GA
MAGAZINE OF THE GEOLOGISTS' ASSOCIATION
Volume 5 No. 1 March 2006

Meetings - March, April, May
High Lodge Column
Regional Meeting
Reunion
Rockwriter 2005
Somerset & Dorset
West of Ireland Field Meetings
Mud, Mud Glorious Mud
Know Your History & Be Proud

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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 2006 are £39.00, Associates £29.00, Joint Members £57.00, Students £17.00.

For forms of Proposal for Membership, and further information apply to the Executive Secretary, The Geologists' Association, Burlington House, Piccadilly, London W1J 0DU.
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LAST Copy dates for the Circular

March Issue January 14th **June Issue April 22nd**
September Issue July 22nd **December Issue October 21st**

Please note that the dates given are for the Circular. They also represent dates at which the magazine will go to press. However, because of the greater time required to set the magazine, items should be submitted as soon as possible and not targeted on these dates. We welcome contributions from Members and others. We are currently limited to 24 pages. Pictures for publication can be as slides, photographs or digital images 360 pixels per inch - preferably on CD.

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Cover picture: High Lodge Column
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ADVERTISEMENTS

While precautions are taken to ensure the validity of advertisements the Association is not responsible for the items offered, for any loss arising or for their compliance with regulations.

NOTICE CONCERNING FIELD MEETINGS:

The Association now has a mobile phone for emergency communications concerning field meetings (UK only). If you have to cancel on the day, or are lost or late for the start of a field meeting, please call the GA mobile phone (07724 133290). The mobile phone will only be switched on just before and during field meetings.

(For routine enquires, please call the GA office on the usual number.)

THE ASSOCIATION

FROM THE PRESIDENT

Next year is the bicentenary of the Geological Society, and the following year our own GA 150th anniversary, and by now all the secretaries of our associated and affiliated local groups will have received letters on behalf of both societies asking for ideas and support for regional meetings which will be held around the whole country at intervals during that two-year period. I do hope that you will respond to that call, since it seems to both Councils to be an excellent opportunity, with appropriate publicity (for which the Geological Society has secured the sponsorship) to raise the profile of geology in the nation at large, as well as further cementing our cordial relations.

Since this is the first GA Magazine of the year, it is also an opportunity, not only to remind you to renew your own subscriptions, but also not to forget to mention the GA to all whom you come across. New members are of course the future lifeblood of the Association, and I can only repeat the challenge that I set you all in my first letter, that is for each of you to recruit a new member every year. Not that the finances of the GA are in bad shape (a good opportunity to thank Bernard Leake again for all he does so well as our Treasurer), but simply so that the GA can continue to flourish and help everyone in this country to be more aware of geology. I am sure that most of you do not need further ammunition, but your potential recruit may not just be interested in what lies beneath their garden topsoil, but also be unaware that the apparently academic word "geology" links, as well as nearly all of their energy and water supplies, but also most of their raw materials for manufacturing, and is the key to efficient waste disposal and the solution of many pollution problems as well as understanding global warming. But enough of all that, the best message to communicate is that so much of geology is fun, and also a wonderful and exhilarating mix of art and science (the art part is what you deduce about the rocks you can't see and the fossils you haven't found!).

In my last letter I spoke of the nights drawing in, but the reverse is now true there is now plenty of light again to go out and enjoy the rocks!

Robin Cocks

REPORT FROM COUNCIL

Council reviewed the November Reunion at University College London and all agreed that the Local Groups and Affiliated Societies had put on their usual excellent displays illustrating their range of interests from field meetings to personal interests always with good illustrations and specimens. A discussion on publicising the event, how often it should be held in London or away from the Capital, the costs involved and how the money could be raised, what the Reunion should be called. The success of the Cardiff event owed much to the very positive involvement of their Museum organisation. It was agreed that a small committee should be formed to review all the factors involved and report back to Council.

The day before the reunion is the meeting of the representatives of the Local Groups and Affiliated Societies. There were many very constructive discussions and, as usual the problem of the interpretation of the details of the group insurance was raised. This is a very difficult problem since the information must be exact. A paper will be prepared and agreed with the insurers to try to overcome this problem.

The Regional Meeting at Keele was discussed and its success was achieved only with by the hard work and organisation of the North Staffordshire Group. A report of the event is on page 8.

The plans for the Sesquicentennial celebrations are still developing: regional events, dinners, talks, reconstruction of historic field meetings (in costume?), a "Geology of the World" field trip and many more are being considered. It was suggested that it would be a good idea to find some other title for the event rather than "Sesquicentenial".

Council received with regret the resignation of Bill French as Editor of the GA magazine. The Council warmly thanked Dr. French for his achievement in establishing and editing the new magazine which has been so successful. Dr. Cocker will be managing the next issue but a new editorial team is needed.

The Treasurer explained to Council the present state of the GA finances and the recommendations of the investment panel that advises on the GA funds. The Treasurer reported that the present Auditor, Maurice Whiteley, who has been the GA auditor for 17 years has resigned. Council expressed their gratitude for all his advice and help in that time.

Council had previously organised a small committee to look into the links between the GA and Local Societies. The committee agreed that there should be more intersociety communication, via perhaps the web site or the Circular. It was suggested that a member of Council should be responsible for links with Local Groups and Affiliates.

The Overseas Field meetings Officer reminded Council that he will resign his post at the AGM and that someone is needed to replace him.

Rockwatch continues to be successful, thanks to the efforts of the many people who volunteer their time to make Rockwatch events run so well.

John Crocker
General Secretary

FROM THE LIBRARIAN

At the time of writing, with north-east winds blowing the snow-in, it is perhaps not inappropriate to mention an example of a "new" Swedish series of maps that has come our way. SGU serie K, no.12: Berggrundskarten (Bedrock map) 11G Vasteras NV 1:50,000 (2005). Vasteras is a town ENE of Stockholm on the north shore of Maleren. However, the other quarters of this sheet to the NE, SW, SE and surrounding sheets have all been published in the SGI (Sveriges Geologiska Undersokning) AF series. Note that each map has a series number and a different sheet number. The SGU has a multiplicity of alphabetical series where scales may vary within the series. For example: Ba includes Stockholm 1:100,000 (no. 24); Skelleftefaltet 1:250,000 (no.57); and Quaternary deposits of Skane 1:250,000 (no. 55). Series Ca with some maps at 1:200,000 also includes the text Guide to excursions in Skania. One has to be careful to give full details when quoting to avoid confusion, though titles and legends are now helpfully given in English.

However, if thoughts are turning to warmer climes, how about the Dominican Republic which occupies the eastern half of the island of Hispaniola (with Haiti in the west). Mollets, H. et al. 2004. mapa geologico de la Republica Dominicana 1:250,000. Geologisches Jahrbuck Reike B, heft 90 (in Spanish). As well as the four sheets covering the republic there is also generalised geological map, a map of sources used, Palaeontology locations map with separate table of samples, and an explanatory text for the geological map. Pages 44-45 include a nice series of seven maps showing the tectonic evolution of the Caribbean. Elsewhere coloured photos illuminate the text with mountain views, excellent sections and empty bays with a few fishing boats for local colour. The latter a contrast to a current report in the Spanish paper El Pais that two-thirds of Spanish beach resorts are no longer able to provide more than the EU-recommended minimum of six squares metres per sunbather. Head for the hills and enjoy your trips in 2006.

Elaine Bimpson
Curry Fund Report Page 11

MARCH MEETING

"Small Contributions" - how the GA is advancing micropalaeontology

Peter Green and Dr Adrian Rundle

Friday March 3rd 2006
Geological Society, Burlington House,
Piccadilly, W1V 0JU at 6.00pm, tea at 5.30.

THE LONDON CLAY AT WALTON-ON-NAZE - ESSEX
EVIDENCE FOR A TSUNAMI

About 30 yrs ago Mike Daniels moved to the Walton area having found bird bones at the Naze. He made these his life study, and now has the worlds best collection of L. Eocene birds. For 30 years this amateur palaeontologist would search the Naze foreshore for fossils, especially birds. The whole pocket would be dug out and removed, to be wet sieved at home. He estimates that he has handled in excess of 10,000 kg for home processing. As well as birds, he found dog sized mammals horse, tapir and small insectivores that had obviously been washed into the London Clay Sea. In the late 1970's he found mm sized glassy particles, that are now know to be ejecta from meteorite impacts (micro-tektites). In 1970 this was an insane suggestion of course. Using mainly Mikes collections I produced a booklet in 1998, "Fossils of the L. Eocene London Clay from Walton-on-Naze-Essex". In the micro-tektite section he made a far reaching prediction. "There is incontrovertible evidence of some cataclysmic event that annihilated the avian community over a wide area, the implications are obvious and far reaching. Consideration of the North Sea Basin as a possible impact site must follow". This prediction would now seem to be confirmed by the Silver Pit crater, a meteorite impact site. A meteorite impact 140 miles north of Walton on the Naze would have produced huge waves, TSUNAMI, that swept away everything in its path into the profusion of trees, and land flora and fauna to be found at this site.

Micro-tektites. Scale 1mm

Bone Nodule

APRIL MEETING

Using British Mesozoic Stratigraphy to Recognize and Understand Global Events

Angela Coe
Snr. Lecturer, Dpt. of Earth Sciences, CEPSAR, The Open University

Friday April 7th 2006
Geological Society, Burlington House,
Piccadilly, W1V OJU at 6.00pm, tea at 5.30.

Some of the most spectacular and important Mesozoic successions are exposed in the British Isles, particularly around its coastline. The successions are important because of the wealth of information that has been recorded from them over several hundred years, their ease of access and lastly because during the Mesozoic Britain was situated close to the junction between the closing Tethys Ocean and the opening proto-Atlantic Ocean. This talk will show how a number of Mesozoic successions in Britain have recently been used to document and interpret key global events. These events have been used to refine the geological timescale and, importantly, help to inform us about current climate change. Examples will include: (1) the Late Triassic and Early Jurassic successions from Somerset which provides evidence for why there was a major environmental change at the Triassic /Jurassic boundary and what caused the mass extinction over this interval; and (2) evidence from the Toarcian-aged 'Jet Rock' exposed along the Yorkshire coast for the release of a massive amount of the powerful greenhouse gas methane into the ocean/atmosphere system through the destabilization of methane hydrate. This event appears to have caused rapid global warming, a change in ocean chemistry, a massive increase in chemical weathering rate, a mass extinction and a crisis in the primary food producers in the oceans.
Pictures all courtesy of Anthony Cohen, The Open University.

The author (Angela Coe) and Dave Kemp (PhD student at the OU) marking up the Jet rock exposed at Hawsker Bottoms, Yorkshire prior to sampling.

The Toarcian succession exposed at Hawsker Bottoms, Yorkshire

MAY MEETING and AGM

AGM and Presidential Address

Blowing hot and cold in the Palaeozoic.

Robin Cocks,

The Natural History Museum

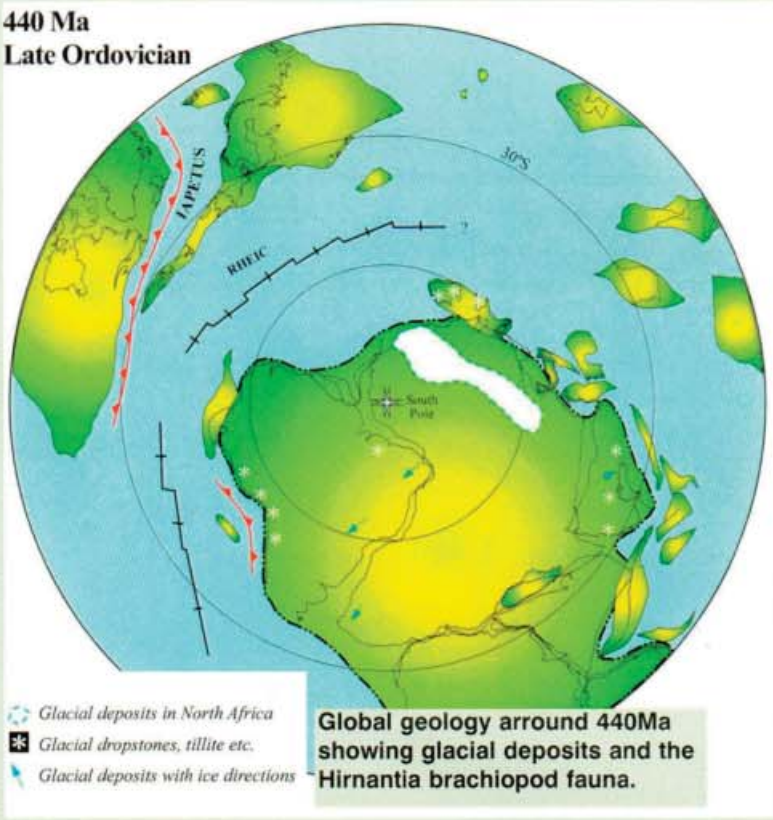
London

Friday May 5th 2006

Geological Society, Burlington House, Piccadilly, W1V 0JU.
The Geologists' Association Annual General Meeting will be at 6.00 p.m. (tea at 5.30), followed by the Presidential Address.

