Appeal for the Archives
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The Geologists’ Association

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

Annual Subscriptions for 2009 are £40.00, Associates £30.00, Joint Members £58.00, Students £18.00.

The new cover of the PGA. See the articles on pages 18 and 19.

Cover picture:  

From the President

In writing the June presidential report, I am reminded of the vital role that the GA plays in upholding the importance of geology on a range of scales, from local to international. For example, the GA can serve as a point of contact to provide critical information on key geological sequences that are under threat from insensitive development plans - in short, acting as an expert witness. This does not necessarily entail opposing development but rather looking for opportunities to enhance geological resources for future study while ensuring that they are appropriately protected. In addition, a major part of our national earth heritage is preserved within our museums and in these increasingly difficult economic times, it can be threatened by local government budget cuts. Together with a number of colleagues on Council, I have recently written to Bristol City Council at the behest of local GA members to express concern about staffing at Bristol Museum, where the post of Geological Curator is at potential risk of being cut. The museum has a long and illustrious history with respect to its world class geological and palaeontological collections. It is firmly established on the itineraries of scientific researchers from across the UK and beyond and furthermore, it serves as a local point for amateur geological activities and the promotion of the public understanding of science in the south-west region. There is simply no substitute for the detailed knowledge of a collection that a dedicated curator develops and merging posts swiftly leads to the stagnation of the collections as a usable resource. This has been repeatedly demonstrated at regional museums in the past where misguided cuts have destroyed what was once a vibrant and well-used section of earth heritage. A dedicated Curator of Geology ensures that exhibitions are mounted and press releases issued, they serve as a central point of contact for local fossil collectors and to solicit new donations, both of which are vital to the future of any museum with natural science collections, and finally, they maintain research links with universities in the UK and abroad, ensuring that the collections are the subject of scientific papers and attendant publicity.

The activities of the GA, together with those of our junior branch, Rockwatch, demonstrate clearly that geology has never been more popular, nor more relevant to society than it is today. Our museums represent a resource of enormous significance in terms of the scientific value of their geological and palaeontological collections and their potential to engage and inform the general public about the world in which they live. As responsible geologists with an eye to safeguarding the future, we must ensure that these values are not compromised.

Danielle Schreve
REPORT FROM COUNCIL

This report covers the meetings of Council in February and March. At this time of the year Council has to consider the financial situation of the Association, looking at how we have managed our finances in the past year and producing a balanced account for the future year. We are very fortunate in having an excellent Treasurer (Bernard Leake) who, with the aid of our Auditor, produces clear and coherent accounts for Council to consider. Of course the funds of the Association have suffered in the downfall of the Stock Market, but due to the careful management of our resources and the advice of our Investment Panel, the Association has been able to minimise the effects of the economic downturn. Council thanked the Treasurer and his advisers for their excellent work. It was with regret that Council noted the retirement this year of Bernard, who has been such a successful Treasurer for such a long time. See the article on page 6. Council was also advised by the Treasurer of the funds given to the Association by legacies and donations. It was only by such contributions to the Association’s funds that the cost of membership could be kept low.

Another of the major events at this time of the year is the giving of awards to people who have given their time and effort to the promotion of geology. The results of Council’s decisions are to be found on page 5. There was considerable discussion on continuing the support that the GA gives to regional meetings of Local Groups whereby local groups are given financial support to arrange an annual special events. The new arrangements to publish the Proceedings by Elsevier is producing benefits other than just financial. The Proceedings have been completely digitised so that back copies from its origins to the current issue can be accessed via the web. The move to a publisher who will dramatically increase the circulation of the journal nationally and internationally and the current Editor, Jim Rose, writes about this on page 18.

The web site is always under consideration by Council. In order to keep the site up-to-date it was agreed that the GA office should have the necessary software to do so. The new arrangements to publish the Proceedings by Elsevier is producing benefits other than just financial. The Proceedings have been completely digitised so that back copies from its origins to the current issue can be accessed via the web. The move to a publisher who will dramatically increase the circulation of the journal nationally and internationally and the current Editor, Jim Rose, writes about this on page 18.

Council all agreed that the latest edition of the Rockwatch magazine was excellent and the all the people who contributed to the magazine should be complimented, see page 17.

Council also continued ongoing discussions about how to attract new members and increase the exposure of the GA, for example by having press releases whenever the Association has some special event, new publications, etc.

John Crocker
General Secretary

CURRY FUND REPORT

At its first meeting of 2009 in March, the Curry Fund Committee received five new applications and considered two from previous meetings. Of the two previous applications, Marble Arch Caves Global Geopark was awarded £6000 for producing a pack of Earth Science Educational Resources/Field Guide to be distributed free of charge to pupils in Northern Ireland and the Republic on the geology of the Geopark. It is aimed at A5 and A2 level geology and geography students and teachers.

Three of the five new applications were funded, one was refused and one was awaiting further information to enable a decision to be made. Dr Anjali Goswami’s application for travel costs to India for a research project was refused as it fell outside the remit of the Curry Fund guidelines. We are awaiting further information from the Dorset County Museum to enable a decision to be made for funding towards the cost of specimen conservation. Warwickshire Geological Conservation Group was awarded £1000 towards cost of a leaflet on the Leamington Building Stones Trail. £4410 was awarded to Peterborough Museum & Art Gallery for a major activities programme and dinosaur exhibition and £430 to Peterborough Museum & Art Gallery for a major activities programme and dinosaur exhibition and £430 to Peterborough Museum & Art Gallery for a major activities programme and dinosaur exhibition and £430 to Peterborough Museum & Art Gallery for a major activities programme and dinosaur exhibition.

We look forward to applications for our June meeting which need to be in the office by 20th May. Guidelines and application forms can be downloaded from the GA’s web site or are available from the GA office.

Susan Brown
Curry Fund Secretary

NEW GA AWARDS!

The Geologists’ Association is delighted to announce three new awards schemes open to members only. These awards, which aim to attract the highest quality applications, seek to encourage new members, to generate high quality papers and articles for our publications, to raise the profile of geology in all arenas and to build on the GA ‘brand’ through acknowledgement of our support in the various outputs generated.

The three schemes are:

1. Geologists’ Association Research Awards, available to all members of the GA of at least one year’s standing, irrespective of age and status, to foster research in any area of earth sciences. Grants will normally be up to £500 and might be typically used for fieldwork or museum research visits.

2. Geologists’ Association New Researchers’ Scheme, which is designed for new or younger researchers in any relevant field of earth sciences, who are registered for either an undergraduate or postgraduate degree. Typical grants are up to £300.

3. Geologists’ Association Meetings Fund, to assist attendance at conferences and field meetings (typical grants up to £300).

In 2009, there will be one application round only (two in future years) with a deadline of 12 noon on Saturday 20th June. All applications must be received electronically. Full details and application forms are on the GA website (www.geologists.org.uk).

GA Magazine of the Geologists’ Association Vol. 8, No. 2, 2009
North-West Dartmoor - 50 years on!

Norman E Butcher
Edinburgh

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

On the 4th February 1959, Bill Dearman and Norman Butcher read a paper in Burlington House to the Geologists’ Association entitled “The Geology of the Devonian and Carboniferous Rocks of the North-West Border of the Dartmoor Granite, Devonshire”, published in the Proceedings on the 24th September that year. The 41 page paper presented a comprehensive account of the geology of a strip of ground in South-West England with which the authors had been jointly wrestling for the previous seven years.

The paper was accompanied by a geological map drawn on his kitchen table by the junior author.

With the paper set entirely in the pre-Plate Tectonics era of geology, the lecture will explore the lessons to be learned on the 50th anniversary of its publication.

The focus will be on the personalities involved in trying to understand geologically this fascinating part of South-West England. The importance of the geological map will be emphasised, what F.J.North described as the “dynamic force” in geology! And in working out the tectonic structure, whether or not within the plate-tectonic model, the need to get the stratigraphy right.

Festival of Geology 2009 - a date for your diary
see page 7

October Meeting

The geology of impact craters and ejecta deposits, new insights into a fundamental process

Dr Scott Thackrey
University of Aberdeen

Friday 2 October 2009
Geological Society, Burlington House, Piccadilly, W1V 0JU
at 6.00pm, tea at 5.30pm

Impact cratering is an essential geological process that in most academic institutions is overlooked. This significant process can be appreciated when observing the moon, for example, where its surface is littered with craters that vary in size (from 100’s of Km down to several cm) and age. Early observations of the moon highlighted the presence of rays emanating from craters. These rays are ejecta deposits. Ejecta deposits are common round all craters and can vary in character that reflects their emplacement mechanism. Through the most recent research conducted at the University of Aberdeen and other institutions our understanding of impact ejecta processes is improving all the time. Here, I will be presenting what ejecta is, how its formed and deposited, how recent research has provided insights into emplacement mechanisms and the future for research in the field of impact cratering and impact ejecta.
Awards and Prizes given at the AGM

The Foulerton Award given by the President to Gerald Lucy for "work of merit connected with the Association" (Photo taken at the Festival Dinner 2008)

The Halstead Medal given to Professor Iain Stewart for "work of outstanding merit to further the objectives of the Association and to promote geology" (Photo taken at the Festival Dinner 2008)

The Henry Slopes Memorial Medal presented by the President to Professor Clive Gamble for "his work on the pre-history of man and his geological environment"

The President Danielle Schreve giving her Presidential address

Professor Bernhard Leake, our retiring Treasurer, who received an Honorary Life Membership at the AGM

The President presenting the new MSc awards for the best dissertations for 2009.

