin related sites, the emphasis will be on his earlier work as a geologist and in particular his field trip in June 1842 to appraise the evidence presented by William Buckland in 1841 supporting the ‘Glacial Theory’. A background to the latter may be found in Quaternary Newsletter 112, 22-28, (2007) and the November edition of Geoscientist (2008). The excursion will be an opportunity to see aspects of the glacial geology of North Wales.

A significant amount of walking will be involved. Climbing over rough ground will be necessary in North Wales. If you are in any doubt as to your ability to participate, please contact the GA office. The weather may necessitate modification of the programme.

Equipment: Ensure you have suitable footwear and clothing.

Cost & booking: Numbers will be limited to 26. Total cost is still to be confirmed but accommodation is being arranged. Register with Sarah Stafford at the GA office sending a deposit of £10 to confirm your place.

**WEALDEN EXCURSION**

Leaders: Pete Austen, Richard Agar, Dr Ed Jarzemowski and Geoff Toye - Saturday 18th July 2009

This trip continues the popular annual excursion to working pits in the Weald Clay of south-east England, where the GA has already participated in some superb fossil finds. The venue(s) will be confirmed later so as to take advantage of conditions at the time. Numbers may be limited. Equipment: You must have suitable footwear, a high visibility jacket and hard hat.

Cost & booking: Further details will be available from Sarah Stafford at the GA office. Register with Sarah sending an administration fee of £5 per person to confirm your place.

**LAKE DISTRICT WEEKEND**

**JOINT MEETING WITH THE CUMBERLAND GEOLOGICAL SOCIETY**

Leaders: Members of the Cumberland GS Saturday 8th - Saturday 9th August 2009

This will take the form of two, one-day-meetings (one in Midland England and one in East Anglia), and details will be provided in the GA Magazine and on the GA website as soon as possible.

**Further Afield in 2009**

**PROPOSED FIELD EXCURSION TO LIBYA, AUTUMN 2009**

Leader: Professor Richard Moody

Approximate dates: Wednesday 21st October - Sunday 1st November 2009

Approximate cost (assuming 15 participants): £2,400

This excursion will provide an exceptional opportunity to examine the varied geology of Libya, from Lower Palaeozoic to Tertiary, sedimentary rocks and volcanics. The itinerary includes the deep Sahara with spectacular sand-seas, mountain scenery and prehistoric rock-art, as well as some of the finest Roman antiquities on the Mediterranean coast at Sistrata and Leptis Magna.


To register your interest, please contact Sarah at the GA Office.

**NORTH GERMANY**

Late August-September 2010

Duration: 10 days including travel from and return to UK.

Leader: Dr Volker Wilde

Local Secretary: Prof Alan Lord

Outline programme:


The region has a wonderful cultural heritage and the geological itinerary will be balanced with opportunities to view Romanesque and medieval architecture and art in, for example, Halle, Halberstadt and Quedlingburg.

**GEOLOGISTS’ ASSOCIATION LOCAL GROUPS**

Cambridgeshire Geology Club

March 9 The Forming of St.Ives, Cambridgeshire - Bob Burn-Murdoch - Curator, Norris Museum, St.Ives

April 20 The Crystal Palace Dinosaurs and other Monsters - Mike Holland

May 11 Cambridgeshire’s Victorian Fossil Hunters - Bernard Os

May 15-17 Weekend Field trip to the Malverns - Dr Paul Oliver

June 8 Earth’s Surface Topography - Dr And colleague hope to run the Bytham River Excursion during 2009. At present the details and timing of the meeting have not yet been finalised. It is likely to take the form of two, one-day-meetings (one in Midland England and one in East Anglia), and details will be provided in the GA Magazine and on the GA website as soon as possible.
Dickson Cunningham.
Contact: Alan Murphy on 07768 821385
E-mail: cambs.geology.club@hotmail.co.uk

Dorset Local Group
March 15 Field trip joint with Bath Geological Society to Osmondting Mills - Alan Holiday.
April 4 Field trip East Haast - Ray Chapman.
May 9 Field trip to Kingston to Houns-Tout to Chapman's Pool - John Chaffey.
May 23-24 Lyme Regis Fossil Festival. Contact: Donn Smith 01300 328011. E-mail: Helden47@btinternet.com

East Midlands Group
March 4 The origins of special rocks and minerals - Dr Bill Fitches.
May 6 Crystalline Palaces - Dr Clive Bishop. Contact: Dr Trevor GreenSmith 01268 785404.

Farnham Geological Society
March 13 How Geology has been used in Serious Crime Investigations - Paddy Reegan.
April 3-6 Field trip: St Austell Granite - Dr Alan Bromley.
April 10 Low Cost Volcano Monitoring - Dr Hazel Rymer.
May 8 The Science of Polonion - 210 - Dr Paddy Reagan.
May 10-16 Field trip: Isle of Man - Dr Bill Fitches.
June 7 Field trip to Averbury to Swindon - Dr Graham Williams and Mike Rubara.
June 13 Perils of Science Journalism - Alan Lewis.
Contact: Mrs Shirley Stephens tel: 01252 680215
Field Trip Contact: Dr Graham Williams tel: 01483 573802. E-mail secretary@farnham.
geosoc.org.uk
www.farnhamgeosoc.org.uk.

Harrow & Hillingdon Geological Society
March 11 Oman: a geological treasure chest. A member reports - Michael Cuming.
Contact Jenny Iles: 020 8866 4348; j.i.iles@btinternet.com
Contact David Greenwood 0208449 6614 email: kvincssk@sky.com.

Lancashire
Contact Acting Secretary Jennifer Rhodes 01204 811203
E-mail: j._rhodes@hotmail.com.

