MAGAZINE OF THE GEOLOGISTS’ ASSOCIATION
Volume 11 No. 3 September 2012

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FESTIVAL OF GEOLOGY
The Geologists’ Association

Established in 1858 The Geologists’ Association serves the interests of both professional and amateur geologists, as well as making geology available to a wider public. It is a national organisation based in London, but is represented by local and affiliated groups around the country. The GA holds monthly lecture meetings, publishes a journal and geological guides and organises field excursions both in the UK and abroad.

Annual subscriptions for 2012/13 are: Full: £40, Associate £30, Joint £58, Student £18.

Subscriptions are renewed annually on November 1. You can join the GA on-line on our website www.geologistsassociation.org.uk/joiningtheGA.html By phone 020 7434 9298 or by post to Sarah Stafford, Executive Secretary, The Geologists’ Association, Burlington House, Piccadilly, London W1J 0DU.

President: Professor Rory Mortimore
Executive Secretary: Sarah Stafford

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GA Guides: gaguides@geologistsassociation.org.uk
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Curry Fund: curryfund@geologistsassociation.org.uk
Rockwatch (junior club of the GA): rockwatch@geologistsassociation.org.uk

Curry Fund Dates for 2012
Applications to be received by  
February 20  
May 20  
August 20  
November 20  

Committee Date  
March 9  
June 8  
September 14  
December 14  

curryfund@geologistsassociation.org.uk

Cover picture:
Exe Breccia Formation at Lympstone Harbour, one of the places to be visited at the EXETER CONFERENCE “Rivers through Geological Time” 13-14 October 2012

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

Items should be submitted as soon as possible and not targeted on these dates. We welcome contributions from Members and others.
gamagazine@geologistsassociation.org.uk
I am writing this report in July with the ‘wettest’ Summer break for years looming. The year started with drought and hosepipe bans and, where I live on the Chalk of the South Downs, concerns were raised for long-term shortages of water by water companies and the Environment Agency. Water, particularly groundwater, plays a huge part in maintaining river flows and hence the ecological balance in the landscape of many parts of the U.K. I have just replied to Ruth Childs, Research Officer at the High Weald AONB Unit www.highweald.org who had a query about why the geology of Weald was unique and what part faults have played in creating the special geological differences within the Weald. Ruth is part of a growing body of those who are involved with the U.K. development and enhancement of Areas of Outstanding Natural Beauty (AONBs). In recent years these have included formation of the South Downs National Park, the High Weald AONB, the North Wessex Downs AONB and many others. It is encouraging to see how many Local geology Groups are helping interpret the geology by recording and enhancing the geological exposures in each of the new AONBs.

These thoughts bring me to the role geology plays in our community and how the GA and Local and Affiliated groups contribute to our understanding and awareness of such major environmental issues. There will be an issue of the PGA next year with the papers from the GA Worcester Conference ‘Geoscience for Science and Society’ which illustrates just how much the GA and Local and Affiliated groups have and are contributing to an appreciation of the role of geoscience to society, including environmental education, how aquifers work and their impact on ecology. The team who made such a success of the Worcester Conference including those at Natural England (Colin Prosser, Jonathan Larwood, Eleanor Brown and, for the GA, David Bridgland, Sarah Stafford and the Local Groups) are to be congratulated. It is to be hoped that future GA conferences can be equally successful.

A further example of the part played by Local Groups is provided by the GeoSuffolk’s 10th anniversary celebrations and the wonderful book ‘A celebration of Suffolk Geology’ (see page 9) produced by Roger Dixon and colleagues. The support of the GA and the Curry Fund to such enterprise is much appreciated locally and I was lucky enough to be asked, as GA President, to plant a tree in Christchurch Park, Ipswich, and visit the Plocene Forest at Sutton Knoll as part of the celebrations and see at first-hand how such support from the GA and Curry Fund enhances local geology in novel ways. (See also GA Magazine Vol. 9, No.3, 2010, p.21).

As part of this development of geoscience in environmental education I am delighted to report that the Presidents and Secretaries of the Geologists’ Association (GA) and the Geological Society London (GSL) met in June to prepare a Memorandum of Understanding (MoU). This sets out areas where the two organisations can support each other and discuss how to take forward geosciences in education. To illustrate the way in which this agreement will work I have copied below the opening paragraph of the draft MoU.

The GA and the GSL wish to work together to promote and encourage greater understanding and education of the scientific, technical and professional aspects of the Earth sciences with particular emphasis on:

- Enhancing public understanding of the contributions the geosciences make to society
- Expanding geoscience education to all age groups
- Collaboration on interdisciplinary meetings.

Once agreed by both Councils and signed by both presidents the full text will appear in the GA Magazine. Taking the last point, a joint GA/GSL symposium on the Hertfordshire Puddingstone has already been proposed by the outgoing GSL President, Bryan Lovell and a planning meeting is being organised by the GA General Secretary, Diana Clements.

As we share the same building for offices, meeting rooms, the Janet Watson Lecture Theatre and facilities at Burlington House such as the lower library and kitchens for our refreshments, it is good to see close co-operation between the two organisations representing geology at national level. For our part in the GA, I thank the GSL Presidents, Bryan Lovell and David Shilston, and Executive Secretary Edmund Nickless, for their very friendly support to the GA on many issues including recording the GA monthly lectures, helping our secretarial staff and for initiating this MoU.

I come from the world of engineering geology and many GA members have a similar background. In addition to visiting local GA groups at Oxford and Ipswich and giving talks to meetings such as the Wessex Downs AONB I have recently taken the Engineering Group of the Geological Society (EGGS) on a three day meeting to the French Normandy coast with my French colleagues from Le Havre University and given a presentation at Geotechnica 2012 near Banbury. These meetings have provided a forum for explaining what the GA is about to a different audience and I am delighted to say is leading to new members of the GA and new leaders for GA field meetings and a possible joint GA meeting with our French colleagues.

To all those GA members who have collared the President with thoughts on how to improve access to field meetings and other events a thank you. I hope some of the explanations about large buses and narrow lanes have been helpful and, as your Council, we are continually looking at ways to make the geology more accessible. An area that is currently being reviewed by the Publications Committee is electronic publication formats including the geology guides. We had an excellent presentation to Council on this topic from the British Geological Survey (BGS). Have you seen the recent appearance of the first issue of Earth Heritage with a GA input from David Bridgland? This Publication can be downloaded from http://www.earthheritage.org.uk/downlo ad.html. If you would prefer a printed copy please contact David as there are plans to provide printed copies to order from the Design & Imaging Unit at Durham University. The arrangements are not quite in place but the guide price for the 40pp issue is around £5.00 plus postage & packing (expensive but printed in full colour, stapled, and on good quality paper)! The current issue (38, Summer 2012) illustrates the GA diversity of ideas, activities and enthusiasm for geocuration and geodiversity across the whole of the UK. Earth Heritage also highlights where the Curry Fund has played an important part in these activities.

I am continually staggered by the variety of topics covered in the GA lectures and the June and July talks were no exception, thanks to Mick Oates who organises these for us. I am now aware that you need >200,000 shells to analyse evolution of ecologies (Jon Todd) and a super computer to investigate biological approaches to climatology (Rachel Warnock). Two or three fossils a year from a local Chalk pit seem irrelevant!
An event not to miss is the joint GA and Devonshire Association conference on Rivers through Geological Time on Saturday and Sunday October 13th and 14th at the Royal Albert Memorial Museum in Exeter. I am looking forward to seeing many of you there and at the Festival of Geology on Saturday 10th November at UCL and I know some groups have potential novel activities for this year’s Festival!

It is a particular pleasure to announce that Eric Robinson, a stalwart of the GA, has accepted Honorary Membership of the Association. Eric stepped in as President to help the GA after the tragic death of Beverley Halstead and was an officer of the GA for many years and made sure the GA Library at University College London was maintained and accessible to all GA members, a tough task in these changing financial circumstances.

Rory Mortimore - President

Report from Council

At the June meeting of Council a discussion was held about whether we should retain the distinction between Local and Affiliated Groups. The distinction is made in the Rules, so any alteration would require a further Rule change - we shall discuss this further at the Groups meeting on 9th November. In the meantime it was agreed that we should amalgamate the contact listings on the website, to make it easier for any new Members to locate a suitable group to join. We will also amalgamate the events section of the GA Magazine but will highlight which are the Local Groups. To remind you, that to qualify for Local Group status, at least 12 members of the group have also to be members of the GA. Affiliated Groups pay the GA £33 which allows them to advertise their events, receive 2 copies of the GA Magazine and other benefits such as entitlement to an award from the GA Regional Meetings Grant. If GA membership of the Local Groups falls below 12 they will need to revert to Affiliated Group status. Likewise, any Affiliated Group whose GA membership is greater than 12 is invited to send the list of GA members to Sarah Stafford and they will be upgraded to Local Group status. The GA Regional Meetings Grant is worth up to £350 and is available to the organisers of regional meetings in which a number of other groups will participate. Apply with details to awards@geologistsassociation.org.uk.

You will see on p.2 that we have streamlined our contacts so that you can email the topic of any query which will hopefully then get to the person concerned more rapidly. Deadlines are also listed there.

Chichester District Council have now dropped their proposed kite surfing zone at Bracklesham and instead have invited the GA to be involved with drawing up a Code of Conduct for all beach users which we are happy to do. We have also been concerned about the groynes and beach recharge works that are currently taking place in front of the Bunn Leisure Centre at Selsey. It appears that plans for this development were approved without the involvement of local geology groups. Council urges anyone aware of potentially threatening planning applications that could affect designated geological SSSIs to get in touch with both the GA and Natural England. For the latter, the best way of doing this is through a known contact or, if uncertain, use our Enquiry Service (enquiries@naturalengland.org.uk 0875 300 3078) which should be able to direct you to the right person for each SSSI.

