GeoConservationUK Newsletter

Volume 4, Number 2

30th June 2013

In this year we commemorate . . . the lava lamp

As this year commemorates several major, but not necessarily geological, inventions and events of 50 years ago the possible events are numerous and just a few have some (vague) geological interest. The recently deceased Doug Engelbart invented the computer 'mouse' in 1963 (and patented in 1970) whilst at the Stanford Research Institute. The basic idea came to him in 1961 when he was in a conference session on computer graphics. Looking for an efficient and easy way to control a computer graphic display screen's pointer he used two small wheels, one turning horizontally and the other vertically, to transmit their rotation coordinates for analysis; when mounted in a small wooden box with a data cable connection to the computer, 'mouse' was an obvious name. Freeze-dried instant coffee was first sold by Maxwell House in 1963. Definitely without the first and probably without the second most modern publications, such as this *Newsletter*, would never be electronically pasted up in the usual small hours of the day. Now as to a vaguely geological invention of 1963, there Is Briton Edward Craven-Walker's Lava Lamp - still manufactured by his company. Within two years of all of these inventions, the seminal papers on modern plate tectonics theory were published - perhaps, the lava lamp hinted at viscosity and convection currents, and the coffee kept the authors awake whilst doing and rechecking all the mathematical calculations?! Then again, the plethora of modern publications on the (social) history of plate tectonics undoubtedly needed the humble mouse at some point in their preparation. However, the lava lamp's a much more attractive item on one's desk!

E D I T O R I A L

Welcome to the year's second (and slightly late) Newsletter issue. As usual I'm happy to say a big "thank you" to its regional contributors and equally to express my frustration with the unreliability of IT hardware and services over the past couple of months. We have come so much to rely upon the latter that, even in geology, traditional knowledge and skills are in danger of being lost. Hence, there is much interest at the moment in the Earth Science component of the revised National Curriculum in England. The situation of A' Level and Higher Geology would also be helped if all university geoscience departments recognised them as valid subjects for entrance purposes. These education matters should be of more than passing disinterest to those of us involved in geoconservation, for without a steady supply of enthusiastic young geologists with early fieldwork experience in the UK the movement doesn't have a long term future. TOM HOSE

ISSUE CONTENTS

GeoConservationUK Newsletter

ENGLAND — *London Geodiversity Partnership*

Overground – Underground: London's Geodiversity for London's People

[A Report by Dr. David Brook OBE, Chair, London Geodiversity Partnership]

At least fifty people attended this workshop organised by the London Geodiversity Partnership (LGP) at the Pavilion in the Horniman Museum Gardens on 7th February 2013. A wide range of bodies was represented including national organisations, local authorities, environmental groups and local geological societies. The aim of the workshop, as outlined by the Chair, was twofold; to:

- Spread knowledge of London's geodiversity and the work of the LGP to a wider audience; and
- Get ideas from the audience to take forward and revise the London Geodiversity Action Plan 2009-2013.

The National and Regional Context of London's geodiversity

Jonathan Larwood explains the national context.

Jonathan Larwood (Natural England) opened proceedings by describing the national context of London's geodiversity and its importance both overground and underground and put this in the context of the Natural Environment White Paper (The natural choice: securing the value of nature) and the National planning policy framework. Peter Massini (Greater London Authority) then explained the regional context of the All-London Green Grid and the Mayor's supplementary planning guidance. This Local nature partnership aims to manage London's green infrastructure on a cross-borough basis through the definition of eleven areas based essentially on landscape classification, with area partnerships determining the strategy and taking forward action needed. Peter also presented (on behalf of a planning colleague who was unable to attend due to family illness) the regional planning context contained within the London Plan and its supplementary planning guidance on geodiversity (Green infrastructure and open environments: London's foundations: protecting the geodiversity of the capital), which was based on the work of the LGP over the last few years

Peter Massini explains the regional context.

Good Practice in Geoconservation

This national and regional context was followed by a series of short presentations on good practice in geoconservation in

Mike de Freitas (London Basin Forum).

Barry Gutteridge (City of London).

Alistair Hayes (London Wildlife Trust).

ENGLAND — *London Geodiversity Partnership* (cont.)

Gerald Lucy (GeoEssex).

Laurie Baker (LGP).

Jane Poole leads the discussion.

and around London. Mike de Freitas (London Basin Forum) explained that London's geology was not as simple as has been assumed and that underlying structures have a significant effect on the basin and throw up numerous problems for construction works.