Everyone talks about tomorrow's possible rain, global warming, and a host of weather-related topics: but what do we know of the weather long ago? From the record of the rocks we can decipher glacial intervals, tropical reefs and times of torrid heat, and also more gentle climatic belts and episodes between those extremes. From the measurement of carbon and oxygen isotopes within fossils and sediments we can also get indirect records of palaeotemperatures, and there are a host of other more or less subtle climate indicators that can be deduced from close study of the geology. But what were the causes of these fluctuations? The morphology and areal extent of lands and seas were certainly some of the many complex and interrelated factors which led to climate change; and successive and changing global palaeogeographies in the Palaeozoic are now becoming clearer, particularly in the well-studied North Atlantic region. However, there are very little or no data from vast areas of the globe, and an enormous area was covered by the Panthalassic Ocean, which was comparable in size to the Pacific today. At some times in the Palaeozoic the situation is now well-understood; for example, there were two glacial periods, the earlier one for a mere half million years at the end of the Ordovician, and the latter lasting for more than an amazing seventy million years in the Carboniferous and Lower Permian, with a preceding icecap also known only from glacial deposits in the Lake Titicaca region of Bolivia, South America. Immediately prior to the Ordovician Hirnantian glaciation there was a brief but interesting period of global warming in the Middle Ashgill. The development of faunas and floras played a critical role in the geography and climate; for example, the progressive advent of firstly small land plants and then large trees made rates of soil and rock erosion very much slower by the end of the Palaeozoic than at the beginning. The situation from the Cambrian to the Permian will be briefly sketched, with the climates of some geological periods and areas over that nearly 300 million year span much better understood than others.

Late Ordocvician glacial striae from Algeria



Global geology arround 440Ma showing glacial deposits and the Hirnantia brachiopod fauna.

ANNUAL DINNER FRIDAY 5TH MAY 2006

Please do join us for the annual dinner which will be held in the lower library of the Geological Society, Burlington House, London, from 7.30 - 10 pm following the AGM and Presidents address. The cost will be £30 per person and the dinner will consist of a hot buffet, two glasses of wine and coffee.

Please send you booking to Mrs Sarah Stafford, The Geologists' Association, Burlington House, Piccadilly, London W1J 0DU enclosing a cheque made payable to the Geologists' Association. Please book by Friday 28th April and indicate if you have any special dietary requirements.

Planning on a visit to the earth Lab?

Those of you who are familiar with the Earth Lab in the Natural History Museum should be aware that access arrangements have recently been changed. In 1998 The Natural History Museum opened the Earth Lab aimed at the geological community, and in particular to local geological societies. Now it is being opened up to make it accessible to a broader audience including schools and families. School groups can book Earth Lab for sessions to study British fossils rocks and minerals, assisted by explainers. Sessions are currently scheduled each weekday during term time between 11.30 and 1.30.

Earth Lab is organised in two sections. The outer gallery area has over 2000 specimens of British fossils, rocks and minerals displayed stratigraphically with their identification labels. Additional information is provided by the computer database, which also pictures the specimens and is available over the net (http://internt.nhm.ac.uk/jdsml/nature-online/earthlab). The specimens were, for the most part, originally on display in the Earth Galleries. Access to the outer gallery is still open to the general public during museum opening hours even when the space is being used for a booked group. However if you are planning a group visit, then you should book.

Outer area with display cases & computer

The inner lab always had restricted opening hours but has the advantage of a staff member on hand to guide you through the various earth science investigations. Here you can use the powerful Leica microscopes which display images on a screen. You can try to identify your own specimens using the reference books provided and by comparing with specimens displayed in the outer gallery area. There is also a handling collection available to visitors. The inner lab is currently not open to drop in visitors but it can be booked for any group including family groups. Do take advantage of this facility.

Improvement of the outer gallery area is planned for 2006-7, including an overhaul of the specimen databases, and this will enhance the facilities for self-directed learners. Audience research will also be carried out during 2006-7 to determine which audiences regularly visit Earth Lab and what their needs are. The level of demand for staffing the inner lab, at fixed times, for drop-in visitors, will be reviewed as part of the survey. So, if you want to ensure that Earth Lab remains accessible, do make the most of it!

For more information or to book a session, please email Margarita Petri: m.petri@nhm.ac.uk or contact her via the Earth Lab website: http://www.nhm.ac.uk/education/activities/adult-activities/index.html. Please give as much notice as possible.

Earth Lab is located on the mezzanine level above the Earth Galleries shop.

Or do you want specimens identified at the Natural History Museum?

Rather than trying to identify your own specimens using Earth Lab you may wish to have them identified by a museum scientist. This facility is still available but again, the procedure has changed. Instead of taking your specimens to a staff member in Earth Lab, talk to the staff on duty at the Information Desk and ask to see someone from either the Palaeontology or Mineralogy departments.

The Enquiries Officers are available at the times below. It is advisable to book a time in advance to be sure of seeing someone.

Palaeontology Department: Monday to Friday 10am - 1pm, 2pm - 4pm
Telephone Simone Wells on 020 7942 5482 or e-mail palaeo-enquiries@nhm.ac.uk

Mineralogy Department: Mondays & Wednesdays 2 - 4pm, Fridays 10 - 12
Telephone Peter Tandy on 020 7942 5482 or e-mail c.stockley@nhm.ac.uk

While the Museum takes reasonable care of the specimens entrusted to it, they are accepted only at the owner's risk.
The Enquiries Service is free to members of the public. However they can only handle a maximum of 10 specimens at a time and a payment may be requested where there is significant staff, postal or other costs, or for multiple enquiries. The Natural History Museum welcomes donations to support the considerable costs of this free service.

Diana Clements
GA Council Member

Inner lab of Earth Lab

High Lodge Column -

To the geologist, the word 'Breckland', the area that stretches from south of Swaffham in Norfolk to north of Bury St Edmunds in Suffolk, is probably associated with the complex series of glacial deposits overlying the chalk of the Cretaceous Period. To help visitors understand the geological processes which shaped this landscape, they can view a column at High Lodge Forest Centre near Thetford, which is a representation of the deposits to a depth of thirteen metres.

In 2004, The Forestry Commission received funding from the Arts Council England, Forest Heath District Council and the 'Arts for All' programme of Suffolk County Council, through the Rural Arts Lottery Programme, for an innovative arts project at High Lodge Forest Centre. The sculptor, Julienne Dolphin Wilding, was chosen to carry out the project and, after a series of public consultation days with adults and children, she chose a geological theme. The idea of the column was inspired by her research at Grimes Graves Neolithic flint mines near Thetford :"I found the whole experience of travelling through the earth intriguing and went back many times, as the substrata are quite visible from the ladder in the shaft."

The column was constructed around a ten-tonne block of concrete and a steel inner tube ten millimetres thick and twelve metres high welded on to a base plate. Twenty-four 'mill stone rings' were then mounted on to the tube and bedded in with mortar joints. Using aggregate materials provided by May Gurney and Frimstone Ltd, Julienne built up a series of layers to create an artistic impression of the geological strata to a depth of thirteen metres. The period of geological time suggested by the column is from the Cretaceous period to the Quaternary, although the Tertiary is absent. In Breckland, the Upper Chalk, which contains flint nodules, was formed about 90 million years ago, from the remains of billions of microscopic planktonic calcareous algae which accumulated on the bed of a huge sub-tropical sea. Bands of flint nodules, made of silica, were the result of chemical processes within the silica-rich sea water and sediment. It is these flints which were later used by humans.

The Chalk was uplifted by earth movements to form a land surface about 65 million years ago and it was this surface which was then covered by the ice sheets of the Anglian Glaciation, beginning 1.5 million years ago. During the warmer episodes within the Ice Age, humans migrated to the area. Some of the earliest remains of human activity have been found at High Lodge, Mildenhall, also on Forestry Commission land. A site at Lynford has yielded bones of mammoths and flint hand-axes of the type made by Neanderthal people 60,000 years ago.

The ice sheets deposited chalky till and the meltwaters laid down variable sands and gravels. The subsequent action of rivers and streams deposited gravels, sands, silts and clays over the region. About 18 000 years ago, during another glacial episode, the Devensian, when the ice sheets advanced again, but only as far south as the North Norfolk coast, Breckland was affected by permafrost conditions. Alternating freezing and thawing of the surface layers created patterned ground of polygons and stripes. The layers of the column are an attempt to depict all these processes.

Whilst stunning in its concept and appearance, the column has been the cause of some puzzlement among visitors as it has lacked an interpretative explanation. This can now be provided because The Curry Fund of The Geologists' Association has very generously given The Forestry Commission a grant of two thousand pounds for the production of an information board. The chairman of 'GeoSuffolk' (Suffolk RIGS), Mr R Markham and his colleague, Dr R Dixon, have given invaluable help with the text content and advice also came from Dr S Boreham of the University of Cambridge.

When this is in place, it will form an introduction to the story of the earth beneath the feet of all those who visit the forest. Julienne Dolphin Wilding realised that we live on the earth's surface, but are mainly oblivious to what is below us and this column is her way of making everyone aware of the geological processes that have shaped Breckland's distinctive and unique landscape.

High Lodge Forest Centre is located off the A1107 between Brandon and Thetford. The Forest Drive and car parks are open daily (except Christmas Day) from 9am to 7pm or dusk, whichever is earlier. The Geological Column is situated in the grassed area on the approach to the Forest Centre from the car parks, so it can be viewed when the Forest Drive is open. For further details, please telephone High Lodge 01842 815434 or the Forest District Office 01842 810271.

Anne Mason - Forestry Commission

The completed coluimn - its height can be estimated from the height of the surrounding trees

Column under construction

Detail at top of column

REGIONAL MEETING

The First Regional GA Lecture

The first Regional Lecture of the Geologists' Association was organised by the North Staffs Group (NSGGA) and held at Keele University on Thursday 10th November 2005. Dr Peter Floyd, Vice Chairman NSGGA, introduced the speaker Professor Richard Fortey from the Natural History Museum and invited him to give his talk entitled "The Earth; An Intimate History". Dr Graham Williams, Vice President of the GA, chaired the meeting and Professor John Winchester; Deputy Head of the School of Physical Sciences & Geography, Keele University gave the Vote of Thanks.

The all-ticket lecture was preceded by a light buffet provided by the NSGGA and free to members of the GA, Local Groups and Affiliated Earth Science Societies.

The lecture theatre filled with the large number of attendees

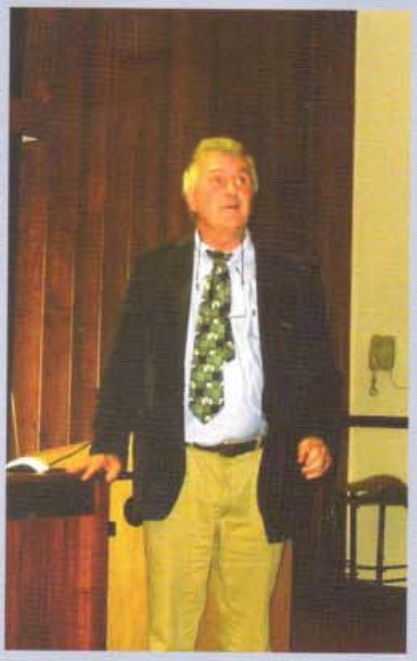
190 people applied for tickets; from as far afield as Durham, Oldham, Glastonbury, Mid Wales, East Midlands and West Midlands; the Open University Geological Society was very well represented. Many had to be refused a ticket due to the enormous response.

150 people turned up on the night and filled the lecture theatre.

The numbers broke down as follows:

NSGGA members	62
Students	22
Visitors	66

The talk was based on Professor Fortey's recent book and examined the history of the realisation of and confirmation of the existence of plate tectonics. Having read Professor Fortey's book previously and listened to the talk, I intend to read the book again to fully appreciate the historical background to this theory. He took us on a journey starting with the Bay of Naples and evidence of rise and fall of the land in the Pozzuoli region where subsidence caused the sea to engulf the marble columns of the "Temple of Seraphis". There are signs of attack by marine clams that Lyell knew as *Lithodomus* some 4 metres above present ground level.



