

# Geoscientist

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**Irresponsible sampling  
Water, sandstone and climate change**

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# Leap of faith

*A recent ruling that held environmentalism akin to religion has had the commentators scribbling. Ted Nield wonders if it's quite as bad as they all seem to think.*

Mr Tim Nicholson, 42, was once a senior executive at Grainger plc., “the UK’s largest listed residential landlord”. In July 2008 however he was made redundant, and took Grainger’s to the Employment Tribunal, claiming unfair dismissal. Nicholson held that, as a committed environmentalist, his lifestyle choices had put him at odds with his colleagues, and that his dismissal contravened employment law that was originally designed to protect employees from religious discrimination. On November 3, Mr Justice Burton delivered a written ruling that in effect brackets strongly held non-religious philosophical stances together with faith for the purposes of the Employment Equality (Religion and Belief) 2003 regulations.



Predictably, there has been uproar from climate campaigners, who do not much like being equated with those who, for example, might believe that the Earth was created in seven days. Their beliefs are “rational”, they say, and to equate them with religion aligns them with witch-doctors and soothsayers. This is an important point because, whereas we can pick and choose religions, averting climate catastrophe requires that we *all* make lifestyle choices like Mr Nicholson.

The UK Government, to the annoyance of secularists, has sought to enhance the public role of religious faith. But having encouraged places of work (under penalty of law) to do all they

can to accommodate the widest range of spiritual beliefs, it has now been shown that – fair play, and all that – similar rights must now be extended to people who make choices based on other criteria. Is this necessarily bad philosophy?

The name of our former President Thomas Henry Huxley is invoked every time we mis-use the word “agnostic”, which he coined to mean a person who is “incapable of knowing”. Science, said Huxley, treats the natural world. It can therefore never produce evidence of the supernatural, if it exists, and a scientist is therefore always professionally incapable of looking directly upon the face of the Creator. Thus we *choose* to believe – or not – as a matter of faith. This stance underpins the “Non-Overlapping Magisteria” (NOMA) Principle, promoted by the late Stephen Jay Gould, and puts atheism on the same footing as theism. This stance is practical and permissive, and allows religion and science to coexist peacefully. Alas, it runs counter to Richard Dawkins’s militant “new atheism”, which holds that only atheism is rational.

Before Mr Justice Brown’s ruling, this mattered. As an atheist, I want the protection of Employment Law too, thank you. Formerly, if I held to the NOMA principle, I could claim (as I do) that atheism is a faith. Now, if Professor Dawkins were to get a job outside a University (where he receives the greater safeguards enshrined in the Education Acts), he would enjoy employment protection too. Camilla Palmer, of law firm Leigh Day and Co, told *The Guardian*: “It’s a great decision. Why should it only be religions which are protected?”.

There is no doubt that it’s a great decision for lawyers. But perhaps secularists should be applauding it, too. ☺



Front cover: Internationally important cone-sheet exposures close to Mingary Pier on Ardnamurchan, peppered with core holes. Photo: Colin MacFadyen. See page 5.

## Geoscientist

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# Who's the who?

*John Cope thinks referees ought to identify themselves.*

I have recently had a paper rejected for publication by the Journal of the Geological Society. I suppose that, having over 160 publications in print, receiving only the fifth rejection of my career is not bad. One referee supported the paper strongly and recommended publication with very minor modification; but a second was strongly critical. The editor correctly sent the paper to a third referee, whose comments were similar to those of the second. Unsurprisingly therefore, the paper was rejected. What is noteworthy is that while the supportive referee signed his comments, both of the critical referees remained anonymous. This is my real gripe.

Would either of these referees be prepared to tell me (or my co-author) to my face what he (or she) wrote? If not, they should not be refereeing papers. I referee quite a lot of papers and research grant applications (probably over 300 during my research career) and have always insisted that my name appears on my comments because I believe that one should be prepared to justify anything one writes. I have recommended rejections but I have never received hate mail or threatening calls because of this. Indeed, the opposite has happened – because I point out what authors need to do to make their papers acceptable and have had grateful messages from authors. It is usually obvious who any anonymous referee is; the style of writing and various other ‘giveaways’ usually make it transparent to the trained reader. To return to this recent case, my colleague and I are 99% sure of the authorship of the two anonymous reports. So what is gained by this anonymity? I would suggest precisely nothing. Were the referees worried that we might review their next research grant application unfavourably?

Referees are far from infallible and I recall some years ago that some archived 1950s manuscripts in the Society revealed one with the referee’s scrawled comment ‘the silly b\*\*\*\*r believes in continental drift!’. I too have suffered. Thirty years ago I discovered Lower Cambrian foraminferans in Wales. These considerably predated the (then) oldest known forams; my manuscript included stereoscan pictures including close-ups of the test wall showing pores. The one anonymous referee’s report that accompanied *Nature*’s rejection stated that foraminferans did not exist in the early Cambrian and even if they did, would not



have such a sophisticated structure. One year later, *Nature* published a description of the same species from Newfoundland, based on material less well-preserved than mine had been. An anonymous referee thus robbed me of the claim to have first discovered early Cambrian forams. Does the need to cover their later embarrassment excuse a policy of anonymity? Hardly.