Barry Gutteridge (City of London Senior Ranger) described the geoconservation works undertaken at Riddlesdown Quarry (the former Rose and Crown Quarry) and the links being formed with local schools and the community. Gerald Lucy (GeoEssex) described the exposure of new faces in glacial gravels at Thorndon Country Park with the help of Essex County Council. Alistair Hayes (London Wildlife Trust) described the work undertaken in his former role at the London Borough of Bromley on the Crystal Palace dinosaurs and the establishment of an audio trail linked to the Darwin bicentenary. Peter Collins (GeoEssex and LGP) described the finding of an erratic boulder of Whin Sill at Mark's Warren Quarry and its transport, courtesy of the quarry operator - Brett Aggregates Ltd – to be placed on public display at the Essex Wildlife Trust visitor centre at Bedfords Park, Havering He also described the co-operation with the British Pakistani Christian Association to replace the plaque commemorating Pleistocene mammal finds in Ilford, which had been installed in 1951 and stolen in January 2012. Laurie Baker concluded this session with a rapid overview of the Green Chain Geotrail from the Thames Barrier to Lesnes Abbey, which was produced by members of the LGP, highlighting features of geological interest following parts of the Green Chain walk routes through the London Boroughs of Greenwich and Bexley.

Workshop Discussion

Following a break for coffee and cakes, which gave an opportunity to see the spectacular views over London from the Pavilion and some useful networking, the workshop session was led by Jane Poole (Capita Symonds) using a series of posters *(see next page)* to inspire discussion.

This session went so well that, instead of breaking up into groups, the session continued in plenary with Jane assisted (slightly!) by the Chair. Questions examined included:

- Which places should be prioritised and how can they be advertised and used for people's benefit?
- How can places, particularly those with good views, be linked across London?
- How can we add a geodiversity element to other initiatives?

The LGP was delighted with the responses we got in this session, which showed the enthusiasm that had been generated for London's geodiversity and produced many positive and practical suggestions, which the LGP hope to use in taking forward the Action Plan.

Thanks are due to the Horniman Museum for providing the venue and arranging the catering, to Capita Symonds and Natural England for their sponsorship of the workshop and to Jonathan Larwood, Naomi Stevenson, Di Clements, Peter Collins Paolo Viscardi and Jane Poole for the efforts they put into organising the workshop. Particular thanks are due to Di Clements, who brought along a small display on London's geodiversity along with examples of some of London's rocks.

GeoConservationUK Newsletter

ENGLAND — *London Geodiversity Partnership* (cont.)

Engaging Partners, Communities and Visitors

Tackling Hazards

Providing Resources

Opportunities for Life Long Learning

What are the perceptions regarding geodiversity and its value to people's existing work and activities?
-Voluntary Community Groups
-Industry
-Developers
-Schools, Colleges and Universities
-Visitors to London
What do communities and visitors find important?

Dealing with Issues such as contaminated land and waste management

Design and Engineering

Sense of Place, Belonging, Green or Open space for Leisure, Recreation and Health

CAPITA SYMONDS

Places of Geodiversity Interest Sites identified within London

Includes:7 SSSIs, 28 recommended RIGS and 15 potential LIGS. These were identified within Supplementary Planning Guidance, March 2012: 'Green Infrastructure and Open Environments, London's Foundations: Protecting the Geodiversity of the Capital'

Legend

0 Sites	(12 Boroughs plus City of London)
1 Site	(9 Boroughs)
2 or 3 Sites	(7 Boroughs)
4 or more Sites	(4 Boroughs)

CAPITA SYMONDS

Places of Geodiversity Interest More than just sites?

Network of Views, Museums, Sites, Buildings ...

The Tube: A powerful advertising tool as well as a means of getting about and linking places together

Using other websites to advertise not just your own

Using characters. This bunch were early proponents of the green movement and made good use of open space!

Linking Together Places of Geodiversity Interest
-How to Advertise
-Transport Links
-What constitutes a Place of Geodiversity Interest?

Linking local museums to other places within the neighbourhood, including schools

Making use of London's Unique Collections, for example UCL's Building Stone Resource

Needs a photo of a good London View here – can anybody help? The Shard, The London Eye, Emirtes Skyway as well as views from the ground

CAPITA SYMONDS

Existing Initiatives use these as opportunities and find out what enthusiasm there is locally ...

There are many existing activities that are designed to get people into the outdoors within London – how can we make a geodiversity link?

GEOCACHING

OPENCACHING

International

National

Involving Partners and Local Communities
- Which Places and Activities?
- Which Partners?

Place Specific

Local

Local Schools, Colleges and Universities

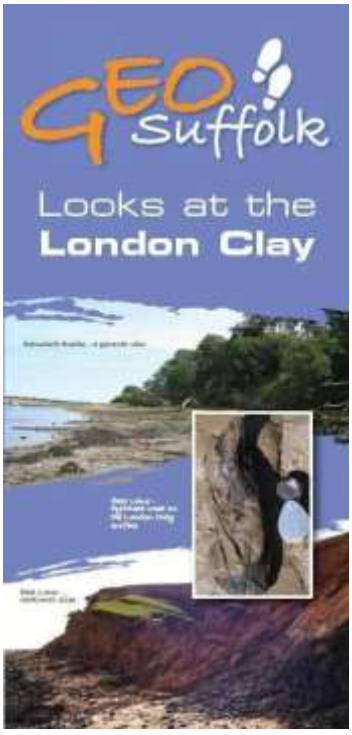
CAPITA SYMONDS

ENGLAND — *GeoSuffolk*

GeoSuffolk Looks at the London Clay

The London Clay comprises a series of muds deposited during the Eocene Period (53 million years ago). It outcrops along Suffolk's southern coast and estuaries, forming low cliffs of brown and grey muds and silty muds, that display a variety of geological structures. There are bands of harder mudstone cemented with lime, locally known as septaria, also thin layers of creamy yellow volcanic ash - part of the Tertiary Igneous Province, as can be seen on the Isle of Skye and the Giants Causeway on Northern Ireland's Antrim coast, as a succession of lava flows. Fossils in the Clay include wood, sharks' teeth and, rarely, bird bones.