Richard Fortey lecturing

The journey then took us through Hawaii and on to examine Oceans and Continents before taking in the Alps and the immense folding that took place there in earlier times.

Finally, Professor Fortey's description of the hair-raising descent into the Grand Canyon can only be surpassed by the chapter in his book.

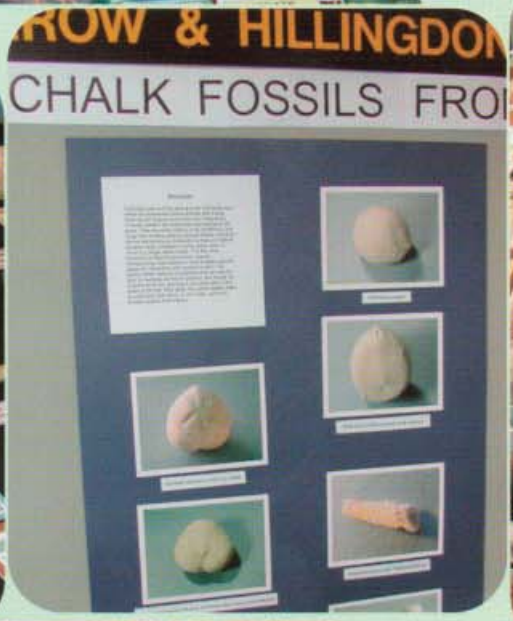
Interspersed with the photographs and illustrations were accounts of experiences and findings of such eminent geologists as Charles Lyell, Eduard Suess, Arthur Holmes, Albert Heim and his models, Charles Lapworth and many others.

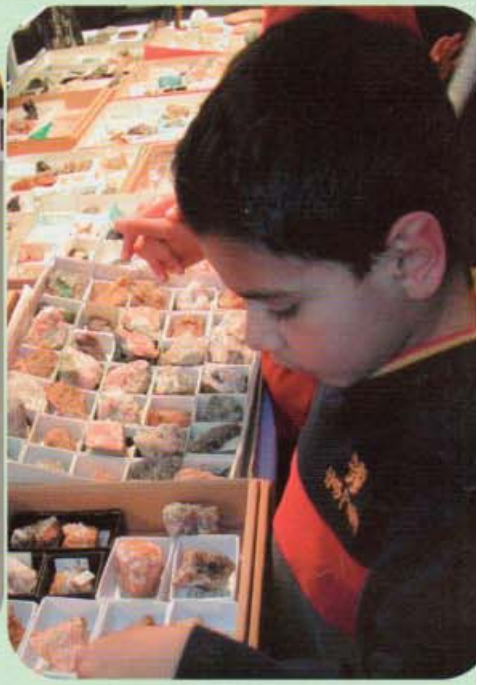
Everyone enjoyed the lecture and at the end Professor Fortey was surrounded by a large number of people who wished to talk to him and ask him to sign their copies of his book.

Mike Fereday Chairman NSGGA

Everyone enjoying the pre-lecture buffet

REUNION PHOTOS





The Reunion 2005 was held in University College London. Local Groups, Affiliates and others produced their usual excellent displays. Rockwatch had lots for the younger members to do including Trilobite racing! A lot of interest was shown in the GA archives.

PHOTOGRAPHIC COMPETITION

Unfortunately there were only three entries for this year's competition, but I think we would all agree that they are stunning pictures. The judges awarded the prize to Linda McArdell for her photo of Sea Stacks

Figure 1. Sea Stack in Cathedral Cove, New Zealand composed of ignimbrite of the Whitianga Group Rhyolites.

Figure 2.The Blue Mesa Trail, in the Painted Desert, Arizona, USA. Eroded lake sediments, composed of Triassic soft sand and siltstone strata of the Chittle Formation.

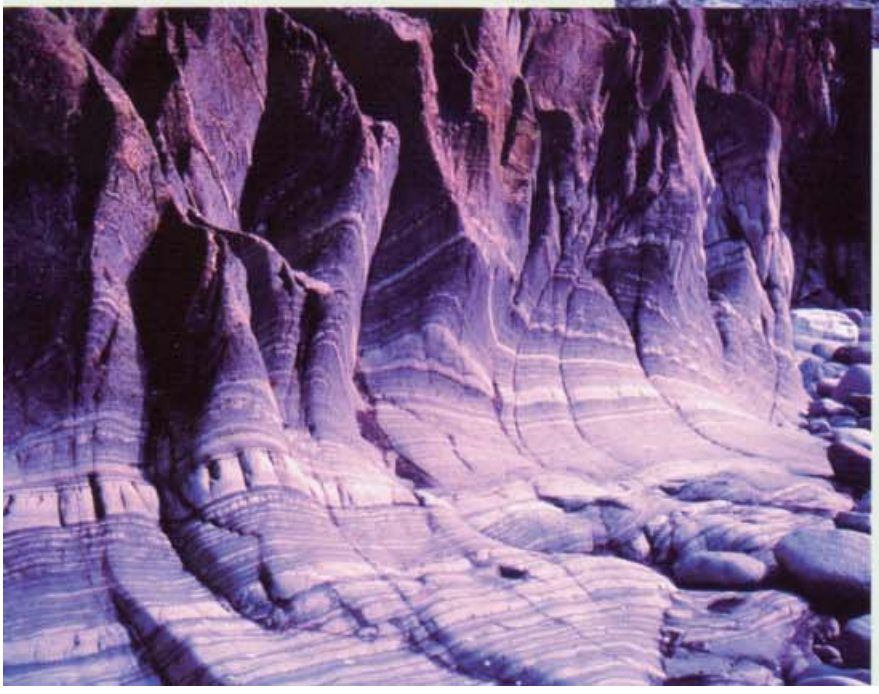


Figure 3. A wave polished section with quartz-sulphide veins of Mid-Cambrian age, in Friog Undercliff.

CELEBRATING 25 YEARS OF GEOCONSERVATION IN AVON

During 2005, the Avon RIGS Group celebrated 25 years of geoconservation work across the Bristol, South Gloucestershire, North Somerset and Bath and North East Somerset areas.

By the first full RIGS meeting on the 27 April 1995, the former geological Conservation Group, as it was known, had already gathered considerable data on geological and geomorphological sites from the former Avon area, over a period of 15 years, since its inception in 1980. Ron Smith (recently deceased) was the first Chair of the Avon RIGS Group. When the Nature Conservancy Council published its Earth Science in Great Britain - A Strategy in 1990, the work of the Avon RIGS Group, was cited as an example of best practice in the ways it was established and how it operated.

During the early days, prior to RIGS status, the number of geological conservation sites grew dramatically through the years. Andrew Mathieson and Joy Coppin (deceased) were founder members of the group, which had close affiliations with the local Wildlife Trust. Staff from local museums, universities, societies, county planning departments and the Nature Conservancy Council were all invited to be part of the group. By 1986, there were 234 sites recorded across our area, helped enormously by Manpower Services Commission funded employment of a team of graduates who visited and recorded about 400 geological sites over a period of a year. At this time, Charles Copp had taken the helm and produced a consultation draft of the most important geological and geo morpholgical sites for use by planning and conservation.

The current group is coordinated by Bristol Regional Environmental Records Centre (BRERC) - this has been a longstanding and successful relationship. BRERC holds information relating to over 1000 geological and geomorphological sites within the former County of Avon. Over 200 of these are currently designated as RIGS.

The Avon RIGS Group are very fortunate to have an area with diverse geology and geomorphpology, spanning almost 500 million years of earth history. There are also strong links with the history of geology in our area. Bath for example, is considered to be the cradle of English geology with many associations with early geologists, most notably that of William Smith - the father of English stratigraphy. In 1799, William Smith produced the world's first geological map, using sites around Bath. Bristol was also an important focus for early geologists, museum collections and a thriving scientific community. For these reasons some of our current RIG sites include buildings associated with some of these early geological entrepreneurs and innovators.

In recent years, the Avon RIGS Group has gone from strength to strength, working closely with the local authorities to review all existing RIG sites and to look at designating new ones. All of this information is now included in the local authority Local Plans. Eileen Stonebridge, a former Chair of the Group has coordinated, with the help of other members, a very successful guide to the building stones of Bristol - called 'Bristol Heritage in Stone'. This has been produced by Thematic Trails, a series edited by Peter Keene. Another member was instrumental in helping to create a new and important RIGS in South Gloucestershire (a former borrow pit for the second Severn crossing - which was due to be filled) which compliments the classic Aust Cliff SSSI. The Group's expertise is regularly consulted by planners, environmentalists and ecologists, especially with matters relating to planning issues.

Our current and most ambitious project will see a complete review of South Gloucestershire RIG sites. A number of these sites will have interpretation boards and an associated website. This exciting work has only been possible with close collaboration with South Gloucestershire Council who bid successfully on our behalf for Aggregates Levy Sustainability Funds. The Council are further supporting the work by providing most of the design expertise to create the interpretation boards. We are confident that these will be some of the best interpretative panels in the Country. The Group is very much looking forward to the next 25 years and continuing to work with all our partners to help conserve our area's unique earth heritage.

Simon Carpenter, Chair, Avon RIGS Group

On the William Smith Trail at Ticking Mill near Bath with members of the Avon RIGS Group

Curry Fund Report for the GA Magazine March 2006.

The last Curry Fund meeting of 2005 received nine new applications and made final decisions on six applications that had been deferred from previous meetings.

Of the new applications, two were funded, three were deferred pending supplementary information, three were refused and one referred to another grant fund. The Earth Science Education Forum was awarded £975 towards the cost of information leaflets about the Forum. A £500 loan was awarded to the Somerset Archaeological and Natural History Society towards the cost of publishing a book on the changing environment of the Somerset Wetlands.

An application from the Chester Museum for classification and provenance of the City's building stones was deferred pending further information. Supplementary information was also required from Timespan for the geology garden it is planning. The application from the City and County of Swansea for support for geological trail around the City centre was welcomed by the Committee but it felt that a slightly different form of presentation might be more effective so a decision was deferred pending additional information. The application from Dorset's Important Geological & Geomorphological Sites for support for two leaflets, one aimed at the public, the other at planners, explaining geodiversity, was refused funding. Whilst the Committee was supportive of the concept, it was felt that the leaflets needed a somewhat different approach, and the organisation was encouraged to re-apply after a change of focus. The Gloucestershire Geoconservation Trust's application was refused as it fell outside the remit of our Guidelines. An application for support for fieldwork from the University of Bristol was referred to the Middlemiss Fund. Funding was refused for the elements of the Langholm Moorland Initiative application highlighted in its application because they fell out side the remit of our Guidelines.

Decisions on applications from previous meetings that had been deferred or were awaiting final approval of draft texts were: Wren's Nest Dudley £377 towards the cost of information boards, North Staffs Group of the GA £900 for a building stones leaflet of Newcastle-under-Lyme and £420 to Warwickshire Museum for and interpretation board. The application from Ravensbourne Geological Society was deferred pending additional information. Minor amendments to the previously agreed applications from Abberly and Malvern Hills Geopark and the Forestry Commission were accepted and the projects signed off.

Susan Brown
Curry Fund Secretary.

Rockwriter 2005 - The winner of this year's competition was James Deighton who wrote a report on his visit to Iceland. The report was too long to reproduce here in full but here are the reports of two of his days to give you a flavour of his writing

A World Of Ice

Day 4

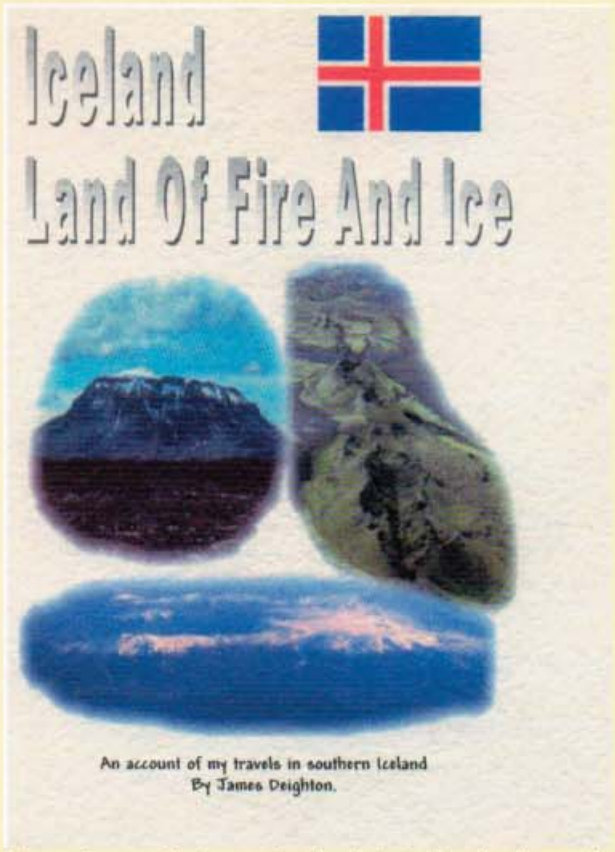
I was pleased to find out that today we would be staying in the local area and would not be travelling far by coach as most of the sites could be reached on foot from the hotel. This was a welcome relief after all the travelling we had done on the coach the previous day and I prepared myself by wearing an extra layer of clothing as we would be outside for long periods of time again. As we set off I noticed once again that the sky was a perfect blue and that there was no sign of any clouds as we crossed over the heather to the nearby visitor centre.