Left: Li Rudi Lui (Cardiff University, MSc Environmental Hydrogeology) for his dissertation on the hydrogeological investigation of the water management plan for Mission Training Area SSSI near Doncaster.

Right: Stefano Patruno (UCL, MSc Micropalaeontology) for his dissertation on the Barremian/Aptian benthic foraminifera of Gorgo a Cerbara (Umbria-Marche region, Italy)
BERNARD LEAKE RETIRES AS GA TREASURER

The GA has had a number of distinguished Treasurers in its time, but perhaps none as eminent as Bernard Leake, who retires from the post this year. He graduated from the University of Liverpool with a first-class honours BSc and PhD, and stayed on as a Leverhulme post-doctoral Research Fellow (1955-57). He then moved to Bristol University in 1957, as Assistant Lecturer, then Lecturer, and Reader in Geology (1968-74). From 1974-97 he was Professor of Geology and Keeper of the Geological Collections in the Hunterian Museum at the University of Glasgow. He has a DSc from the University of Bristol and an Honorary DSc from Glasgow (1998). He was awarded the Lyell Medal of Geological Society of London in 1977 and made an Honorary Life Fellow of the Mineralogical Society in 2004. Since his retirement from Glasgow in 1997, he has become an Honorary Research Fellow at the School of Earth, Ocean and Planetary Sciences at the University of Cardiff.

His long-term research interests have been centered on petrology, taking a particular interest in the amphibole group of minerals, and has been a leading figure in the International Mineralogical Association’s classification of these minerals (an alkali amphibole from India was named Leakeite in his honour in 1992); and, over many years, the mapping of large parts of Connemara, South Mayo and the Galway Batholith in Ireland. His 6" mile field sheets, many of which have now been presented to the Geological Survey of Ireland, have been described as "works of art as well as science." Assisted by his research students, in 1964, he set up the first XRF facility for the geochemical analysis of rocks in a British university.

He also found the time, and energy, to be the Treasurer (1981-85, 1989-96) and President (1986-88) of the Geological Society of London, as well as a Sub-editor (1971-72) and Scientific Editor of the Journal of the Geological Society (1972-74). He was Treasurer at the time of the moves to establish the Geological Society's own Publishing House and President when it was set up in 1988. In 2004, the Mineralogical Society recalled his work for them “as an associate editor of Mineralogical Magazine, as an abstractor, and as a managing trustee and astute financial advisor over the last 40 years.”

Quite apart from all of this, when asked by the GA in 1996 if he would become our Treasurer, and to try to assist us to overcome our serious financial problems, he nobly rose to the occasion, and has been our Treasurer (and Book-keeper) from 1997 until this year. As he remarks in his Financial Report for 2008 (in the Annual Report for 2008 which has just been issued to all GA members), he sees the job of Treasurer as ensuring "that Council can carry out its wishes in a sustainable way, which means that over a period of years expenditure must not exceed income nor should income pile up unused," a goal in which he has succeeded admirably. He will be succeeded in the post by Dr. Graham Williams.

Richard Howarth

Other peoples’ comments:

Sarah Stafford from the office: I was thinking back to when I first heard that Bernard would be the new GA Treasurer, feeling quite daunted as I had never spoken with him in all the years he had been in office at the Geological Society as President and then Treasurer. However, I immediately warmed to him, nearly every time he came into the office to "do the books" ie complete the accounts ledger by hand !, he asked me how I and my family were and told me joke. He really has a wonderful sense of humour. He is also, in my opinion, extremely wise, thinking very careful about questions I ask him and always coming out with the most sensible, sound answers. He has what would be considered today "old fashioned" values but I also hold the same so I shall miss him greatly, not only as Treasurer but as one of the GA Members who has become a friend who is always a pleasure to talk with.

An anecdote provided by Graham Williams (the new Treasurer) that when Robin Cocks was asked to become GA President, he checked first that Bernard was going to remain Treasurer before saying yes.

A letter sent to Bernard, copied to the President, from David Horsley said "This note is to congratulate you on being, in my view, the best Treasurer the GA has had since I joined the Association in the 1960s. I recognise the vast amount of work it has entailed but it is to your wise judgement that we GA members are specially beholden".

The Editor is sure that we would all endorse that statement.
A DATE FOR YOUR DIARY
Festival of Geology 2009

Following from the success of the Festival of 2008, the Festival for 2009 will again be held in University College London.

The Festival will take place on Saturday 31st October 2009 with field trips on Sunday 1st November.

The groups meeting will take place on Friday 30th October in Burlington House.

Tony Iles took some pictures at last year’s Festival, and the visitors all seemed to be enjoying themselves - proving once again, that "Geology is Fun!"

She is obviously enjoying herself

Young geologists enjoying all carving

Steve Etches & shows us his fossil crocodile

Bob Markham always enjoys himself

Marjorie Carreck seems pleased about the Curry fund grant for the archives

All attention on the OUGS stand

Excitement with the GA

The Amateur GS, with their alluring Quiz

He’s got a full size Dinosaur behind there!

Professor Iain Stewart enters the fray

Bob Markham always enjoys himself

These two seem to have found the sixpence

GA Magazine of the Geologists’ Association Vol. 8, No. 2, 2009
GA trip to Chafford Hundred, East London  2nd November 2008

As part of the Festival of Geology the GA ran a number of trips in the London area as tasters to the local geology. Chafford Hundred is a new town built within the old Chalk quarries at Grays in Essex. Essex Wildlife Trust have worked with the developers to ensure that at least some of the quarries are left as nature reserves within the new town. Geology has been included in the Plan and Gerald Lucy, Peter Allen, Mike Sandison, Danielle Schreve and others have been active in working out a geology trail. Details of the geology are displayed at the Chafford Gorges Visitor Centre and 2 trail leaflets are currently in production. It is hoped that this location will also be included in the new GA Guide to the London area as it is one of the few locations where there is still public access to exposures.

The Chafford Gorges Visitor Centre is a good place to start. There is a panoramic view over Warren ‘Gorge’ (the new name for all the pits, and now a nature reserve) and a cup of coffee can be enjoyed whilst discussing the geology. There is ample car parking and the Centre includes a gift shop, as well as providing information on the local environment.

One of the geological highlights of the trail is an exposure showing excellent periglacial features. Essex Wildlife Trust is doing an excellent job in keeping the buddleia down so that the face can be seen clearly from the adjacent road. Unfortunately, joined-up thinking is not part of the project, and the local council have recently planted a row of hawthorn along the fence which will soon obscure the face unless some agreement is struck to keep this at a low level, at least in front of the best bit of the face.

Chalk in these quarries is from the White Chalk sub-group (formerly known as the Upper Chalk) and is of Seaford Chalk age. An important marker horizon, the Whittaker’s 3”, can be followed along the trail. This is within the Micraster coranguinum zone. The contact with the Thanet Sand is usually also well displayed. A ramp has been constructed up the side of one of the faces so that the contact can be seen at relatively close quarters (but protected by a fence). Essex Wildlife Trust has been active in keeping this exposure cleared too but by November the buddleia obscured it somewhat. It is an unusual contact as both the Bullhead Beds and the overlying Thanet Sands have been ‘pulled down’ into a series of solution hollows.

The Thanet Sand is better displayed in Sandmartin Cliff near the top of another of the old pits, now a housing estate. It is beside the Sandmartin pub, so named after the nesting habits of these birds on the adjacent site. The face has been fenced in, largely to protect the birds, but sadly it seems the noise and lights of the pub have frightened them off in recent years. It is worth asking for the key at the Chafford Gorges Visitor Centre, but be warned, a Risk Assessment may be required (available from Diana Clements via the GA office). With careful examination bivalve fragments can be found in the cliffs and in places, where not covered in scree, a horizontal contact with the Chalk can be seen. The Thanet Sand is capped by gravels of MIS 9 age although they are really not accessible at this site. This horizon is best examined at the SSSI at Greenlands Pit, Purfleet on the other side of the M25 (although access there is currently very difficult). Unfortunately this fenced area is in danger of becoming overgrown and I would urge Essex Wildlife Trust to include it within their conservation programme. A more accessible face of Thanet Sand can be seen on the south side of Mill Wood on the west side of the Chafford Gorges Nature Reserve, not far from the Station.

The trip finished at the top of Gray’s Gorge where mammalated sarsens have been gathered together by the quarry
men. The group spent some time discussing how this process may have happened and looking for the holes left by rootlets. This is another area that has recently been cleared by the Essex Wildlife Trust to whom we are most grateful. Without them the excellent geology in this area would soon not be visible. So much of London’s Geology requires this sort of attention and sadly, at most exposures in the London area it is currently just not happening.