London Clay, with fault at Nacton Shore, Suffolk



GeoSuffolk's new leaflet, ***GeoSuffolk Looks at the London Clay***, written by Dr. Roger Dixon provides a tour of the London Clay exposures of the Deben, Orwell and Stour estuaries — from Ramsholt Rocks to Harkstead Shore. The London Clay acts as an impermeable base to the water table in south Suffolk, with numerous springs issuing from the sands above, and locations to view this spring-line landscape are suggested. There also is information in the leaflet on the use of the mudstone as a building material, with various examples, including Orford Castle, and of London Clay bricks in Waldringfield and Hemley churches.

Suffolk Coast and Heaths AONB, together with the Ipswich Institute gave financial help with the production of this leaflet, which is free and available in hard copy (print!!) at Ipswich Museum and as a pdf file from GeoSuffolk's website, www.geosuffolk.co.uk . *Caroline Markham*

FEATURE ITEM — *Editor's white page horror*

Without your contributions this would be just a plain white space, any editor's usual horror with just a few days to publication! It's no good sitting there thinking nobody could be that interested in what your group is doing and anyway it was a few months ago - you'd be quite wrong! Our regular readership is always interested in what's happening outside their home area and, most importantly, our occasional readers would be astounded at just how much the voluntary geoconservation sector does in terms of events focussed on interpretation, education, site recording and conservation. We need to showcase our events to the potential readership outside of the geoconservation community if we are to attract the level of public and official support, let alone funding, that our efforts truly deserve. So, please do your bit and send in those stories and pictures - the next *Newsletter* deadline is 23rd September 2013.

GeoConservationUK Newsletter

ENGLAND — *Black Country Geological Society*

Some Geoconservation Work Days

Between Saturday 6th October 2012 and Saturday 2nd March 2013 Black Country Geological Society (BCGS) members, in association with the Birmingham and Black Country Wildlife Trust (B&BCWT), assisted with clearance work at four Black Country sites. The B&BCWT own all four sites: Barrow Hill, near Dudley; Barr Beacon Quarry *(see top left)*, Walsall; Blue Rock Quarry, Rowley; and Springvale Park, Wolverhampton. The works generally involved the clearance of undergrowth and trees to open up exposures at each site.

Although clearance work at Barrow Hill and Springvale Park had been undertaken earlier in the year they had become heavily overgrown again after the very wet summer. Consequently, an annual and on-going programme of clearance and maintenance work, over the same period, has been implemented to help protect these sites.

The Barrow Hill site contains exposures of dolerite intruding Etruria Marl country rock and examples of calcite veining from later hydrothermal activity. Exposures of Permo-Triassic Kidderminster Conglomerate overlying Bridgnorth Sandstone occur at Barr Beacon Quarry and show evidence of dune cross bedding, flash flooding and fluvial conditions. Blue Rock Quarry contains an exposure of the classic Rowley dolerite, or Rowley Rag, used to pave much of Birmingham. The exposure shows examples of spheroidal weathering, hydrothermal calcite veining and two episodes of intrusion. The Springvale Park exposure comprises Carboniferous Coal Measures sandstone and siltstone/ shale with ironstone bands and rare plant fossils.

In April 2013 BCGS members helped with clearance work at the Rubery Cutting *(see above, bottom left)*, in association with the Lickey Hills Ranger Service and we are currently looking into organising some clearance work along the Himley railway cutting near Wombourne.

Andy Harrison

NEWS ITEM — *Charnwood Forest Heritage Lottery Fund Bid*

The Charnwood Forest Landscape Partnership Board, with Leicestershire County Council as lead partner, have submitted a bid to the Heritage Lottery Fund (HLF) for a Landscape Partnership project based on Charnwood Forest. Geology provides the central theme for the bid with several of the projects being directly related to geology. They include making international links with other countries that have yielded Precambrian fossils, increasing intellectual access to collections of Charnian material, holding geology community events (such as rock and fossil roadshows), creating more geology trails for walkers and cyclists, a building stones project, increasing opportunities to visit quarries, linking geology to arts and making a DVD on Charnwood geology, biodiversity and landscape for the layperson. The costs of the project is £97, 850 in the development phase with a 56% grant requested from the HLF, and the delivery phase will cost £2, 893, 725 for which 82% is sought from the HLF. The partnership involves many regional and local organisations and BGS, with much volunteer labour promised. The outcome of the Round 1 bid will be known at the end of October. If successful, this will be followed by a development phase to work up all the projects in detail and the Landscape Partnership programme will start in 2016.