After a brief stop we continued on along the path but started to climb up the side of a steep hill and once at the top everyone admired the magnificent panoramic views of the sandur, the mountains and the endless seas of ice. We followed our teacher along a different path that led us down a small valley in which a stream ran and after passing around a corner we were confronted with our next site. Ahead of us stood a natural amphitheatre of tall basalt columns over which a waterfall flowed tumbling down to the river below. This was Svartifoss one of the symbols of the Skaftafell national park and it looked magnificent as the early morning sun illuminated its many unusual overhanging basalt columns that flanked it.

Leaving behind Svartifoss we began to cross the heath on top of the hill again towards the ice-capped mountains that we could see until all of a sudden we stopped. We were now standing on the edge of a cliff overlooking the glacier called Skaftafellsjökull. The shear size and majesty of the whole scene took my breath away. I was overwhelmed by this great river of ice that just filled the entire scene, the colours were amazing, and every different shade of blue was present amongst the endless white of this amazing spectacle. From our vantage point you could see everything we had talked about in class from the crevasses and moraines to the kettle holes and periglacial lakes, it really brought it to life in a way that no textbook ever could. After what seemed like no time at all but was more like an hour it was sadly time for us to leave and we walked back to the hotel to have lunch.

In no time at all we were on our way again as we set off to explore a glacier close up and I could hardly contain my excitement as we approached Svinafellsjökull another valley glacier that was just behind our hotel. I had never noticed that it was there before, as it lay hidden behind a series of high moraines that showed just how far the glacier had retreated due to global warming. It was very interesting

looking at the moraine as it contained all sorts of different igneous rocks from basalt to rhyolite that had been transported down from the mountains by the giant conveyer belt that is a glacier. After pocketing a few samples we moved on to the glacial snout or at least what we



thought was the snout but as our teacher later told us the ice continued on under the moraine as the rocks helped to insulate the ice so that it took a long time for it to melt. We scrambled up on to the ice and were immediately shocked to see that it was not the pure white ice we had expected to see but was covered in moraine and looked almost black. After been careful not to fall down any of the cavernous crevasses we headed back to the coach that was waiting to take us on to the final-stop of the day.

The road followed the mountainsides closely as we rounded the headland that jutted out towards the sea. Everyone immediately noticed the change in rock type of the mountains out of the window as the dark coloured basalts and dolerites gave way to the pale coloured rhyolites. This was unusual in Iceland because most of the rocks are mafic due to the hot spot that provides Iceland's volcanic activity but these rocks were silicic due to magmatic differentiation. This was an amazing revelation and everyone tried to recall all the things we had learnt about this process when suddenly the coach stopped again.

We had arrived our teacher told us, at her most favourite site in the whole of Iceland not because of its geology but because of its unrivalled beauty. Sure enough she was right a most amazing scene of beauty awaited us. Spreading out in front of us was a huge glacial lake with a massive glacier called Breidamerkutjökull at one end that fed the lake and floating around in the water were massive icebergs. Some of the icebergs were as big as buildings and remembering that 90% of an iceberg is under water they must have been truly gargantuan and the lake inconceivably deep. This was Jokulsarlon and we were told was one of the places where they filmed the car chase sequence in the latest lames Bond film. The formations were unbelievable and the variety of colours on display was fantastic which only became more varied as the sun set over the horizon turning the ice many shades of pink and gold. Sadly yet again I found myself leaving all too soon as

we were called back to the coach after all it was getting dark and we needed to get back for dinner.

At the end of a most enjoyable day, which I believed to be the best yet, I began to pack my case, as I knew that we would be leaving tomorrow morning and I did not want a repeat of the mad packing that preceded the departure from the last hotel.

Woolly Hats And Waterfalls

Day 5

It was time to leave Skaftafell and we all boarded the coach for the return journey back along the ring road retracing the route we had taken on day 3. We soon left behind the glaciers of Vatnajökull and the sandur before crossing the Laki lava fields again. It was another fine day but with perhaps a bit more cloud but the sun was still shining and it seemed as if the weather would be kind to us once again.

After a couple of hours we reached the village of Vik on the southern most tip of Iceland. As we travelled along the road I could see the famous symbols of the village the row of sea stacks called Reynisdrangar that jutted out from the headland that the village sat next to as these cliffs offered protection from the prevailing wind. Legend has it that the stacks were once a pair of trolls that tried to pull to shore a ship they had just wrecked at night but before they got it ashore the sun came up and turned them and the ship to stone. The village was very nice and we stopped off at a wool shop that sold many hundreds of different Icelandic woollen garments, which the village is famous for. After careful deliberation I decided to buy a nice woollen hat that matched my coat and would keep me warm in the cold Icelandic wind.

We got back on the coach and set off around the headland to the beach on the other side where we were told we would have lunch in a cave. When the coach stopped we all filed off and after collecting our lunch walked round the corner to the cave. The cave was cut into a columnar basalt cliff and looked not dissimilar to Finigal's cave on the west coast of Scotland. The columns also provided a great opportunity for us to practice our climbing skills after our sandwiches. After exploring a little further along the beach I came across some pillow lavas, which must have formed when the basalt lava came into contact with water. One was split open and you could clearly see the different cooling layers and the vesicles within. Returning to the coach our teacher then pointed out to us where we were heading next. A little further up the coast was another cliff line but this time there were arches as well as stacks.

No sooner had we set off than we arrived at the top of the cliff at Dyrhdlaey after a rather scary drive up the side of the steep cliffs along a small dirt road in the coach. Once out of the coach we proceeded directly to the edge of the cliffs where we had a panoramic view of the area. Behind us was Myrdalsjokull with the hidden Katla volcano beneath the glacier and in front of this was what our teacher told us to be a moberg volcano. A moberg is a volcano that forms under an ice cap and the ice restricts its growth so that it ends up having steep sides but a flat top. The presence of this extinct volcano proved that at one time the ice must have covered much wider areas of Iceland during the ice ages.

Then in front of us we could all see the great sea arch stretching out into the north Atlantic. This scene seemed to encompass all we had learnt about headland erosion and the various stages in the formation of a sea stack that I will always remember this view. It was a wonderful setting but as was always we had to be off as there was much more to see yet before the day was over.

Continuing along the ring road for about half an hour we came to the small settlement of Sköga, which has a magnificent waterfall called Skögafoss. Once outside the coach you could hear a thunderous roar

as the water plunged over the 60m fall. As the water hit the ground below it created a great amount of spray that formed a lovely rainbow when the sun shone on the veil of spray. The ground around the fall was covered in ice and I almost slipped several times but managed to retain my balance. After moving back to the coach I noticed a sign at the side of the car park, which said that according to ancient legend, one of Iceland's early Viking settlers hid a chest of treasure behind the falls, however no one has ever found it. This to me just summed up this part of Iceland as it was so steeped in history and legends you could not be anything but fascinated by it all.

Our final stop of the day before the hotel at Nesbud was another waterfall called Seljalandsfoss. It was not as big or as impressive as Skögafoss but seemed to me to resemble a miniature Angle falls. What was impressive however was the different layers of rock the waterfall had exposed. At the bottom was a layer of basalt pillow lavas followed

in the middle by a thick layer of palagonite and topped with a thin layer of basalt lava. This was our teacher told us a classic example of what makes up a moberg volcano and we discussed their formation in great detail.

After our lengthy discussion we drove on to our hotel, which we could see was situated next to a large building with steam issuing from it and all across the hillside. As soon as we got off the bus the smell of sulphur greeted us and we knew instantly that this was an active geothermal area and that the large building next to the hotel was a geothermal power station. We settled in for the night after a filling meal of fish and chips knowing that the next day would be the last we had in Iceland.

Somerset and Dorset Field Meeting –

Saturday 1 and Sunday 2 October 2005

Robert Chandler & Hugh Prudden

Saturday started with a morning visit to Ham Hill in south Somerset 6 miles west of Yeovil (ST 4793 1686) led by Hugh Prudden. Hugh explained that a whole day was required to do full justice to all the geological features and so the party only explored the northern end of the hill. The party first examined samples of Ham Hill Stone (a bioclastic limestone) with the aid of hand lenses. This revealed shattered but generally non-abraded shell material and we speculated on the palaeoenvironment of the latter and the processes that might have transported and fragmented the shells. We were then shown enlarged slices of Ham Hill Stone as seen through a microscope taken from a paper by Dr Tim Palmer, which revealed clear calcite cement, oyster shells and shell fragments tunnelled into by microbes andfilled with iron minerals (Palmer, 1997). We then visited a length of old quarry face that has been protected from further stone extraction partly as a result of strenuous efforts by the Somerset Geology Group. Ham Hill Stone is an important part of the geological and architectural heritage of south Somerset and it is important that a rock face is left to tell the story. Hugh discussed the sedimentary features including a massive bed with scours and trough cross-bedding, indicating high-energy transport from the south-west, overlain by thinner planar beds. En échelon tension gashes with faces lined with calcite crystals and associated shear joints with horizontal striae suggest dextral strike-slip movement Hugh explained how S W England was riven with NNW-SSE strike-slip faults including the Watchet-Cothelstone fault to the west and the Poytington Fault close to Sherborne to the east. Manifestations of the Tertiary wrenching are to be found in

Massive beds of Ham Hill Stone overlain with thinner flat-laying beds. Note the gull on the left

many quarries. We also noted two sets of sub-vertical, parallel N-S joints, each about a metre wide which appear to be associated with a shear zone. We then examined a large block from the base of the Ham Hill showing bored pebbles up to 10cm across and apparently formed from reworking of the underlying Yeovil Sands. Again, we speculated as to the processes involved and some invoked erosion of a cliff line to produce the pebbles and this led on to a discussion of the possible reasons for the erosion such as increased current and or wave action and tectonic uplift (Hart, 1992). The quarry faces at Ham Hill have extensive gulls which generally open downwards. It would seem that the location of some gulls have

The party at Ham Hill overlooking the Somerset levels

been partly determined by the presence of the aforementioned brittle fractures. The strata appear to have foundered; some blocks have dropped some 3 m. Brunsden (1996) has described the overburden loading-clay extrusion-lateral spreading model to explain the foundered strata on Portland Bill and this model may well apply to Ham Hill. The extrusion of the underlying weak silty-clays, present in the underlying lower beds of the Yeovil Sands, might well have occurred when saturated, possibly during the melting of permafrost.. The morning finished with a view over much of Somerset from the flanks of the hill and yet more speculation on aspects of palaeogeography and the possible influence of contemporary faulting and sea-level changes. The Ham Hill Stone is from 1m to 50 m in thickness and rapidly thinning to the east forming a lens-shaped mass within the Yeovil Sands. One can discern from the scattered outcrop a N-S axis. It is missing to the west where Inferior Oolite rest directly upon the Yeovil Sands. Hugh invited the group to consider the isopachyte map for the Inferior Oolite as shown in the memoir for the Shaftesbury sheet (Bristow *et al.*, 1995, figure 17 page 19). There is a strong suggestion that the Inferior Oolite thickens into a half-graben. Might the Ham Hill Stone have similar controls, especially as there appears to be a strike-slip NNW-SSE fault running along the Parrett valley to the west? Lunch was taken at the Prince of Wales on the hill. Ham Hill can be warmly recommended to all. It is a country park with open access, good walking and fine views over the premier county and is a GCR site. The warm brown Ham Hill Stone has been dug for building stone since Roman times, has great character, weathers well and can be shaped with ease. Hugh makes no apologies for referring to the 'Yeovil Sands' a term which has been in use since 1879. The politically-correct should refer to the 'Bridport Sand'.