Mole Valley Geological Society
www.dendron.net/mvgs. E-mail: Richard Higgs director@microw.co.uk

North Staffordshire Group
March 5 AGM and Chairman's Address: Shank Bay to Wave rock - Elizabeth Hallam. Contact for details Eileen Fraser 01260 271505. Contact field trips: Gerard Ford 01636 673409.

Oxford Geology Group
Contact 01865 272960. E-mail: secret@oxr.ac.uk or call pro-
gramme secretary 01865 272960.

Ravensbourne Geological Society
March 10 The Moon - Greg Smr-Kromsej.
April 14 Brachipods - Les Davies.
May 12 How to Make and Break an Asteroid - Prof. Hilary Downes.
June 9 Chalk and Talk - Dr Ian Jarvis.
July 14 Charles Darwin as a Geologist - Chris Duffin.
Contact Carole McCarthy Secretary: 020 8854 9138. e-mail: cmccarthy@talktalk.net.
Contact Graham Wilkins 01492 583052. E-mail: Wilkins@ampsyx.org.uk

South Wales - Cymdeithas Daeraeg Gogledd Cymru
Contact Jonathan Wilkins 01492 583052. Email: Wilkins@ampsyx.org.uk

South West Group Cymdeithas Y Daeardegwyr Grwp Dyffryn Cymru
May 21 AGM and the Old Red Sandstone of South Wales - Brian Williams. Full details to follow. Contact Geraint Owen 01792 295141. www.swgsa.org.uk

West of England
March 10 Obsidian from North Western USA - Dr Alison Rust.
Contact Graeme Churchard 0117 967 1066. www.wega.org.uk

West Sussex Geological Society
March 8 Field trip: Sarsens in Stanmer Park - Stewart Uliyett.
March 20 The Geology of the Thames Tideway Project - Dr Jackie Skipper.
March 29 Building Stones around Chichester Cathedral - David Bone. April 17 Utilising low cost G.I.S. and Remote Sensing to aid disaster risk assessment - Dr Naomi Morris.
April 19 Winchester Building Stones - Dr Simon Conway Morris.
May 15 Landscape evolution in South East England - Dr Stewart Uliyett. Contact Betty Steele 01903 209140 E-mail: kande16@talktalk.net

Field trips:
October 12 Hastings Foresham Walk - Ken Brooks.
October 18 Field meeting.

AFFILIATED SOCIETIES

Amateur Geological Society
Quartz the most precious mineral? - Dr Monica Price
January 13 AGM and New year Party.
Enquiries: Julia Daniels 020 8346 1056.

Bath Geological Society
March 5 The 1607 Flood; a Tsunami in the Bristol Channel - Prof Simon Hallett.
April 2nd After Darwin: where is evolution going? - Prof. Simon Conway Morris.
May 7 Bath and Bristol as a Cradle of Geology 1750-1850 - Prof. Hugh Torrens.
June 11 Hydrogeology - Lakes, Valleys - Contact Miss Vicki Griffiths: Email: chair-
man@bathgeosoc.org.uk
www.bathgeosoc.org.uk

Belfast Geologists' Society
March 16 Reconstructing Sea-level Change: what the past can tell us about the future - Dr Robin Edwards.
April 20 AGM Contact Peter Milar 9064 2886.

Black Country Geological Society
March 30 AGM followed by Future plans for Dudley Museum. Contact for information contact Barbara Russell 01902 650168. www.bcgs.info

Brighton & Hove Geological Society
March 4 Fossils as drugs: pharmaceutical palaeontology - Dr Chris Duffin.
March 18 AGM and Members evening - Prof. Simon Conway Morris.
Contact Lincoln James 01326 311420

Cheltenham Mineral and Geological Society
May 18 Dolyrhir Quarry nr Kington - minerals and fossils
For more information on lectures: contact Kath Vickers 01453 827007
Contact Alan McKay 01462 547225.

Craven & Pendle Geological Society
Nigel Mountney Ph.D., University of Leeds
Contact: Paul Kabbra@msn.com or www.cpgs.org.uk

Cumbrian Geological Society
March 11 AGM - residential Address Contact Susan Beale 016974 78353
cumbgeol@fmail.net. www.cumbria-geol-soc.org.uk.

Dorset Natural History & Archaeology Society
Contact Jenny Cripps email:jenny@dor-
mus.demon.co.uk

Edinburgh Geologists' Society
January 14 lecture by Dr Ed Stephens from...

Earth Science Teachers Association For membership contact: Hamish Ross PO Box 23672 Edinburgh EH3 9XQ Tel: 0131 681 6410 Email:Hamish.ross@education.ed.ac.uk ESTA website www.est-a.uk.org

East Herts Geology Club Meeting 4.3D Mapping - Dr Holgar May 2-4 Field trip to Torquay area. May 9 & 10 Hertfordshire Puddingstone at Ware Museum. May 26 What are terrestrial planets made of? - Dr Alan Nutman (RSOD). Check website for venue or contact Diana Perkins 01920 467755. www.rsog.org.uk Email: info@rsoghc.org.uk Visitors most welcome - £2

East Midlands Geology Society March 14 AGM and Members evening. April 13 Lecture by Neil Ellis Contact Secretary Janet Slater email: jslaletter@zoom.co.uk www.emgs.org.uk


Friends of the Sedgwick Museum, Cambridge Contact: Dr Peter Friend 01223 333493.