ENGLAND — *Cumbria GeoConservation*

Eycott Hill Reserve BioBlitz Day

In January 2013 the Cumbria Wildlife Trust purchased Eycott Hill, a locality scheduled as a Site of Special Scientific Interest for its biology and geology. It was a chilly day for June but many people attended the BioBlitz and took part in the organised walks. It is the CWT's first summer as owners of this new site and the BioBlitz day was an opportunity for experts and the general public to identify and report their wildlife finds. Cumbria GeoConservation (formerly Cumbria RIGS) was invited to the event and Michael Dewey lead a geology walk *(see top right)* over Eycott Hill. As the leader has an interest in lichens, the walk also focussed on the lichens growing in profusion on the rocks *(see bottom right)* and walls.

The north-south trending andesitic lava-flows are a feature of the reserve. The younger Dinantian limestones form the eastern section of the reserve. Due to glacial drift they are poorly exposed, but an excellent outcrop is adjacent to the road, with a tumbled-down lime kiln. From Eycott Hill summit, much of Cumbria's geology is seen. Such as the Skiddaw Group rocks on Blencathra and the Carrock Hill Complex to the west. To the southeast the Borrowdale Volcanic rocks in the central Lake District and the Pennine Cross Fell Inlier to the east are seen.

The Eycott Volcanic Group rocks are chemically different with less silica content than the nearby Borrowdale Volcanic Group rocks. Originally the Eycott Volcanic rocks were thought to be older than the Borrowdale Volcanic rocks on the basis of an acritarch fossil found in the sedimentary beds found at the base of the Eycott lavas. This evidence has since been reassessed and both volcanic groups are now dated to late Llanvirn to Caradoc age (456 to 464 million years ago). The Eycott volcanics were erupted in a sub-aerial environment with rare marine incursions. They were formed from mobile basaltic-andesite magma that was poor in silica that rose to the surface and erupted as fluid lava from shallow-sided volcanoes.

Mike Dewey [Secretary, Cumbria GeoConservation]

NEWS ITEM — *New Malvern Hills GeoCentre*

The newly opened Malvern Hills GeoCentre featuring Cafe H2O is the official visitor information centre for the Geopark Way; it is situated on the western slopes of the Hills, providing information about the Abberley and Malvern Hills Geopark, the Malvern Hills AONB, and the Malverns. Wall maps in the Centre show the Geopark and its geology, the Malvern Hills AONB, the Malvern Hills and Commons. iPads mounted on "ipad trees" allow visitors to access a wealth of information, and a large video wall shows panoramas and videos of the region. The Centre has panoramic views from the Centre over Herefordshire towards Wales. Its Cafe H2O serves a range of light locally sourced / home-made lunches and refreshments. A range of souvenirs, maps and postcards are also available for sale. Unusually for these days in the countryside the car park is free! Full details can be found at the website http://www.geocentre.co.uk/

GeoConservationUK Newsletter

ENGLAND — *London Geodiversity Partnership*

Geo-conservation day at Gilbert's Pit, Charlton

Gilbert's Pit in Charlton, south-east London, is one of 7 SSSIs in London. Formerly worked for chalk for lime and Thanet Sand for use in the foundries of Woolwich Arsenal and for glass-making, it is the type section of the Woolwich Beds, part of the early Eocene Lambeth Group. Building rubble was tipped in the pit after the Second World War, obscuring the Chalk and much of the Thanet Sand. However, while much of the section is covered by scree, the Lambeth Group and Blackheath Beds at the top can still be seen. As such it is a valuable teaching aid, particularly for engineers who have to understand the nature of these sediments, which are met in excavations under London.

Over time, the face has been largely obscured by vegetation and the London Geodiversity Partnership identified the site in the London geodiversity action plan as a priority for geo-conservation and improved access. Following discussions with the land owner, the Royal Borough of Greenwich, a geo-conservation day was held at Gilbert's Pit on Sunday 28 April 2013, organised by Di Clements of the Geologists' Association and Laurie Baker of the Open University Geological Society's London Branch, both of whom are members of the Partnership.

The photographs show the progress of the work through the day and Di Clements reports:

"*Many thanks go to all who took part in the geoconservation day at Gilbert's Pit. We achieved our objective of clearing a swathe up the existing scree slope to enable us to see the best route to install a stepped pathway to improve the access to the Lambeth Group and Blackheath Beds. A few of the smaller trees were felled as well, with thanks to Laurie's colleagues from the Shooters Hill Woodlands conservation group. Jackie Skipper of GCG, probably the leading expert on the Lambeth Group at Gilbert's Pit, took groups to the top of the exposure to explain the section more fully and we hope everyone enjoyed the day.*"

The London Geodiversity Partnership will continue to work with Greenwich Council Parks and Open Spaces Department to ensure that this SSSI can continue to provide geologists and engineers working in London with the insight into the Lambeth Group that is needed for developments to be successfully completed. Natural England have indicated that they will help in drawing up detailed plans to make the exposures more accessible.