Chafford Gorges Nature Park includes an SSSI for the Quaternary Gravels. This is located at the exit of Lion Gorge where a cutting was made to transport the Chalk down to the Thames. It is known as the Lion Pit Tramway and is dated at MIS 7. Except when cleared for research purposes there is not much to see, but a viewpoint over the tramway allows discussion of this important interglacial site and other SSSIs relating to different interglacials along the Thames nearby (see Schreve, 2004 for further details). A new pamphlet describing the site is currently being published jointly by Essex Wildlife Trust and GeoEssex and should be available from the Chafford Gorges Visitor Centre later this year: Hot and Cold Running Water: the History of the Thames in Chafford Hundred. This will complement the pamphlet covering much of the GA trip as described above: Walk the Walk: The Chalk Walk. We eagerly await publication of both of these pamphlets which will hopefully bring the geology of the area to the attention of a wider audience.

References

Guides (available from the Visitor Centre)
Essex Wildlife Trust Chafford Gorges Nature Park leaflet - (map with some of the features marked)
Essex Wildlife Trust and GeoEssex pamphlets (currently in press):
1) Walk the Walk: The Chalk Walk
2) Hot and Cold Running Water: the History of the Thames in Chafford Hundred

Diana Clements

LIBRARY NOTES

Limitations of space including exciting reports of the Association’s activities out and about plus details of our lecture programme have meant that Library Notes have not appeared for a while. So perhaps now is the time to remind you all of the existence of the library, especially as you may have summer and autumn trips in the pipeline. Registration as a library user is an extra benefit of being a member of the Association. As our library is totally incorporated within and managed by UCL Library Services, holding a library card opens up all the separate libraries that fall under the UCL umbrella, not just the Science Library within the DMS Watson Building but includes the main library within the Wilkins Building and the Institute of Archaeology Library in Gordon Square for example. Remember that to register (through me preferably) a photo (passport size) plus copy of the photo page of your passport/driving licence (to prove the photo is you) and proof of address (utility bill) are required. This applies to renewals as well although photo could be taken from your year old card if it is OK. Anyway try www.ucl.ac.uk/library, although maps and guide books are not on the system so get back to me for these.

Finally I must say a belated ‘thank you’ to our distinguished overseas member Dr. George Zammit Maempel for his scholarly publication “Illustrators and their illustrations of Maltese fossils and geology” (Publishers Enterprise Group (PEG),2007). We are taken onwards from the sixteenth century with copies of original illustrations and map with details of those usually unsung collaborators - the artists, engravers and lithographers who produced the final exquisite work - their names only included in very small print perhaps unnoticed by the rest of us. Dr. Zammit Maempel is to be congratulated on his meticulous research resulting in this fine addition to the series ‘Contributions to the history of Maltese geology and palaeontology’. We are most grateful for his donation to the GA. Those who have visited Malta will be familiar, of course, with his work at the modern addition to the Museum at Ghar Dalam.

Elaine Bimpson
Librarian

Help Needed for the Archives: Please could any member who still has a copy of Circular 784 of June 1976, copies of the 1993, 1994, 1995 1996 Annual Reports, either give these to the GA, or send photocopies to the GA office as soon as possible, so that the Archive bound set in the GA Office can be made complete.
Wales by M. F. Howells 2007
British Regional Geology, British Geological Survey
ISBN 978-085272584 (SB), £18, x + 230 pp with 1:625,000 geological map of Wales and the adjacent area in back pocket

This useful overview of the geology of Wales has been published as part of the ongoing regional geology series. Originally the principality was divided in two with North Wales dominated by Anglesey and Snowdonia and South Wales by the Carboniferous limestone and coal measures. As a result Mid-Wales tended to be neglected. The production of modern 1:50,000 maps is now rapidly filling this gap in basic coverage and this combined memoir has rectified this deficiency.

Before the introduction there is an excellent Landsat image which (apart from some mist filling the valleys around Builth Wells) is crystal clear as it shows the structural grain of much of the countryside. The introduction itself outlines the broad geological history of Wales and sets out the key developments resulting from several centuries of detailed investigations. While this introduction ends with a necessary explanation of how plate tectonics have moved this small fragment of crust around the globe since late Precambrian times, the first map showing the position of Wales within the early distribution of the continents appears highly doubtful.

The first detailed chapter provides a coherent account of the complex nature of the mainly Precambrian basement and scattered outcrops along with the more extensive areas of Anglesey and the Llyn peninsula. Like the rest of the text it is illustrated with plenty of clearly drawn colour figures and many fine photographs. However, the typeface is hard to follow and a two-column style similar to 1:50,000 sheet explanations would be easier to read. This is followed by extensive chapters on the Cambrian, Ordovician and Silurian sedimentary systems, incorporating the extensive volcanism centered on Snowdonia during the Ordovician which is associated with subduction under North Wales as the Iapetus Ocean closed. The account of the Silurian has some outstanding figures showing the different patterns of sedimentation across Mid-Wales. This chapter ends with a brief overview of the Caledonian orogeny, the mountain building phase resulting from the continental collision when the Iapetus Ocean disappeared. While this outlines the pattern of metamorphism which produced the famous slate deposits, it does not explain how varying metamorphic grades relate to a simple temperature and depth of burial diagram rather than ending with an abstract pressure.

The Devonian follows with a description of the Old Red Sandstone which was deposited over large parts of Wales with a clear hiatus in the middle of this period at the culmination of the Caledonian orogeny. Given its significance the Carboniferous chapter is the longest, as it not only has to cover the intricacies of the lower limestones followed by the millstone grit, but the later coal measures. Yet again some diagrams are unnecessarily turned sideways when they are so well drawn they could have been reproduced the right way up at a slightly smaller size. Naturally it includes a short section on the different coal types found in the valleys of the South Wales coalfield which can be mapped in terms of volatile content or rank of coal with anthracite having the highest carbon content and lowest rank. As structural geology is only dealt with in passing, this chapter concludes with a summary of the Variscan orogeny when another continental collision this time impinged on the southern margin of Wales.

Though Permian and Mesozoic sediments are limited and largely confined to the coastal area adjacent to the Bristol Channel, they are not overlooked. Like the following chapter on the Cainozoic this text draws heavily on offshore evidence where quite thick sequences are developed. The varied superficial deposits which cover the bedrock in many places are described in the rather dated Quaternary section of this latter chapter. Even if it has a great summary map of the glaciation of Wales, with ice flow directions and drainage patterns showing the limits of the Irish Sea and local ice including the extent of ice-dammed lakes, it does not relate this to the regular fluctuations in global climate and sea-level recorded in deep ocean cores and so gives an over simplistic impression of these events. Furthermore, while it is noted that uncalibrated radiocarbon dates have been quoted (see Geology Today 2004, vol. 20 (3) pages 95-96), this causes endless confusion with the timing of events, especially as the final interesting chapter about geology and man uses calendar years for the end of the last ice age.

Most of the section at the back listing BGS publications could have been combined with a more extensive unified bibliography. While there is often some lag in the production of such books, recently published references such as the excellently produced Newcastle Emlyn 1:50,000 map and explanation (sheet 211) in Mid-Wales should have been cited as in press. Furthermore, it is daft that the main text omits useful references when the figure captions cite them: this should not be off-putting to novice readers (in my youth I simply skipped such details). Aside from such technical irritations this book fills a valuable gap in this long running series which urgently needs updating in many other regions. Further editions should be one of the highlights of the British Geological Survey’s output: the results of ongoing surveys and the latest research need to be reported in such an accessible manner to as wide an audience as possible.

David A. G. Nowell
FIELD MEETINGS IN 2009

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

FOSSILFEST V
Leader: Nev Hollingworth Saturday 13th June 2009
Location(s) have still to be decided but plenty of fossils can be expected. Equipment: You must have a hard hat, hi vis vest and suitable footwear. Cost & booking: Numbers will be limited to 26. Register with Sarah Stafford at the GA office sending an administration fee of £5 to confirm your place.

IN THE FOOTSTEPS OF CHARLES DARWIN - NW MIDLANDS AND NORTH WALES - JOINT MEETING WITH THE GEOLOGICAL SOCIETY
Leader: Prof Peter Worsley Friday 19th June - Wednesday 24th June 2009
To commemorate the 200th anniversary of Charles Darwin’s birth in 2009, this field excursion will visit a number of localities in his home area of Shropshire - Staffordshires and also North Wales. Besides the general Darwin related sites, the emphasis will be on his earlier work as a geologist and in particular his field trip in June 1842 to appraise the evidence presented by William Buckland in 1841 supporting the ‘Glacial Theory’. A background to the latter may be found in Quaternary Newsletter 112, 22-28, (2007) and the November edition of Geoscientist (2008). The excursion will be an opportunity to see aspects of the glacial geology of North Wales.

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

Equipment: Ensure you have suitable footwear and clothing.

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

WEALDEN EXCURSION
Leaders: Pete Austen, Richard Agar, Dr Ed Jarzembowski and Geoff Toye
Saturday 18th July 2009

This trip continues the popular annual excursion to working pits in the Weald Clay of south-east England, where the GA has already participated in some superb fossil finds. The venue(s) will be confirmed later so as to take advantage of conditions at the time. Numbers may be limited.

Equipment: You must have suitable footwear, a high visibility jacket and hard hat.