Geological Society of Glasgow March 12 What can we learn about bedrock rivers from Scotland's glacial rebound? - Prof. Paul Bishop. April 9 Rocks, landscape and man - the 600 Ma history of Mid-Arygill - Dr Roger Anderstong. May 14 Members' night. Contact: Dr Iain Allison email: i.allison@admin.gla.ac.uk

Geological Society of London Contact Email: turs@surgeon.com

Hastings and District Geoloigcal Society December 14 AGM and Christmas party. Contact Diana Williams email: lpgyken@aol.com www.hastingsgeolosoc.org.uk

Hertfordshire Geology Society March 5 AGM. April 16 Introducing to Pembrookeshire field meeting - Dr Peter Banham. April 18 - April 23 Field excursion to Pembrookeshire - Brian Blackmore, Dr Peter Walsh and Dr Peter Banham. May 7 Great stratigraphic myths - Dr R.J. Bailey. May 9 Field visit to Hertfordshire Bourne and Berkhamsted - Dr John Catt. June 13 &14 Symposium on the Chalk of Hertfordshire www.hertsgeosoc.ology.org.uk Contact Linda Hamling 01793 423815.

Horsham Geological Field Club December 6 The Club's Christmas Party. January 14 Scientists through Coelacanth eyes. - Peter Forey. Contact Mrs Gill Woodthatch 01440 250371

Hull Geological Society March 19 Rotunda the William Smith Museum of Geology, its history and rede-velopment and the Annual General Meeting. Contact Mike Horne 01482 346784 Email: mike@home28.freeserve.co.uk

The Jurassic Coast Details are available on the web site at www.jurassiccoast.com.

Leicester Literary & Philosophical Society (Geology) March 11 Is it real? From trilobites to whole outcrop - Dr David Williams and Dee Edwards. March 17 Annual Saturday Seminar Speakers: Professors Peter Worsley, Paul Smith and Dr Lyall Anderson. Chris Lewis, Chris Duffin and Tom Sharpe. Charles Darwin and the Great Pioneers of Geology. March 25 AGM and Chairman's Address. Rocky tales of a geotechnical engineer - Dr Nuria Sanz-Andrade. Contact Andrew Swift 0116 2523646; email as48@le.ac.uk

Leeds Geological Association March 12 Volcanic plumbing systems from Africa to Antarctica - Dr Dougal Jerram. April 23 What can fossils tell us about ourselves - Prof Simon Knell. May 7 The Geology of the United Arab Emirates - Dr Richard Ellison. Enquiries to Gen. Sec. a.d.origstocke@supanet.com Email aorigstocke@hotmail.com

Liverpool Geological Society March 6-15 National Science Week Events. March 24 Distinguished Member's Address: Professor Silvia Gonzales. Contact: Joe Crossley: 0151 426 1324 or email yrsgeocrossley@hotmail.com.

Mid Wales Minerals, Fossils and Geology Club Meeting 25 AGM and Chairman's Address. Rocky tales of a geotechnical engineer - Dr Nuria Sanz-Andrade. Contact Andrew Swift 0116 2523646; email as48@le.ac.uk

Manchester Geological Association March 18 What Environmental Magnetism can tell us - Prof Barbara Maher. Contact Nick Snowden 07932 927040 nick_snowden@mancat.ae Email info@mangelosoc.org.uk www.mangelosoc.org.uk All meetings in the Williamson Building, University of Manchester.

Mid Wales Minerals, Fossils and Geology Club Contact Bill Bagley 01686 412679.

North Norfolk & Suffolk Mineral, Fossil and Geology Club www.nnhms.org.uk

North Norfolk Mineral & Lapidary Society Meetings at St Georges Church Hall Churchfield Green, Norwich. 19.30hrs every first Tuesday of the Month except August. Contact: clansdell@btinternet.com

Northern Geological Society February 11 Professor Richard Worden (University of Liverpool) - Dr Simon Harley. www.northerngeolosoc.org March 15 Field Field Trip: Local Heroes at Woolhampton Hawkins - by Prof. Peter Worsley


Reading Geological Society Outcrop - Dr David Williams and Dee Edwards. Contact Andrew Swift 0116 2523646; email as48@le.ac.uk

Reading Zoological Society Contact: Mike Horne 01482 346784 Email: mike@home28.freeserve.co.uk

Shropshire Geological Society December 10 AGM www.shropshiregeolosoc.org.uk for details contact Dr. Kelly Wood 01743 206563;

Southampton Mineral and Fossil Society Contact Gary Morse 01489 787300.

Stamford and District Geological Society March 11 AGM and members evening. Contact: Bill Leverington on 01780 752915.

Sussex Society Contact: Chris Hodgeson 01926 511097.


West Dorset Geolosoc Contact: Chris Hodgeson 01926 511097.

Wessex Lapidary and Mineral Society Contact: Pat Maxwell 02380 891890 email: rnmmaxwell@tiscali.co.uk

Wessex Mineralogical Society Contact sylvia.woodhead@btinternet.com

Yorkshire Geological Society Contact: trevor.morse@1883.638893.com www.yorksgoalsoc.org.uk

For any member visiting Portugal before the end of March 2009 it maybe well worth-while visiting a special exhibition on Nery Delgado (1835-1908) at the Museu Geologico, 8 Academia das Ciencias 19-2 Lisboa Portugal.

He was a renowned scientist, working for the Portuguese Government. This exhibition shows the life and works of Nery Delgado. One of the major collections of fossils, pre-historic artefacts, geological maps and manuscripts associated with his research.
Looking at Jurassic Churches - Saturday 7 June 2008 (Part 2)

The afternoon was devoted to just two of the most famous churches in Northamptonshire and the British Isles. The first, Earls Barton (SP 852638) retains possibly the most photographed tower; the second All Saints, Brixworth, is perhaps the church about which the most column inches of description have been written.