Dr David Brook OBE [Chair, London Geodiversity Partnership]

ENGLAND — *Buckinghamshire Earth Heritage Group*

(Near) Blizzard conditions at Coombs Quarry in March

As the group of around twenty visitors arrived at Coombs Quarry on Sunday 17th March they were greeted by a sudden flurry of snow and falling temperatures *(see top right)*. The plan had been to start with an indoor hands-on fossil session at the 'depot' before the quarry visit, but with the possibility of snow cover and an early end to the day, the group instead started with the quarry.

The enthusiasm for finding fossils in such bleak, cold, wet conditions was admirable *(see middle right)*. The children were quickly covered in mud, soaking wet but had big grins on their faces—having discovered lots of the bivalves and brachiopods loose in the scree below the quarry's faces. Fossils such as echinoids (sea urchins) and gastropods (see snails) were nowhere to be seen; they were believed to be in hiding from the cold!

In the shelter of the 'depot', Tony Britten allowed the children to closely examine some of the fossils from his own collection. The group discussed, 'What is a fossil?' and looked at how some were preserved. The children requested a return visit in the summer when the gastropods were 'out of hiding' so a family event will now be planned for August.

Jill Eyers

NEWS ITEM — *The Farrell Review*

The Farrell Review of Architecture and the Built Environment (only for England) has issued its first Call for Evidence. Sir Terry and his panel of expert advisors have asked for submissions grouped around four key themes: Understanding the role for Government in promoting design quality in architecture and the built environment; The economic benefits of architecture and design, and maximising the UK's growth potential; Cultural heritage and the built environment, including the value of our historic built environment as a cultural asset and in successful place-making; Promoting education, outreach and skills. Culture Minister Ed Vaizey wishes to encourage as many people as possible to come forward because: *"Hearing from a wide cross section of people across the sector will help Sir Terry Farrell and in turn DCMS look at the future of policy in this area, and we need the whole industry to come forward with their views."* The documentation can be accessed at http://www.farrellreview.co.uk/ . Submissions should be made through the online form before 5pm on Friday 19th July. The geoconservation community should respond to this consultation to ensure that our key points are put across about the need to use appropriate local materials, including local stone, within the built environment; often the relevant information can be found in at Local Geological Records centres, or whichever database houses the records we prepare from geoconservation fieldwork.

Tom Hose

GeoConservationUK Newsletter

NEWS ITEM - *The Geological Society & the National Curriculum*

The GEOLOGICAL SOCIETY of LONDON - SUBMISSION TO DEPARTMENT for EDUCATION CONSULTATION: REFORM of the NATIONAL CURRICULUM in ENGLAND (April 2013)

1. The Geological Society is the UK's learned and professional body for geoscience, with more than 10,500 Fellows (members) worldwide. The Fellowship encompasses those working in industry, academia and government with a broad range of perspectives on policy-relevant science, and the Society is a leading communicator of this science to government bodies, those in education, and other non-specialist audiences. This submission has been prepared in consultation with our Education Committee, whose members include school teachers, university lecturers, other educationalists and industry geoscientists, and was also informed by input from others in the Earth science education community.

Content of draft programmes of study

2. In December 2011, the Geological Society, together with the Royal Geographical Society, the Earth Science Teachers Association, the Geographical Association and the Royal Meteorological Society wrote to Department for Education officials regarding the review of the National Curriculum for England. We highlighted the importance of Earth science in the school curriculum, while recognising that it would not be the subject of a separate programme of study, and that topics would be split across the Geography and Science programmes of study. We provided a grid setting out the key topics in Earth science (in the broadest sense – including atmospheric science, for instance) which all school students should be taught, both to equip them as well-informed 21st century citizens, and to stimulate the next generation of trained Earth scientists whose skills will be needed to generate economic wealth and tackle global challenges. This grid identified the programme of study and Key Stage (KS) in which we thought it most appropriate to introduce each topic.

3. The Geological Society is pleased to see that many of the recommendations set out in this grid have been adopted in the new draft National Curriculum. We recognise the difficulty inherent in appropriately assigning Earth science topics across the Geography and Science programmes of study, so as to introduce key ideas in Earth science while ensuring that the overall programmes of study are cohesive. A particular challenge is to ensure that related content in geography, physics, chemistry and biology is appropriately linked. Nonetheless, we have some significant concerns, particularly regarding the limited Earth science content of the KS3 and KS4 Science programmes of study. Furthermore, some of the Earth science content at secondary level (both in Geography and Science) appears disjointed, and the key concepts to which it relates are not sufficiently clearly identified.

4. The Earth science components of the KS1 and KS2 Science and Geography programmes of study are appropriate to their respective age groups, and are well structured. We are pleased to see the emphasis placed on fieldwork in physical geography, at KS1-3.

5. As noted above, we are concerned that the Earth science content proposed for KS3 and KS4 lacks cohesion. Greater emphasis should be given to key concepts such as plate tectonics (which is mentioned in passing) and the rock cycle (which is not explicitly mentioned). Rather than just encounter disparate elements of these topics, for example as explanatory factors behind geographical processes, it is important that students know that they are being taught the 'big ideas' of a vital branch of science. These fundamental unifying concepts should be taught as part of the Science programme of study, even if they are also mentioned in Geography, because to understand them, students must deploy the scientific skills rightly identified in the 'Working scientifically' sections of the draft curriculum, which trained science teachers (whether or not they have specialist knowledge of Earth science) are more likely to be able to convey effectively.