Details of the GA Festival on Saturday 10th November are included in this Magazine. Groups should have received forms to complete with their requirements for displays. We look forward to seeing you there. Do please spread the word amongst geologists and non-geologists alike and refer them to the website where full details can be found. Don’t forget that there are also 3 field trips arranged for the following Sunday, 11th November. The Annual Groups Meeting will take place on Friday 9th November at Burlington House.

It is not until the AGM in May that we give our Annual Prizes and Medals but already we have to start thinking about nominations for the Halstead Medal as the deadline on 30th November falls before the next issue of this Magazine. A reminder that the Halstead Medal is awarded for work of outstanding merit, deemed to further the objectives of the Association and to enhance the GA in the eyes of members and non-members alike. Deadlines for Research Awards are 15th September and 15th February. Please see the GA website for details.

Planning is underway for four exciting overseas trips in 2013 to Bordeaux, India, Majorca and Peru. Please see the calendar in the centre pages for further details. In order to gauge whether these trips are viable it would be helpful to register an interest at an early stage. Please send your details to fieldtrips@geologistsassociation.org.uk. This helps us in the planning but does not commit you.

Geologists’ Association - South Wales Group were inadvertently missed off the Annual Report they are now added as an addendum to the Annual Report on the Website. Apologies and see the bottom of the Circular notice.

Diana Clements
General Secretary

CURRY FUND REPORT

The Committee welcomed Professor Rory Mortimore as the new Chairman of the Curry Fund at its June meeting. There were six new applications for the Committee to consider at this meeting and applications deferred from previous meetings which had been awaiting further information so decisions could be made.

The Dry Stone Walling Association of Great Britain was awarded £500 towards the cost of reprinting its updated leaflet “Geology for Wallers”. £365 was granted to the Geologists’ Association for reprinting its “Geology of London Guide”. Elizabeth Devon’s “Box Rock Circus” project was granted £336 towards setting up a series of fossil rubbings in the Rock Circus.

Norfolk Geological Site Records Online was offered £1000 towards support for updating its geological records on completion of the project. An application from the Philpot Museum in Lyme Regis was refused and one from Herefordshire & Worcestershire Earth Heritage Trust awaits further information before a decision can be made.

Decisions were made on the outstanding applications from Cheshire East Council for support for a Geology Trail Leaflet around Tegg’s Nose Country Park - granted £1000 and from Bucks Earth Heritage Group for making safe an SSSI prior to further research work on the site - a grant of £1500 and an interest-free loan of £1500 repayable within two years were made.

At the end of the meeting, Roger Dixon presented the Chairman with a copy of the book “A Celebration of Suffolk Geology – GeoSuffolk 10th Anniversary Volume” Edited by Roger Dixon, for the GA Library. The project had received support from the Curry Fund which enabled sixty copies to be distributed free to local schools. Producing this volume was a mammoth undertaking with some forty authors celebrating many aspects of Suffolk Geology, culminating in a weekend of geology in Suffolk in May, to celebrate its launch.

Our next meeting will be in September and we look forward to receiving your applications.

Susan Brown
Curry Fund Secretary.

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Susan Brown
Curry Fund Secretary.
**October Meeting**

Outcrops to Paintbox; mineral pigments in artists’ paints  
Dr Ruth Siddall  
University College London

Friday October 5 2012  
Geological Society,  
Burlington House,  
Piccadilly, W1V 0JU  
6.00 pm, tea at 5.30 pm.

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**OCTOBER 13 - 14**  
Conference and Field Trips  
Exeter  
Geologists’ Association Annual Meeting

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**NOVEMBER 9**  
Local Groups Meeting

**NOVEMBER 10**  
FESTIVAL OF GEOLOGY:  
Local Group exhibitions/displays, Rock and Fossil stalls  
Lectures, Discovery Room, etc., etc - see back cover

**NOVEMBER 11**  
Field Trips - see poster on back cover

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**December Meeting**

The Paleocene-Eocene Thermal Maximum: rapid global warming and its impact on the biosphere  
Dr. Phil Jardine  
Birmingham University

Friday December 7 2012  
Geological Society,  
Burlington House,  
Piccadilly, W1V 0JU  
at 6.00 pm, tea at 5.30 pm.

The Paleocene-Eocene Thermal Maximum (PETM) was an interval of rapid, transient global warming that occurred approximately 56 million years ago. It was associated with a similarly rapid injection of greenhouse gases (methane and/or carbon dioxide) into the atmosphere, which acted to increase global temperatures by more than 5 °C in just a few thousand years. The PETM therefore provides an indispensable analogue for understanding the likely environmental and biotic impacts of projected anthropogenic carbon emissions.

The impacts of the PETM on the biosphere were varied. In the oceans, planktonic microorganisms experienced extinction, diversification and global scale biogeographic reorganizations. Sea floor dwelling (benthic) forms suffered a major extinction event. On land, primates and ungulates diversified and spread from Asia into Europe and North America. Dwarfing in some mammal lineages also occurred during the PETM interval, and trace fossil evidence suggests that insects reduced in size at this time as well. Plants also responded to the PETM in a range of ways, with increased tropical diversification and poleward migration, and some limited extinction. Intensive study of the PETM event has therefore highlighted the complex relationship between climatic and biotic change, and the challenge of predicting climate-driven migration, extinction, and diversification successfully.
GA Festival of Geology 2012

Make a weekend of it by extending the GA Festival to Sunday 11 November by joining one or more of the 3 Trips

Non-GA Members and Beginners welcome

1. London Building Stones Walk
   Led by Eric Robinson
   Eric will take advantage of the newly-designed Green Park Station to begin his Building Stone Walk along Piccadilly to Hyde Park Corner where there is a great variety of building stones to examine. For those of you who have not yet seen the station, it is a masterpiece and for those of you who have, come and learn about the details from Eric.
   Meet at 10.30 at the south (Green Park) entrance to Green Park Underground Station. The walk will last around 1 ½ hours.

2. Crystal Palace Monsters (plus geology)
   Led by Joe Cain, UCL historian of science
   Two hour walk around Crystal Palace Park, focusing on Benjamin Waterhouse Hawkins’ life-sized 1854 sculptures of prehistoric 'monsters' and the accompanying “Geological Illustrations”. You’ve seen photographs, but nothing compares with seeing these famous pieces in situ. Tour also includes some history of the park and gardens.
   Meet at 2 pm at Crystal Palace Railway Station regular trains from London Victoria and London Bridge stations (approximately 30 minutes). Also regular overground trains via the Islington-New Cross Gate line. The excursion will finish by 4 pm.
   For those who cannot decide whether to go on Eric's or Joe's walk, we hope there will be sufficient time between the walks to allow you to do both.

3. The Geology of Ramsgate’s Harbour
   Led by Geoff Downer
   The purpose of this excursion is to add a new dimension to a geology fieldtrip and to explore how the natural environment has influenced the development of a maritime town. We shall consider why the port of Ramsgate is situated where it is, what factors led to its rapid growth in the eighteenth and nineteenth centuries and how the coastal geomorphology has influenced the design of the harbour. We shall follow the development of the harbour site, considering aspects such as sedimentation processes, construction materials and engineering challenges, as well as the role the harbour has played in Ramsgate’s history.
   Meet at 11 am on the Royal Esplanade, Ramsgate. The excursion will finish at about 4pm

For further details and to register for any of the above trips please contact
fieldtrips@geologistsassociation.org.uk or telephone 020 7434 9298

There is a charge of £5 per person per trip
GA Festival of Geology 2012
A running theme in David Bridgland’s second Presidential Address was that terrestrial deposits of gravel, and gravel in particular, are perceived to be rather dull. At every opportunity, however, he attempted to persuade his audience otherwise, pointing out in his preamble that those most glamorous of all geological finds, dinosaur fossils, are largely found in such contexts. For him, working in the Quaternary, the equivalent finds would be exciting extinct animals like woolly rhinoceroses and mammoths. He also illustrated a model of an extinct giant wombat, in the visitors’ centre at Lake Mungo, New South Wales, Australia, the shallow, now dry lake there having formed by deflation of a meander core. Perhaps the most exciting thing to come from local gravels, as he showed, is the Swanscombe skull, from the Boyn Hill Terrace of the Thames in North Kent, the site now being a National Nature Reserve.

He then turned to the examples of deposits from more exotic rivers, illustrating the huge scale of the cross bedding in the gravels of the River Euphrates, in Turkey, and the calcareously cemented gravels and finer-grained alluvium of the River Orontes in Syria. He described how studies of these rivers have revealed much about uplift and subsidence on local (related to active faults) and regional scales during the Pliocene–Quaternary. He went on to illustrate Palaeolithic artefacts in situ in deposits of the Orontes and to discuss how the collections of similar finds from English gravels had inspired a succession of recent projects in which the geology was researched in order to provide a better understanding of the archaeology. Such projects on the Trent and the Fenland rivers have improved our understanding of the evolution of these systems, the Trent having once been the main river to flow into the North Sea via the Wash. All, as he stated in what became another running theme, worked out of gravel!

There followed an exposition on what can be learned from the study of gravel deposits, in terms of palaeo-flow directions, information about past environments and changes in these, and alterations to drainage patterns. There were illustrations of cross bedded and imbricated gravels, both of which can be measured to indicate flow directions, and of ice-wedge pseudomorphs in quarry sections, clear indicators of former tundra conditions. There was even an example of patterned ground showing up on the top of an ancient Thames gravel in Essex, exhumed by quarrying from beneath the Anglian till (i.e. from beneath boulder clay about 450,000 years old). The best evidence for palaeo-environments and climate comes, where present, from fossils of various types; further illustrations of these included a tiny, humble snail (Pupilla muscorum) which is highly characteristic of cold-climate assemblages.