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

LAKE DISTRICT WEEKEND - JOINT MEETING WITH THE CUMBERLAND GEOLOGICAL SOCIETY
Leaders: Members of the Cumberland GS Saturday 5th - Sunday 6th September 2009

This weekend excursion will follow some of the routes detailed in the CGS’s new book “Exploring Lakeland Rocks and Landscapes” as reviewed by Sue Brown in this issue. If there is sufficient interest we may be able to arrange an inexpensive meal in Keswick on the Saturday evening. Please note that the whole of Saturday will be spent in the field. Even in August weather conditions can be severe so make sure that you have adequate field gear and bring a packed lunch. If you are in any doubt as to your ability to participate please contact the GA office.

Equipment: Ensure you have suitable footwear and clothing.

Cost & booking: Please note that the GA will not be arranging accommodation. Register with Sarah Stafford at the GA office sending an administration fee of £10 to confirm your place. Please let Sarah know whether you would be interested in joining us on the Saturday evening.

ON THE CHILTERN LINE TO WARWICKSHIRE
Leader: Dr Martyn Bradley Sunday 20th September 2009

The rail journey from Marylebone to Warwick cuts across the strike of Tertiary, Cretaceous, Jurassic and Triassic strata. From the train we can follow the landscapes as we travel down the geological succession. On arrival in Leamington Spa we will view a small river cliff by the Leam before visiting the...
Royal Pump Rooms for coffee('or lunch'); with an opportunity to sample the mineral rich waters. A walk via the elephant wash and riverside Avonbank gardens will continue up the parade noting building and ornamental stones. Those who wish may continue on to Warwick and its castle built of and on fine exposures of Bromsgrove sandstone. There is Acocks sandstone and Marlstone in Warwick buildings too.

If there is sufficient demand the itinerary can be run in reverse on Saturday 19th September.

Equipment: The BGS solid 1:625,000 south geological map will be useful.

Cost & booking: Numbers will be limited to 16 each way. 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.

POT LUCK

Leader: Dr Mick Oates

September/October 2008

Once again, a trip not to be missed with interesting geology and lots of fossils to keep the collector happy. Date and locations are still to be arranged.

You must have suitable footwear, a high visibility jacket and hard hat.

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

SEDGEWICK MUSEUM OF EARTH SCIENCES

Leader: Dr Liz Harper

Saturday 7th November 2009

This is an opportunity to visit this world famous museum with its magnificent collections.

Cost & booking: Further details will be available from Sarah Stafford at the GA office. Register with Sarah sending an administration fee of £5 per person to confirm your place. Please note that there is an additional donation of £1 per person to the museum to be collected on the day.

FURTHER AFIELD IN 2009

PROPOSED FIELD TRIP TO LIBYA, AUTUMN 2009

Leader: Professor Richard Moody

Approximate cost (assuming 15 participants): £1800

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

The provisional itinerary includes Tripoli, Nalut, Jado, Ghadames, Yfrann, Sbratha, Sebha, Birak and the 'Great Man-made River', Germa, Mandara Lake, Mahanqush, Akakus Mountains, Tadrart, Alawynat, Ghat, and Leptis Magna.

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

WORKSHOP ON RECENT FORAMINIFERA IN BRITISH AND IRISH SHELL SANDS

Leader: Dr Adrian Rundle

Saturday 13th February, 2010 from 10.30 a.m.

The next microfossil workshop in this series is on Recent Foraminifera. The principles for collecting good Recent shell sands and how to separate the Foraminifera from mineral grains will be covered, as well as how to sort residues under the microscope and mount selected specimens on slides. A booklet will be supplied covering aspects of the study of Recent Foraminifera, including a key to the most commonly encountered species. During the morning the booklet and two slides (with 64 named species) will be used in the introduction. In the afternoon there will be a chance to study the literature, process samples and make your own slides. The main aim of the workshop is to enthuse participants and to enable them to continue their studies afterwards.

Meet: At the leader’s house, 55 Dancer Road, Richmond, Surrey, TW9 4LB (map reference TQ 191759, location map available on request).

Equipment: If you have a suitable binocular microscope (about x20 to x40) please bring it along together with its light source. Bring a packed lunch. Tea and coffee will be provided.

Cost: £8, to cover materials and administration.

It is essential to register with Adrian (telephone 0208 876 6645) for the workshop as numbers must be limited to 12 per day. A back up on Sunday 14th February can be arranged if needed and later dates if more than 24 express an interest.

NORTH GERMANY

Late August-September 2010

Duration: 16 days including travel from and return to

Leader: Dr Volker Wilde

Local Secretary: Prof Alan Lord

Outline programme:


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

To register your interest, please contact Adrian (telephone 0234 394 047) or Sarah at the GA Office.

GEOLOGISTS’ ASSOCIATION LOCAL GROUPS

Cambridgeshire Geology Club

June 8 Earth’s Surface Topography - Dr Dickson Cunningham.

September 14 The Pleistocene Geology and Fauna of the River Trent - Tom White.

Contact: Alan Murphy on 07768 821385. Email: cambs.geology.club@hotmail.co.uk

Dorset Local Group

July 7 Field trip: Mupe Bay - Alan Holday.

July 18 the President’s field trip: Dumford Droog in Layton Maltrovers to Dancing Lodge and Winstip.

August 8 Fossil and Mineral Fair at the Allendale Centre Wimborne.

August 16-24 Joint trip with West OUGS to Ireland.

Contact Doreen Smith 01300 320811. Email: Helidon47@hotmail.com

Essex Group

June 3 Underground Wars - Prof. Peter Doyle.

September 2 Unusual Microfossils - Dr Adrian Rundle.

October 7 Geology in the Deserts - Dr Peter Burs.

Contact Dr Trevor Greensmith 01268 785404

Farnham Geological Society

June 7 Field trip from Avebury to Swindon - Dr Graham Williams and Mike Rubra.

June 12 Perils of Science Journalism - Alan Lewis.

June 19 Shere - a Midsummers’ eve geowalk - Dr Graham Williams.

July 5 Field trip: Farringdon and Abingdon - Sponge gravels and Corallian - Dr Graham Williams.

July 10 Members evening and presentations.

September 11 Dolerite Emplacement and Continental Breakup: the Theron Mountains, Antarctica - Donny Hutton.

October 9 Brick making and Chalk Mining Hazards in Reading - James Ford.

Contact - Mrs Shirley Stephens tel: 01252 680215

Field Trip Contact - Dr Graham Williams tel: 01483 573802 Email secretary@farnham-geosoc.org.uk

www.farnhamgeosoc.org.uk

Hardrow & Hillington Geological Society

June 10 A geological traverse across eastern Morocco - Dr Charlie Underwood.

July 8 Chandrayaan-1:Mineralogical Mapping of the Lunar Surface - Dr David Smith.

August 3-10 Field meeting: Pembrokehire - Roger Sutphen.

August 12 Meeting: Walk around the area of Pinner Chalk Mines - Ken Kirkman.

September 9 Diamonds Through Time - Prof. Andy Field.

Contact: Jean Sippy 020 8422 1859 Email: jeansippy@btopenworld.com Field trip information Alan Wheeler 01344 455451.

Kent Geologists Group

June 16 Dr Frederick Dixon and 'The Geology of Sussex' - Roger Brook.

June 27 Field meeting: Maryon Park, Chardton, London - Adrian Rundle.

July 21 Professor Richard Moody - Geography
of Libya and the Romans.

August 13  A geologist’s contribution to enhancing global security - Dr Alan Heyes. Contact: h.Main@kcl.ac.uk

The Kirkaldy Society (Alumni of Queen Mary College)June 6 Alumni event at Queen Mary College. June 19-21 Field trip to Suffolk - Bob Montague. Contact: Tony Iles: 020 88664348; a.j.iles123@btinternet.com

The Oxford Geology GroupJune 6 Field trip to Bury St Edmunds and de-glaciation of the Middle Usk Valley in Gloucestershire - David Owen

September 19 Field trip: St Davids, Mendip - Andy Farrant (BGS)

Abergavenny area - Adrian Humpage (BGS)

September 8 The driest place on Earth - Chris Gerald Lucy

July 14 Charles Darwin as a Geologist - Chris Schreve President of the Geologists’ Association.

July 18 Field trip: the Geology of Malham Tarn Nr Wrexham - Dr Jacqui Malpas.

June 9 Chalk and Talk - Dr Ian Jarvis. Ravensbourne Geological Society

Contact information www.kgg.org.uk or call pro- gramme secretary 01865 272960.

May 10 - Guided walk - Paul Coates; 01373 474086

email: simonccarpenter@yahoo.com

John Rodgers(CGS)

August 8 & 9th Joint Excursion With The Geologist’s Association Saturday - The Glenderaterra valley. Meet at the car park behind the Bicenrathyr Centre, Threshold at 10.00am NY 303257 Sunday - Rocks & landforms along the shores of Derwentwater. Meet in public car park (pay & display) at The Theatre by the Lake, Keswick at 10.00am NY 303 257. Contact Susan Beale 016974 78353 simonccarpenter@yahoo.com

www.cumbgeol.org.uk

Contact 01373 474086

The Devonshire Association (Geology Section) June 5-7 Annual meeting at Dulverton. June 14 Field trip to Valley of the Rocks, Lynmouth - Peter Keene. September 19-26 Field trip to Brittany - Dr John Rodgers(CGS)

Carn Brea Mining SocietyJune 16 Trewavas Mine Restoration - Steve Poildes. October 25 Field meeting; Trewavas Mine - Steve Poildes August 18 Field trip to the Poldoyo Valley or Great Condurrow.