NEWS ITEM - *The Geological Society & the National Curriculum* (cont.)

6. The curriculum should use the names of the key concepts in Earth science, and should also explicitly mention 'geology'. We believe that learning outcomes in science should include knowing what different types of scientist (besides chemists, physicists and biologists) do. This is an important step in raising students' awareness of the opportunities which exist for further study and careers in a wide range of sciences and engineering. The future prosperity and well-being of the UK will depend on the supply of trained personnel in these fields.

7. The rock cycle is not explicitly mentioned in the draft curriculum, although isolated elements which constitute it are mentioned in KS2 Science and KS3 Geography. Metamorphism / metamorphic rock is not mentioned at all. The rock cycle should be identified as a topic in KS3 Chemistry, following on from the simple treatment of formation of igneous and sedimentary rock in KS2 Science. It would be sensible to retain the reference to rocks, weathering and geological timescales in KS3 Geography, as elements of geographical processes and explanatory factors for geographical features. The emphasis in the Science programme of study should be on the rock cycle as an evidence-based explanatory model.

8. We are pleased to see that plate tectonics is mentioned in the draft curriculum, but we note that this is only among a mixed list of specific geographical features and processes in KS3 Geography. It is quite right that plate tectonics should be referred to at this stage, for example to explain the location of volcanoes and earthquakes. But it is also important that students understand it as a unifying scientific theory in Earth science, which is based on observed evidence and explains much of how our planet works. We believe that this is best done in KS4 Physics, where it would complement the existing content on the internal structure of the Earth (in relation to pressure, temperature and depth) and on sound waves in matter (where we are pleased to see seismic detection, both of earthquakes and of subterranean structures, explicitly mentioned). The deeper understanding gained in this context (and appropriate to this age group) would build on the simpler process-based reference to plate tectonics at KS3 Geography.

9. Few Earth resources are explicitly mentioned. Quite rightly, sourcing water is identified as an important topic (in Chemistry KS4). It seems odd to pick out calcium carbonate, but not to mention other mineral resources (e.g. metal ores). We suggest that this bullet point is replaced with: 'minerals as raw materials, e.g. metal ores, limestone as a building material'. There is also no explicit mention of fuels sourced from the Earth (though there is a general reference to fuel sources, with no further detail, in KS3 Physics). Fossil fuels (oil, gas, coal) are among the most important resources we get from the Earth. Neither the carbon cycle (mentioned in KS4 Biology) nor carbon capture and storage (CCS) (mentioned in KS4 Chemistry) make much sense without considering the formation, extraction and use of fossil fuels, and possible alternative energy sources. The carbon cycle should be addressed in KS4 Chemistry, in addition to any study of it in biology, as a unifying concept in which context fossil fuels, climate change (and indeed the formation and use of calcium carbonate) can be understood.

10. We are pleased to see that KS3 Chemistry will include the composition of the Earth and its atmosphere, changes to the atmosphere over geological time and the climate impacts of anthropogenic carbon emissions. 'Efficacy of recycling' seems out of place here, as it does not clearly relate to the preceding bullet points. It would be more relevant to highlight sustainable energy use, or resource use more widely (which would of course include recycling). Issues such as sustainability and the human impacts of climate change might be more sensibly addressed as part of human geography – use of resources is mentioned in KS3 Geography, where these concepts could also be highlighted – but this need not preclude also raising these issues in chemistry.

Delivery of the new curriculum

11. In most cases, Earth science content will be taught by non-specialist teachers, whether as part of the

GeoConservationUK Newsletter

NEWS ITEM — *Earth Science in the National Curriculum* (cont.)

Science or Geography programmes of study. They may lack confidence in delivering content with which they are less familiar. These challenges may be greater for geography teachers who specialise in human geography, especially if key scientific concepts are to be taught principally within geography. The Geological Society, along with other organisations such as the Earth Science Teachers Association (ESTA) and the Earth Science Education Unit (ESEU), is committed to supporting teachers without an Earth science background who are expected to deliver such content. For example, the Society runs an annual training course for teachers (the Geoscience Education Academy), which is actively supported by industry and academia, and we have developed significant online teaching resources on the rock cycle and plate tectonics. We also stand ready to work with examination boards as they develop new qualifications in light of the new National Curriculum and other education policy developments.

12. The Geological Society is pleased to have discussed development of the curriculum over recent months, and is grateful for the opportunity to respond to the present consultation. We would be happy to discuss further any of the issues raised in this submission, or to help in any other way we can as the review continues.

The Geological Society is to be wholeheartedly congratulated by all, and supported by its Fellows, on such a comprehensive and measured response. It is to be hoped that the relevant politicians and civil servants (let alone special advisors) heed its content — here's hoping that the latest revision will pay heed to the Geological Society's and others' responses to the initial proposals. *Tom Hose*

FEATURE ITEM — *ESTA: everything you need to know (well almost!)*

What is ESTA?