Those seeing Earls Barton Anglo-Saxon tower for the first time were visually impressed. Each of the tower’s quoins is constructed in ‘long and short’ style and preserved to almost the tower’s full height. Constructed of Barnack Stone, the quoins clearly display their bedding orientations, for example: The north-west quoin reads: BVFR, BH, BVFR, BH, BVFR, BH, BVFR, BH, BVFL, BH, BVFL, BH, etc. The south-west quoin reads: BVFR, BH, BVFR, BH, BVFL, BH, BVFL, BH, etc. (See part 1 for explanation of symbols)

Between the quoins, ornamental Barnack Stone pilasters, each set on a pedestal, also exhibited their bedding orientation. The majority of their vertically orientated long stones were noted as being edge-bedded (BVEB), rather than face-bedded (BVFB).

John explained that the reasons for the manner in which individual stones were used could generally be related to the bedding ‘grain’ of the rock. The tower’s overall appearance was delightful but it had a certain lack of precision; there were for instance a different number of pilasters on each of the tower’s faces. This annoyed one author sufficiently for him to describe the tower as ‘the highest expression of infantile art… the swan’s song of Anglo-Saxon architecture’.

An element of this lack of perfection was explained. In very many ornamented Anglo-Saxon churches, stones emplaced into quoins or pilasters were cut back (that is their visible surface was shaped) to be of equal width; clearly the quoin stones at Earls Barton varied in width. John explained further that the tower of Earls Barton was often cited as an example of proof of the Anglo-Saxon use of render. Most church historians believed (in his view incorrectly) that stone cut backs were cut as stops for this render. Certainly, modern render filled the areas between the pilasters and quoins, but the lack of apparent equal width of the quoin stones supported the belief that they were not cut back. To understand the term ‘cut back’, the attention of the party was drawn to the string-course between the first and second stages of the tower, there unusually the underside of many stones were cut back. The width of the string course was, therefore, constant and it matched the width of the higher string courses. It could be concluded that the cut backs were made subsequent to the tower’s construction.

The west doorway to the tower provides a good example of patterned Anglo-Saxon work. The jambs of the round-head
appearance and it was once described as ‘perhaps the most imposing architectural memorial…yet surviving north of the Alps’. Its range of rock types drew comment from Arkell and the GA visited the site in both 1921 and 1938. Dr Diana Sutherland kindly addressed the party, describing her painstaking work over a number of years which resulted in the identification and plotting of the stones displayed in the wall fabrics. She kindly exhibited for comparative purposes geological examples of the many rock types seen in the lower church walls; most of these originated from the Charnwood Forest area some 45km. to the north. Both past visiting GA parties had concluded that the Charnian material must have arrived in the Brixworth area in glacial till. Diana explained that together with Professor John Hudson, whom she introduced, she had examined local tills and found such material missing. The Roman Jewry Wall in Leicester, however, contained a similar suite of rocks, therefore, possibly the rocks were reused from this or a similar Roman wall. Roman tiles figured prominently in the church construction. Diana’s work also entailed identifying the numerous burnt stones which were widely distributed in the walls; these too were carefully plotted on wall fabric diagrams. On the north wall, immediately above the position of an early aisle structure, the presence of a band of burnt stones clearly provided evidence of a fire.

From the evidence of the incorporated stones the church was thought to have been constructed in very brief terms, as follows: Phase 1, the erection in the 8th century of a large stone church (partially proven by excavation), consisting of a western porch-like entry, a nave and choir or octagon - apart from local stones like Northampton Sandstone and Middle Jurassic limestones this included numerous reused Roman stones from Leicester area as well as Triassic, possibly Carboniferous sandstones and Roman tiles; Phase 2, slightly later, the side walls of the nave raised with the local stones and Roman tiles to create a clerestory; Phase 3, the choir with low level covered ambulatory rebuilt or created, this phase including travertine as well as the local stone types; Later Phases, including extensive modification during the mid-18th century. Each of the first three phases includes fragments of burnt stone which it was felt came from the material being reused from other ruined buildings.

Diana kindly escorted the party around the site and arranged for their ascent of the tower. Ascending the stair turret, fragments of travertine were noticeably seen to be abundant. Members were most appreciative of Diana’s guidance. John Potter raised a number of points concerning the interpretation, these he had expressed in the brochure received by members. In particular, Brixworth was one of only two churches he had observed where favourable building stone was available and yet wall quoins, window and door jambs of supposed Anglo-Saxon age were not constructed in their typical patterned style. The tower’s south door, the south-east nave quoin, and the tower windows into the nave which they had just observed, worried him. Secondly, the wide distribution of burnt stones, scattered over three centuries of workmanship was difficult to explain. All agreed that Brixworth provided a fascinating and challenging mix of problems upon which to end the day.

Those present made a request that next year’s church excursion should visit comparable churches in the South Midlands. John, agreeing to this request, expressed concern at the lack of attendance of local Association members.

The following articles may be of use to those who wish to know more:

- Northamptonshire Stone, Dovecote Press.

John F. Potter
The last issue of the GA Magazine was so full that we didn’t have enough space for some of the photographs of the Discovery room at the Festival of Geology, so here are a few to give a flavour of that busy day! Running events alongside Rockwatch, was the Kent Geologists’ Group and the UCL Museums & Collections, all of whom were kept extremely busy all day with streams of young (and not so young!) visitors, keen to try out the many activities on offer.

A little later in November, Rockwatch was off to join the South Wales Group of the GA at their Geofest held in the National Museum of Wales in Cardiff. This was another busy day and thanks to helpers from the South Wales Group and to some of our Rockwatch members and families, we were able to run a full complement of activities for visitors.