Craven & Pendle Geological Society Nigel Mountrath Ph.D., University of Leeds Contact: Paul_Kabma@mn.com or www.cpgs.org.uk


July 4 Field trip: Cross Fell & The Pennine Escarpment (Also includes a visit to “High Cup Winery”) - John Rodgers(CGS)

Bristol Naturalists’ Society Contact 01373 474086 Email: info@bristol-nats@yahoo.com

www.cumbgeol.org.uk

For more information on lectures: contact Kath Vickers 01453 827007 Contact: Alan McKay 01452 547255.

Carn Brea Mining SocietyJune 16 Trewavas Mine Restoration - Steve Poildes. October 25 Field meeting; Trewavas Mine - Steve Poildes August 18 Field trip to the Poldoyo Valley or Great Condurrow.


Craven & Pendle Geological Society Nigel Mountrath Ph.D., University of Leeds Contact: Paul_Kabma@mn.com or www.cpgs.org.uk

Cumberb
John@thornhayes.freeserve.co.uk

The Dinosaur Society
www.dinosaur society.org. Contact: Prof Richard Mould (rm@virgin.net)

Dorset Natural History & Archaeology Society
Contact: Jenny Crips. email: jenny@domon.co.uk

Edinburgh Geotechnical Society
www.edinburghgeotech.org.uk

Earth Sciences Teachers Association
For membership: contact: Hamish Ross. PQ Box 23672 Edinburgh EH9 9XQ Tel: 0131 651 6410 Email:Hamish.ross@education.ed.ac.uk

ESTA website www.estauk.org.uk

East Herts Geology Club

www.ehgc.org.uk email: info@ehgc.org.uk

Visit of most welcome - £2

East Midlands Geological Society
March 14 AGM and Members evening. April 18 Lecture by Neil Ellis. Contact Secretary Janet Slater email: J.slater@zoom.co.uk

www.emgs.org.uk

Essex Rock and Mineral Society

June 20 Field visit: Chafford Gorges. Thurrock Essex - Gerald Lucy. June 28 Field visit: Chas Island, Maldon, Essex - Graham ward and Bill George. July 14 Exceptional Fossil Preservation through the Ages - Diana Clements. July 26 Field visit: Crag sites of Suffolk - Bob Markham. September 8 The Icey Moons of Saturn - Gerry Markham. Saturday 11 September 11: AGM and Christmas party. East Midland AGM - Dr Peter Banham. AGM and Members evening.

I.Allison@admin.gla.ac.uk

Contact Dr Iain Allison email: I.Allison@adimin.gla.ac.uk

Geological Society of Norfolk
Contact Email: elvin.thurston@virgin.net.

Hastings and District Geological Society
December 14 AGM and Christmas party. Contact: Diane Williams email: iggyken@aol.com www.hastingsgeoloc.org.uk

Hertfordshire Geological Society
March 5 AGM.

April 16 Introducing to Pembrokefield field meeting - Dr Peter Banham.

April 18 - April 23 Field excursion to Pembrokefield - Prof. Barrie Rickards, Dr Peter Walsh and Dr Peter Banham. May 7 - Great stratigraphic myths - Dr R.J. Bailey. May 9 Field visit to Hertfordshire Bournes and Berkhamstead - Dr John Catt.

John@thornhayes.freeserve.co.uk


Horsam Geological Field Club
June 10 Geology and the Underground - Dr Jonathan Paul.

July 12 The Club’s social event - visit to the South Downs Palaeontarium, Chichester and a picnic afterwards.

July 8 Field visit of Brow Wood and Southend.

Contact Mrs Gill Wood hatch 01403 250371

Hull Geological Society
July 6 Afternoon boat trip to view chalk Contortions at Old Dor Flagborough. July 26 Field visit to Wold SS51 - John Avram.

July 11 Field meeting: Cayton Bay - Barrie Horsham. July 26 Flagborough Research - Ian Hepworth and Mike Home. August 29 Road Show at Home Museum. September 6 Field meeting: Quaternary geology of Dane’s Dyke and South Landing - Mike Hepworth. Contact Mike Home 01482 346784 Email: mikelhome28.freeserve.co.uk www.hgo.org.uk http://go.to/hullgeological

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

Leicester Literary & Philosophical Society
June 5-7 Weekend field excursion to Uffington and Chedder 

Dr Hilary Davies and Dr Cynthia Burek July 11 Field meeting: Kirtlington Quarry, a local nature reserve, exposes the Great Oolite Group and Churchill the birthplace of Wil Smth. pm: Headington Quarry/Magdalen Quarry - Owen Green. July 29 Evening field visit to Titon on the Hill Railway Cutting Childrens welcome. Leader: TBC. August 8 TBC Bradley Fen, Peterborough Leader: TBC Contact Andrew Swift 0116 2523646; abrigstocke@supanet.com

Liverpool Geological Society
Contact: Joe Crossley. 0151 426 1324 or email ljpco@hot,com.

Manchester Geological Association
Contact: Nick Snowdon. 07832 921040. n i c k . s n o w d e n @ m a n c a t . a c . u k email:info@mangeolassoc.org.uk

www.mangeolassoc.org.uk

Mid Wales Minerals, Fossils and Geology Club
Contact: lan Flames. 01066 412679.

Nordic Mineral & Lapidary Society
Meetings at St Georges Church Hall Churchfield Green, Norwich. 19:30hrs every first Tuesday of the Month except August. Contact: Caroline Halder @btinternet.com

North Eastern Geological Society
www.dur.ac.uk/j foulen/NEGS.html


Reading Geological Society
Contact Christine Hooper- for lectures 0118 9471597 email: Christine.hooper@btalktalk.net Contact David Ward - for field trips 01344 483955

The Russell Society
Email Frank Iboro 0195078@btopenworld.com

Yorkshire Geological Society
www.yorksgeolsoc.org.uk

svh.gabbros@btinternet.com

Contact Sue Hay on 01432 357138 or info@ehgc.org.uk

The Woolhope Naturalists’ Field Club
Contact sylvia.woodhead@btinternet.com

Westmorland Geological Society
Contact pat Maxwell 02380 891890 email: n remarxwell@focals.co.uk

Wessex Lapidary and Mineral Society
Meetings at St Georges Church Hall Churchfield Green, Norwich. 19:30hrs every first Tuesday of the Month except August. Contact: Caroline Halder @btinternet.com

North Eastern Geological Society
www.dur.ac.uk/j foulen/NEGS.html


Reading Geological Society
Contact Christine Hooper- for lectures 0118 9471597 email: Christine.hooper@btalktalk.net Contact David Ward - for field trips 01344 483955

The Russell Society
Email Frank Iboro 0195078@btopenworld.com www.yorksgeolsoc.org

Shropshire Geological Society
www.shropshiregeology.co.uk

Meetings every Monday evening at Sidcup Arts Centre.

Contact Audrey Tampling 020 8303 9610 Email: Atampling@aol.com

Southampton Mineral and Fossil Society
Contact Gary Morse 01489 787300.

Stamford and District Geological Society
June 10 Evening visit to Broad Marsh Caves Nottinghram. June 20 Field visit of Pode Hole. July 18 Field visit to Maxey. August 29 Field visit of Bradley Fen. Contact: Bill Leardoy on 01780 752915.

Ussher Society
Contact Clive Nicholas 01392 271761.

Warrington Geological Conservation Group
June 17 Field trip: Topography walk in the Ilkington area - Jon Aidley July 15 Field trip: Quarryman’s with Cadlecoe Church and Canal. September 18 Trip to Griff No 4 Quarry North Warwickshire - Martyn Bradley. September 12 Field trip to Boons Quarry - Martyn Bradley. Contact: Chris Hodgeson 01626 511097. Contact Martyn Bradley 01926 428835. Email: martyn.brady@warwick.ac.uk. www.wggg.co.uk

Wexford Mineral and Lapidary Society
Contact Pat Maxwell 02380 891890 email: nemarxwell@focals.co.uk

Westmorland Geological Society
Contact sylvia.woodhead@btinternet.com

Yorkshire Geologists Society
Contact Trevor Morse 01833 638893 www.yorksgsolic.org.uk
WSGS Study Tour of Guernsey 2nd to 6th May 2008.

Dr Paul Olver led a party of seventeen West Sussex Geological Society members to Guernsey in May 2008.

The southern part of the island is an elevated and dissected plateau. It is formed from ancient metamorphic rocks, which are over a billion years old. The northern part is lower lying and formed from 400-500Ma igneous rocks. Glacial deposits are found around the coastline, with raised beaches and submerged peat bogs indicating changes in sea level over the last ten million years.

The week started on the Friday evening with an introduction on the geology of Guernsey and then on Saturday, 6 May we started at L’Eree Headland looking at the L’Eree Granite by the converted Martello tower at Fort Saunarez.