Of late, another problem has emerged, as manuscripts are sent out online. I believe it impossible to fulfil a refereeing job properly with an online version and always work from hard copy. With this latest paper, one referee raised a query that was in fact fully addressed; I suspect it was missed through online reading.

So come on Geological Society, insist that referees are always identified! ☺

**Soapbox** - is open to contributions from all Fellows. You can always write a letter to the Editor, of course; but perhaps you feel you need more space? If you can write it entertainingly in 500 words, the Editor would like to hear from you. Email your piece, and a self-portrait, to [ted.nield@geolsoc.org.uk](mailto:ted.nield@geolsoc.org.uk). Copy can only be accepted electronically. No diagrams, tables or other illustrations please.

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# Carousel



**Cameron Davies**, (left) geologist and entrepreneur who pioneered coal mine methane (CMM) mitigation technology in the UK and Europe has recently moved from executive to non-executive director of Alkane Energy plc. He is now an independent consultant in the alternative energy sector, an IPCC adviser and a vice-Chairman of the UNECE Group of Experts on CMM emissions from underground coal mines. T: 0044 1892 542905 E: [camdav@hotmail.com](mailto:camdav@hotmail.com)

**Edmund Nickless**, (right) Executive Secretary, has accepted an invitation to represent the Geological Society and to become a member of a Review Group as part of the NERC Review of the postgraduate skills needs of the UK Environmental Sciences Sector over the next decade and beyond. Review outcomes will be used to inform the next NERC Training Strategy and also to provide a reference point for all postgraduate level training activities within the sector, including CPD and short courses.



**Colin Summerhayes** (left) was elected (on 10 December 2009) President of the Society for Underwater Technology, a group that deals with subsea engineering, oceanography, seabed survey and offshore minerals including oil and gas. As a Fellow, he hopes to strengthen links between the two societies.

**Ian Thomas**, (right) Director of the National Stone Centre based in the Peak District, has recently returned from a seven week fact-finding tour of Scandinavia following the award of a Winston Churchill Memorial Fellowship. He visited more than 50 training centres, quarries, workshops, conservation bodies and government agencies (including the national surveys). His purpose was to study traditional building craft training and materials within the context of modern restrictive regulations and policies. The knowledge and experience gained will be applied to the development of the new £1.5 million craft and conservation-related training facility, due to open at the NSC in mid-2010. (Further information on the Churchill Fellowships is available from [www.wcmt.org.uk](http://www.wcmt.org.uk).)



*All Fellows of the Society are entitled to entries in Carousel. Please email [ted.nield@geolsoc.org.uk](mailto:ted.nield@geolsoc.org.uk), quoting your Fellowship number*

## Looking ahead

*Geological Society of London, 18 & 19 January 2010*

Lynne Frostick (University of Hull and GSL), John Ludden (Executive Director, BGS) and Marje Wilson (University of Leeds) have written to UK Earth science departments and institutes inviting them to promote a forthcoming meeting entitled *Earth sciences in the 21<sup>st</sup> century: a forward look*. In a covering letter the initiators say that the outputs of the independent meeting (supported by NERC and GSL) will be owned by the community. The letter says: "We feel that we can influence the long-term strategy of the major funders of the Earth Sciences research in the UK, in Europe and internationally. This will include strategic science direction, specialist training and Earth Sciences infrastructure requirements."

The meeting will be limited to about 100 Earth scientists, "in particular mid- early-career scientists, who will carry the outputs of this forward look into the future". The first day will focus on input from around 100 scientists. The second day will involve around 25 scientists as part of a writing team. A plenary session will be followed by five or six breakout groups, each tasked with discussing and making recommendations on a series of themes relevant to Earth sciences research and teaching in the 21<sup>st</sup> Century. The focus of each theme will be refined through an open web discussion forum.

If you are interested in attending this Forward Look please contact Vicky Hards at [vlh@bgs.ac.uk](mailto:vlh@bgs.ac.uk) Applications will be reviewed by the discussion topic leaders and coordinating team in order to assure an appropriate cross-section of scientists are involved. In addition to scientists from the departments and institutes the Society will also invite key industry figures, representatives of the Royal Society and NERC and ERC fellows.

For further information: <http://www.bgs.ac.uk/ukgeoscience/>





## Under the volcano

*Ian Donnelly pays tribute to OU volcanologist John Murray*

Friday 9 October 2009 marked the 40<sup>th</sup> anniversary of Dr John Murray's first day of fieldwork on Mt Etna. John, a volcanologist based at the Open University, has devoted his life to the study of Etna's ground deformation and topography. Mt Etna, Sicily, is Europe's highest and most active volcano, reaching approximately 3320m above sea level. It has a long and complex recorded history of activity since the dawn of European civilisation. Notable recent eruptions occurred in 1971, 1974, 1981, 1983, 1991-1993, 2001, 2002-3 & 2008-9, and all have been investigated by Dr Murray.