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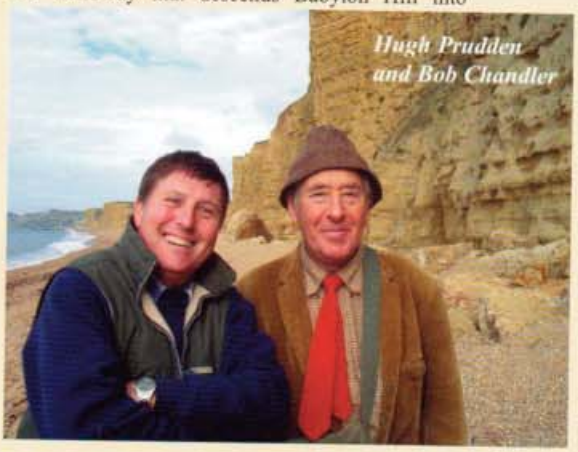
http ://www.jncc.gov.uk/earthheritage/gcrdb /GCR.asp

Right : Hugh Prudden sets the scene. Left: Pebble Bed with borings. Note key for scale.

The Inferior Oolite

Hugh had set the scene and made reference to the tectonic influence on sedimentation in Upper Lias times and its influence on the present disposition of the Ham Stone. It remained now to review the nature of the Palaeozoic basement and contemporary movements in the lower Middle Jurassic that had a profound effect on the distribution of sediment deposition of the Inferior Oolite. From Ham Hill, the party moved on to Yeovil Pen Mill station. The station building is constructed of Inferior Oolite limestone of Middle Jurassic age along with some blocks of Ham Stone. It was pointed out that this oolitic rock did not have its origins in a high-energy environment and that the ooliths probably had a biological origin being formed in relatively deep water in contrast to the wave or current generated structures seen in the Great Oolite of Oxfordshire. Large ammonites and nautiloids could be seen in section in the walls of the station buildings and it was suggested that most of the rock had been quarried from nearby Halfway House, a pit exploited for ammonites, mostly of the genus *Parkinsonia*, in the 19th century. These were cut and polished and sold as curios and ornaments. There is a fine example on display in the Geological Museum in London. Our next stop was a splendid old holloway that descends Babylon Hill into Yeovil. Here we discussed the origin of the large calcareous doggers (burrs) of the Bridport Sands. At Bradford Abbas churchyard we visited the grave of Professor James Buckman (see Chandler & Sole, 1996). A short account of the Buckman family was followed by reference to the contribution of one of James's sons Sydney Buckman to biostratigraphy and geological time measurement. Members were encouraged to consider the passing of time in the absence of any sediment deposition and the nature of the deposits locally. Sydney Buckman had likened these thin beds of rock to the strings of a child's fishing net separated by holes that represented periods where no deposit preserved. Our final location for the day was Lows (Louse) Hill. This is the only permanent, accessible exposure of the famous Bradford Abbas Fossil Bed. This is an SSSI and we confined ourselves to a study of the section and collecting from ex-situ material. The site exposes a succession of thin beds of oolitic limestone, some crowded with Graphoceras including the zonal index *Graphoceras concavum*. Above part of the Inferior Oolite is reduced to a few centimetres of limonitic conglomerate called the Irony Bed upon which lies a thin remnant of the Astarte Bed that on the coast at Burton is in excess of 0.3m. Sunday was a bright cool day. We met at the Freshwater Caravan Park near Burton Bradstock and made our way along the beach to an old cliff fall. In a large fallen block, it was possible to examine almost the entire thickness of the Inferior Oolite (Chandler & Dietze, 2003). The sponge beds were well exposed and members made collections of fossils from fallen blocks along the beach. Moving to the entrance of the caravan site we were met by David Sole who kindly allowed us to examine some mechanically excavated rocks removed for the purpose of extending the caravan site. Many excellent fossils were found and much discussion took place regarding the profuse number of fossils in the quarry. We were fortunate indeed to have with us Colin Parsons who, in the 1970s, contributed much to our understanding of these rocks. We moved north travelling through Beaminster and on to the famous Horn Park quarry. Bob Chandler has described some of the ammonites in the past (Chandler, 1997). We examined the remarkable erosion surface exposed at the top of the Horn Park Ironshot Bed and hypothesised on the nature of the calcified ammonites planned through by erosion and overlain by sediments only slightly later in age. The site has been developed under the FACELIFT project through English Nature to expose the profusion of Brasilia in the Horn Park Ironshot Bed, a layer affectionately termed 'the dinner plate bed'. Above the erosion plane we examined the two divisions of the Red Bed. Burrows penetrate both levels of the bed and it is clear that here, in contrast to the ironshot beds, diagenesis was at least at an ammonite zones duration in taking effect.


Hugh Prudden and Bob Chandler


Examination of the Inferior Oolite at Burton Bradstock

Our final location was Waddon Hill at Stoke Knap. We received a warm welcome from Dudley Tolley whose family have been on the site for generations. We climbed to the top of the hill (also a Roman Hill fort) and examined the entire succession through the Inferior Oolite. It was also possible to look down to Horn Park, deep in the valley below where the same strata had been displaced downward by faulting. The view from the hill is truly magnificent and Dudley has extended a warm welcome to any member who wishes to make a visit to the site which has a public footpath. The trip was made all the more enjoyable by a motivated and enthusiastic group and the bottle of wine presented to the party leaders at the end.

Acknowledgements: We thank Sherborne Castle Estates, Lucy & Brian Lock, Rod Condliffe (Freshwater Caravan Park), Ted Seal (Horn Park), David Sole, Dudley Tolley and English Nature for allowing access to SSSI locations.

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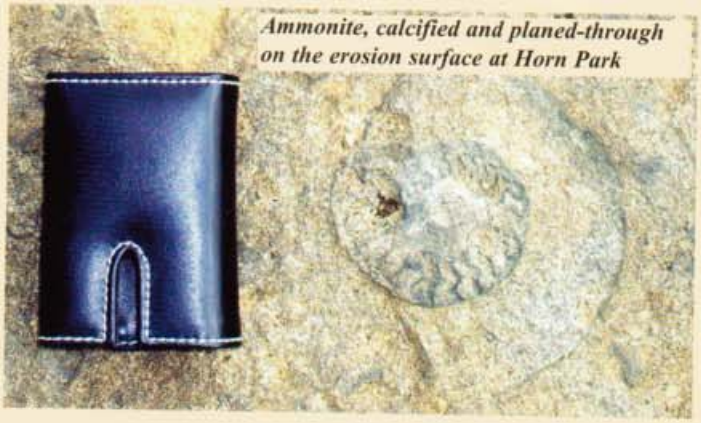
Bob Chandler


The Sponge Beds at Burton Bradstock


Ammonite, calcified and planed-through on the erosion surface at Horn Park

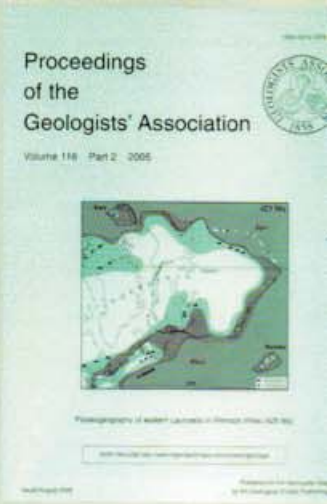
In the Proceedings

In the following paragraphs, the Editor reviews forthcoming articles in the Proceedings of the Geologists' Association.

Firstly, I apologise for the late mailing of the final combined issue (parts 3 & 4) of volume 116, containing the set of papers commemorating the life and work of Professor Douglas Shearman (1918-2003) and guest-edited by Professor Graham Evans. This should have reached readers before the end of December 2005. The late send-out resulted from a series of small, but cumulative, holdups at the printers which managed to combine with the Christmas and New Year holidays to finally delay mailing until early January.

My second, and most pleasant, duty is to inform you that the search for an Editor-elect for the Proceedings has now been completed. Council and the Editorial Board are pleased to announce that Peter F. Riches, currently undertaking a PhD at Royal Holloway following a distinguished career in industry (and of whom more anon), will be taking over from me as Editor following the AGM in July 2006. I will be working with Peter throughout the year to ensure a smooth transition is effected.

Part 1 of volume 117 of the Proceedings contains the final group of papers either arising directly from, or invited following, the joint History of Geology Group (Geological Society) and GA meeting on The Amateur in British Geology which was held in March 2002. In Notes on 'The Amateur' in the development of British Geology, Hugh Torrens reviews the many confused usages of the term 'amateur', which has been taken in the past to imply that a worker with such status may be: an enthusiast' unpaid, unqualified, or even useless! Torrens argues convincingly that it is high time that the more neutral term 'outsider' be adopted for such persons, since there is ample proof, provided, for example, by the papers in this issue and the earlier ones arising from the meeting (c.f. Proceedings 114 (3), (4), 2003; 115 (1), (4), 2004) of the many significant contributions made by such geologists and that their work cannot be dismissed as necessarily second-rate. The second paper, British women who contributed to research in the geological sciences in the nineteenth century, by Mary and Thomas Creese is an invited update of their definitive review, which originally appeared in the British Journal for the History of Science in 1994 and which I have long thought ought to be made more accessible to members of the Association. The Amateurs meeting provided an excellent opportunity to do so in context. Jim Kennedy's paper. C.W. Wright: a most professional amateur, reviews the life and work of Claud William Wright (b. 1917), whose professional career was as a senior civil servant in Whitehall, first in the War Office and Ministry of Defence, thereafter in the Department of Education, but whose life-long geological persuits embrace definitive work on Cretaceous stratigraphy, ammonites, echinoids, asteroids and crabs. A fine justification of Torrens' plea for 'outsider' to replace 'amateur' as a descriptive term, if ever there was one. Simon Knell and Michael Taylor provide a second invited paper - Hugh Miller: fossils, landscape and literary geology, which reviews the life and work of a fine spare-time geologist who was in turn a stonemason, banker and newspaper proprietor, and who made the fossil fish fauna of the Old Red Sandstone justifiably famous. Finally, Anne O'Connor writes on Samuel Hazzledine Warren and the construction of a chronological framework for the British Quaternary in the early twentieth century, reminding us of the importance of his archaeological and geological work, particularly at Clacton-on-Sea, which assisted the efforts made by his more celebrated contemporaries to construct a reliable ge ological frame work for the British Quaternary.



Issue 117 (2) will contain a set of papers commemorating the life and work of Professor John Michael Hancock (1928-2004), better known to all as 'Jake'. These arise from a joint memorial meeting of the GA, Geological Society and Palaeontological Association which was held in October 2004, convened by Professor John Cope, who has also guest-edited the issue. It provides an extremely stimulating group of papers, which should be of interest to all GA members but they will be of particular interest to students of the Cretaceous. More details will follow in the next issue of GA.

Richard J. Howarth

THE GA NEEDS YOUR HELP

Three volunteers are needed to help run your Association:

*** We need someone to be the Commissioning Editor for the magazine who could help generate articles for the magazine.**

*** If you have any experience with QUARK XPRESS desktop publishing soft ware, please contact John Crocker - the General Secretary - as we need help in putting the magazine together**

*** The Web Site needs someone with experience in DREAMWEAVER to help keep the site up-to-date. It is not an onerous job, as the site only needs minor up-dating most of the time but occasionally, like when the new lecture series is announced, there is more work to do.**

IF YOU CAN HELP IN ANY OF THE ABOVE PLEASE CONTACT JOHN CROCKER VIA THE GA OFFICE. - THANKS

MUD, MUD GLORIOUS MUD

Mud, mud glorious mud - in the Norwich Crag of Suffolk and today in Somerset

Roger Dixon recently took us through the rise and fall of Dunwich in Suffolk where the sea has been eroding back the cliffs for centuries. 12km further north is Covehithe. When the sea sweeps away fallen material from the base of the cliff here it reveals a small bench composed of muds. These muds are generally described as having formed in shallow marine conditions approx 2 million years ago. It has been proposed that the deposition of these muds took place during a cold snap known as the Baventian (West et al, 1980).