The President now turned to his real passion: the study of the stones in the gravels. He showed how angularity–roundness categories designed for sand grains can be adapted for use with flint gravel clasts, the analyses being confined to the flint because it is best to compare like with like and flint, which is ubiquitous in gravels in southern Britain, has probably the greatest resistance to rounding of all the rocks encountered. A case study was detailed from near the northern limit of flint dominance, one that reminded the audience that gravel also occurs on beaches. This was from the Kirmington SSSI just south of the Humber, where adjacent quarries had revealed gravels that were interpreted differently: as a beach and glacial outwash deposits, although this had been controversial, some workers thinking they all represented a single shoreline gravel body. The President had applied angularity–roundness analyses to the two gravels and at first sight they did indeed look different. The beach gravel was quite well rounded and he was happy to endorse the earlier interpretation. The supposed glacial gravel, in contrast, was dominated by very angular material. In flint, however, this category implies very freshly broken material, often by frost (freeze–thaw). It had been noted that many of the flints in this gravel were indeed frost shattered, with the pieces remaining side by side in the exposure. When the very angular category was removed from the analysis the two gravels, as shown in histograms, had similar distributions of the other categories, leading to the conclusion that they were one and the same gravel, of beach origin, but that in one of the quarries they had been greatly affected by frost.

Finally the lecture turned to the study of gravel provenance, undertaken by identification of the component clasts. Here the President acknowledged contributions over the years in the Proceedings, including the mid 20th Century work of the Weald Research Committee and, closer to his own field, by the recently deceased Cambridge geologist Richard Hey. Hey had pioneered ‘counting the stones’ in Pleistocene gravels and had thereby recognized the products of the Thames in East Anglia. Like the President, he had also been interested in cherts, which, being largely indestructible, form the most exotic components in many gravels. The audience was treated to photomicrographs at various scales, as well as drawing from the Proceedings, of various types of chert, including crinoidal varieties from the Carboniferous and Rhabaxia (spongicule) chert from the Oxfordian in Yorkshire, the latter an important indicator of glacial transport when found in gravels further south. There were also images of cherts with rhombs and others with ooliths, as well as exotic like tourmalinized quartzite (with pleochroic schorl). The President mused that at least one of these through-the-microscope images had made its way onto a floor covering, as confirmed by a member of the audience in the discussion.
This brave speaker admitted to being a molecular biologist by training who has only recently turned her attention to geology, having taken on a PhD at Bristol, co-supervised by former GA President Mike Benton. She also admitted that her research is undertaken almost entirely on a computer (in fact she uses the ‘Blue Crystal’ supercomputer at Bristol). The objective of her work is to use differences in the DNA of living species to gauge the time elapsed since these species diverged from their relatives: the ‘molecular clock’. Rachel’s aim is to compare the evidence from the palaeontological record (e.g. from first appearances) with indications from the ‘molecular clock’. A particular intention is to use the ‘molecular clock’ to make up for shortcomings in the fossil record, such as intervals of non-preservation. Nonetheless, the palaeontological record has been used to calibrate the ‘molecular clock’, having first sought to accommodate various aspects of preservational bias and other confounding factors.

Although agreement has generally been good, Rachel noted that there are quite common instances where the ‘molecular clock’ indicates an earlier species divergence than can be verified from fossils. An example given was turtles, the earliest palaeontological record of which is Triassic, yet which might, depending on how the ‘molecular clock’ is calibrated, have originated in the Permian. This raises the interesting possibility that the earliest turtles were around before the great end-Permian mass extinction, expanding greatly in the depleted ecosystems that prevailed after the vast majority of pre-existing species had disappeared.

There followed an enthusiastic grilling by the audience, covering such topics as whether palaeontology was superior to the molecular evidence (the tactful answer seemed to be that they complement each other) and the difficulty in extending the ‘molecular clock’ back into the Precambrian, with so little in the way of a fragmentary palaeontological record to use for calibration.

David Bridgland
"There's no geology in Suffolk" and "Suffolk geology? It's only gardening!" have been familiar taunts for as long as I can remember. There have been Geological Surveys and other memoirs but nothing covering the county as a whole. Indeed, the only previous work covering the geology of the county was a series of five papers entitled "A Contribution to Suffolk Geology" by Harold Spencer. These were published after he had retired from the Ipswich Museum, in the Transactions of the Suffolk Naturalists’ Society between 1967 and 1972, and later collated (1979) to form a single volume. However pre-Crag deposits were only cursorily discussed.

GeoSuffolk’s new book, “A Celebration of Suffolk Geology”, marking the tenth anniversary of the Earth science group, goes some way to filling that gap. The book was launched on Saturday 12 May 2012, with 53 people attending the event, at the Reg Driver Centre in Ipswich, with most of the authors and sponsors present. Following introductory speeches by Bob Markham and me, the project editor, the book was ‘launched’ by Lord Cranbrook, the first Chairman of English Nature. After a glass of bubbly and lunch Bob led a geological walk around Christchurch Park. To commemorate the event, Prof. Rory Mortimore, in his first official role as GA President, planted a fine specimen of Fitzroya cupressoides, named after Vice Admiral Robert FitzRoy, who was the Captain of the Beagle and a Suffolk man! In thanks, Rory was presented with a Chalk core specimen from the Project Orwell Storm Relief Tunnel, an engineering project with which he was involved during the 1990s. The tour ended at Christchurch Mansion, where guests dispersed to enjoy the exhibits. The following day saw 24 of the participants meet for a field excursion to examine the geology of GeoSuffolk’s flagship site, Sutton Knoll. The weather was beautiful (for a change), and the two day event ended with an excellent ‘roast’ lunch at The Sutton Plough.

The GeoSuffolk volume is believed to be unique of its type in Great Britain. It does not purport to be ‘a geology of Suffolk’. Rather, it aims to provide a flavour of what Suffolk geology and geomorphology have to offer. Recognising that there is a need to attract the non-scientist and non-geologist in an attempt to broaden the appeal of Earth science, the aim was to appeal not only to the serious academic but, in true GA spirit, the well-informed amateur and non-specialist. Therefore, the papers are something of an eclectic mix with a variety of articles, ranging from academic, reviews and new research to historical, educational, personal commentaries and reminiscences – something, it is hoped, for everyone.

The book opens with introductory essays on the general geological background, landscape and, above all, the human experience, response and fascination with geology. This is followed by papers on aspects of the stratigraphy, from deep Silurian through to the Chalk, Eocene, Crags, pre-Anglian and glacial deposits, the Palaeolithic record and geomorphology. A final section comprises a diverse assortment of eight papers, on topics ranging from building stones and 3-D mapping to historical accounts and engineering geology. Details of the contents can be found using links on the GeoSuffolk’s web-site: www.geosuffolk.co.uk

The book, with 42 contributors and 38 articles, runs to nearly 500 pages, with over 350 figures, and is in full colour throughout. It is the product of two years of planning, development and writing. Generous sponsorship played a major rôle, with nearly £10,000 raised towards production costs. At least a quarter of the 600 copy print-run is being distributed free to schools, universities, libraries and museums as part of GeoSuffolk’s continuing outreach programme, and was part-funded by a generous grant from the Curry Fund of the Geologists’ Association for that purpose.

The Volume will be the focus of GeoSuffolk’s display at the GA Festival of Geology on 10th November 2012. Copies of the volume will be available for £20. Postal copies can be obtained by contacting: info@geosuffolk.co.uk (£28 to include p&p).

Roger Dixon
The Spring of 2012, being uncharitably wet, was naturally inclement for the excursion to Ketton. However the rain of earlier had eased by the time of assembly at 10.30, so the party of 21 was subjected to merely grey skies and cool temperatures instead of the customary deluge. Ketton Quarry is the finest inland site for the Middle Jurassic anywhere in the UK, with a sequence that ranges from the top of the Whitby Mudstone Formation (Toarcian) of the Lower Jurassic to possibly the base of the Oxford Clay Formation (Callovian). It is a vast quarry, very possibly first opened by the Romans, and is exploited for the limestones of the Lincolnshire Limestone Formation of Bajocian age, which are used to make cement on site. The overlying Rutland Formation clays provide the aluminium compounds for the cement making process.

After making the acquaintance of our host - Roy Dumford - we received the bad news that the mini bus promised had not materialised. Therefore our first action was to walk the mile or so to the end of the quarry which showed the best sequence. However, that was fine as it gave us a chance to get acquainted and also allowed a more leisurely appreciation of the geology as we went along. The leader had hoped to take the party to the lowest beds exposed, a sequence from the Whitby Mudstone Formation to the base of the Lincolnshire Limestone Formation that was revealed by sumps dropped in the floor of the quarry. However, in the absence of scuba gear, the deep lakes created by the unseasonable rain defeated the objective and we had to begin our examination of the beds towards the base of the Lincolnshire Limestone. The leader stressed the highly dynamic setting for the deposition of the beds in the quarry and explained how the palaeogeographic position on the shallow margins of a seaway dictated a rapid alternation of environments as sea level fluctuated.

We then made our way up the sequence and in turn examined the Lincolnshire Limestone Formation, the Rutland Formation, Blisworth Limestone and Clay, Cornbrash Formation, Kellaways Formation and finally right at the top of the quarry (in the drag of one of the faults that characterise the section at the north east end of Ketton Quarry), a metre or so of dark clays that may represent the base of the Oxford Clay Formation. For the structural geologists among us, this area of the quarry provided much diversion in the form of several significant faults which have rearranged the beds so that several are repeated, notably the Cornbrash, that here is much reduced in thickness. It was while studying the Cornbrash that one of the party discovered a very fine large specimen of the ammonite Macrocephalites.