ESTA or the Earth Science Teachers' Association is a registered charity that started life in 1967 as 'The Association of Teachers of Geology' and changed its name to ESTA in 1988. The Association's aim is to advance education by encouraging and supporting the teaching of Earth sciences at all levels, whether as a single subject or as part of other courses such as science or geography. ESTA is run by Council: a team of eight unwaged volunteers acting as Chair, Editor, Secretary, Membership Secretary, Treasurer and three Co-ordinators representing the primary, secondary and higher education sectors. Co-options to Council allow other ESTA members to contribute in various ways and at present the co-opted members of Council cover GeoConservation, Conference Liaison, Advertising and New Media. Members of ESTA can be found all over the world and include full-time, part-time and retired teachers who have worked or are still working in schools, colleges, universities, museums, fieldwork centres, outreach and adult education centres.

What does ESTA do?

The Association supports Earth science and geology teaching by:

- Influencing policy decisions affecting Earth science and geology education at a national level;
- Engaging with national awarding bodies or examining groups;
- Producing updates on curriculum development and teaching;
- Offering a mentor service for new teachers at all levels;
- Providing a support network of fellow members;
- Delivering ESTA teaching materials and courses;

FEATURE ITEM — *ESTA: everything you need to know (well almost!)* (cont.)

- Providing and running a dedicated website;
- Arranging an annual course and conference;
- Publishing two issues of the magazine ***Teaching Earth Sciences*** each year;
- Publishing two newsletters (***ESTA News***) and two briefings (***ESTA Briefing***) each year.

Where's the ESTA website and what's on the site?

The ESTA website is at: www.esta-uk.net and the site also gives links to allow users to follow ESTA on Facebook and via Twitter. Visitors to the ESTA website will find that there are ways to access various teaching resources such as Earth-Science-on-Site, JESEI (Joint Earth Science Educational Initiative), Earth Learning Idea and ESEU (Earth Science Education Unit). There are also links from the ESTA website to professional bodies, to other teaching and learning sites and to a host of Earth science topics in the news for both the UK and the world. The website also provides access to the Tedbury Camp fieldwork resources, to a range of virtual 'A' Level geology experiments as well as various web-based resources created, tested and used by working teachers.

From the ESTA website members can also find back issues of *Teaching Earth Sciences* and the resources: GEOTREX and STEGO. These two resources comprise PowerPoints, worksheets, quizzes, notes and exercises. GEOTREX is a collection of over 460 resources suitable for 'A' Level geology and STEGO is similar to GEOTREX, but is basically a set of resources best-suited for teaching at Key Stages 3 and 4.

What's so special about the ESTA Annual Course and Conference?

These events have been held at venues across the UK and the most recent conferences have been held at BGS (Keyworth) and at Southampton, Leicester and Durham Universities. Each year ESTA aims to provide separate INSET courses for primary, secondary and higher education teachers, but more importantly aims to provide networking opportunities and exchange of teaching and learning ideas during the rest of the conference. This is essential for most Earth science teachers because most work in isolation in their own schools and colleges. Other key elements of each conference are academic updating lectures, fieldwork visits, exhibitions of resources and ESTA's annual 'Bring and share' session in which members are encouraged to have their own "ten-minutes-of-fame" and stand up and share their teaching ideas with others. A recent comment about the ESTA Course and Conference probably best sums everything up: "Members who were not able to attend the ESTA Conference this year missed a real treat – not only in the Conference as a whole, but in the many and varied Earth-shaking ideas shared by all those who were there."

The next Course and Conference, entitled 'Communicating Geoscience', will be held at Plymouth University from 27th-29th September; Prof. Iain Stewart will be there and I hope to see you there! Information about this event is available on the ESTA website: http://www.esta-uk.net/

Maggie Williams

[ESTA Chair 2011-13]

GeoConservationUK Newsletter

NEWS ITEM — *Higher Geology in Scotland*

A small group (comprising Prof. Stuart Monro, Dr. Ruth Robinson and Dr. Joice Gilbert were offered) a short thirty minute meeting with Dr Alastair Allen on Tuesday 24th June. We had circulated our 'Ask' for a new Higher Earth Science before the meeting, but had only just completed the audit to see how much geology is in other subject areas as claimed by SQA, so this was being presented for the first time.

In attendance at the meeting were Roddy Gillespie (SQA), Murray McVicar (Learning Directorate) and a representative from Education Scotland who is one of the new Senior Officers appointed to take responsibility for each of the 8 curricular areas. Annabelle Ewing was there for the whole session. Unfortunately Liz Smith couldn't make the meeting.

After Alastair Allan arrived, we got a chance to pitch the new Higher in Earth science as a great opportunity to do something innovative that builds on knowledge and skills from the 5th year sets of Highers, has a wide array of skills training, and independent learning framework. The ES person stated that there wasn't any room for a Higher Earth Science in the senior phase and we responded to that question with a number of counter arguments (including choice of 6th year for the ES Higher to avoid clashes with the full 5th year and 106 teachers saying they are interested to teach it). We presented the audit of Earth science content in the new courses, and argued that there was insufficient coverage of the topic in Environmental Science, Geography, Biology, Chemistry and Physics. The narrowness of the science base was also mentioned at this point with the TIMMS graph.