While walking along the cliff top at Covehithe nearly 20 years ago I became intrigued by what I saw. On those occasions when the present day sea was just starting to reveal the top of the bench, the muds appeared through the modern beach detritus as a series of roughly parallel "ridges". As more material was removed it could be seen that the "ridges" were composed of horizontally bedded rippled muds with miriads of narrow vertical burrows and some desiccation cracks. Between the "ridges" the muds occupied "ruts" regularly spaced at 2 to 3m apart. I took measurements of the orientation of the "ruts" over a distance of up to 2.5km; this distance was oblique to the strike line and equivalent to a width of exposure of 1.6km. This confirmed that the "ruts" had formed roughly parallel to each over a wide area. (Over the same period of time the cliffs have eroded back 110m, equivalent to 155m up or down dip, clearly showing that the "ruts" and their orientation have persisted). The muds infilling the "ruts" had no ripples and their bedding was contorted; the narrow burrows were present but their orientation varied and they were sometimes distorted. The muds infilling the "ruts" had clearly slumped into them; but what were these "ruts"?.

It was only when I was reading an article on the geotechnical properties of muds that an answer appeared. My phone call to Bristol University was returned and Brian Hawkins generously shared his knowledge and told me where the inspirational photograph in his article was taken.

In May of 1990 I spent a weekend in Bristol to see a friend graduate from Circus School. With a few hours spare, I just had to take the opportunity to visit the northern end of nearby Sand Bay. This location was conveniently close to tide measuring stations at Weston-Super-Mare and St Thomas's Head. The daily tidal range was therefore known to be over 11m at springs, 5m at neaps. This was undoubtedly a macro-tidal setting and the modern day "ruts", know as rills, were visible over a considerable length, extending more than 500m below spring high tide level. In the higher inter-tidal zone the rills were spaced 3 to 4m apart and could be seen to dissect the otherwise fairly flat mud. They were flat-bottomed, slightly sinuous but all roughly parallel to one another. In the mid inter-tidal zone the rills were 2 to 3m apart and as

"Rut" in Norwich Crag muds. Note how the thin horizontal bedding has sometimes become unstable nearthe open "rut" and has slumped. Where mud has been lost the overlying beds have sagged downwards.

the mud between was softer and less stable the profiles of the "ridges" were more irregular with narrower tops. Desiccation cracks were present on the "ridge" tops and a little way down the sides, as in the Hawkins' photograph. However, when I recently revisited the features in November 2005, desiccation cracks were rarely to be found. As it had been more tricky to walk along the slippery narrow "ridges" and also more difficult to walk through the clartey rill infill, I chickened out of investigating the lower inter-tidal zone.

A few shells were found in the alluvium in the bottom of the rills and the mud itself showed patches of a Chlorophyte, occasional bird footprints and some root/stem holes (probably Spartina) but generally speaking the muds in the higher and mid inter-tidal zones showed little faunal or floral activity. Towards the lower inter-tidal zone I saw the openings of about half a dozen burrows (lug-worms ?): perhaps I would have found more had I managed to actually investigate the lower inter-tidal zone. In the Norwich Crag muds of Covehithe it would be tempting to explain away low faunal and floral activity as the result of a cold climate on the often exposed inter-tidal zone. However, the modern day example at Sand Bay simply reminds us that sometimes a habitat is not appealing or that there may be more desirable habitats available.

Howard Mottram (GeoSuffolk)

with thanks to Hugh Prudden (Somerset Geological Group)

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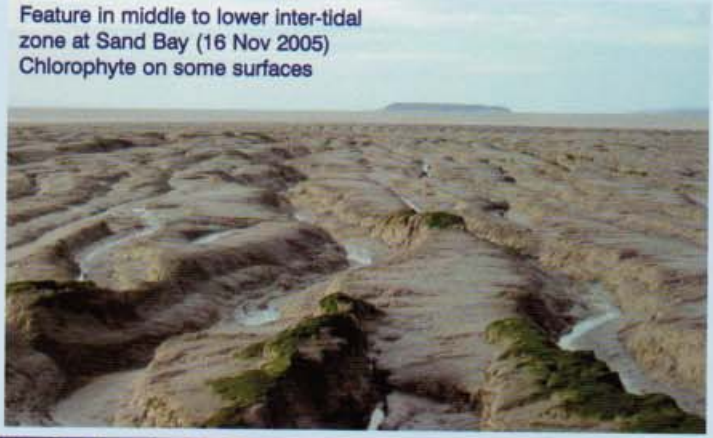
Folds in Norwich Crag muds (Compass for scale)



Feature in middle to lower inter-tidal zone at Sand Bay (16 Nov 2005) Chlorophyte on some surfaces

West of Ireland Field Meeting, September 2005

Introduction:

Ireland straddles the former Iapetus ocean and fragments of the northwest margin are preserved in the west of Ireland as a collage of terranes with an incomplete cover of younger rocks. This field meeting gave us the opportunity to study the remnants in an area less familiar to us than Scotland. From north to south, the areas explored by us were the North Mayo Grampian Terrane separated by the Clew Bay- Fair Head Boundary Fault Zone from the South Mayo Trough, and the Connemara Terrane.

Day 1: Dublin.

Twenty three members met in Dublin. Most had been on the Field Meeting to the north Irish Coast in 2004, a tribute to the leader, John Arthurs, formerly Director of the Geological Survey of Northern Ireland. We were welcomed with a reception at the Irish Geological Survey by the Director, Dr Peadar McArdle, a keen advocate of presenting geology to the public. With Irish charm he not only provided wine, but also opened the Survey shop on Sunday evening. We repaid his gesture by forming an orderly queue and stocking up with maps and guides.

Day 2: Travelling to the West

Our introduction to the west of Ireland began as we left Galway along Lough Corrib and over the Maam Pass, which separates the rugged Dalradian Maumturk mountains from smoother Ordovician and Silurian mountains of Joyce Country and so to Killary Harbour at Leenane.

Luggage deposited, we explored the southern shore of Killary Harbour in glorious weather. Killary Harbour is an ice carved fjord running E-W, large enough to have held the British Grand Fleet for a Royal review in the early 20th century. It is dominated to the north by the steep flanks of Mweelrea with splendid corries below a narrow summit ridge. The Ordovician-Silurian rocks here are of interest because nowhere else in Britain or Ireland do Lower Palaeozoic rocks outcrop north of Dalradian. These are the clastic infill of the South Mayo Trough which originated from an intra-oceanic island arc/fore arc complex that collided with the Laurentian margin during the Llanvirn. Subsequent transcurrent faulting and what has been term "strike slip shuffling" brought the Dalradian Connemara Terrane into southerly juxtaposition during the late Ordovician. The succession was folded regionally into the Mweelrea syncline and Killary Harbour lies on the southern limb.

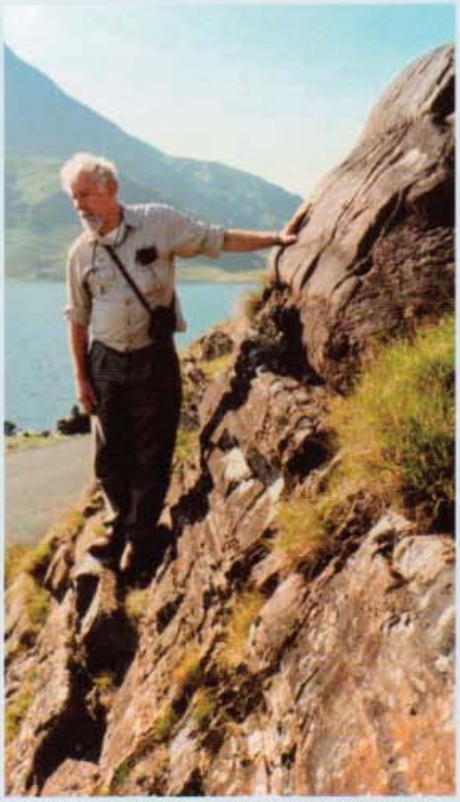


Fig.1: John Arthurs and the Turbidites near Killary Harbour with graded bedding that no one disputed

The first exposure in a small quarry was the Rosroe Fm, a conglomerate with cobble sized rounded clasts-dacites, granites and gneisses- and sandy intercalations. Then to a roadside exposure of Silurian deepwater turbidic sandstones ((Lettergesh Fm) where Bouma sequences with classic graded bedding and sole marks were seen (Figure 1). The relationship between these Ordovician and Silurian exposures became clear at the head of Killary Bay Little where the southwards directed Salrock Thrust emplaces Rosroe Fm,

Fig 2: Looking south to Ben Corragh, volcanic crags are faulted over smoother sandstones and conglomerates

forming cliffs on the hillside, above shallow marine red mudstones of the Silurian Salrock Fm. A few paces down the road an exposure shows an ignimbrite with pumice fiamme and lithic fragments, a reminder that pyroclastic rocks occur throughout the Ordovician succession.

After dinner, Professor Paul Ryan, of Galway University, put our tour in context with a lecture on the tectonic evolution of western Ireland. Island arcs and continental fragments docked with the Laurentian margin. Reversal of subduction polarity coupled with sinistral faulting and thrusting during the Caledonian and Acadian events produced the final complex configuration.

Day 3: Joyce Country

The weather was overcast for exploration of Joyce Country and the Ordovician /Silurian succession. The early Ordovician Lough Nafooey Group, predominantly basaltic lavas, outcrops east of the Maam Valley fault zone and, seen from a view point on the northern shore, the Lough Nafooey fault on Ben Corragh brings arc volcanics into contact with underlying younger sandstones of the Rosroe Fm with a marked break of slope and distinctive changes in the hillside morphology (Figure 2).

At Finny river, a little further north, good examples of spilitic pillow lavas, with interior vesicles and glassy chilled margins were found in a small quarry. Down towards the river more pillows overlay brecciated andesitic lavas with prominent feldspars and included jasper in a clast supported debris flow. The jasper precipitated by hydrothermal activity suggested the possibility of volcanic-hosted massive sulphide ore deposits and the area has been unsuccessfully prospected for lead, zinc and copper. Stepping-stones over the river with more or less dry feet, and a short bog trot across sphagnum moss brought us to further exposures of banded jasper overlying breccias and showing syn-sedimentary seismic deformation and volcanic bombs.

A mapping exercise in a traverse along the north shore of Lough Kilbride from St Brigid's Church to Finny school gave us insight into the fill of the Trough. We progressed from Ordovican volcanics

through Silurian desert red beds to shallow marine quartzites with abundant Skolithos burrows, and then deeper water greywackes and mudstones.

The route home took us through Westport where the northern boundary of the Trough abuts the Clew Bay - Fairhead fault zone. This is part of the major tectonic line that extends westwards to Newfoundland where it is expressed as the Cabot Fault, and eastwards to Scotland where it is observed as the Highland Boundary Fault. Here, seen in a small quarry, hydrothermal fluids have converted ophiolitic ultramafics of the Cambro-Ordovician Clew Bay Complex to talc-magnesite. Discovered in a survey for gold, planning permission to develop the site has been refused because of the potential damage of quarrying to the tourist industry.

Figure 3:The E-W Kill Fault separates dark organic Kill Sandstone from brown serpentinites of thr Deer Park Complex.

Day 4: Clare Island

In wet, blustery weather we boarded the Island Princess, at Roonagh Quay to visit Clare Island. The name of the boat commemorates Granuaile O'Malley, who in the 16th century, dominated the area with a fleet of galleys. The castle by the harbour was the first stop for a historical vignette.

The geology of the island, astride the Clew Bay - Fairhead fault zone, is dominated by E-W faults. We walked in worsening drizzle to Portruckagh, a headland bisected by the Kill Fault which cuts the Silurian Kill Sandstone and Strake Banded Formation but which also entrained ophiolites of the Deer Park Complex. These have undergone hydrothermal metamorphism and the deeply cleft fault separates serpentinites with the characteristic brown of weathered olivine to the north, from the dark carbonaceous Kill Sandstone to the south (Figure 3). A scramble to the top of the headland, and across the small bay subvertical Strake Banded Siltstones displayed clear banding with intercalated tuffs.