To mark this auspicious occasion, John invited his (180-odd!) past field assistants to celebrate in Sicily on his 70<sup>th</sup> visit to the volcano since 1969. More than 30 volcanologists and geologists travelled from different parts of the world and congregated in the small town of Nicolosi, situated on the southern flank of Etna. From here many of them climbed to the edge of the central crater at the summit.

This day gave the opportunity for many old friends to meet and to exchange memories, experiences, stories and events that had made their work with John on Mt Etna in years gone by so memorable and rewarding. The celebrations continued long into the evening in Nicolosi where John gave a presentation on his work and experiences over the past few decades.

John's dedication to the investigation of Mt Etna is unrivalled. He has undertaken this work with infectious enthusiasm and in doing so has inspired an entire generation of volcanologists and geologists, many of whom subsequently went on to develop their own careers in volcanology, Earth sciences and geohazards throughout the rest of the world.

John, on behalf of your friends and colleagues we are truly grateful to you for having given us opportunities, experiences and wonderful memories. Many congratulations on this incredible achievement; it was an honour to attend this reunion in Sicily in recognition of your outstanding, distinguished contributions to volcanology and in particular our understanding of Mt Etna. ☙



## Vandals, wha hae wi' samples fled

*Irresponsible sampling continues, despite the existence of the CHUGD/GA Code of Practice, reports Adler deWind*

The July 2005 issue of *Geoscientist* (15.7, p15) carried a letter from Dave Cheer of St Andrews University on the issue of irresponsible coring of exposures in the Garvellach islands. Dr Cheer was distressed to see textbook features disfigured. Seeing this letter prompted geologist Colin MacFadyen of Scottish Natural Heritage to investigate the issue. He has now produced two items for *Earth Heritage* magazine (see issue nos. 27 pp.12,13, and 28 p.17, at [www.earthheritage.org.uk](http://www.earthheritage.org.uk)). These pieces have now been circulated to UK Earth science departments with a letter asking researchers to adhere to good practice

as outlined by the Committee of Heads of University Geoscience Departments (CHUGD), and the *Code of Conduct for Rock Coring* prepared by the Geologists' Association (GA).

Says MacFadyen: "Exposures in key localities are still being damaged by researchers. In August this year I was absolutely appalled to discover internationally important cone-sheet exposures close to Mingary Pier on Ardnamurchan (pictured) peppered with hundreds of holes. A UK-based researcher has taken responsibility for some of the damage at that site (he was overseeing a US team who undertook the work in the summer of 2008) and at SNH's request he will attempt to make good some of the damage, by filling in the holes for which he has taken responsibility. SNH has requested that the researcher also considers funding the republishing of the GA's core code in a more proactive goodwill measure."

"I have raised the issue of irresponsible coring with the Geoconservation Commission and it has been agreed that there is a need for further action to raise awareness of the core code, urging folk to sample responsibly" says MacFadyen.

Colin MacFadyen may be contacted at [colin.macfadyen@snh.gov.uk](mailto:colin.macfadyen@snh.gov.uk). The Coring Code of the GA forms part of the fieldwork code and can be downloaded at [www.geologists.org.uk/downloads/GAffieldworkcode.pdf](http://www.geologists.org.uk/downloads/GAffieldworkcode.pdf).

DISTANT THUNDER

# Smith, Noble and the Hackness Connection

*John and Jennifer Powell\** uncover a fascinating connection between William Smith and the man who immortalised him in marble.

At the recent opening of a new building dedicated to the 'Father of English Geology' on 25 June 2009 at Keyworth, the great man's presence was made palpable by a number of exhibits – among which is a marble bust of William Smith by notable Victorian sculptor Matthew Noble. Here lies a fascinating link between Smith, the sculptor Noble, Sir John Johnstone and the village of Hackness, near Scarborough.

The fine bust of William Smith was deposited in the

Wandsworth store of the Natural History Museum (NHM) where it had been moved in 1985 when the Geological Survey (then the Institute of Geological Sciences) transferred ownership of many of its collections to the NHM.

Although listed in John Thackray's catalogue of the NHM collections, the bust was hidden in a corner behind models of the atomic structure of crystals, and had acquired a fine patina of cobwebs and dust. Thanks to the help of NHM staff, especially David Smith and Jill Darrell, the

William Smith Marble Bust (1850 copy), by Matthew Noble; William Smith Building, British Geological Survey, Keyworth, Nottingham

bust was transferred, on long-term loan, to the new William Smith Building. Here he sits on a plinth of dark grey Carboniferous Limestone from Castletown, Isle of Man.

Hackness Hall, near Hackness, North Yorkshire.