A memorable “first” for Rockwatch in November was our Conference “Planet Earth in the 21st Century - Your Future” for Year 8 and Year 9 school students. Six schools from North and East London sent ten pupils each to the conference. We had three talks; Chereé Stover from BP spoke on Energy Supplies, Chris Turney from Exeter University on Climate Change and Joanne Wade from Impetus Consulting on Sustainable Development. Iain Stewart from Plymouth University (and the television face of geology) chaired the day. After each talk, the students broke up into discussion groups then returned to the conference with their comments and points of concern. After the final talk and discussion, Iain summed up the whole day. The students had considerable knowledge of the issues and were very aware of what they might do, as individuals, to play their part in helping to ameliorate the problems facing our planet today. However, it was on Climate Change that they found the greatest challenges and raised the most questions and to which the answers were more difficult! Students and their teachers found the day interesting, challenging and a great learning experience. All seemed keen to have another conference. The participating schools plan to use the day as a teaching resource and, with the help of the CD produced of the talks, should find it can be used to support many areas of the curriculum. The Geological Society gave us the use of Burlington House for the day, helped with the planning of the event and helped on the day. The GA Curry Fund gave a grant towards the costs and Rockwatch Management Committee members and other geological colleagues helped and supported the groups on the day. Rockwatch is extremely grateful to everyone who helped to make the day a success and we hope that this might be the first of a series of similar events for school students in other parts of the country.

As this goes to press we are preparing our spring programme of events in museums, at festivals of geology and field trips specifically for our members. Each year we find more people who are keen to help run trips for our members and so we cover more areas of the country. We already have a number of new sites to visit this year, as well as many old favourites for day and residential visits.

Rockwatch is fortunate to have wonderful sponsors and many people who are willing and keen to help encourage and support young people who wish to learn more about the world around them. Many thanks to you all.  

Susan Brown
Chairman.
Tour to the Rift Valley in Northern Tanzania.

Introduction.

Twelve members met in Arusha to tour the Rift Valley in Tanzania. The leader, Professor Barry Dawson of Edinburgh University, mapped the Arusha-Manyara-Natron area for the Tanganyika Geological Survey, and was, in 1960, the first to descend into the north active crater of Oldoinyo Lengai. The tour explored the Rift Valley about a ~200 km wide zone with three different orientations. Earliest faulting in Tanzania in the late Tertiary produced a tectonic depression limited to the south east by the Pangani graben and to the southwest by the Eyasi half graben, each influenced by basement structures. Large shield volcanoes formed in association with the episode of faulting. These Older Extrusives (>1.2 Ma B.P.) are mainly alkaline basalts with flows that filled and extended beyond the depression. No outcrop is seen where lavas cover early basement rocks and the earliest dated, a nephelinite at Essimigoro, is 8.1 Ma B.P.

Major faulting between 1.2 and 0.9 Ma B.P. formed the present day north-south Rift in the centre of the depression. Unlike the narrow graben in Kenya, in Tanzania the Rift is a half graben with a steep east facing escarpment which stretches from the Kenya border, through the Natron, Engaruka, Manyara and Balangida basins. The Floor of older lavas, is broken by tilted fault blocks, having steep and gentle slopes. Faulting is accompanied by explosive Younger Extrusive volcanics which are mainly ultra basic/ultra alkaline and accompanied by carbonatites. Pyroclastics and lavas form major steep volcanoes. Active volcanism continues. Contemporaneous minor volcanic features are widespread.

Arusha to Mto wa Mbu.

The journey west paralleled the edge of the Masai basement block, the southern boundary of the early tectonic depression. It crossed a faulted terrain climbing steep scarps and down dip slopes towards the escarpment. In the north were the younger lavas, Menduli and Burko and many smaller tuff cones, asymmetrical because of prevailing east winds. Some are basaltic scoria cones but others, such as Lashaine rising 700 ft above the plain south of Monduli, are carbonatite tufts with basaltic (granulate) and mantle xenoliths (harzburgite / dunite). Travelling northwest, Essimigoro, the oldest volcano in Tanzania, was passed: in the east it has the sharp upstanding outlines of a strato-volcano, to the west, breach of a crater permitted extensive lava flows with smooth profiles. Descent to the key road junction at Mto wa Mbu led to the foot of the escarpment with the Manyara basin to the south and the Engaruka and Natron basins to the north (Figure 1).

Mto wa Mbu to Natron Basin.

North of Mto wa Mbu the road skirts a single unsegmented scarp ~250 - 500m high which abuts the highly faulted Engaruka block, and then descends into the Engaruka Basin. This is separated from the Natron Basin by a horst block.

Figure 1. Looking south along the Rift wall near Mto wa Mbu with Lake Manyara in the distance. The nearest butresses are formed of basalts from the Crater Highlands. The distinct butresses are of metamorphic basement.

With Older Extrusives, Ketumbeine and its distinctive profile (Figure 2), and Gelai to the east, and Younger Extrusives, Kerimasi and Oldoinyo Lengai to the west. The boundary fault runs close to Kerimasi and, buried by nephelinite and carbonatite tuffs, disappears beneath that mountain (Figure 3). The horst is disturbed by minor volcanic features. There are many tuff cones with greater deposition of tephra to the northwest due to prevailing winds close to the escarpment. Maar type explosion craters and tuff rings with low angle outer slopes and vertical inner slopes.

Relationships of tuff cones to dated pyroclastics form Kerimasi. Debris flows to the east and north of Oldoinyo Lengai extend ~16 km across the Natron Basin and into Lake Natron as islands.

Natron Basin and surroundings.

Present day Lake Natron is shallow ~4m, with an evaporation rate of ~20mm/day during the dry season. The saline waters (pH>9.5) are rich in sodium salts leached from volcanic sources as well as by direct input. Much of the surface is covered by brona and halite deposits.