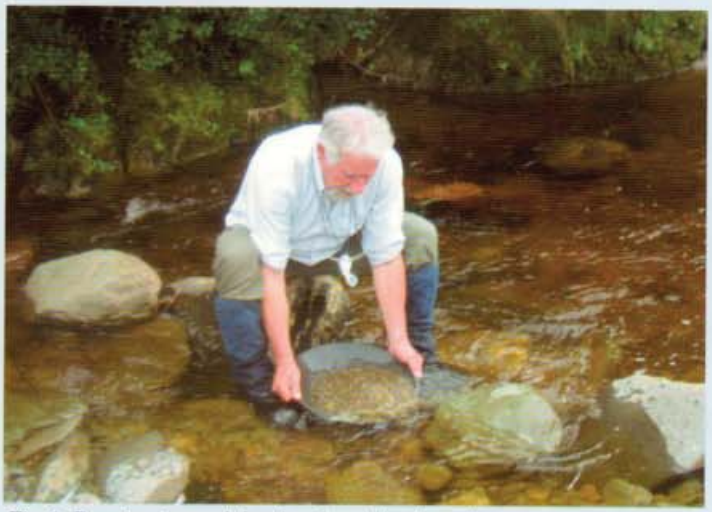


Fig.4: Panning is much harder than it looks and not an easy way to a fortune - John shows us the requisit skills

It rained steadily, so we dried out at the harbour hotel but then undeterred, out again, to Leckascannaimore, a headland north of the harbour with evidence of the inundation of the early Carboniferous coastal plain where grey siltstones and sandstones of the Capnagower Formation overlie fluvial channels and thick palaeosols.. The return to Roonagh Quay was stormy and reached with several members grateful for a short trip, for they had temporarily misplaced their sea legs.

Day 5: Murrisk Coast

Murrisk is the rugged mountain country that lies between Clew Bay and Killary Harbour. Travelling west along the south shore of Clew Bay, we passed the quartzite mountain of Croagh Patrick and at its summit is St Patrick's Bed. Pilgrims climb the mountain bare-foot. Mammon intrudes on piety, for a faintly visible track up the mountain was constructed in the 1980's for gold exploration drilling sites.

In the bay at Shivelagh Rocks, we inspected small conjugate faults in the cliffs at the contact of Knockmore sandstones and Strake Banded Fm siltstones. Discussion ranged from relationship to the major faulting offshore to small-scale features that influence civil engineering in such faulted ground. Much shearing was noted, which could provide channels for mineralisation and here, there was a positive clue for the Shivelagh Rocks, a silicified serpentinite dyke and part of the Deer Park Complex, are of listwaenite and contain fuchsite, a bright green chromium mica often associated with lode gold.

After a cliff top walk over Old Head and views across Clew Bay, we drove to a small gorge for instruction in gold panning. Some were successful, most not, and it was hard, wet and cold work for little reward (Figure 4).

On then to inspect a purportedly gold-bearing white quartz vein exposed in the bogs of the Doolough Pass. Despite persistent midges, John tutored us on ore reserve calculation, mine planning and economics, and on the environmental impact of a mine. Although there was some evidence for gold, "Finian`s Rainbow" it wasn`t and without leprechaun assistance a speculative gold mine was a risk too far. Rain started again and we returned home, resolved to stick with the day job.

Day 5: Achill Island

Achill Island was the furthest journey to the north; initially the weather was dull and we relaxed in the coach to enjoy the commentary as we crossed the Dalradian - Carboniferous unconformity and entered the Grampian Terrane of north Mayo, beyond the Clew Bay-Fair Head Line. We were reassured by the familiarity of the Dalradian group terminology, originally defined in Scotland but adopted in Ireland.

After a stop on the south of the Corraun Peninsula to observe ice moulded Dinantian arkosic sandstones lying unconformably on Dalradian schists, we crossed the short causeway to Achill Island. At Carrickmore reversely graded pebbly psammites (Appin Group) with folds verging to the south showed that we were on the overturned limb of a major nappe thrust-sheet or 'slide'.

Fig.5: Seastacks in tightly folded quartzites and conglomerates at Ashleam bay.

Ireland contd.....

A small roadside quarry above Keem Bay with an amethyst vein held attention as we sought good crystals, before descending to the sea for lunch in improving weather. Here a further slide separates the inverted succession of Keem limestones, schists and conglomerates of the Appin Group to the north, from schists of the Argyll Group in the Achill Nappe to the south.

A sombre visit to the deserted village of Slievemor then took us to a last stop at Ashleam Bay where there are steep cliffs and near-shore stacks of vertically dipping, tightly folded quartzites and conglomerates. Even in the rain, they made a marvellous photo-opportunity, but slippery underfoot, no one ventured to the edge to provide a foreground figure (Figure 5).

Day 6: West Connemara

South of the Lough Nafooey Fault system, we were in the Dalradian Connemara Terrane. The rocks differ from those of north Mayo with a higher metamorphic grade associated with thrust emplacement and major Ordovician and Caledonian igneous intrusions. At Mannin Bay complexities became apparent for the Connemara Terrane is thrust over the Ordovician volcanic arc. Metamorphosed and intensely mylonitised arc rhyolites in the footwall of the Mannin Thrust are exposed through the erosional window of the Delaney Dome, surrounded by metagabbro amphibolites in the hanging wall.

An obligatory "tourist" stop was made at the Alcock and Brown monument near Errisianan, marking the first transatlantic flight, which landed in a nearby bog. The monument, set on a high ridge, commands a panoramic view of the surrounding countryside with outcrops of the Cashel Schists. Since the sun was shining we celebrated their achievement with a group photograph (Figure 6).

We passed through Clifden to the re-opened Streamstone marble quarry. The marble is a metamorphosed, dolomitic limestone with a characteristic yellow-green colour due to included patches of serpentine. Interbanded with white, brown and sepia variants in polished slabs, it gives complex folds of great beauty. Connemara marbles are susceptible to weathering and not ideal for external use but marble from Streamstown was used to pave the chancels of the Cathedrals of Truro, Bristol and Peterborough, as well as the steps of Worcester Cathedral.

On to the shore at Omey Island, where there is a well exposed contact between a satellite monzogranite pluton of the Galway granite batholith and the Streamstown Schist, with granitic and aplitic apophyses penetrating hornfelsed schists. The thermal aureole extends into the adjacent Lakes Marble Formation and there are skarn deposits with minerals including wolframite.

The Connemara Metagabbro Complex is regarded as the root zone of an eroded calc-alkaline batholith. Most of the intrusion lies to the south of the Dalradian block but we visited a northern exposure at Currywongaun where there is a metagabbroic cumulate with well preserved but intensely folded igneous layering. The coarse grained rock was banded with pale anorthositic layers alternating with dark hornblende-pyroxene rich layers.

The day was especially enjoyable for those who enjoy igneous and metamorphic rocks, but two extras ensured all tastes were served: An unscheduled stop took us to Dogs Bay when one of the party enthused of the shell sands seen on a previous visit. This bay, near Roundstone, has a mile long clear white beach and dunes formed almost exclusively of comminuted shell fragments and foraminifera tests. At Mannin Bay there are so called "coral sands" but these are rather derived from calcareous algae, the two species most abundant being *Lithothamnion corallioides* and *Phymatolithon calcareum*. Both beaches provided samples for home microscopy enthusiasts.

Fig 6: A happy party in sunshine celebrating Alcock and Brown's very happy landing

Day 7: East Connemara.

A fine day and the first stop in a quarry in the Ballynakill Schists (Argyll Group) gave an opportunity to search for minerals; finds included staurolite, andalusite, cordierite, garnet and tourmaline. At Ternakill, the walk was dry underfoot and midge free. Here the Oughterard Granite intrudes the Claggan Boulder Bed with skarn deposits formed by metamorphism of carbonate rich rocks. Mineral collecting was again the order of the day and good examples of grossular and almandine garnets obtained.

Two hundred metres uphill brought us to an outcrop of rounded ice moulded crags in the Claggan Boulder Bed Formation, composed of rounded clasts varying from pebble size to about 0.5m (Figure 7). Clasts were of varied origin and included granites as well as metasediments, in a semipelitic matrix. The boulder bed, like its lateral equivalents in Scotland, is regarded as a tillite deposited below floating sea ice.

We walked on to the site of the early 20th century Northwest Copper Mine worked for sulphur and copper from a massive

Fig 7: Examining the ice moulded boulder bed at Ternkill.

stratabound sulphide lens in a quartz-biotite schist of the Lakes Marble Fm. Now disused, only extensive water filled workings and spoil heaps remain. Weathered and honeycombed gossan or "iron cap", a residue of insoluble ferric hydroxide prominent underfoot, would have alerted early prospectors to the enriched underlying ores principally pyrrhotite and chalcopyrite.

Mining was a continuing theme as we visited the Glengowla silver and lead mine which worked from about 1850 to 1865. Meticulously restored, it now functions as a show mine and tourist attraction. Rock and ore were removed by hand drilling and blasting. For those familiar with Pennine ore fields where galena is found in rakes, pipes

and scrins, there was a surprise, for here the galena occurred as discrete masses within the limestone. How did the miners know where to work? Nevertheless they succeeded, for at its peak it was claimed as the richest mine in Ireland, producing 36 tonnes of galena and 140 oz of silver.

Lunch at Maam Cross was by a reconstruction of a scene from "The Quiet Man". Relief from waxen figures of John Wayne and Maureen O`Hara followed quickly, and at the next exposure - Lough Nahasleam - migmatic Cashel Schists, which we saw at Errisianan, here reached sillimanite grade because of volcanic arc calc-alkali intrusions.

We returned to Leenane through Glen Inagh, a wild, empty valley with contrasting morphology of the Benna Beola range to the west and the Maumturk Mountains to the east

Quaternary and Holocene:

Throughout the trip the effects of Pleistocene glaciation deserve mention. The route west was through the Irish Midlands where Carboniferous limestones are covered by tills, sands and gravels and more recent peat bogs. The line of maximum ice advance of the Midlandian Stage (=Devensian in U.K.) is marked by an E-W line of moraines and glacial outwash deposits. Indeed, the road to Galway is built along an esker (from gaelic: eiscir- a causeway).

The study area, originally a peneplaned plateau, was dissected in the Pleistocene glaciation to form mountainous landscape with numerous corries high on the mountains, best seen between Clew Bay and Killary Harbour. Ice scouring excavated softer rocks and lines of structural weakness along faults producing the deep, U-shaped, Maam, Doolough, Inagh and Erriff valleys. The effect of basement structures on the topography was emphasised each evening as we returned to Leenane, for the Eriff Valley Fault controls the N-E orientation of that valley and the upper part of Killary Harbour, which widens dramatically and changes to an E-W orientation after intersection with the N-W Maam Valley Fault zone.

At lower levels, glacial deposits were common, either of hummocky till deposited by ice, or silts, sands and gravels by meltwater seen as kame terrace deposits along the Maam and Eriff valleys. Drumlin fields were common, most spectacularly in Clew Bay where the westerly extension of the Ox mountains glacier deposited long narrow drumlins on the low ground, extending into the bay.

Much of the landscape was covered by blanket bog. Within the peat cover remnants of forestation, mostly Pinus, were frequently seen. On each daily trip low angled sunlight delineated potato beds up steep valley sides, from so called "lazy bed" strip farming. In the nineteenth century, this area was a highly populated rural community but its depopulation was exemplified by the deserted village seen at Slievemore on Achill Island and the monument in the Doolough pass commemorating the Louisburgh Famine Walk.

Day 8:

And so back to Dublin, most to the airport, and a few to enjoy another night in Ireland and to reflect on a memorable trip. Its success owed much to careful preparation and planning by John Arthurs. The organisation was "smoothed" by Trudy his wife, who charmed the Hotel into late suppers. But it wasn`t all geology: John and Trudy`s coach trips are enlivened by folksongs, by traditional story telling and poetry readings so that there was a welcome taste of Irish culture and much laughter.

N.B. " Finians Rainbow"— a film of the 1960`s; Finian played by Fred Astaire steals the crock of gold in a bog, from a leprachaun Og - Og is played by Tommy Steele. All end happily and the film includes the song "How are things in Glockamarra" sung byPetula Clark. Light relief helps recall in the elderly!

Gerry & Brenda Slavin with contributions from John Lonergan, David & Pauline Shilston, Mavis Gill & Jo & John Crocker.