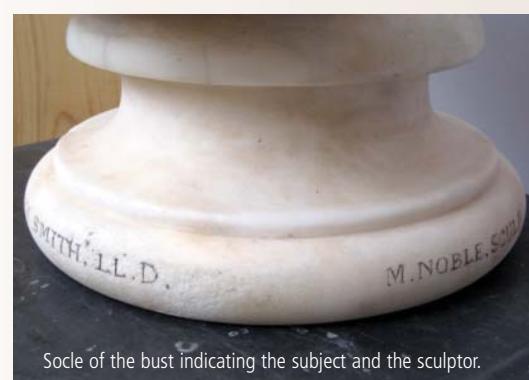


Many will be aware of the influence that Sir John Johnstone (1799–1869) great-great grandfather of the present Lord Derwent, had on the career and national recognition of William Smith. Following his release from debtors' prison in 1819, Smith travelled and worked in northern England. He was employed to advise on the water supply to Scarborough, and later (in 1828) Sir John employed him as his estate manager at Hackness Hall. This appointment lasted until 1834, after which Smith acted as Sir John's scientific adviser. Together with his nephew, renowned geologist John Phillips, Smith helped design and acted as Clerk of Works for the building of the Rotunda Museum, Scarborough (completed 1829). Here he illustrated the local geology and strata in correct stratigraphical order, together with representative fossils. The newly refurbished Rotunda Museum was opened in 2008 (*Geoscientist*, May 2008) by HRH Prince Charles in the presence of Lord Derwent, founding Chairman of the Scarborough Museums Trust.

During this late stage of his career, Smith lived in the village of Hackness, and the foundations of his Estate Manager's office can still be seen at Hackness Hall Hotel. Indeed, the Middle Jurassic Callovian stratigraphical unit, the Hackness Rock Member (Osgodby Formation), was defined by Smith during his detailed geological survey of the estate, and his original hand-coloured, 'six-and-a-half-inches to the mile' geological map of the Hackness Hills was published in 1832. Hackness Rock (a sandstone) was used in the construction of the original Rotunda Museum.

Coincidentally, the man who was eventually to become his sculptor, Matthew Noble, was born at Hackness in 1817, the son of stonemason Robert Noble, and served his apprenticeship with his father. His artistic abilities were spotted by Sir John, who arranged for him to study in London under renowned sculptor John Francis, with whom he lodged as a young married man. Sir John Johnstone therefore fostered the careers of both William Smith and Matthew Noble. At the time of Smith's death in 1839, Matthew Noble was 22 and, living in the same small village, it is likely that the two men were closely acquainted (Hugh Torrens, tells me that in a letter (1849) John Phillips notes that Noble "knew him [W.S.] familiarly at Hackness")

Noble, then aged 33, was commissioned to produce the bust in 1850 for a sum of £50 – to commemorate the opening of the Museum of Practical Geology,



Socle of the bust indicating the subject and the sculptor.



William Smith LLD, oil painting on canvas, by Hugues Fourau, 1837; Geological Society of London

South Kensington, in 1851. It is a replica of the bust that he made in 1848 for the memorial to Smith in St Peter's Church, Northampton, where Smith is buried. The original and copy were based on the famous oil portrait of Smith (Hugues Fourau, 1837) painted two years before Smith's death. However, the great man looks a good deal younger in Noble's sculpture – perhaps reflecting the artist's earlier memories of a more youthful Smith with whom he was acquainted.

Noble worked mainly in the Manchester area, and regularly in Leeds. He exhibited at the Royal Academy, London from 1845 (aged 28) and first came to widespread public attention in 1856 after winning the competition to design the prestigious Monument to the Duke of Wellington in Piccadilly Gardens, Manchester. His prolific commissions in bronze and marble included many notable Victorians, such as Michael Faraday and Sir John Franklin, including pictorial reliefs illustrating his (disastrous and incompetent) search for the north-west passage.

Noble later acquired great fame and respect as a leading sculptor of portrait busts and statues often for public monuments, and was commissioned to make many sculptures of important figures, including Queen Victoria, Prince Albert, the Bishop of York, and many others. His monumental sculpture can be found in various cities in the UK including London, Bradford, York, Manchester, as well as in India. Noted for his '*rare kindly qualities of heart and mind. Generous in his acts and in his sympathies*' (according to his obituary in the *Art Journal*, 1876), he died at his home in Kensington in 1876, aged 56, leaving many works unfinished. There is a monument to him in St Peter's Church, Hackness. ☀

#### Acknowledgements

Thanks to Hugh Torrens for his helpful advice.

#### Sources

- H S Torrens, 'Smith, William (1769–1839)', Oxford Dictionary of National Biography, Oxford University Press, 2004.
- Martin Greenwood, 'Noble, Matthew (1817–1876)', Oxford Dictionary of National Biography, Oxford University Press, 2004.
- John Thackray, 1995. Catalogue of Portraits, Painting and Sculptures at the Natural History Museum, London.
- \*John Powell, *Chief Geologist England, British Geological Survey*. jhp@bgs.ac.uk. Jennifer Powell, Researcher, Mapping the Practice and Profession of Sculpture in Britain and Ireland 1851–1951

## Deaths

- Read obituaries online at [www.geolsoc.org.uk/obituaries](http://www.geolsoc.org.uk/obituaries).