Figure 2. Ketumbeine, an Older Extrusive shield volcano, from the west. Note the break of slope. The lower slopes consist of basaltic lavas, with more viscous trachyandesites and trachytes on the upper slopes. The flat top is due to caldera collapse. Walls of bedded pyroclastics as at Kikete and Loolmurwak (Figure 4), originated when magma came into contact with seasonal surface and subsurface waters. Relationships of tuff cones to dated debris flows from Oldoinyo Lengai indicate an age ~2.5Ma BP. Many are ori...
Nakuru lavas are tholeiitic basalts that are intruded by quartz diorite dikes at Kambanji and Scarboro. They are mainly alkali basalts and the east by the Natron Basin boundary northeast for ~90 km and are limited to Highlands. These older volcanoes run road up the escarpment to the Crater Highlands at Mto wa Mbu, a ramp takes the Serengeti and Olduvai.

“Snow Mountain” together with Mount Oldoinyo Lengai was classified as a summit (Figure 5) was misinterpreted as weathering of carbonatites near the formation of simpler carbonates and atmospheric moisture follows and the early after extrusion but reaction with plex Na-K-Ca carbonates nyerereite and lavas contain phenocrysts of the com-

Oldoinyo Lengai and the anhydrous Natrocarbonatites are unique to East Africa as the “Cradle of Mankind”. Activity from the northern north of Kilimanjaro with a volume of ~28 km3. Expected difficult walking in elephant expeditions and calcretes from recrystallisation of carbonatite tephra from Oldoinyo Lengai.

Figure 5. Oldoinyo Lengai, looking south from Lake Natron. The white weathering of carbonatites near the summit was misinterpreted as snow in the nineteenth century.

Pliocene activity continued until March/April 2008 with widespread ash and tephra tuffs in the position. The crater is now filled with a major ash cone. We drove towards the col between Oldoinyo Lengai and the Lengai’s lava to the escarpment, against which pyroclastics are deposited and then walked through grey ash fields to a lava flow of the 2006 lava flow. Expected difficult walking in elephant grass was not encountered for it was flattened, swamped by ash. The lava consists mainly of thick blocky aa and thinned pahoehoe lobes, with a pale grey/whitish exterior colour (Figure 6) but on freshly broken surfaces the inte-

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The Gregory Rift Valley and Neogene-Dawson, J.B. 2008. Further Reading:

Leaving Arusha for the airport, low clouds cleared, revealing Kilimanjaro, the highest mountain in Africa, formed by the fusion of three major volcanoes: Shira, Mawenzi and Kibo (5895 m) still with fumarole activity... a tantalising call for another visit.

GA magazine of the Geologists’ Association Vol. 8, No.1, 2009

Gerard Slavin, Brenda Slavin & Peter Wood.
As part of the 150th GA and 60th NSGGA Anniversary Celebrations we were pleased to welcome Professor Aubrey Manning Emeritus Professor of Natural History, University of Edinburgh Lecture titled “2008 - UN INTERNATIONAL YEAR OF PLANET EARTH.” Held at Keele University on 6 November 2008 THE 6th PROFESSOR WOLVERSON COPE ANNUAL LECTURE

A few years ago the North Staffs Group of the Geologists’ Association instituted an Annual Lecture to commemorate Wolverson Cope, founding Professor of Geology at Keele University and a life-long supporter of the G.A. and its local Group. The aim was to enable the local community to hear distinguished earth scientists speak on topical subjects.

The selection of each Wolverson Cope Lecturer evokes considerable anticipa-
tion within the Group but the choice of the speaker for 2008 was of particular importance. First, this year marks the 150th anniversary of the inception of the Geologists’ Association, our national body; 2008 also marks 60 years since the North Staffordshire Group formally came into existence.

In this context, the choice of Professor Aubrey Manning as the Wolverson Cope Lecturer for 2008 was especially apt, not least to this writer, as Wolverson Cope’s successor in the Keele Chair of Geology and an (unoffi-
cial) member of the first Zoology class taught by the then Dr. Manning at Edinburgh University! Aubrey Manning is well known as a broadcast-
er and television personality, famous as presenter of popular series such as ‘Earth Story’, ‘Landscape Mysteries’, etc. As such he is possibly the most recognisable public face of geology in this country and abroad.

However, despite his distinguished career in the life sciences and his international standing as an authority on animal behaviour, Professor Manning constantly asserts his amateur status in the geological sciences. Paradoxically, his non-professional standpoint actually enhances his authority as public communicator – and also places him firmly in the ranks of those for whom the Geologists’ Association was created.

The communication skills, experience and wide-ranging insights that charac-
terise Professor Manning’s broadcasts were consummately displayed in the Cope Lecture he delivered to an enthu-
siastic capacity audience at Keele on 6th November. From the rather dry title of “2008 - UN International Year of Planet Earth”, Prof. Manning conjured up from the geological and biological records a fascinating account of the interaction and mutual dependence of organisms with our home planet, cul-
inuating in the emergence of Man, as arguably the first (and perhaps last?) organism capable of bringing about mass extinction.

In a fascinating talk, laced with humour and personal insights, he emphasized the important aim of this ambitious project, to increase public and political awareness of the Earth Sciences, as vital to achieving sustainable development and he outlined the ten research themes (from Groundwater to Deep Earth) identified for international support within the project. Professor Manning ended with a plea for all of us interest-
ed in the Earth Sciences to become more involved (scientifically and emo-
tionally) in the current struggle for sur-
vival of our species on this planet. As he expressed it, “…. we have nowhere else to go!”