A tip-off from our host alerted us to the presence of large numbers of fossils on a dump of stripped strata known as the ‘Blisworth dump’, and indeed it did seem as if most of the material was from that horizon. Therefore we ended the day with a search of the dump that resulted in many excellent finds.

The day closed with sincere thanks to our host Roy, and Geoff Swann expressed the Association’s appreciation to the leader. More general thanks are due to the management of Castle Cement for their courtesy and willingness to host geological parties, a rarity these days among large quarrying concerns and much to be applauded.

Andrew Swift
CIRCULAR No. 992 September 2012

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 Field Meetings. If making multiple bookings, please enclose a separate cheque for each meeting unless you have first confirmed that there are places 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 other persons that you are including in your booking. 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 collect you from the nearest railway station. This service cannot be guaranteed, but please ask before booking.

FIELD MEETINGS IN 2012

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

PLEASE ALSO REFER TO OUR WEB SITE (http://www.geologistsassociation.org.uk) FOR ANY CHANGES TO THE PROGRAMME AND FOR FINALISED DATES

HOLBROOK BAY, HARKSTEAD, SUFFOLK

Leaders: Graham Ward and Bill George Saturday 15th September 2012

The foreshore here is a wave-cut platform in the lower part of the London Clay (Harwich Formation) and yields sharks’ teeth, teleost bones and the occasional Phyllodus palate. Articulated skeletons of mammal/s/elephants have also been found in an Oxygen Isotope Stage 7 interglacial channel deposit in the foreshore. Palaeolithic artefacts have been found on the foreshore, washed out of overlying Stour terrace gravels derived from older interglacial deposits.

Equipment: Wear suitable footwear. Pack lunch. Attendees must be capable of walking on rough tracks and a muddy foreshore.

Cost & booking: Numbers will be limited to 25. 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.

THE GEOLOGY OF EARLY MIDDLESEX CHURCHES

Leader: Prof John Potter Saturday 22nd September

This a full day excursion to a range of early Middlesex churches particularly for the benefit of John’s regular attendees. The limited range of unusual building stones available for early builders in stone in the London Basin will be examined. We are hoping to arrange a coach with at least two pick up points starting in central London. This will avoid problems with large numbers of cars.

Equipment: Bring a quality lens and binoculars. Pack or pub lunch.

Cost & booking: Numbers may be limited depending on whether coach travel is possible. The attendance fee is also dependent on the final arrangements.

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 make sure 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 (07724 133290). 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 the usual number.

Travel regulations are observed. The GA acts as a retail agent for ATOL holders in respect of air flights 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.

Further details will be available from Sarah Stafford at the GA office.

Isle of Purbeck


This meeting is arranged to coincide with the publication of Prof Cope’s revised GA Dorset guide. It will begin with an introductory talk, probably in Wareham Public Library, on the Friday evening. Saturday and Sunday will be spent in the field examining the succession in the Isle of Purbeck, which ranges in age from the Upper Jurassic, through the Cretaceous and into the Palaeocene; many of the rocks are fossiliferous. The principal structure of the area is a major monoclinal fold which has caused local overturning of the succession. The area is also famous for magnificent coastal scenery and its evolution, whilst economically Purbeck is important as the site of the largest onshore oilfield in western Europe. The new guide should be available before the trip.

Equipment: Hard hats are essential but there is no requirement for high visibility jackets. Please note that the trip will be quite strenuous physically. There are steep climbs from sea-level to some 130 m

(425 ft), together with steep descents that are likely to be muddy. Beaches are often rough and traverses will involve boulder-hopping, seaweed covered rocks and soft shingle. Boots with good ankle support are strongly recommended. Good waterproof clothing may well be needed as the coast is exposed to Atlantic weather. We hope to be in the vicinity of at least one hostelry each day for lunch.

Cost & booking: Numbers will be limited to 25. Car sharing may be necessary. We will be based in Wareham which has a mainline railway station and is well equipped with hotels, pubs with accommodation and B&Bs. Please note the GA will not be arranging accommodation. If there is sufficient interest we will a group dinner on the Saturday night. Further details will be available from Sarah Stafford at the GA office. Register with Sarah sending an administration fee of £10 per person to confirm your place.

FOSSILFEST VIII
Leader: Nev Hollingworth
Sunday 28 October 2012

Our yearly popular trip.Location(s) have still to be decided but plenty of fossils can be expected. Attendees will need to be sure they can safely cope with the conditions to be found in working quarries.

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 sending an administration fee of £5 to confirm your place.

OVERSEAS TRIPS 2013

Geology of the Bordelais
(see article in this Magazine P.21)
Leader Professor Jean-Pierre Tastet, University of Bordeaux and CAP Terre, assisted by Professor Graham Evans, University of Southampton.
24 – 29 May 2013

The geology of the Bordelais will be presented with particular reference to the geological control on the sitting of the famous vineyards and the character and history of the coastal zone. The geology of the various AOC (Appellation of Controlled Origin) vineyards will be demonstrated and illustrated by wine-tastings in the various Chateaux. Also, the evidence of the evolution of the coastline during the last 6,000 years as well as the impact on man will be examined by visits to the coastal dunes systems, especially Dune de Pilat, Lac de Sanguinet, Bassin d’Arcachon, Gironde estuary and marshes. Visits to local museums will provide an opportunity to understand the history of human occupation during the Holocene.

The provisional programme is:
Arrive Bordeaux. Each participant must make their own travel arrangement to and from Bordeaux, night in Bordeaux.
1 – Geology of the Quaternary fluvial terraces, their relation with the Medoc AOC (Margaux, Saint-Éstèphe, ...), night in Soulac (or Pauillac).
2 – Girondes marshes, ocean coast, their dynamics: the coastal erosion and 6,000 years of evolution, Soulac museum, night in Bordeaux.
3 – Saint-Emilion vineyards: geology and character of the wine, medieval city (UNESCO world heritage site), underground cellars (ancient rock extractions).

Transport will be coach. The approximate maximum cost will be 700 Euros. This will include six nights hotel accommodation (extra for single occupancy), breakfasts, lunches with Bordeaux wine, only one dinner (day 1 in Soulac). A geological tour of the city of Bordeaux and its building stones will be included. A deposit of 100 Euros will be required for the booking after the exact dates forwarding to all members who express an interest.

MAJORCA: trailwalking traverse of the Serra de Tramontana
30th April – 11th May 2013

This is different from the usual run of GA overseas trips. It will be a group of 8 members plus two leaders who will make a coast to coast traverse of the island along the strike of the limestone mountains making up the Serra. The principal leader will be Tony Brook who writes: "The island of Majorca is the largest of the Balearics, in the western basin of the Mediterranean. Its northwestern flank consists of a broken range of limestone mountains known as the Serra de Tramontana, which are the summit ridges of the submerged northeastern continuation of the Sub-betic Cordilleras of Southern Spain. The Serra consist of a disjunctive series of Jurassic Limestone blocks, which have been pushed up and along northwest thrust planes, to create limestone escarpments and coastal cliffs, with the intervening valleys and basins preserving older deposits, and also showing karstic features. The recently-constructed trail through the mountains, known by its European designation as GR221, and locally as ‘The Drystone Route’, links up ancient paths, tracks and trails through the Serra as it winds its way from coast to coast, producing, in the process, a linear geological traverse and trailwalking expedition across this Mediterranean island".

Accommodation will be half-board in a combination of mountain ‘refugis’ and resort hotels. Participants should be fit and experienced, and capable of carrying a laden rucksack for reasonable distances each day (on one day, 22 km). For eager field geologists, this reconnaissance expedition will be a memorable experience. The cost, excluding travel to and from Majorca and personal daily expenses, will be £560. Would interested members please email Tony Brook: anthony.brook27@btinternet.com by 30 November.

PERU
Spring 2013 (April-May)
(with add-ons to Easter Island or Galapagos possible)
Organised by Professor Dick Moody (rtj.moody@virgin.net)
Provisional Itinerary:
Day 1. LHR-Lima via Madrid Day 2. Tour of Lima and museums
Days 3-4. Geology of Lima Area: Day 6. Lima to Ica (Oasis and Fossils)
Day 15. Cusco-Puno on train. Day 16. Lake Titicaca
Day 17. Local geology of Puno Area.
Day 18. Puno to Arequipa
Day 19-20. Colca Valley (Condors )
Day 21. Arequipa to Lima to UK. (or onto Easter Island or Galapagos)
Estimated cost: £3200 double room occupation.
Contact Richard if interested.
rtj.moody@virgin.net

INDIA 2013
India 2013
Leader Dr Michael Oates
January/early February 2013

Preparations are in hand for a Field Meeting in India in late. The leader will be Dr Mick Oates, assisted by Indian geologists expert in particular areas. It is planned to fly from London to Mumbai, and then to examine the geology and cultural attractions of NW India, basing ourselves at various places, probably including Jaisalmer, Jodhpur and Kutch. There will be good opportunities for fossil and mineral collecting.

Travel in India will be by air-conditioned coach and domestic airlines. Hotels are very comfortable and will probably include some former palaces of local rulers. Costs are still being calculated, but are expected to be in the region of £2500 per person.
If interested in possibly joining this trip, please advise Sarah at the GA Office.