This granite is 646Ma in age and part of the Cadomian Orogeny; it was formed from heated gneisses, which were then intruded in a subduction zone similar to the modern Andes. The ocean was subducting to the southeast under France (the other side of the ocean was subducting under the Malverns producing the Welsh Borders volcanism). There are large megacrysts, indicative of slow cooling at depth, xenoliths of country rock. Aplite veining was visible. The beach pebbles include flint, from both glaciations and the chalk that outcrops on the sea floor northeast of Brittany.

Next stop was Lihou Island, with the eight metre raised beach visible on the L’Eree Granite (LEG) bedrock (Fig.1). The upper, finer material is Devensian (0.5Ma) - glacial loess deposited by an anticyclonal system, which raised dust on tundra in the Birmingham area. Below this are coarser Anglian (2Ma) deposits. These are on a Quaternary - Precambrian unconformity, with over 640Ma years missing! Nearby at Fort Le Crocq, Perelle Bay, we saw Perelle gneiss xenoliths, which are the rock into which the LEG intruded, some are partially assimilated "ghosts". Then on to Fort Richmond to examine a raft of schist. This is part of a 1500Ma metasediment, almost absorbed into the granite and showing a high degree of metamorphism. The metasediment was laid down as silts and muds in an ancient ocean.

The next site was L’Eree headland facing Lihou Island. Here we looked at the building stones of St. Apollines Chapel where the rubble exterior displayed most of the rocks we were to see in the field during the next few days (2 diorites, epidote, Icart gneiss, dolerite, Cobo granite); the only rock not represented was St. Peter Port Gabbro. Then on to Spur Point, north of St Peter Port. Here the St Peter Port Gabbro is well exposed. Normally the crystals in a gabbro would be random but here they are uncharacteristically layered due to successive crystallization phases; so first hornblende then plagioclase crystalizes giving this igneous rock a sedimentary appearance. Where the gabbro is completely composed of hornblende crystals and consequently jet black in colour it is known as bojite. This suggests rapid crystallisation due to volatiles such as water increasing in the magma. Some of the ‘normal’ layers show rounded crystals of hornblende and these are colloquially known as ‘Birds Eye Gabbro’.

By boat to Sark on Sunday 4th May.

From the harbour we made our way to Port la Jument, on the west coast of Sark, to have a look at the exposures of biotite-rich gneiss of Icartian age (Fig.2). Here the dolerite dykes which intrude the gneiss showed fine-grained chilled margins. Sporadic light greenish pods up to 3m long and lm wide occur in the gneiss, and are composed of grey serpentine criss-crossed by veins of fibrous asbestos. The core of serpentine is surrounded by yellowish talc and greenish chlorite with pockets of milky quartz. A double fault was seen in the corner of the bay forming a V in the cliff. Some of the gneiss showed excellent small-scale folding of the foliation. In the afternoon we looked at Little Sark granite which is quartz dioritic in composition - then back to Guernsey.

On the following day, Monday, we visited Cobo Bay to examine the colourful, orange Cobo granite formed at the end of the Cadomian Orogeny 500mya (Fig.3).

Finally, on Tuesday, our last day we stopped at Moulin Huet, a bay on the south eastern corner of the island where good exposures of Icartian gneiss were found which had been intruded by dolerite dykes. This is a very brief description of our extremely interesting and stimulating tour with Paul in May 2008.

Betty Steel
As this issue of the magazine goes to press, the new Rockwatch field trip programme is just starting, and, once again, we have a number of "firsts". It's always exciting to have new sites to visit and to see them become firm favourites within a short space of time.

With that in mind, our first new field trip this season will be to the Cotswold Water Park and the Colne Gravel Quarry with Neville Hollingworth, where we hope to find a range of fossils from the lower Oxford Clay (Peterborough Member). Another "first" will be with Martyn Bradley looking at the geology during a train journey between London (Marylebone) and Warwick, then spending the afternoon exploring Warwick and its museum before the return train journey in the early evening.

Our indoor events so far this year have included visits to Hertford and Sedgwick Museums and a joint Science Week event with the British Geological Survey (BGS) in Keyworth. We spent three days at Hertford Museum for its "Funky Fossils and Marvellous Minerals" event during the February half-term. The Museum is currently closed for refurbishment, but we had hundreds of visitors to the Millbridge Rooms where the event took place. Children and adults alike had great fun making fossil replicas and quickly became adept at identifying the fossils they had made! We also took along some splendid rocks and fossils from the Rockwatch collection. The best time for me was on the last day when two of the children correctly identified our replica Baryonyx claw - the first time that's happened!

Our annual visit to the Sedgwick Museum kept us busy all day with a steady stream of visitors talking to them about "Geology in Your Shopping Basket", an aspect of geology that few had ever considered. Our hope is that, after this event, many more people will have an idea of how geology and shopping are related and how geologists are involved in most aspects of their everyday lives. Students from the Earth Science Department "Time Truck Team" were also at the Sedgwick helping visitors to understand the concept of geological time and identify fossils. A "Charles Darwin" look alike gave a talk on his life and times to adults and older children. The day was very successful and brought hundreds of visitors to the Museum in this, Darwin's bicentenary year.

There will be more Darwin events at the Sedgwick later in the year, so check the museum's web site if you are interested.

Rockwatch is an active supporter of National Science & Engineering Week (NSEW) and this year, we again spent the week with BGS at its HQ in Keyworth near Nottingham. We had almost 1,000 school children visit for the three-day "Fossil & Rock Show" Schools' Event and then on the Saturday had a Family Fun Day. Families came from as far afield as Kent and Norfolk as well as the East Midlands, to enjoy gold panning, fossil plaster casting, making earthquakes, visiting the core store, making Jurassic dioramas and much more. This has become a highly popular annual event and hundreds of visitors return year after year. Rockwatch is very pleased to partner BGS for both the schools' programme and the public event, helping to show so many people just how relevant and important geology is...
My name is Mia and I am 10 years old. I am a Rockwatch member.

I think "Droplets and the Stone" is a brilliant book because it manages to explain the usually complicated cycle of how a certain landscape is created.

I love the way it is illustrated and how it makes the droplets and crystals characters which makes the story more fun and inviting to read. I found the story easier to take in than most other cycles because there is only a small amount of writing on each page and a picture to explain the writing and there aren’t (sic) many difficult words in it. Another thing I liked about it is that every few pages or so it has a “did you know…” which gave you extra information. It also gives you a warning about pollution and why you shouldn’t drink water if you’re out walking. Overall, I think it is a brilliant book and you should definitely think about buying it.

* Karst landscape

The book is available from GeoSupplies www.geosupplies.co.uk, tel. 0114 245 5746 for £4.95 incl. p&p

Mia, who is one of our young Rockwatch members, very kindly agreed to review the book “Droplets and the Stone” for the GA Magazine. Since this is a book for children, I asked a young Rockwatch member to review it for us. We thought that readers of the GA Magazine who have children, grandchildren or know youngsters who are interested in the world around them, might find the review interesting and be thence be encouraged to buy a copy of the book for a youngster they know! We are always keen to encourage our Rockwatch members to take an active role in the club wherever their talents lie and from time to time to like to share some of these activities with GA members.

Susan Brown
Chairman
PROCEEDINGS OF THE GEOLOGISTS’ ASSOCIATION (PGA)

At the beginning of 2009 the Proceedings of the Geologists’ Association completed 150 years of publication and began a link with Elsevier who will now publish the journal. This change will bring a substantial, annual, financial reward to the Geologists’ Association and make the journal available to authors and readers through electronic delivery as well as retaining the present paper copy. At the same time Elsevier have digitized all the back numbers of the PGA and have added them to the Elsevier Journal Archive, the type of marketing and promotion typical of all other Elsevier journals with a presence on Science Direct and a visibility at important international meetings such as AGU (American Geophysical Union) and EGU (European Geophysical Union). These activities are essential for those wishing to publish in academic geoscience journals, because this is where their papers, and the messages they wish to deliver, will make the impact that is required for successful science.

To find the journal go to the Elsevier website: www.elsevier.com and look for Proceedings of the Geologists’ Association which is identified by a number of logical criteria (its name, subject area) and also highlighted by reference to a ‘New Partnership’ on the home page of the Earth Science section. Alternatively, just look up Proceedings of the Geologists’ Association on Google. Reference to the home page of PGA will provide full details of the journal and details of some highly cited papers and some papers recently accepted for publication. Science Direct, referred to above, is the electronic home of all Elsevier Journals. It provides electronic versions of all papers published in PGA and these can be accessed at www.sciencedirect.com and then typed in the name of the journal. This means that the PGA is now accessible to anyone using science direct throughout the world. Papers are available in the form of pdfs that can either be accessed through a personal subscription or an institutional membership, or they can be bought, one-off as individual papers. PubMed, as members of the GA, a code will be provided by the secretariat and access to all back numbers will be free. As a resource this is quite wonderful and I can tell you that the Secretary of the GA has already taken advantage of this facility.

The change of Publisher for the PGA also sees a change of Editor, and Jim Rose replaces Peter Riches as Editor in Chief with David Horne and John Powell as Editors. Details of these individuals can be found on the PGA website, or some of you may have already been taken advantage of this facility.

It is my intention to keep the GA Magazine up to date with progress in PGA, but at this stage I recommend use of the electronic sites and see the papers that have been submitted and accepted ready for publication in the next issue.