The Society notes with sadness the passing of:

- Archer, Alan\*
- Baumer, A\*
- Bishop, Richard\*
- Francis, Christopher Michael George\*
- Guilford, Colin\***
- Knight, Jack\*
- Mills, Anthony B\*
- McKinlay, Alex C M\*
- Rickards, Barrie**
- Truss, Stephen\*

In the interests of recording its Fellows' work for posterity, the Society publishes obituaries online, and collects them once a year in its *Annual Review*. The most recent additions to the list are in shown in bold. Fellows for whom no obituarist has yet been commissioned are marked with an asterisk (\*).

If you would like to contribute an obituary, please email [ted.nield@geolsoc.org.uk](mailto:ted.nield@geolsoc.org.uk) to be commissioned. You will receive a guide for authors and a deadline for submission. You can also read the guidelines for authors at [www.geolsoc.org.uk/obituaries](http://www.geolsoc.org.uk/obituaries). To save yourself unnecessary work, please do not write anything until you have received a commissioning letter.

Deceased Fellows for whom no obituary is forthcoming have their names and dates recorded in a Roll of Honour in the next available *Annual Review*.

#### Help your obituarist

The Society operates a scheme whereby Fellows may deposit biographical material for use by their obituarist. The object is to assist obituarists by providing useful contacts, dates and other factual information, and thus to ensure that Fellows' lives are accorded appropriate and accurate commemoration. Please send your CV and a photograph to Ted Nield at the Society.

If the past is the key to your present interests, why not join the History of Geology Group (HOGG)? For more information and to read the latest HOGG newsletter, visit the HOGG website at: [www.geolsoc.org.uk/hogg](http://www.geolsoc.org.uk/hogg).

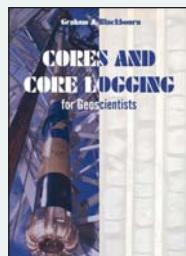
# Reviews

**Books available for review:**

Interested parties should contact the **Reviews Editor, Dr. Martin Degg 01244 513173; m.degg@chester.ac.uk**, only.

Reviewers are invited to keep texts. **Review titles are not available to order from the Geological Society Publishing House unless otherwise stated.**

- Clarkson, E. & Upton, B. (2010), *Death of An Ocean: A geological borders ballad*, Dunedin.
- Lovell, B. (2010), *Challenged by Carbon: The oil industry and climate change*, Cambridge.
- Sneider, R. & Larner, K. (2009), *The Art of Being a Scientist: A guide for graduate students and their mentors*, Cambridge.
- Trewin, N. & Hurst, A. (eds) (2009), *Excursion Guide to the Geology of East Sutherland and Caithness*, Dunedin.



## Cores and Core Logging for Geoscientists (2nd Edition)

**Graham A Blackbourn**

**Published by:** Whittles Publishing

**Publication date:** 2009

**ISBN:** 978-1904445-39-5 (in USA: 978-1-4398-0116-1)

**List price:** £37.50

**164 pp**

[www.whittlespublishing.com](http://www.whittlespublishing.com)

Many will welcome this updated edition of a well known and well used favourite, first published 20 years ago under the title '*Cores and Core Logging for Geologists*'. The slight change of emphasis to '*Geoscientists*' is presumably intended to reflect the broadening of geological training and application that has occurred in the intervening two decades.

Even a brief perusal of this short book suggests that it will be a valuable addition to the library of any practising geologist or geoscientist. It is nicely constructed, printed on good quality paper, well illustrated by diagrams and photographs - including an excellent 12-page colour section - and supported by three useful appendices, a short bibliography and an effective index. It is a practical manual for the taking and logging of rock cores, mainly for use in geological exploration and geotechnical investigation, and I would expect users, especially new practitioners, to come to regard it as a valued companion.

Dr Graham Blackbourn is well positioned to present this focused guidance, having spent nearly 10 years with a major oil company prior to publishing the first edition of this book, and then establishing his own consultancy based near Edinburgh. He is recognised for specialist expertise in petrography and reservoir quality, and for technical publications on marine clastics, continental 'red bed' facies and diagenesis in clastic reservoirs. But this has not detracted from his ability to engage to a high standard with the basic mechanics and disciplines of taking and logging rock cores that are suitable for a range of end uses.

As the title makes clear, this book is intended for experienced geoscientists and geologists, and does not waste space discussing geological principles that should be known to the user. Dr Blackbourn is correct, in his Preface, to note that newly-trained geologists will rarely have encountered rock cores in their studies, in any sort of serious sense, yet many start their professional careers by being immediately confronted with the task of logging seemingly endless metres of such cores, with much possibly hanging on the reliability of their record. I recently witnessed the embarrassment of a consultant geologist in court, who had

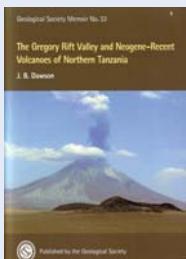
misguidedly relied on ex-quarry core logs prepared by a novice, describing a complex bedded sequence of mudstones, calcareous mudstones, occasional limestone and seams of shale as being wholly and simply 'limestone'. The value of this manual is that it builds on a basic geological training and provides clear guidance on the whole process of taking cores and then subjecting them to logging, testing, interpretation and storage.