SQA's comment to the audit (started by Murray McVicar) was that our audit was only based on the examinable content (which is the only content laid out in the CfE Course Unit Support Notes) and was not the whole content of these courses; they commented that other materials and topics would be included. SQA brought this point up again later as an argument that there COULD be more Earth science in the new courses. Finally, we were offered a Baccalaureate. We didn't know how to react to this but did say we would look more into that possibility. However, we made it clear that we were still requesting that they consider this opportunity to develop a great new Higher that offered something different, innovative and complementary.

We finished the meeting with a statement about the pivotal and unacknowledged role of earth science in the economy, the skills training, jobs and opportunities it can provide, and the primary insights that we should be giving all our young citizens about the functioning of the planet and its resources, so that they can understand resource and stewardship issues from (at least) a basic level. Also we questioned why a subject that is so important to the economy and understanding of the planet didn't have a higher priority.

We are grateful to Annabelle Ewing for setting up a meeting with the Minister at such a busy time in the parliamentary calendar. We are now awaiting his response and understand this may be delayed because of the summer recess.

Dr. Joyce Gilbert

Education Officer
Royal Scottish Geographical Society
Lord John Murray House
15-19 North Port
Perth PH1 5LU
Scotland,
UK

M E E T I N G S and C O N F E R E N C E S

ProGEO regional working group No 3, Northern Europe 2013 Meeting

ProGEO
The European Association for the Conservation of the Geological Heritage

Geological heritage and geoconservation at the north western edge of Europe

The Whin Sill at Lindisfarne Castle (top), Hadrian's Wall (bottom)

2013 Meeting Newcastle upon Tyne, UK
16 – 20 September 2013

Outline Programme
Monday 16 September 2013
Field excursion to the Northumberland Coast – how geology, landscape history and tourism interlink. Proposed Itinerary – Woodhorn Colliery – a former coal mine area now a cultural centre, Lindisfarne (Holy Island), Bamburgh Castle and other nearby localities.

Tuesday 17 and Wednesday 18 September 2013
Scientific sessions at Northumbria University, Newcastle upon Tyne
Conference dinner on the evening of Wednesday 18 September.

Thursday 19 and Friday 20 September 2013
Post symposium field excursion
Thursday – West of Newcastle to Hadrian's Wall and Whin Sill and North Pennine Orefield localities (19th century mining area in the North Pennines Area of Outstanding Natural Beauty and Geopark)
Friday – County Durham– including the classic Magnesian Limestone localities of the Permian (linked to Limestone Landscape project) and Durham Cathedral – geological setting and building stones

To receive more information please email:

lesley.dunlop@northumbria.ac.uk

GeoConservationUK Newsletter

MEETINGS and CONFERENCES

GeoConservationUK acknowledges the support of *Rockhounds Welcome!* in the production of this *Newsletter*

24th International Congress on the History of Science, Technology & Medicine

HOGG is supporting the **INHIGEO** engagement with this week long Manchester University based conference; the following symposia have been scheduled:
S112, Geology in art and literature : all day Tuesday 23rd July + the first session on Wednesday 24th July;
S113, Geologists in the field : all day Friday 26th July + the first two sessions on Saturday 27th July.

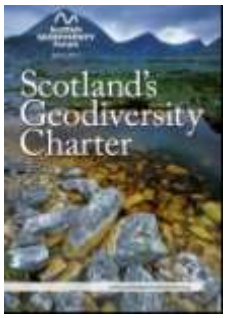
There are three geo-history field trips; details at:
http://inhigeo2013.historyofgeologygroup.co.uk/?page_id=225

Tom Hose of HOGG/GCUK is leading the *"Buxton Spar and Spa"* field excursion on Thursday, 25th July that will partly recreate a Geologists' Association excursion of 1904. Naturally, sampling the delights of Buxton water will literally be on the menu (and available from St. Anne's well - *see left*) in the included luncheon. Together with a tour of Buxton's architectural spa heritage, Poole's Cavern and the geology of the Grin Low area will be examined, with fine views from the vantage point of Solomon's Temple *(see right)*.

Registration (now at £280) details can be found at:
http://www.ichstm2013.com/registration/index.html

NEWS ITEM — *Good News (x2) from Scotland*

The Scottish Government has recently confirmed its agreement to provides funds for the North West Highlands Geopark and the Shetland Geopark for two years; this should enable them to develop a long-term business plan.



A new edition of ***Scotland's Geodiversity Charter*** has just been published with a foreword by the new Minister, Paul Wheelhouse MSP (Minister for Environment and Climate Change); it can be downloaded as a pdf file from: http://scottishgeodiversityforum.org/charter/

Meanwhile, the Scottish Geodiversity Forum is preparing a document which they plan will help encourage Local Authorities in Scotland to take forward actions under the ***Charter***.