**GEOLGISTS‘ ASSOCIATION**
**LOCAL GROUPS (LG) AND AFFILIATED SOCIETIES**

**Amateur Geological Society**
- September 11 Members evening
- October 9 Tyrannosaurus Rex – Dr Chris Duffin
- November 13 Frank Stokes Memorial Lecture – Hertfordshire Puddingstone – June Tubb
- November 24 AG Mineral and Fossil Bazaar 10.15 - 3.30 pm at St Mary's Church hall Finchley.
- Contact Julia Daniels 020 8346 1056.
- Field trips: john.wong@hertscc.gov.uk

**Bath Geological Society**
www.bathgeolsoc.org.uk

**Belfast Geologists‘ Society**
Contact Email:peter.millard@nireland.com

**Black Country Geological Society**
For information contact Barbara Russell 01902 650168. www.bcgs.info

**Brighton & Hove Geological Society**
Contact John Cooper 01273 292780 email: john.cooper@brighton-hove.gov.uk

**Bristol Naturalists‘ Society**
Contact 0117 474086 Email: simonccarpenter@yahoo.com

**Cambridgeshire Geology Club (LG)**
- Contact – Ken Rolfe on 01480 496973, mobile 07777 678685.
- www.cambridgeshiregeologyclub.org.uk

**Carn Brea Mining Society**
Contact Lincoln James 01326 311420 Further details www.carnbreaminingsoociety.co.uk

**Cheltenham Mineral and Geological Society**
For more information on lectures contact Anne Kent 01452 610375 For more information on Field trips contact Kath Vickers 01453 827007.

**Craven & Pendle Geological Society**
For more details on the activities of the
Cumberland Geological Society www.cumberland-geol-soc.org.uk

**Cymdeithas Daeaereg Gogledd Cymru:**
Ann Kent 01452 610375 Email: jeansippy@btopenworld.com

**Devonshire Association (Geology Section)**
Contact Jenny Bennett 01647 24033 email J.A.Bennett@exeter.ac.uk

**Farnham Geological Society (LG)**
Contact Jonathan Wilkins 01492 583055 Email Wilkins@ampyx.org.uk www.ampyx.org.uk/cdgc

**Geological Society of Cymru – South Wales Group (LG)**
September 15 Field meeting: Forest of Dean – Tom Cotterell.
October 20 Field meeting: Amroth – Marros Sands, Carmarthenshire – Geraint Owen.
Contact Lynda Garfield at secretary@swgs.org.uk

**Geological Society of Norfolk**
Contact Email: Dr David Waterhouse at david.waterhouse@norfolk.gov.uk www.norfolkgeology.co.uk

**Harrow & Hillingdon Geological Soc.(LG)**
September 12 Mountains in the Sea – Prof Tony Watts.
October 10 How comets threaten satellites – Anton Kearsley.
November 14 CAT scan of an active volcano: three dimensional seismic tomography at Montserrat – Dr Michele Paulatt.
December 12 The Big Bang and the Expanding Universe – Graham Marriott. Email: jeansippy@stopenworld.com Field trip information Allan Wheeler 01344 455451. www.hhgs.org.uk

**Hastings and District Geological Society**
Contact email: iggyken@sol.com www.hastingseosoc.btk.com

**Hertfordshire Geological Society**
September 6 Making mountains: a view from the Eastern Himalaya – Dr Tom Angles.
September 20-23 Field trip to the Yorkshire Dales – Clive Maton.
October 4 Forensic geology – Dr Jane Evans.
November 1-8 Gemstones – Dr Sally Oldershaw.
December 6 Meteorites – Dr Hilary Downs.

**Horsham Geological Field Club**
September 12 Bluebell Railway: reaching East Grinstead – David Barry of DLB Environmental.
October 10 Impact cratering and Ejecta deposits – Dr Kieren Howard.
November 14 The Geology and Scenery of the Isle of Mull – Lesley Collins.
December 8 Christmas Party.
Contact Mrs Gill Woodhatch 01403 250371 www.hhfc.club.officeive.com

**Hull Geological Society**
Contact Mike Horne 01482 346784 Email:mike@horne28.freeserve.co.uk www.hullgeolsoc.org.uk

**The Jurassic Coast**

**Kent Geologists Group of the Geologists‘ Association (LG)**
September 18 Captain Scott, Glossopteris, and the Beacon Sandstone – Nick Baker.
October 16 What is this thing called Quantum Theory – Dr Chris Woolston.
November 20 Reconstructing Holocene Climates – Dr Angela Self.
December 18 Christmas evening.
Contact Outdoor Secretary Mrs Ann Barrett tel: 01253 623126 email: annbarrett@tesco.net

**Kent Geologists‘ Society (Alumni of Queen Mary College) (LG)**
October AGM and Alumni day at QMC.
Contact Mike Howgate 020 8882 2606 or.

**Magazine of the Geologists‘ Association Vol. 11, No. 3, 2012**
What has Rory done with the Chalk?
Saturday 14 and Sunday 15 April 2012
The Sussex coast weekend
Led by Professor Rory Mortimore

The weekend started when we met at Hope Gap car park near Seaford and walked down Hope Bottom to the beach, which consisted of an extensive wave-cut platform. This, as Rory pointed out, is an excellent place to collect fossils. Echinoids (Micraster and Echinocorys) peppered the Chalk on the shore, often seen as ‘D’ shaped sections on the surface of the rock. Less commonly, beautiful flint casts were to be found among the pebbles.

The wave-cut platform was within the Hope Gap Beds, approximately mid-section in the Lewes Nodular Chalk Formation. It weathers into a recognisable and characteristic, egg box-like structure.

Time-wise, this is at the base of the Coniacian stage and about 88 Ma, one third the way into the Upper Cretaceous. This isn’t quite archetypal Chalk, being hard and white with flint bands, but it’s fairly close. We would have to wait until the afternoon to see ‘classic’ Chalk in the younger beds making up the brazen face of Haven Brow, the first of the Seven Sisters.

Chalk is a type of limestone and, as such, is predominantly composed of calcium carbonate, in this case formed mostly from the microscopic shells of marine, planktonic calcareous algae (coccoliths), which are held relatively loosely together. Flint and marl seams punctuate the successions and are often used as markers to delineate the beds and formations, with the latter being more a feature of the earlier formations and the former of the later Chalk formations, though not exclusively.

At the time when the Chalk was being laid down, this part of what is now the UK was submerged beneath about 300m of shelf sea, at a comparable latitude to the Mediterranean. The Tethys Ocean, at equatorial latitude, was far to the south and temperatures were substantially hotter than the Mediterranean is today, due to there being much more CO₂ in the atmosphere. The sea level was substantially higher than it is today and this was a world probably devoid of polar icecaps. And land was far away, which we know from the fact that the Chalk at this location doesn’t contain sand and silt washed off nearby landmasses.

At first glance, it’s easy to see why Chalk was once dismissed as featureless and boring. However, with the help of Rory, who has focused his enormous energy and enthusiasm over many years on this rock, the group was quickly able to look beyond this blank sheet, and start to distinguish features in the Chalk, some of which described major events in the earth’s history. At a distance from the cliff, the most obvious feature was the repeating, half metre high, units of Chalk and flints. Rory though was cautious and wouldn’t speculate on the time that it had taken for these units to be deposited. Was it 40 to 50 ka? “No, we couldn’t be sure” as sedimentation could have stopped or the surface could have been eroded as these units were laid down. Some of the group were hoping for a bold declaration that this was evidence of a Milankovich Cycle, but it is clear that more work is needed.

Walking closer to the cliff, Rory pointed out a bed near the base that was rough to touch with clearly visible networks of veins permeating it.

Vein-like structures in the Chalk caused by pore-fluid escaping.

It is easy to pass by or see as a meaningless curiosity, but Rory recognised it as important, from his Antarctic Survey days. Working on turbidite successions with sedimentary dykes and slump beds, he realised that this is unmistakable evidence that this bed had been subjected to a very violent event in its past. The veins were pore-fluid escape structures. More importantly though, this event must have occurred shortly after the sediment was laid down, when the rock was still relatively un compressed and able to allow its fabric to be substantially restructured. Further evidence recording this event was seen in an adjacent layer of flints, which showed re-healed fracture lines. The still-forming flint had been sheared by the ground movement with the shear then becoming knitted together. What makes this significant is that, for many years, the received wisdom was that there were no tectonic events during the Cretaceous in this area. In reality, much was happening tectonically when the Lewes Nodular Chalk was being deposited - Africa was rotating into Europe and the North Atlantic was opening - and the area was undergoing faulting, uplift and folding (the ‘Subhercynian’ period of tectonism).

By good fortune, the tide was out, allowing us to walk westwards towards Seaford Head. The magnificent sea cliff rising near Hope Gap exposes a vertical section through the northern limb of the Seaford anticline (the crest and the southern limb have long since been lost to the sea). The violent events, which resulted in the disturbed bed and shattered flint, may have been the result of the beds sliding as they were tilted during the formation of the Seaford anticline.

We retraced our steps along the beach eastwards towards the Cuckmere Valley, where Rory pointed out some giant calcrete boulders that appeared as if they had been hurled onto the beach. It would have been easy to have mistaken them for blocks of karst paving ripped from a Yorkshire moor, but they were originally soft Chalk. Rory commented that you needed to know about these layers if involved in engineering projects. They might only be a couple of metres thick, but boring or drilling equipment meeting this layer would come to an abrupt halt. In the cliffs above the beach, the light-brown, wind-blown calcareous loess, several metres thick, could be seen resting on an eroded...
chalk surface (possibly a river terrace, part of the ancient Cuckmere valley). Water percolating though the loess deposit dissolved some of the calcium in it, which combined with the soft Chalk layer below, transforming it into the dense, extremely hard limestone we saw on the beach and in the cliff.

A little further on, Rory pointed out raised mounds on the beach with a shaft in their centre. Once thought to be Roman wells, these curious structures on the beach had a far more ancient and interesting origin. Acidified water has dissolved chalk down vertical pipes to produce the ‘wells’ in the Chalk surface (then tens of metres above), stopping only when the water reached an impervious layer of sheet flints. Cliff-retreat has stripped-back tens of metres of Chalk above and now only the base of the ‘well’ remains. Like the calcite layer beneath the loess described above, the walls of the ‘well’ became calcified and hardened. In the cliff behind, cross-sections of these dissolution pipes (sediment-filled swallow holes) were highlighted by their fill of darker loess sediment.