J. Rose,
Editor in Chief,
Royal Holloway,
University of London.
Getting the most from the PGA

The Proceedings of the Geologists’ Association is among the oldest of geological journals, the first volume having been produced in eleven parts over the period 1859-65. This year’s volume, of which the first issue is imminent, will be its 120th. Over the years, it has included numerous important papers on physical geology and geomorphology; stratigraphy; palaeontology; petrology; structural geology; the history of geology; and records of field excursions, both in the UK and abroad, many of which are today invaluable as they often record details of sites which are either no longer exposed and/or accessible. The journal’s contents over the years were recently summarised in “The PGA Illustrated”, GA Magazine, 7 (4), 7-9, 2008.

Now all this can be at your fingertips, thanks to Elsevier, the new publishers of the Proceedings, who have generously scanned the entire run of the journal, including the “Jubilee Volume,” Geology in the field, published in 1910.

If you are a GA member then you can browse this entire contents, and download articles of interest to you, completely free of charge. To access the articles, all you need to do is to sign up to the GA section of Elsevier’s ScienceDirect site, via the GA office: geol.assoc@btinternet.com. GA office: please contact Sarah Stafford at the GA office: geol.assoc@btinternet.com.

(1) Go to: https://www.sciencedirect.com/pgeolaer.com, if you are in Japan).

(2) This asks you to enter your name and your GA membership number. When you input your GA membership number, please put a zero in front of it, e.g. enter XXXX as 0XXXX, etc. (If you unsure of your membership number, please contact Sarah Stafford at the GA office: geol.assoc@btinternet.com).

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GA magazine of the Geologists’ Association Vol. 8, No. 2, 2009
ANIMALS, ARCHAEOLOGY & PALEOENVIRONMENTS TO A MISSING INTERGLACIAL

Dr. Danielle Schreve's Presidential Address described some of the work that has justified a case for recognising the evidence from a former Brick Pit at Grays. This was as a previously unrecognised but highly significant Middle Pleistocene Interglacial correlated with Marine Oxygen Isotope Stage 9.

Professor John Morris of UCL (twice President of the GA) conducted very significant work between 1845 and 1850, including finding a complete elephant skeleton, amongst the Natural History Museum's collection of some 1600 well preserved fossils of 27 mammal species. These were spectacular, but their age was controversial, and their exact locations confused. The Brick Pits, south of Grays, are now almost entirely built over, apart from under a busy road, for which approval to excavate is unlikely. These specimens had been either forgotten, or attributed to the (then) major established Interglacials, around 400k and 120k ago.

Grays showed no clear parallels with any other established interglacials. In it the cave bear had been replaced by the brown bear, the "Clacton" Fallow Deer and other species known from earlier interglacials had already become extinct and other species had appeared, such as the Spotted Hyena and a form of water vole (with its very useful "vole clock" presented by the progressively changing disposition of the tooth enamel).

Rich woodland species, among these larger mammals, such as Merck's Rhinoceros, gave strong evidence of breeding populations. Rare elements such as bottlenose dolphin were also present, indicating the proximity of the Thames. Above all, there was evidence of early humans, from brown bear paws bearing incontrovertible evidence of flint tool butchery. Excavations at the Globe Pit, published in 1957 and 1993 fetched up no fossilising tidal conditions, and some Romes. Topping this was a rich shellbed with a copious vertebrate fauna. The flint industries are recognised as Clactonian below, with Acheulean above, representing Lower Palaeolithic, followed by the Mid Palaeolithic Levallois - made by the earliest Neandertals which is characterised by the manufacture of artefacts 'of predetermined shape, probably for hafting on to spears'.

The Acheulean was always clearly separated from the Clactonian, thereby allowing some ideas to be general, concerning the origins of the people that made these industries.

Once temperatures warmed sufficiently, the first people into Britain perhaps came from areas such as the North German plain. They had no long tradition of handaxe manufacture. The Acheulian visitors came later in the interglacial, from areas such as France and Spain, and they already had handaxes.

In Palaeogeography the discovery at Purfleet, that the Thames ran from West to East - initially caused much consternation. It was later discovered to result from a reverse "S", which was later abandoned. The Thames was then a large, slow flowing river, deeper than 5 metres, and 10km across. A muted saline influence was evidenced by forams and ostracods. Mammal remains, such as the white-toothed shrew indicated warmer conditions than the present day.

Cudmore Grove presents a Channel infill, with a rich shell assemblage above a dark detrital mud layer, and then clays with Alder trunks. The site clearly links up, contributing Badger, Red Squirrel and Water Vole (with intermediate stage teeth, by the vole clock). Bird remains. Birds included Ducks, Little Crane and Whooper Swans, while 14 species of Reptiles include 7 which are no longer indigenous. Exotic species of Snakes and Frogs confirm that conditions were warmer than today.

On Hackney Downs George Worthington Smith had found handaxes from the buried land surface. Chris Green, working on the unglamorous Nightingale Estate, found molluscs, pollen, plant macrofossils and beetles, although it was probably too deep for vertebrates. Mean July temperature was estimated at 19 to 20, and January from -4 to +1°C.

The importance of high precision geochronology was emphasised, in particular from uranium-series dating. An example from Marsworth in Bucks was given, where dating of a tufa to interglacial stage level had been possible. It is clear from long pollen records on the continent, together with marine cores, that the MIS 9 interglacial has three temperate peaks. Considerable offset exists between the duration of these peaks in the marine record, compared with the evidence from the pollen records.

The River Wiper (Germany), and The Somme, (France) provide consistent contemporaneous evidence in river terraces.

In summary, a study of these localities, which have pronounced similarities by several different criteria, indicates that they represent a discrete additional interglacial with mean summer temperature warmer than today. The mammal fauna has features that are unique and different from those of the established interglacials earlier and later. The succession of human artefacts was significant, and it is recognised that the Neandertals appeared around 250k years before present.

It is now suggested that the evidence at these locations consolidates a case for declaring a legitimate additional intermediate interglacial, in the late Middle Pleistocene, around 300k years before the present.

Danielle Schreve's lecture was highly informative and entertaining, and sent the GA members off to their annual dinner with a roseate glow of anticipation.

Tony Iles
The Australia-Asia Collision, and its consequences for Ocean Gateways, Climate and Life?
Prof. Robert Hall, SE Asia Research Group, Royal Holloway, University of London

Today Pacific water passes into the Indian Ocean, creating an Eastern Indian Ocean warm pool that supports an immense diversity of both marine and terrestrial life forms. Professor Hall demonstrated that it had not always been so. The gateway had been fully open before 25Ma, but closed in the early Miocene, when Australia collided with South East Asia. He showed with some computer animations the implications of successive situations at the gateway throughout a long and complex geological history, which had included almost total closure of the flow. He explained that rapid movements of small plates had led to subduction being more important than the direct effects of the collision. This had major effects on both the geography and the biology. The area is still dynamically very active.

Professor Hall probably surprised many of us, by demonstrating with superimposed outline maps, the immense size of Borneo - which could accommodate the area of the UK comfortably within its boundaries. He also cast light on the work - and no doubt the character - of the great AK Wallace who had conducted research there in dense jungle, with few pathways. He added that working there is not a great deal easier today, though coordinated teamwork, and technical advances such as Satellite Navigation and Radar make a significant difference.

This lecture allowed a taste of an enormous sequence of events, presented coherently enough to allow our fascinated audience to stay in contact, without our brains actually hurting. It would be very useful if Professor Hall could produce a summary that could be enjoyed searg.rhul.ac.uk/current_h the space of days, rather than an hour - preferably one of those books that contains a DVD in the cover.

N.B. Some computer animations and a copy of the paper that will keep you busy for days can be found at: http://searg.rhul.ac.uk/current_resea ch/plaste_tectonics/index/html

Evening Lecture December 2008

The Chalk Revolution: What have we done to the Chalk in England?
Prof. Rory Mortimore, University of Brighton

Dr Schreve introduced Professor Mortimore as "The King of the Chalk". His modest protestations may be confidently set aside, as he explained that several Colleges refused his proposed Chalk-based PhD project, saying the formation had insufficient variation to support a thesis. The formation was familiar enough, but considered to be featureless, and devoid of useful or interesting sedimentary and structural features. His subsequent body of work has clearly turned that view on its head.

He opened up cooperation with continental workers, particularly with the "neighbouring" colleagues in France, where a major project addressed the nature of groundwater flooding in the Somme. He recognised that understanding the stratigraphy was vital. Major revisions of Chalk lithostratigraphy began in Northern Ireland (BGS 1977) and Northern England (BGS 1978). It took from the 1970s to the 1990s to get similar revisions fully accepted for southern England. Broadly at the same time there was a thorough revision of the Cretaceous System of stages by the international geological community (Birkeland et al., 1984).