There are seven chapters, starting with an admirably concise two-page Introduction. Chapter 2 (25 pages) gives an up-to-date review of drilling and coring methods, while Chapter 3 (23 pages) provides thorough guidance on core handling. The core of the book, so to speak, is Chapter 4 (42 pages) on core logging, which represents an excellent and beautifully illustrated step-by-step methodology for the preparation of 'preliminary logs'. Options for core analysis and testing are described, non-prescriptively, in Chapter 5 (20 pages), which importantly includes limitations. Chapter 6 (14 pages) tackles interpretation and preparation of final logs, but this should not be misunderstood; some 'interpretation' of factual observations is often desirable in preparing a 'final log', which can be produced from the preliminary log for presentation purposes. The book does not go beyond its brief in terms of interpretation - oil geologists, engineering geologists and others will need to apply their specialist knowledge and skills in interpreting the overall meaning and implications of core logging data produced on the basis of this manual. Chapter 7 (seven pages) closes the book by providing guidance on core preservation and storage.

Overall, this is an impressive little book that presents practical, sensible guidance on an important topic for several branches of applied geoscience – all based on actual rather than academic experience. I have no hesitation in recommending its purchase to all geologists and geoscientists, but most especially to those who are just starting their professional careers, for whom the book will long remain a trusted companion.

*Dr Ian Sims, RSK STATS Limited, Hemel Hempstead*

... Caribbean Plate Debate continues: [www.geolsoc.org.uk/gsl/views/debates](http://www.geolsoc.org.uk/gsl/views/debates) . . .



## The Gregory Rift Valley and Neogene-Recent Volcanoes of Northern Tanzania Geological Society Memoir No.33

J B Dawson

Published by: The Geological Society of London

Publication date: 2009

ISBN: 978-86239-267-0

List price: £65.00;

(GSL Member price: £32.50)

102 pp

[www.geolsoc.org.uk](http://www.geolsoc.org.uk)

This account is in the best tradition of geological memoirs, giving a fine, detailed, comprehensive overview of the geology of a particular region, the northern Tanzania section of the East African Rift zone. Scientifically this rift segment is important not just for its wide array of volcanoes (including Oldoinyo Lengai, the only currently active carbonatite volcano – and shown on the cover), but also for the Olduvai hominid sites and the game sanctuaries of Ngorongoro and Serengeti.

Although the central theme is the volcanoes, this work will be of interest to geophysicists, structural geologists and geomorphologists, because the author is effective in using the volcanology to explore interrelationships between these specialised fields. Chapter 2 provides a valuable background history of the recognition of the Great Rift Valley, followed by accounts of regional geology, geophysics, tectonics and the sedimentary basins. Coverage in some aspects is perforce summary, but still provides the necessary framework supported by abundant references.

Chapter 7, on the volcanoes, forms the core of the work. As well as run of the mill basalts, trachytes and rhyolites (including per-alkaline varieties), there are lots of exotic rocks (such as carbonatites, melilitites, nephelinites) to excite the specialist. Here a specific map summarising the distribution patterns in the different magma types (geographic/age) would be useful. In addition to the picture on the cover, there are 26 superb colour plates, and two Appendices with radiometric dates and unpublished analyses. The author considers the idea that the rifting and volcanism in N. Tanzania is the latest manifestation of the progressive southward splitting of the African plate, but concludes this is a "matter of debate".

In providing such a wealth of information on the field, petrographic and chemical relations of this extraordinary region, the author draws upon an immense amount of experience to date. He refers to this work as an "interim report", and he has certainly achieved his aim of providing the essential foundation for further research. For this, the final Chapter (9) points the ways forward, following a thoughtful appraisal of the petrogenesis in Chapter 8. Contrary to what is stated on the back cover, the book does not conclude "with a discussion of the volcanism in relation to the plume-related African Superswell". Anyone for whom this might have special appeal should be advised that the Superswell is mentioned on page two and page 18 (as indexed) in reference only to topographic uplift. Otherwise, read and enjoy this landmark publication.

Ken Bailey, University of Bristol

# Letters

*Geoscientist* welcomes readers' letters, and every effort is made to publish them as promptly as possible. You can help by keeping letters to around 300 words or fewer. Please write to **Dr Ted Niell**, Editor, at The Geological Society, Burlington House, Piccadilly, London W1J 0BG or email [ted.niell@geolsoc.org.uk](mailto:ted.niell@geolsoc.org.uk).

All letters are published at [www.geolsoc.org.uk/letters](http://www.geolsoc.org.uk/letters), and a selection subsequently presented in the magazine. Please note that letters may be edited.

## Relocation of Gilmerton UKCS to Keyworth

*From John Collinson (Rec'd & Pub'd 4 November 2009)*

Sir, Bob Leppard's letter in November *Geoscientist* drew attention to disquiet over the BGS decision to transfer the important offshore well archive to a new facility at Keyworth. The decision, announced in August, took all users of the Gilmerton facility that I have contacted by surprise. BGS Executive Director John Ludden (a member of GSL Council) and BGS Director of Information Richard Hughes, assert that extensive consultation took place, including contributions from universities, the oil industry and the Geological Society. The single meeting, which took place at the Natural History Museum in May, was attended by 30 invited participants. The Geological Society was (apparently) represented by its Executive Secretary. I would be interested to ask what advice the Executive Secretary gave, what evidence and opinions were collected beforehand to support that advice, and from whom such evidence and opinions were taken.