Cuckmere Valley was cut by the River Cuckmere, now canalised but once displaying the classic serpentine shape of a lazily meandering mature river. However, as with perhaps all features in the Chalk, its position is no coincidence. The river has eroded a deeper structure - the Cuckmere Haven Fault - which is still active and responsible for earthquakes, albeit very minor ones.

We then spent an hour getting to Exceat, before walking back to the beach on the eastern side, which is the first of the Seven Sisters - Haven Brow.

The Seven Sisters. The nearest is Haven Brow. Haven Brow cliff.

Looking up at the shear face of Haven Brow, Rory divided it into three sections based on their brittle fracturing styles. The base of the cliff - the Belle Tout Beds - displayed conjugate fractures, which formed several distinctive features - huge buttresses jutting onto the beach, angled cracks, some in-filled with sheet flint bands and some slickensided faults. By contrast, the middle section of the cliff had noticeably different vertical joints, which, end on, resembled volumes stacked in an enormous bookcase. Near the top of the cliff, there were once again conjugate joints, noticeable as ‘V’ sections weathered into the Chalk.

The Beds at Haven Brow are particularly useful for Rory at the moment, as most of the large London tunnel constructions are through Seaford Chalk and this is almost completely displayed in this section. A number of flint bands were prominent in the cliff and Rory told us that these could be traced for huge distances across Europe. Not only did this make them important stratigraphical markers, it also indicated that, at the time they were formed, a geographically large scale event had occurred creating the conditions conducive to flint formation.

Sunday’s exploration of Sussex coast Chalk began on the west side of Castle Hill, Newhaven showing Culver Chalk unconformably overlain by early Palaeogene deposits.

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the mouth of the River Ouse at Newhaven, under the cliff at Castle Hill. This site is where successive generations of forts have been built since Roman times to guard the strategic spot. And the name 'Castle Hill' is immortalised in stratigraphical markers - Castle Hill Flints and Castle Hill Marls. The Castle Hill flint band is traceable over 1,000s of kilometres and it retains its character throughout. We were now looking at the Culver Chalk, which were deposits from Early Campanian, about 82 Ma.

As a brief interval in our Chalk exploration, Rory led us up Castle Hill to the basal Palaeogene beds, about 55 Ma, sitting unconformably on top of the Chalk. About 25 Ma of deposits (assuming they were laid down at all) appear to have been lost to erosion. The Palaeogene deposits at Newhaven started with sediments laid down in a warm, shallow, marine environment changing to a river environment.

Lignite is common in the succession, which is important to know, as it is radioactive and of concern when building in the area.

Moving back to the Chalk, Rory explained that interwoven thin seams of marl were a characteristic of the Newhaven Chalk and that this pattern was not the result of the sediment being altered after it was laid down (for example, by pressure dissolution as others had suggested). Rather, it was a feature of the Chalk as it was laid down. How was Rory sure of this? The clayey parts of the marl seams had been burrowed by organisms such as calianassid shrimps to create the trace fossil *Thalassinoides* and other small branching trace fossils (for example, *Chondrites*) after they had been deposited. These marl seams are markers of events, which resulted in substantial changes in the life of the Chalk sea. Indeed, all fossils, ranging in size from those at the nanno scale to the micro through to macro sized fossils, are noticeably different above and below this seam.

Some marl seams are very widespread across the European platform, traceable over huge distances to Germany and Poland. One marl seam in this part of the Newhaven Chalk Formation - the Old Nore Marl - has been shown to have a Europium anomaly and this has been recorded as far as Kazakhstan. It is a record in the Chalk of a volcanic event that covered an enormous area of the earth’s surface and one that was sustained over a long period of time. Indeed, the great number of marl seams could indicate many such episodes.

Below the Old Nore Marl horizon, we hunted for giant *Parapuzosia* ammonite fossils. They were not easy to find initially, as they were heavily weathered, but once someone found one sightings rolled in thick and fast.

We then headed back to the cars and on to the fourth destination of our Chalk weekend, Priars Bay at Peacehaven, about a couple of miles to the west. 188 steps have been set into the vertical face of the cliff, providing a magnificent way to examine the Early Campanian Chalk (Tarrant Member of the Culver Chalk at the top down to the mid Newhaven Chalk at the bottom). As we descended, we were revisiting familiar horizons - the ones we’d seen at Newhaven in the morning. In particular (and with a lot of help from Rory), we spotted the Castle Hill Flint bands near the top and the Old Nore Marl near the bottom.

On the way back up, we re-examined the levels in much more detail, although I think some of this enthusiasm was motivated by need to gain respite from the seemingly interminable steps.

We completed our look at the Chalk with a visit to the low cliffs at Saltdean beach, where the Chalk is 'in a state of ruin' as Gideon Mantell may have aptly described it. The Early Campanian, Newhaven Chalk, had been subjected to cyclical thermal, freeze-thaw activity during the Quaternary, resulting in a castellated appearance (involutions) of the topmost part of the cliff.

So, what has Rory done with the Chalk? Through his years of investigation, he has caused a paradigm shift in our understanding and appreciation of this important rock and 30myrs of earth’s history. As a result of his painstaking re-examination of the Chalk, we now have a much greater insight into the tectonics, volcanism and ecology of the Upper Cretaceous and how this fits into the global picture.

Many thanks Rory for a superb weekend.

Grahame Mayo

Have you entered the Festival Photographic Competition?
Details/forms from GS Office
Nominations needed for Halstead Medal

for work of outstanding merit, deemed to further the objectives of
the Association and to promote geology.

Open to Members and non-Members.

Nominations needed by 30 November 2012
for presentation at the AGM in May 2013

Please email your nominations to the General Secretary:
awards@geologistsassociation.org.uk
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Curating James Bateman’s Geology Collection

James Bateman (1811-1897) was a horticulturalist and landowner, famous among the scientific community for his work on orchids. From 1840-1871, Bateman and his family lived at Biddulph Grange in Staffordshire, where he created spectacular gardens to display his collection of plants and reflect, as he saw it, God’s design for nature. The geological gallery, at what was originally the entrance to the garden, was designed around the seven days of creation, and presents a unique display of the non-evolutionary views of one of Darwin’s contemporaries at a time of major scientific development and changing ideas.

The face of the gallery, which at one time must have presented an impressive display of large and unusual fossils, shows the impact of changing functions and neglect over the years. Most of the specimens have been removed from the wall and it is thought that many have been lost. ‘Surviving’ specimens from the frieze and other remains of Bateman’s geology collection at Biddulph Grange are now kept in storage, mostly in a large antique wooden chest of drawers.

The collection was assessed by Vicky Tunstall in 2010, my predecessor in the West Midlands Regional Geology Stewardship project, which is funded by the Esmée Fairbairn Foundation. The collection was found to be in a relatively good condition. However it was deteriorating due to the current method of storage, as most of the collection was loose in the wooden drawers, gathering dust and in danger of bruising or breakage.

When I visited Biddulph Grange in March 2012 as the new project officer for regional geology, I found the fossils in a similar state. Thanks to a grant from the Geologist’s Association Curry Fund, I was able to provide materials and equipment for stabilising the collection. Helen Wilshaw, the collections manager at Biddulph Grange, is keen to promote the collection through temporary displays and geology-related events. I offered to spend the day training staff and working on the collection, identifying good display specimens and cleaning off the worst of the dust.

In May 2012, Helen and I went through all the drawers in the specimen cabinet in turn, taking out the specimens and lining each drawer with a layer of Plastazote. We cleaned the specimens using soft, natural bristle brushes. In some cases, even this small conservation step made a huge difference as more clearly defined plant and animal fossils began to emerge from the rock. We then rearranged the specimens in the drawers according to the specimen type and the size of the objects, putting delicate or unstable specimens in lidded archival white card trays, and cushioning each of the objects with acid-free tissue. Minerals were placed in polyethylene sealable bags to protect them from dust and other contaminants.

Larger specimens such as a section of limestone with fossil fish, a ripple slab and a fossilized turtle were dusted off and moved onto shelves with better support with a cover of clear plastic sheeting. It is incredible to think that these specimens were once cemented into the wall of the geological gallery and admired by Victorian naturalists and other visitors to the gardens.

The gardens are now owned by The National Trust, who for the last 20 years has been working to conserve and restore the garden in line with Bateman’s vision. Restoring the gallery is currently a long term goal for the Trust, with the focus now being on stabilising the structure of the gallery buildings and conserving the remaining specimens in storage. By using the impressive fossils in the collection for small displays and events at the garden over the next few years, it is hoped that geology will remain a central aspect of Bateman’s legacy at Biddulph Grange, inspiring visitors, volunteers and staff, and connecting natural displays in the garden with the history and development of ideas in the nineteenth century.

Holly Sievwright, Assistant Collections Officer (Regional Geology)
The Potteries Museum & Art Gallery
As budding geologists, our young Rockwatch members and others who, though not members, seem keen to support our public activities, are not put off by a drop, or even non-stop torrents of rain, such as we experienced in Cheshire recently! In early June, no less, we joined Manchester Geological Association and others for a day of public activities for all the family, as a tribute Fred Broadhurst, long standing GA Member. The rain did not stop all day; it was atrocious! The event was held at the Park Heritage Centre, Park Bridge, Ashton under Lyne and lots and lots of families braved the elements for a family fun day. They had a wonderful time making Jurassic dioramas, wax fossil rubbings, fossil replicas, exploring a replica coal mine, making clay dinosaurs, hunting for fossils buried in sand and many other geo-activities, keeping families busy all day. I’m delighted that we had Rockwatch families helping at this event and to whom we are most grateful. Fred was a local geologist and, after his retirement from Manchester University, he put all his energies into encouraging adults and children to enjoy and learn about the world around them, something he’d been doing for much of his life. There are many people who owe Fred a great debt for introducing them to the joys of geology, from explaining complex field problems to exploring the building stones of Manchester. Amongst other activities at this event visitors were excited to crawl through part of model coal mine tunnel made by (retired) local miner Gary Brain and funded by the Curry Fund.