GILBERT KELLING

Footnote: The venue for this lecture was also highly appropriate, named after Prof. Alan Gemmell, founding Professor of Botany at Keele and famil-
lar to those of a certain age as a famous broadcaster and long-serving member of the venerable radio pro-
gramme “Gardeners’ Question Time”.

The NSGGA would like to give thanks to the Geologists’ Association who generously con-
tributed towards the costs of the lecture.

ANNUAL DINNER

The Annual Dinner this year will be after the AGM, Award ceremony and Presidential address on Friday May 1st. We have a wonderful venue this year in the Cavendish Hotel situated con-
veniently just down the road from Burlington House.

This is an excellent opportunity to meet the Award winners, meet up with old friends and fellow members. We extend a warm welcome to new Members and those who have been unable to join us in recent years for a fantastic evening. The cost for a 3 course meal including coffee is £35. Please send your cheque, payable to the Geologists’ Association, to me Sarah Stafford as soon as possible. It is always a great event!

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THE FIRST WELSH ROCK STAR,
by Dr Malcolm Smith

A feature from the Countryside Council for Wales to celebrate the bicentenary of Charles Darwin’s birth on 12th February 1809.

It’s one of those common pub-quiz questions! Who “discovered” evolution? Your mind goes blank! But when you hear the answer, you recall that name. Charles Darwin. An old man with a long white beard. Something about a Beagle and a voyage around the world an age ago. Well you will almost certainly not know is that Darwin was primarily a geologist. And that, as a fit young man in his early twenties, he learnt an awful lot of his skills observing what was in the natural world around him while he trampled over the hills and mountains of North Wales.

But there’s more. This was the mid 19th century when many geologists thought that the Biblical Flood - the one that Noah made the ark to survive - had shaped much of the landscape they saw around them, the deep valleys, huge boulders scattered across the land and much else. This was also a time when divine creation explained the huge diversity of life on Earth.

Spending time in Cwm Idwal (today a National Nature Reserve) beneath the towering Glyderau peaks in Snowdonia, Darwin became convinced that massive glaciers had carved out the cwm and left their evidence for all to see. He was to be proved right.

It is now recognised that about 20,000 years ago, a glacier flowed out of the cwm and into Nant Ffrancon, smoothing and abrading the rocks in its path. It formed part of a huge ice sheet that covered most of Wales. Even more recently, between about 13,000 and 11,500 years ago, a smaller glacier reoccupied the cwm, bulldozing rock debris in its path leaving the spectacular ridges, rockmores and moraines seen around the lake today.

Charles Robert Darwin was born on the 12th of February, 1809 at The Mount, a grand house in Shrewsbury where he grew up amongst wealth, comfort and country sports. He toyed with becoming a physician like his father, or a clergyman. But it was the natural world that fascinated the young Darwin, the colours and shapes of rocks and the variety of plants and insects he collected.

After losing interest in a medical course at Edinburgh, he studied theology at Cambridge, graduating early in 1831. Restless throughout his university years to learn more about nature, he volunteered in August 1831 to assist Adam Sedgwick on a geological tour of North Wales.

Sedgwick was one of the most famous geologists of his day and Darwin, with time on his hands - and no need to work because he had private means - was more than eager to learn. “I am now mad about geology”, he wrote at the time in one of his many notebooks.

Sedgwick was looking for evidence of older rocks underneath the limestone that outcrops across several parts of North Wales. They visited the ruins of Castell Dinas Bran and the limestone cliffs of Mynydd Eglwyseg near Llangollen; the Vale of Clwyd; and St Asaph where in the nearby Cefn Caves they found a fossilised rhinoceros tooth.

From there they travelled by horse-drawn gig to Conwy and the west side of the Conwy valley where they examined igneous rocks, those formed from molten rock when it cools. After a visit to the quarries at Bethesda to see slate, a metamorphic rock formed by intense heat and pressure from rock being buried, they went on to Anglesey.

Returning to Bangor several days later, Darwin visited the impressive giant bowl-shape of Cwm Idwal while Sedgwick went elsewhere. Still on a huge learning curve, it’s rather reassuring for today’s young students to know that the evolution pioneer didn’t recognise any of the glacial-carved features which he did eleven years later on a return visit. And he mis-identified several rock types too!

“His trip with Sedgwick was carefully advanced geology but it was vital for developing his craft”, comments Rev. Michael Roberts, Vicar of Cockermouth in Lancashire, a geologist and an expert on Darwin.

“Sedgwick introduced him to careful note-taking in Wales and he learnt all the basics of geology. It would be hard to devise a better three week trip for any trainee geologist. It was his ‘Sedgwick intro-duction’ to the Welsh rock types too!”

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It’s for his book “On the Origin of Species” published in 1859 that Charles Darwin is remembered. It proposed natural selection by which the plants or animals most suited to their environment are more likely to survive, reproduce and pass these characteristics on. It hit the world like a thunderclap, provoking a frequently vitriolic debate which eventually de-bunked the religious establishment’s reliance on divine creation.

His “The Descent of Man” published in 1871 caused even more fury because it suggested that humans descended from apes, an assertion that aroused the then Bishop of Oxford to ask “whether it was through his grandfather or grandmother that Darwin claimed descent from a monkey!”

Charles Darwin was a kind, pleasant man, unassuming and modest, characteristics ill-suited to the hornet’s nest of argument with the establishment of his day. But he stuck with his theories which are widely accepted today.

Sandra Herbert, Professor of History at The University of Maryland, argues in her highly acclaimed book, “Charles Darwin, Geologist” (Cornell university Press, 2005), that Darwin’s developing ideas about geology were the crucial driving force for his insights into the evolution of species for which he is famed. And it was those formative field trips across North Wales where he learnt so much of his geology that make him our very own rock star.
Festival of Geology and Local Groups.