*Edmund Nickless replies:* The Society received notice of the BGS Information Management Facilities Review, of which the Gilmerton Core Store formed part, on 12 January 2009. The letter invited me to become a member of the "Stakeholder Review Panel", alongside representatives of other bodies, some of whose names Collinson cites. However I neither took up this invitation nor responded to the letter. The letter arrived just as we were preparing for the Council Residential Meeting, possibly the busiest period in the calendar apart from the Society AGM. Sadly, by the time that event was behind us, the invitation had been forgotten. As a result, I canvassed no opinions – because, contrary to Collinson's assertion, I had no involvement in the process and was not present at the May meeting in the Natural History Museum. The original invitation having been overlooked, and no follow-up letter received from BGS, notice of the consultation was not advertised to the Fellowship in *Geoscientist* or online.

*From Andy Sims (Rec'd & Pub'd 5 November 2009)*

Sir, I must add my voice to the concerns being expressed regarding the future of this facility and, particularly, to its invaluable contents. Together with colleagues, I have recently completed a visit to the Gilmerton facility to review and log some 470ft of core material from Tertiary sediments. The cores we reviewed recently were largely unconsolidated: there is no chance of such material's surviving transport to Keyworth. The value of such cores will, therefore, will be significantly degraded by the proposed move. We would not stand for geological vandalism of key outcrops and should consider damage to unique core material in transit to be equally unacceptable.

... Caribbean Plate Debate continues: [www.geolsoc.org.uk/gsl/views/debates](http://www.geolsoc.org.uk/gsl/views/debates) ...

*From John Collinson (Rec'd & Pub'd 10 November 2009)*

Sir, The very least that should happen is that the cores are transported in specialised trucks with anti-shock suspensions, as commonly happens in industry and that all cores are photographed before shipping. The lack of a photographic archive of UK cores is, in any case, a cause for concern. I can carry out a large part of a core-based study in the Norwegian sector sitting at my desk in England, using on-line photographs on the NPD website, whereas in the UK I have to travel to a core store for even basic information. BGS should compile a photographic database that would be a really worthwhile legacy of this debacle.

*From John Ludden & Richard Hughes\* (Rec'd & Pub'd 24 November 2009)*

Sir, BGS has been the custodian of the unique UK Continental Shelf (UKCS) core and records collections at Gilmerton (Edinburgh) for many years on behalf of the Department for Energy and Climate Change (DECC) and predecessor departments. Under a Memorandum of Understanding with DECC the BGS provides access to the collections for the oil and gas industry and the academic community in the UK and abroad. BGS's announcement in late August of its proposal to close the Gilmerton core store and re-locate the collections to its head office site at Keyworth has attracted much recent attention, with both objection and support being voiced.

BGS's collections of data, samples and records are currently spread over 41 separate locations at seven sites across the UK: three in England and four in Scotland. Some of these facilities have been assessed as "not fit for purpose" by The National Archives, and the large number of sites and locations inevitably means very high running costs. In late 2008, therefore, BGS instructed independent consultants (Tribal Group) to undertake a review of all its information management facilities, to identify the limitations of the current configurations and propose alternatives. The review involved a consultation phase during which the opinions of a range of users were solicited, including representatives of Oil & Gas UK, DECC, UK university geoscience departments, the Geological Society, UK Collections Advisory Committee, The National Archives, The Coal Authority, Ground Forum etc. Stakeholders were asked specifically to comment on new possible storage options including relocating existing Scottish facilities to Keyworth, and moving appropriate parts of the collections into commercial storage.

While stakeholders recognised the potential benefits of consolidation of collections at Keyworth, some concerns were expressed that such a move would put further distance between the UKCS data/collections and oil and gas industry users. During the review the consultants therefore looked at the geographical distribution of the Gilmerton store user community. Analysis of users (both commercial and academic) over the past two years shows that 25% of visits were made by users based in Scotland and that the remaining 75% had to travel from various parts of England, Wales, Ireland and further afield including North America.

The cores are to be relocated to a new purpose-built facility, which will be an extension to the existing store of similar size. It will have 'state of the art' powered mobile racking, and will be large enough to accommodate the contents of the Gilmerton store, with expansion capacity for strategically important cores from all sources that we expect will be deposited in the coming years.

There will be ready access to sample preparation and photographic facilities not available in Gilmerton, and to all the other facilities offered at the BGS head office. The BGS Chief Curator is currently reviewing core examination facilities worldwide as a means of identifying best practice, and the independent BGS Collections Advisory Committee are reviewing and feeding into the plans. It is expected that two additional confidential core viewing laboratories will be fitted out to augment the existing excellent facilities.