A serious blip in the weather for our visit to Torr Quarry in Somerset in late May, meant that sunburn was a real possibility, but fortunately everyone was well prepared with sunscreen and sun hats. Torr Quarry, the largest in southern England, is mainly worked for its Lower Carboniferous Limestone (Blackrock Limestone). Thanks to its rain-link, it has supplied much of the limestone for the London Olympic project. It was supplied and used as aggregate for construction, so will have essentially been used on most areas of the Olympic site and you’ll be some of the few to know that! Eddie Bailey who led the trip, explained something of the structural geology of the region to set the context for what we could see at the site. We spent time here exploring the Jurassic limestones which lay unconformably above the Carboniferous limestones and the children (and their parents) found lots of fossils including some super brachiopods and bivalves. After a picnic lunch, we visited the now dormant Coleman's Quarry, where this famous Carboniferous Jurassic unconformity is also clearly visible. It was in nearby Vallis Vale that Henry de la Beche, the first Director of the British Geological Survey, appointed in 1835, first realised that this now classic site showed a time gap of some 180 million years. The children were astonished to learn that they were actually walking on an ancient Jurassic sea bed as they walked through the quarry! The quarry floor clearly showed evidence of marine life from those far-off times with abundant mollusc marks and a variety of fossils. Not far from this ancient sea floor there were magnificent crystals of zoned calcite which children and parents collected finding some superb trophy samples to take home.

The inclement weather required some modification of the itinerary for our annual weekend visit to Wales! Steve Howe and John Davies ensured that we had a splendid weekend and everyone enjoyed it hugely. Our first day was spent mostly around Foel Penderyn, just north of the Head of the Valleys Road. The open upland area of Foel Penderyn, cut by small quarries in the Carboniferous Limestone and Millstone Grit was excellent walking country and we spent some time here looking for fossils and discussing the local geology. Some fossils were found, but they are uncommon in these limestones, so they may be of help here in dating the rocks. After a picnic lunch we walked to Scwd yr Eira waterfall, and this is where the recent rains left their mark, with some very boggy areas to negotiate, more like small streams! The children loved the steep descent down to the waterfall far more than I did and barely noticed the equally steep ascent, unlike me! Scwd yr Eira is famous for the path that runs behind the waterfall allowing one to cross the river behind the fall. Most of the group did the river crossing which was exciting as the falls and the river were very full! We had a challenging fossil hunt on the ascent amongst some shales and a few rather squashed fresh water bivalves were found by the eagle eyed youngsters. Back at the top we stopped to explore the erratics dotted along the track.

Sunday dawned wet and grey so we met at the Brecon Beacons Visitor centre at Libanus, where John gave us a short seminar on the local geology as the hills gradually appeared through the clouds! As the weather brightened we drove over to Heol Senni Quarry and
SSSI with non-marine Devonian rocks (Welsh Lower Old Red Sandstone), essentially pebbly cross-beded sands formed in braided river systems. The quarry is a record of Earth history covering the roughly 417 to 354 million years ago. Because of its SSSI status we could not collect fossils but our eagle-eyed youngsters were adept at spotting them. We enjoyed our picnic lunches in the sunshine on this splendid hillside quarry with its amazing views of the surrounding hills.

After lunch short drive to Cwm Porth with stops en route to take in the local geology and stunning views, allowed us to visit the Porth yr Ogof cave. This is a large cave complex with an easy access at river level, but because of the heavy rains and high river level we were unable to get into the cave although did explore the mouth and saw some perilously attached rocks above the mouth, looking far from secure. We also managed to spot water running underground from a side viewpoint, the old dry valley, and the river resurfaced further downstream. And, on the drive back to the main road saw sink holes scattered about the fields.

We were lucky on our visit to Coln Gravel Quarry in the Cotswolds, as once again we evaded rain that blighted many parts of the area during the day and were able to enjoy watching (and hearing!) planes from the nearby Fairford Air Tattoo as we looked for fossils. Everyone had a marvellous day and lots of fossils were found, including some superb belemnites - especially good for me as my prize belemnite, part of the fossil collection I take to schools and public geology events, had mysteriously disappeared, and I was able to replace it! Lots of ammonites were found, including the one we use as the Rockwatch logo, Kosmosceras; that’s always thrilling. Additionally, a nice mammoth tooth with its root system intact, bivalves, brachiopods, a piece of marine reptile rib, corals and some very attractive calcite crystals were found. And, some of the big nodules, full of a range of fossils and caused great excitement and not a little expenditure of energy getting them back to base, so they could be added to collections. I think Neville Hollingworth (who led the trip) managed to find the only hand axe, a specimen of rocks and fossils that we’d see en route. He distributed these amongst the group to carry on the trip – very sensible as some were surprisingly heavy! Nev explained the points of simple mapping and gave out base maps to fill in, check list to complete of rock types, fossils and minerals seen along the way and a sketch map showing salient features of the area.

The walk at Treak Cliff, where Martin had some 12 or more bags of hand specimens of rocks and fossils that we’d see en route. He distributed these amongst the group to carry on the trip – very sensible as some were surprisingly heavy! Martin explained the points of simple mapping and gave out base maps to fill in, check list to complete of rock types, fossils and minerals seen along the way and a sketch map showing salient features of the area. Went He had numbered stops on the map, coinciding with the numbered specimen bags and off we went, through Winnat’s Pass, stopping to look at the rocks and discuss the finer points of the geology and onward to Windy Knoll where we stopped for our picnic lunch, trying hard to evade the wind! Everyone climbed to the top of the Knoll to look at the bitumen deposit and think about how/why it might have formed. Time was already running short as we had a big group, so we moved on to Mam Nick and looked at Mam Tor, but instead of climbing to the top, skirted around the side to see the landslip which was very dramatic and astonished those who’d not seen it before. Even the article and photographs in a (relatively) recent edition of our Rockwatch magazine had not prepared them for the magnitude of the slip. And at each of the numbered stop points we looked at the rocks, soils, landforms, any minerals and fossils and plotted what we saw on our simple base maps and filled in the check lists. Odin’s Rake, our last stop of the day was the site of lead mining in the area. It was known that lead mining was begun there by the Romans, but whether or not the Danes and Odin in particular, worked the lead mine here is impossible to verify. There are still patches of galena to be seen on the sides of the mine and some rather spectacular fluorite. Across the road where the rock was crushed by horses pulling a heavy roller round a metal circle and where children sorted the crushed rocks for the galena, the vegetation is still very sparse and clearly growth has been reduced by residual lead in the soils. One hesitates to think of the effect that lead might have had on the children working there.

It was an interesting trip for Rockwatch in that one of the participants is now a second year student at Sheffield university, Castleton was where his father proposed to his mother when they were both students and his father read geology at Sheffield and was a student of Martin’s (who is just about to retire from Sheffield). Rockwatch really is one big happy family organisation!

Thanks to Martin (and all the group who were very proactive) it was a superb trip. He not only prepared the day brilliantly, he also left the children with some homework, viz. sorting a jumble of events from the area into order and a series of questions related to the day.

So, once again, we have had a series of excellent events and we are indebted as ever, to all those who so willingly and expertly gave their time and enthusiasm to encourage our members to learn more of our world and its geological history. Thank you all.

Susan Brown
Chairman
Owing to two members withdrawing at the last minute, a planned GA excursion to the Bordeaux area had to be cancelled. However, three members who had already booked their travel decided to make a private excursion. Professor Jean-Pierre Tastet (J-PT) of Bordeaux University and the association CAP Terre (http://www.cap-terre.org/), who had organised the trip from the French end, very kindly agreed to give us a flavour of what we were missing. Thanks to J-PT’s kindness, and Elaine Bimpson’s readiness to find all the geological maps we could ever need at a moment’s notice, we obtained an excellent introduction to the area.

Two of us travelled out by train (only a day’s trip by Eurostar and TGV), and the third flew out. The following morning, at J-PT’s suggestion, we took an introductory bus tour, which showed us the main architectural highlights, and gave us information about the history of the city. After lunch, J-PT met us in Bordeaux’s centre and after a quick orientation introduced us to Hélène Vignau-Haramburu, a colleague and member of the local geological association, who took us on a building stones walk. The recent ambitious cleaning and rebuilding programme showed the city to great advantage, and our hosts were able, with the aid of numerous maps, sections and cartoons, not only to give a clear interpretation of the geology but also discuss the palaeontology and the history of the buildings, and give other fascinating insights that would otherwise have been hidden from us.

The Oligocene starfish limestone (Calcaire à astéries) was the main building stone used before the advent of the railways, and had been quarried from the opposite bank across the Gironde. (The name “Gironde” is derived from the Occitan equivalent of the French word for swallow. The open mouth of the estuary 60 miles downstream, and the two tails of the Garonne and the Dordogne that together form the system, do look a little like the bird.) Being relatively young, of Rupelian age, and relatively unconsolidated, the rock was porous, friable, and not very resistant to weathering, and the sand blasting to clean off centuries of pollution had also in some cases removed its protective patina. Bordeaux’s problem was our opportunity though, and some fascinating fossils were revealed, such as the rib of a sirenian (a sea cow) poking out of a wall.

On seeing us examine the ammonites in the multi-million euro, one mile-long, polished Cretaceous limestone pavement, one of the more recent additions to the building stones collection of the city, a street vendor took delight in pointing out another problem for Bordeaux. He told us that as soon as it rained, people were slipping on it and breaking their legs.