Groups of the GA were offered support from the Curry Fund to come to the Festival of Geology last November. A condition of support from the Curry Fund is that the recipients should write a report of their activities. Below is a heavily reduced report from three of the Groups who received support and wrote up their experiences.

1. The Open University Geological Society display at the GA Festival of Geology featured the OUGS 2008 field trip to the Auvergne. An extensive set of photographs was displayed, with maps and text that explained the geological context. Yvonne Brett of the OUGS London Branch, pictured with Peter Franklin and Nicole Gay manned the stand for the day, with Linda McArdell, the Society Information Officer. The photographic display was augmented with a collection of rock samples from the Auvergne volcanoes, and surrounding areas affected by the volcanic debris.

High points from the Festival were the visit to the stand by Dr Iain Stewart, presenter of the OU/BBC series Journeys from the Centre of the Earth, and signing up four new members to the Society. Iain went away with a Membership Application form, so who knows, he could be the fifth to sign up.

2. The West Sussex Geological Society showed photographs of their Field Trip to Guernsey led by Dr Paul Olver in May 2008. This area appealed to his primary interests in igneous and metamorphic rocks. The only fossils and sedimentary deposits are glacial - and nearly all the geology is between the high and low water. The helpful and friendly owners and staff of the hotel we stayed in and the superb views overlooking Rocquaine Bay, what more could the group ask for?? A review of the Field Trip will appear in the next magazine.

3. The Geology Section of the Leicester Literary and Philosophical Society visited the GA’s Festival of Geology. A selection of past Charnias (the Newsletter of the Section), seminar abstract booklets and copies of the recently produced Building Stones of Leicester book were displayed. This was the first time the Geology Section had participated in the GA’s Annual Festival.

A number of amateur and professional geologists visiting the stand with many being interested in Leicestershire’s famous fossil locality and beauty spot Charnwood Forest. We had the opportunity to sell the advantages of joining the Geology Section. Our newsletters and booklets proved to be very popular, and encouraged interest in the geology of our part of the world.

The team had a fun day out and took it in turns to man the stand, while the others attended the lectures, browsed the stalls and exhibits or even did a little shopping.

The Geology Section would like to acknowledge the assistance of the Curry Fund of the Geologists’ Association for the grant towards the cost of producing the display materials and the team of helpers and poster and banner designers for their sterling efforts on the day.

Lost for an Easter present?
Then why not give an ammonite in chocolate - The Old Fossil - Milk Chocolate Tablet?
This ammonite, with its beautifully curved and remarkably preserved shell has become the iconic fossil. But you need not be a palaeontologist to enjoy them - here they’ve been preserved in velvety smooth milk chocolate for just a little longer, so you can treat yourself to this precious fossil. Yours for only £711 from Hotel Chocolat.
"A Building Stones Guide to Central Manchester"

Four walks through the city centre.
by Morven Simpson and Fred Broadhurst
Available from Manchester Geological Assn: www.mangeo-lassoc.org.uk or from Fred Broadhurst 77, Clumber Road, Poynton, Stockport, Cheshire SK12 1NW £5 plus £1.00 p&p.

This delightful pocket sized guide is the perfect companion for a stroll around central Manchester and excellent value for money. Aimed at the non-geologist, it would nevertheless satisfy the curiosity of those geologists who wished to know more about the provenance of the building stones of this city.

The book has full colour photographs on the front and back covers and in the centre are twenty pages of superb colour photographs. There are many of the building stones, some of buildings themselves and four pages with detailed maps of the walks, complete with scale and compass direction.

A short introduction explains the types of rocks used and how they might have been formed. It points out the changing role of building stones over time and how now, most of the stone used in buildings is not local but comes from across the world. The authors opted to describe four walks around the city which include "the best" of the building stones.

Information on how to get to the start and finish point of the walks is also given. The contents page is clear, there is a geological glossary at the end of the book and a table of geological systems and their ages, particularly helpful for the non-geologist.

The walks are very clearly described with each numbered stop on the map emboldened in the text so it's easy to spot. Brief descriptions of the rock types used (capitalised in the text) and their provenance, with just enough detail given to make it interesting, but not too much to scare off the uninitiated! The text is clear, easy to follow and eminently readable. I hope copies are available in all the city's bookshops.

I don't know the city, but look forward to exploring it with the help of my grandchildren, who live nearby, and who are Rockwatch members. So, together and with this splendid pocket guide, we will learn more about the building stones of Manchester and the world around us - what a bonus, I can't wait to start walking!

Susan Brown
Anticline, Hartland Quay, North Devon

You will notice that some of the weaker shale beds have eroded from this limb of the anticline resulting in the formation of the cave. This leaves the overlying beds unsupported and, as they are cracked, rock falls are a frequent occurrence. The winning photograph of the 2008 Festival (see thumbnail), first printed in the December 2008 magazine, was taken from the other side of the cave where the sandstone bed, that forms the roof, is fractured and has partially collapsed. From this close up you can see that the beds are “right way up”, and that the wonderful patterns of iron oxide permeate from the many cracks. Sole marks can be seen on the undersides of both the broken bed and the bed above. Ripple marks are visible on the upper surfaces of most of the exposed beds around Hartland Quay, showing many different wave and current patterns. The iron oxide staining is not isolated to the bed photographed, it is apparent on the beds above my head that are not washed by the sea. Broken pieces of complete beds can be found on the beach seaward of this anticline with wonderful patterns of staining, but I guess the sea would soon wash them clean. Truly an ephemeral feature worthy of recording, little works of art in their own right. The rock is Upper Carboniferous, shales, mudstones and more resistant sandstones, deformed in the Variscan.

Photo and text Linda McArdell