KNOW OUR HISTORY AND FEEL PROUD

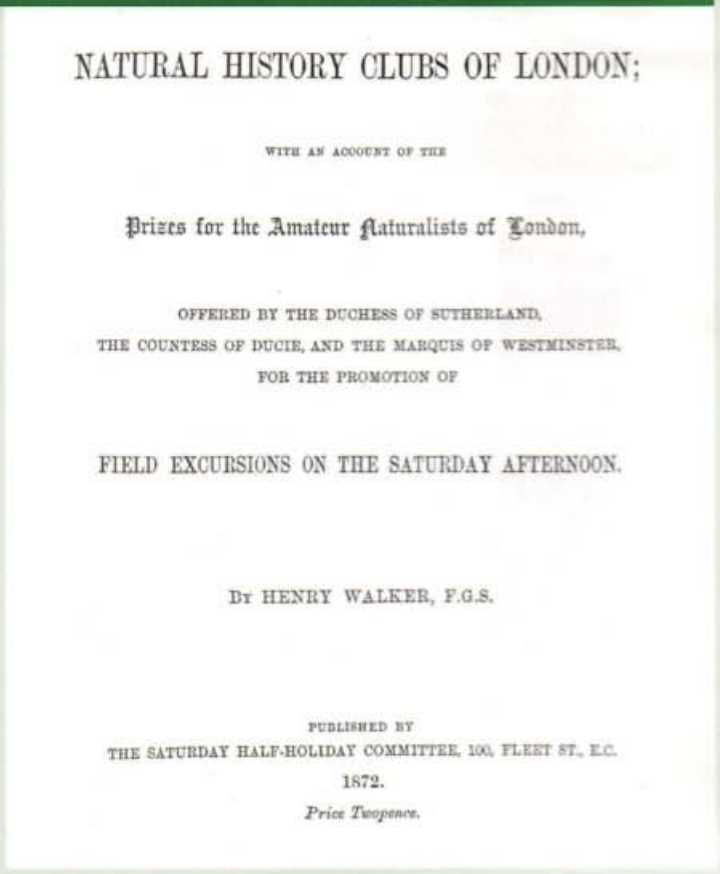
In late November, the History of Geology Group (HOGG) of the Geological Society convened a meeting to draw attention to the contribution of women to our science. As speaker after speaker made their contribution, it was gratifying to note the emergence of the GA as one of the principal channels through which women were able to make their mark in geology. For many of us this was not a surprise but an accepted fact. However, we were proved wrong in our assumption of that fact as a normality, as the contributions of other societies were assessed and found to be very different.

Number 3 in the GA's original constitution of 17th December 1858, unanimously adopted, stated that: "Ladies shall be eligible for election as Members, and shall enjoy all the rights and privileges of either Town or Country Members, as the case may be". While our first List of Members includes only ten women out of a total of 200 names, the excursions which have always been a special and unique feature of our Association saw many more women attending, as photographs demonstrate. Although Lady Lyell and the Misses Horner (Charles Lyell's sisters-in-law) attended a social function of the Geological Society Club, admission of women to meetings of the Geological Society itself was defeated when moved by Leonard Horner in 1860, and again in 1889 when the bye-laws were revised, and only relaxed in 1904 when attendance was allowed "dependent upon the consent of the majority of Fellows present" (H.B. Woodward 1907, The History of the Geological Society of London). Fellowship of the Society for women came only after the First World War, by which time women had long been not only members, but also office-bearers in the GA.

The record of all this was outlined by Susan Brown at the HOGG meeting, with reference to several ladies who sustained the Association with a blend of 'good housekeeping' and good science. Two, the late and much-missed Muriel Arber and Susan Brown herself, have risen to our highest office, that of President, but dozens more have kept the machinery turning on publications, field meetings, libraries and all the other more or less permanent GA committees. That record is a proud one, which we should all boast about on appropriate occasions!

In any history of the Association, prominence is rightly given to our field excursions as one of our strongest claims for attention in comparison to other geological organisations. From short ventures into the Weald of Surrey or the heights of Middlesex and North London, our outings progressively became more adventurous, usually using the expanding railway system, and the cheap fares which they offered, to go further afield. We took advantage of excursions promoted by the original Thomas Cook from his firm's headquarters in Nottingham, and we moved into the charabanc era in the 1890s. But before all that, we were also deeply involved in another social reform for which, like the integration of women, we also ought to be duly proud.

Flexible working schedules and part-time stints which suit our families and our recreational life are now very much the accepted mode, but in the mid-Victorian years work was much more rigorous in the hours it claimed. Nine in the morning until five or six in the evening, and six days a week, were the norm, leaving only Sunday for free choice - and then outings or church were the main options outside the home. Against the treadmill of such life for those who worked in shop or office, there grew in the 1860s a bold challenge which came in the form of The Saturday Half-holiday Committee, which sought the



NATURAL HISTORY CLUBS OF LONDON;

WITH AN ACCOUNT OF THE

Prizes for the Amateur Naturalists of London,

OFFERED BY THE DUCHESS OF SUTHERLAND,
THE COUNTESS OF DUCIE, AND THE MARQUIS OF WESTMINSTER,
FOR THE PROMOTION OF

FIELD EXCURSIONS ON THE SATURDAY AFTERNOON.

By HENRY WALKER, F.G.S.

PUBLISHED BY
THE SATURDAY HALF-HOLIDAY COMMITTEE, 100, FLEET ST., E.C.
1872.
Price Twopence.

Saturday afternoon release of City workers, giving scope for country rambling and the pursuit of natural history, including geology.

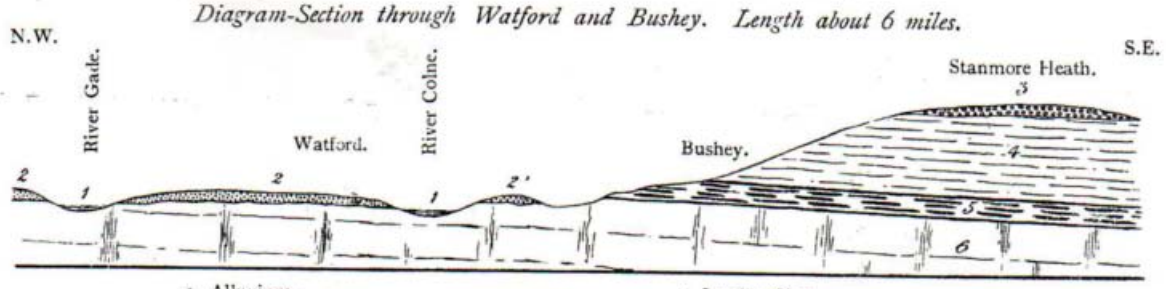
The times we are talking about, the 1860s, were very much in the aftermath of the Great Exhibition of 1851, which had done so much to stimulate public interest in scientific and engineering progress. The Geologists' Association as much as any society was involved at all levels. Blue-collar engineers, who were actively working on the complex engineering of the new main drainage (both sewer systems and water supply) and the growing network of the London Underground, led excursions for GA members in ways which would probably make the present-day Health and Safety Executive blanch with horror, although there are no serious consequences recorded! It was a period in which geology was well to the fore in public awareness, just as it has been recently in the wake of various popular TV series, and the GA rose to the occasion. When the Crystal Palace was bodily removed from Hyde Park to Sydenham, William Paxton, its great designer, introduced a physical representation of the geological strata of his native Derbyshire, including the Clay Cross coalfield, into the hill slope close to the more-mentioned life-size dinosaur models. There is a Carboniferous Limestone cliff and spar-lined mine adit, passing upwards into a full Coal Measure cycle, with coal seam capped by a mussel band; and all this has now been recently restored by Bromley Council, in whose borough the Crystal Palace site stands, with help from the GA Curry Fund, all to our satisfaction.

But what should be the reason for our proper pride in our prominent role in supporting the Saturday Half-holiday campaign? Our role is neatly summed up by quotation from the twopenny "Guide to the popular Natural History Clubs of London", sold by the Campaign Committee in 1872 from 100 Fleet Street (see the replicated cover page here):- "Since the year 1864, and especially within the last two years, these societies have multiplied rapidly in and around the metropolis. They exhibit the Saturday Half-holiday in a light that is

Excursion to Watford, on Saturday, May 17.

Directors: Wm. Whitaker, Esq., B.A., F.G.S., Geological Survey of England; and John Hopkinson, Esq., F.L.S., F.G.S., Hon. Sec. Watford Nat. Hist. Society.

Diagram-Section through Watford and Bushey. Length about 6 miles.



1. Alluvium.
2. Gravel.
2' Brickearth. } Glacial Drift.
3. Pebble Gravel.
4. London Clay.
5. Woolwich and Reading Beds.
6. Chalk with Flints.

Leave Euston Station by the 2.10 p.m. train for Bushey Station, taking return tickets to Watford. At Bushey Station meet members of the Watford Natural History Society. Visit Chalk-pit near the Station *(Upper Chalk, Boulder Clay,* and *Terrace Gravel)*, and Brick-yard at Chalk Hill *(Reading Beds)*; thence walk to the Gravel Pits at Colney Butts and near the Toll Gate, on the road to Cassio Bridge *(Middle Glacial?)*, and from there to Watford Station.—[For Reports of previous Excursions to Bushey and Watford, see "Proc. Geol. Assoc.," Vol. ii., p. 43, Vol. iii., p. 65, and Vol. iv., p. 284.]

Geological Survey Map, No. 7.

Excursion to Knockholt and Sevenoaks, on Monday, May 26.

Director: J. Logan Lobley, Esq., F.G.S.

Leave Charing Cross by the 11.25 a.m. train for Halstead (single tickets, fare 1s. 7d.), at which Station the Chalk of the North Downs is well seen. Walk through Halstead Place Park to Knockholt Beeches, and thence descend the Chalk Escarpment, passing through Chevening Park (Earl Stanhope's), and cross the Upper Greensand to the Gault vale at Chevening Village. Chipstead Tile Yard shows Brickearths overlying the Gault in which are here found *Ammonites interruptus, A. auritus, A. lautus, Belemnites minimus,* and *Inoceramus concentricus.* Cross the infant Darent to Chipstead village on the Lower Greensand which forms the hilly and beautiful country to the south.

At the Amherst Arms, River Head, the Party will dine at 3 p.m.

At River Head the Folkestone Beds are exposed, but better seen near the Bat and Ball Station, where occur fine examples of ferruginous concretions, "Box-stones." At Sevenoaks Station are extensive excavations in the Hythe Beds, and the Kentish Rag is well displayed.

Return from Sevenoaks by the 8.1 p m. train.

This Excursion will be the second of the above-mentioned series.

Geological Survey Map, No. 6.

JOHN FOULERTON, M.D.,
Hon. Sec.

University College, London,
April 28th, 1879.

most gratifying to its friends and promoters, and they provide for every Saturday a recreation which is delightfully enjoyable to those who share in the excursion to the field, the pond, the quarry, and the woodland. The sight of a crowd of field naturalists, assembled on Saturday afternoon at the railway station to catch the first train that leaves town after two o'clock, is happily one that the Londoner can hardly help seeing."

Although 'excursions' were well within the scope of the second GA "Law" of December 1858 as 'facilitating the study of Geology', it was not until T. Rupert Jones facilitated the amendments to the Laws in 1880 that 'Field Lectures or Excursions' were formally listed as an activity of the Association. However, the first known formal GA excursion was run in April 1860 by excursion train to Folkestone, followed by others to Maidstone in June and Charlton in August the same year. Our active role in outdoor geology was well known to the Saturday Half-holiday Committee, for on the second page of the 1872 pamphlet quoted above they say:- "The Geologists' Association is becoming famous for its popular and successful Saturday afternoon excursions to places of interest around London. The excursions are conducted by professional geologists and naturalists of the highest character; the excursions are fairly representative of the classes for whom the agencies of the Saturday Half-holiday movement have been put into operation".

The flavour of the numerous 'excursions' is well captured in the single printed sheets of paper which passed as the regular Circulars of the Association after 1865, setting out the destination, time of train from the London termini, the fare, and the expectations (see example reproduced here from 1869). What was also added on occasions was the type of refreshment needed at the tea stop (meat teas were often offered if booked in advance!). From these outings, planned as much as to give healthy recreation as to advance scientific knowledge, grew the Association's strength in the recording of temporary sections and the whole achievement of the Weald Committee, as well as grass roots understanding of the local geology, particularly of southern England. Accounts of the outings were more often written up for publication in the Proceedings than nowadays, providing the basis for the 1910 Jubilee volumes, Geology in the Field, that invaluable compendium of facts now long lost to us beneath built-up areas, and the inspiration for the buff-jacketed Centenary field guides, which we started to publish in 1958. But there is much of interest in the Circulars, which I have previously talked about in print (1990 Proceedings of the Geologists' Association, 101, 101-117), and there is also a fascinating review by Chris Green (1989 PGA, 100, 17-29) of the development of GA excursions over the first 120 years.

From all of this, GA Members should take a proper pride, not only in our shared fellowship with the ladies in our formative years, but also in the way in which our forefathers laid the foundations for field excursions and popular guides to the classic areas of this country.

Eric Robinson

ABOVE: Twelve Pins Mountain range taken from Bunowen
BELOW: Keel from Meenaun
Both photos taken by John Arthurs, the Leader on the West of Ireland Field meeting.