The joy of having J-PT as a guide was his intricate knowledge of the city combined with his being a wonderful raconteur: how many of us are ever likely to be called on to identify the rocks that had been substituted for a consignment of whisky to help determine where the deed was done? An apparently ordinary street was given interest by a vivid description of how, underneath our feet, a seven-storey car park had been constructed. The same technique, in which a box is excavated in stages, and walls constructed to prop up the walls, is currently being employed to create stations for the Crossrail project in London. This was only Day 1, and in our opinion we had already been treated to a fine demonstration of applied geology. However even better was to follow.

On Day 2 J-PT organised a welcome by a vineyard at St. Emilion, which we visited by train. After a walk and lunch in the mediaeval town that was fascinating in its own right, we were given an introduction to the process of winemaking, and a tasting of wines, at the nearby Château Clos Madeleine. A tasting of wines from Clos Madeleine itself and from Château Magnan La Gaffelière, a property managed by the same firm down the hill but on a very different terroir, allowed us to judge for ourselves the effect of different soils on wines of the same vintage.

Day 3 saw J-PT finding time in his busy schedule (among many projects, he was producing a film about a newly-discovered karstic cave; see http://www.grotte-de-tourtoirac.fr/) to take us by car into the Medoc. A whistle stop tour of the new university campus in the suburbs was followed by a drive out into the country, where we stopped for a comprehensive explanation, using an impressive set of displays setting out the detailed geology on a large scale, of how the region had acquired its special character as a location for viticulture. Repeated inundations of the Aquitaine basin over the last 30mys, and more recently the effects of a series of...
Six natural terraces. This formed an array similar to that found in the Thames Estuary, comprising well drained but poor soils on a limestone bedrock. The well-known Margaux apppellations were found on terraces 3, 4, 5 and 6, not on terraces 1 and 2.

For a long time it was generally thought in the wine trade that those terraces in sight of the river had proven to be the best sites for viticulture. However, in the middle of the nineteenth century, under the 1855 Classification (and long before detailed surveys informed by modern geological science had been completed), the châteaux of the area (this simply means the premises that produce wine, not necessarily a stately home) were rated by Bordeaux Chamber of Commerce, purely on the basis of the historical price that the wines had been able to command. When the pedology and geology were looked at in more detail in the late twentieth century, it turned out that all but one of the wines placed in the highest category in the 1855 Classification (“first growth”) were produced from vines grown on two terraces only, Terrace 3 and 4. These are the most dissected and best drained of the terraces.

We were given practical demonstrations of different approaches to viticulture, and the opportunity to sample the produce, at two very different châteaux. The first, a small artisanal château, was owned and operated by a very knowledgeable fourth generation viticulturist who still tended 80-year old vines planted by his grand-parents, who were long standing friends of J-PT. Christophe Landry was obviously passionate about growing methods, including rotation of imported fertilisers and unnecessary energy inputs.

In the afternoon, after a journey north past many famous châteaux, a brief stop at Château Margaux, which has a very grand house built by the architect of the Bordeaux opera house, and lunch at St Estèphe, we visited Cos d’Estournel. This is a château that produces a second growth claret on Terrace 3. There great lengths have been taken to apply a scientific approach to terroir, and modern winery technology. A detailed survey of the château had been carried out by a soil scientist colleague of J-PT (see Becheler, P; Tastet, J-P; Arangoïts, D: Geologie, Terroir et Viticulture au Château Cos d’Estournel (Saint-Estèphe) Geologues, no 168) to identify all the distinct sub-units in terms of soil type. At the point at which the soil changed the plants would be marked, and sometimes those only centimetres apart would be picked separately at harvest time. 72 different terroir sub-units (same geology, same soil and same vine species) had been identified, and as a result 72 different vats for the grapes from each had been built in a new winery which had cost millions of euros. This enabled fine judgements to be made as to which grape varieties to plant on which sub-unit, and which grapes would produce the best wine in the actual weather conditions of each year. The cost had been huge, but the outcome in terms of better wines apparently justified the effort. The proportion of the output used for the first wine of the château (Cos d’Estournel), which commanded a much higher price than the second wine (Pagodes de Cos) has increased, over the years, by over 30%. We were able to compare the 2008 vintages of both wines after a talk on the history of the château, and a tour of the new winery. Both were fine wines, but we could sense why one commanded the higher price.

We also had a brief opportunity to walk the vineyards with J-PT, referring to his large-scale geological maps. Having identified the area immediately underlain by Tertiary limestone, we looked for fossils, and two species of Oligocene echinoids, the very small Sismondia and the much larger Echinolampas were found amongst the vines. We also found a bivalve and a gastropod.

Our journey back to Bordeaux allowed J-PT time to expand on everything from his schooling at the local school run by his father (he was glad to be allowed to go to boarding school near the University at the age of ten) to enthusing about the role of the amateur in archaeology and geology. His touching on the work at the Sanguinet Lake on the coast whetted our appetite to find out more, but sadly that would have to wait for a possible future official GA visit. However we did get a hint of the treasures in store when we visited Arcachon, and the Dune du Pilat (the tallest sand dune in Europe), by train and bus, the next day. Although the 100m climb to the top of the dune was quite tiring, the views were exhilarating. Helpful displays about its formation had also been provided in English. In Bordeaux itself there are all sorts of interesting things to see that we enjoyed on the final day of our visit, including the Musée d’Aquitaine, which has a wonderful display of the archaeology and the world class palaeontology of the area.

In short our private excursion was well worth the effort, and we have no hesitation in recommending that the GA re-present the originally envisaged trip. Professor Jean-Pierre Tastet is not only a perfect host but is hugely knowledgeable. Combine that with a fascinating region, which has much to offer to those following a wide range of disciplines, and you have the makings of a first class study tour.

Richard Trounson
Paul King
This report covers the latter part of the 52nd (2010-11) session and the first part of the 53rd (2011-12) session.

The highlight of 2011 was Geofest, a two day public orientated celebration of geology on 22nd/23rd October, at the National Museum, Cardiff with displays, activities and talks (see below).

**Indoor Meetings:** During 2011 the Group held six indoor lecture meetings, in Swansea and Cardiff Universities: January - Methods and techniques in Quaternary geosciences: reconstructions of the last British ice sheet (John Hiemstra); February - Tuffs and traces: biodiversity in terrestrial environments in the Upper Silurian Old Red Sandstone of southwest Wales (Susan Marriot) - joint meeting with the South Wales branch of the Geological Society; March – AGM: Devonian trees and forests in Svalbard and New York State: newest insights in the earliest forest (Chris Berry); October – Geofest: two days of displays, activities and talks on Archaeopteryx: celebrating 150 years (Dr John Nudds), The biggest pterosaurs in Britain (Dr Dave Martill);

**Field Meetings:** During the year seven field meetings were held: April – The building stones of Llantwit Major (Jana Horak [joint meeting with the Welsh Stone Forum]); May – Three Cliffs Bay, Gower (John Davies); July – Mineral riches of the Black Mountain (Alan Bowring); August – The minerals of Sully Island (Lynda Garfield and Dave Wellings) [postponed from June due to bad weather]; August field weekend – Porth Clais to Caerfai Bay, Pembrokeshire (Sid Howells) and Ramsey Island (Sid Howells); September – Vallis Vale and Trefin to Amroth coastal section (Geraint Owen).

**Rockwatch:** The Group hosted a Rockwatch Weekend over the weekend of 8th/9th July in which 46 Rockwatchers visited four localities in the Llandrindod Wells and Builth Wells area looking for trilobites, graptolites and brachiopods.

**Events:** In March, the British Cave Research Association and the Group held a weekend symposium on The geology and archaeology of Welsh caves, with talks on the Saturday and field excursions looking at Caves and Karst of the Swansea Valley on the Sunday. In May, the Group supported Wales in Miniature: A Conference in Memory of Douglas A Bassett at St Fagans National History Museum, Cardiff, at which three members of the Group gave contributions. In September, the Group exhibited a poster at the GA’s Annual Festival of Geology in London in November, with a displays on the Minerals of Sully Island and RIGS around Cardiff.

**Committee:** The Committee (2011-2012) comprised: President: Malcolm Shaw; Vice-President: Geraint Owen; Secretary: Lynda Garfield; Treasurer: Hazel Trenbirth; Programme Secretary: Stephen Howe; Membership Secretary: Mike Gregory; Editor: Rhian Kendall; Committee Members: Lesley Cherns, John Davies, Janet Hiscott, Tom Sharpe, Cindy Howells, Gareth Owen. Ex officio Vice President: Nigel McGaw.

We once again gratefully acknowledge the continued support that we receive from Cardiff and Swansea Universities and Amgueddfa Cymru - National Museum Wales, and the British Geological Survey Wales office.
FESTIVAL OF GEOLOGY

SATURDAY 10 NOVEMBER 2012
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Activities for children of all ages with fossils, racing trilobites, Jurassic dioramas and more

Further Festival details
www.geologistsassociation.org.uk
www.rockwatch.org.uk

Four Talks
Professor Paul Bown
Investigating the History of Climates and life through deep sea drilling

Professor Rory Mortimore
Using fossils in construction projects: London Tunnels to Stonehenge

Professor Iain Stewart
Seismic Faults and Sacred Sanctuaries

Professor Jenny Clack
Populating Romer’s Gap: rebuilding terrestrial ecosystems after the Devonian mass extinction

Walks and Field Trips Sunday 11 November
Professor Joe Cain: Geological Illustrations at Crystal Palace
Dr Eric Robinson: London Walk: Green Park and Hyde Park Corner
Geoff Downe: The Building of Ramsgate and its Harbour

Amateur Photographic Competition
any geological topic
1st prize £100 2nd prize £50 3rd prize £25

The Geologists’ Association: 020 7434 9298