The traditional long-standing Lower, Middle and Upper Chalk divisions and the Senonian Stage have now been totally superseded. Detailed correlations between northern and southern England have been supported using borehole geophysics and geochronological methods, particularly isotope stratigraphy. This has helped solve the contentious link between, for example, the Black Band in Lincolnshire and Yorkshire and the Plenus Maris in the Southern Province Chalk. It is now possible to pick out individual lithostatigraphic layers, using borehole geophysical methods. Combined with many cored boreholes and field sections this information has made it possible to illustrate lateral variations on both a local and regional scale and to determine the timing of these variations. A key result from this work is the recognition of a complex tectonic history for the Chalk. A regional scale example is the eastward thickening into the Weald Basin of all the older Chalk (Cenomanian to Coniacian) whereas the younger chalk (Santonian to Campanian) thickens in the opposite direction into the Hampshire Basin. The cause of this shift in the locus of sedimentation is the inversion of the Wealden Basin into a dome resulting from multi-staged compression tectonics beginning during the Upper Cretaceous and not just Cenozoic Alpine age folding. The numerous local folds across the Chalk country of southern England and the Paris Basin show similar local-scale tectonic effects on chalk sedimentation. A key event recognised across northern Europe the Alps and more widely happened in the Santonian c. 84Ma.

The impact of these growth tectonic events is seen in the influx of clastic clay sedimentation into chalk basins, in a change in the sea-bed profile inducing erosion and slumping, and generation of particular styles of fracturing in the Chalk. Marl seams very effectively record horizontal movements between layers. Contemporaneous fractures produced during these events are frequently sheet-like.
BOOK REVIEWS

BRITISH FOSSILS
by Peter Doyle
Shire Library 2008. pp 64

This recently published book on British Fossils by Peter Doyle will, I'm sure, be a welcome addition to the book-shelves of anyone with even a passing interest in fossils and who wants to learn more about them. It doesn't claim to be a comprehensive guide to any and every fossil that might be found on these islands. And, although it takes a somewhat didactic approach, that is not to say it's dull or unappealing; far from it! Peter Doyle is an accomplished and enthusiastic teacher who clearly wants to share his enthusiasm and knowledge with his readers.

The opening chapter starts with the basics - The Meaning of Fossils - and goes on to explain just what fossils are, how they are formed, puts that into context with an explanation of the geological record and concludes with the process of their naming and classification. This is followed by a brief introduction to the geology of the British Isles, an essential guide to any "would be" collector of fossils from these shores. It also gives some examples, beautifully photographed, of where fossils might be found in Britain.

There's a short chapter on fossil classification showing how knowledge of our geological history greatly aids understanding of the fossil "story" for collectors. The next section of the book is a beautifully illustrated collection of some of Britain's most common fossils, grouped in the main divisions of geological time. And finally, a chapter with practical advice on collecting fossils - essential reading for the novice collector and will also serve as an aide memoir for those whose knowledge is in need of a little updating! There's a suggested reading list and a useful index at the end. The book is very nicely illustrated throughout, mainly with the author's own photographs.

I'd recommend it for anyone new to fossil collecting who wants to develop some understanding of the fossilisation process and thus to gain greater enjoyment of collecting. It provides enough information for a collector, both the novice and more experienced, to identify some of the more common fossils likely to be found on an expedition.

Susan Brown

Geology of the Jurassic Coast.
The Red Coast revealed,
Exmouth to Lyme Regis.
Richard Edwards
Coastal Publishing pp.130

This is the first of three books planned to be published on the geology of the Jurassic Coast (Dorset and East Devon) World Heritage Site by the World Heritage Jurassic Coast Trust and this one focuses on the rocks of east Devon. The book benefits from being extremely well illustrated.

After an introduction to the World Heritage Jurassic Coast and its significance there is a section on the general geology of the coast with cover of the plate tectonic history of the area as well as the history of geology (William Buckland, Henry De la Beche etc). There is then a good section on the background geology of the area for those less familiar with the principles of geology. This is followed by a section (The Story of the Rocks and Landscapes) working through the rocks stratigraphically starting with the late Permian rocks seen around Exmouth at the extreme western end of the World Heritage Coast through to the Quaternary. The rocks are described in some detail and a good knowledge of geology is useful to fully benefit from this. There is also an explanation of the relationship between the geology and landscape of the area.

The next main section is a walk along the coast from west to east explaining what you can see and illustrated with pictures and extracts from the relevant Ordnance Survey map. There is very useful cross-referencing from this section to the earlier section on The Story of the Rocks and Landscapes. The final section is on useful rocks and minerals found in the area for example Beer Stone and Salcombe Regis Stone used in the building of Exeter Cathedral. The book is completed with a good glossary and bibliography for further reading as well as a fold out map and coastal sections inside the back cover. All in all this is an extremely useful book for those visiting the area and at £9.95 it is a bargain especially remembering profits from the sale of the book benefits the work of the World Heritage Jurassic Coast Trust.

Alan Holiday
**Book reviews**


One could say this is a travel book with a difference. The author is known to many GA members as a quietly-spoken fellow-member of GA Council and the organiser of our overseas field trips. The reviewer came across it by chance, just recently, when looking for something else in the historical and biographical books section of a library, borrowed it, and found it an unpottodownable read - a wonderfully written autobiography by a petroleum geologist who has known it all, from Arctic snows to desert heat and tropical jungle, and who eventually ended up running his own oil company. It is evident from quotations in the book that the author has always had a gift for lucid and engaging writing, whether in his own diary entries or in letters home to his parents from the many places in the world where he has been based. These materials, in addition to an excellent memory, must have furnished a great deal of the basis for the recollections from which the text has been built.

The title, rather than referring to some obscure aspect of geological well-sitting, recalls exploits as a small boy growing up in the countryside near Shrewsbury. His interest in geology was sparked by a sixth-form schoolteacher who had been a mining geologist in Rhodesia. Thereafter, a First Class Honours degree in geology from University College London (gained while supplementing his grant from his local County Council by working part-time as an ironmonger) was followed by twenty years with British Petroleum (1957-77), where he ended up as Chief Geologist in their Scottish office at the time of the North Sea development; then Chief Geologist of the British National Oil Corporation (1977-84), which became Britoil in 1982; and, finally, Managing Director of Croft Exploration Ltd. (1985-97). But these dull facts belie an immensely human story and, simply, a "jolly good read". The book bristles with lively accounts of close encounters with wildlife, snowy wastes, desert sands, mangrove swamps, near-death experiences in helicopters, and the many people he has trekked with, or shared meetings or meals with, along the way in Australia, Abu Dhabi, England, Indonesia, Libya, New Zealand, the Philippines, Russia, Scotland, Singapore, Sumatra, Thailand, the USA and Alaska. It is perhaps hardly surprising that the author’s liking for people, and respect for other cultures, has encouraged him to learn to converse in Arabic, Thai, Malay, Russian, French and Spanish (the book finishes in 1999, at the point at which he was about to add Japanese to his amazing portfolio of languages).

The characters in the book are by no means confined to business colleagues. He writes warmly of family and other friends, and is surprisingly open about his personal relationships, including his difficult first marriage, and there is a moving account of the death of his second wife from cancer. On a lighter note, readers will be able to find out such useful things as: what one should do when attacked by hundreds of fleas, or mosquitos; how you should get out of a helicopter on a mountaintop, and what happens when your life-jacket inflates while you are in one; how can a submarine be of use; and how do you set up a small oil company? Buy, read and enjoy (I have now purchased my own copy)! If nothing else, this will convince you that the GA’s overseas trips are in a very safe pair of hands indeed.

Fossil Hunting at Bracklesham & Selsey
By David Bone
ISBN 978 0 9562018 0 5. £4.50 incl. p&p

This recently published A5 pocket guide to fossil collecting from the Bracklesham and Selsey area of West Sussex will be very useful for those planning a fossil collecting trip to the area. The book is well illustrated throughout with excellent photographs, mostly the author’s own, a couple of simple geology maps and two showing where fossils can be found on the beaches at both places.

The layout of the book is easy to follow with good sized print. After a very brief introduction there’s a short section on “Reconstructing the Past” followed by a helpful “When and Where to Go”. There are some good tips on what you might find on the beaches and how to look for fossils - small is good and big will then find you! Then follows a longish section on the more common fossils likely to be found and on many pages there are extra facts in boxes. There are some helpful hints on cleaning and storing fossils - important if your collection is going to be useful to you and others. The book concludes with short sections with details of the local geology, the last Ice-Age impacts on the area, flint fossils that might be found and finally present day impacts of coastal erosion. There’s a useful bibliography and contacts list for those wishing to learn more.

It’s a useful guide which can easily be popped in a pocket and used for identification in the field. There’s not too much detail, but enough to add to the understanding and enjoyment of a fossil collecting expedition for collectors of all ages and most levels of competence. I’ve bought my copy already!

Susan Brown

GA magazine of the Geologists’ Association Vol. 8, No. 2, 2009
Box folds, i.e. folds with a square, angular profile, form in materials with a high mechanical anisotropy such as a strong mineral fabric like the Precambrian phyllite from Rhoscolyn, Anglesey, shown on the top figure, a), a well developed bedding as in the Carboniferous turbidites from Bude, shown in b) and the lubricated multilayers of paraffin wax. In the bottom figure, a deformed evaporite multilayer from the Castille and Toledo evaporites of New Mexico shows a variety of fold structures including Box folds (4), upright chevron folds (3) and single layer buckles (1 & 2). Box folds can form on all scales from folds with a wavelength of a few mm (upper figure) through folds with a wavelength of a few 100m (b) to folds with wavelengths of 10km and greater as for example the folds currently forming in the Zagros mountains of western Iran.