Not only will these facilities provide for the needs of our industry users, but they will open new opportunities for university departments to use the Keyworth core store facilities to further support education and training in petroleum geosciences (see for example *Geoscientist*, March 2009).

Concerns have been raised regarding potential damage and loss of integrity of the Gilmerton cores during transportation. We want to reassure the community that BGS takes this issue extremely seriously. Throughout the history of Gilmerton's operation, until four years ago, both offshore and onshore hydrocarbon core and samples were sent directly to Gilmerton. After curation, the onshore (landward) cores were held at Gilmerton until they were released. At this point, the boxes were placed on pallets and transported to Keyworth, where all the onshore cores have been held. BGS is not aware of a single piece of core being damaged by this process. The core boxes are well packed during curation (core is always double boxed for added protection), and the boxes are kept horizontal throughout transport. It is because we have been regularly transporting core and samples from Gilmerton to Keyworth without damage for the past 20 years that we can be confident that the planned move will work without adverse effects.

The extension to the existing facilities at Keyworth has been made possible due to a major injection of capital funding for the Keyworth site from the Department of Business, Innovation and Skills. BGS and NERC are acutely aware that we must deliver the best possible science and service to our stakeholders, as efficiently and effectively as possible.

We foresee a day when university departments and others will send scientists to the Keyworth facility to work on cores from the North Sea, from onshore UK geothermal wells, from holes drilled for potential radioactive waste storage sites or key palaeo-environmental sections – all in one purpose-built facility. BGS believes strongly that the proposed consolidation of the Gilmerton collections at Keyworth is the best way forward towards guaranteeing the future accessibility of these unique collections, in perpetuity, for the benefit of industry and academia alike.

\*Executive Director, Director of Information and Knowledge Exchange, BGS

. . . Caribbean Plate Debate continues: [www.geolsoc.org.uk/debates](http://www.geolsoc.org.uk/debates) . . .

## Hydraulic Despotism

From Jonathan Harrop (*Rec'd 28.10; Pub'd 3.11.2009*)

Sir, “Harappan Collapse” (*Geoscientist* 19/9) explains the demise of the Indus Valley Civilisation, some 4000 years ago - monsoon rains declined, and the Indus and its tributaries ceased to provide the water supply necessary for the type of agriculture practiced. Without its agricultural base, this highly organised society could not function. It was not, however, lack of water *per se* that caused the collapse (the Indus has always had plenty of that): it was the ending of reliable floods. The Indus Valley Civilisation was of a form known sociologically as “hydraulic despotism”, and similar societies appeared in the ancient world in various areas from Egypt to China. They were arguably the most rigid societies that have ever existed.

Hydraulic despotism developed under specific geo-climatic conditions - arid flood plains which were reliably and regularly flooded by large, silt-bearing rivers. The societies themselves typically featured a very powerful, centralised state with an all-pervasive and highly bureaucratised civil service which directed virtually all aspects of life. The rationale for this socio-political system was the absolute necessity for irrigation to be managed on a massive scale in order to maximise agricultural output and to minimise flood damage. Without proper organisation, large floods in an otherwise dry environment are of little agricultural value. Hydraulic despotism ensured that central government was well informed, via its civil service, particularly about river behaviour (the ancient Nilometer can still be seen at Aswan). Furthermore, governmental directives, via the state bureaucracy, could be articulated in a comprehensible manner to the workforce without being deflected by the hierarchical vagaries inherent in other social systems.

Given that agriculture was dependent on annual floods, it was necessarily seasonal work, leaving the mass of the population

available for other work during “off-seasons”. Under these circumstances and under rigid state control, education flourished and empires expanded beyond the plains where they had originated. Most notable of all, however, was the hydraulic penchant for building-work - extensive urbanisation at Harappa, the Great Wall of China, the Hanging Gardens of Babylon. Most impressive of all was the Great Pyramid at Giza.

Hydraulic states declined for a range of reasons. The diminution of monsoon rains ended the Indus Valley civilisation. Although surprisingly resistant to change by earlier foreign colonisation, hydraulic despotism in Egypt slowly declined under Arab control; its final vestiges only disappeared with the construction of the first Aswan Dam. China, however, has bucked the historical trend.

The philosophy of Confucius (a state bureaucrat who lived some six or seven centuries before the unification of China) still resonates deeply with the Chinese psyche. He spoke of a rationally ordered and understandable cosmos, and the importance of a well educated bureaucracy to manage human society within it. He was the product of and advocate for hydraulic despotism. The emperors of the Qin Dynasty inherited the system from the pre-dynastic states, and little has changed since - even under the Nationalist Kuomintang or the short-term occupations by Mongolia and Japan. The Chinese Communist Party - the latest state incumbent - has preserved that country’s rigid, bureaucratised socio-political system in a way that would be clearly recognisable to Confucius. Although it may have disappeared long ago elsewhere, hydraulic despotism remains alive and well in China. ☙

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# 1984 and all that

*Rick Brassington argues that the Society should reject “Orwellian logic”*



In the anti-totalitarian novel *1984*, Eric Blair, better known as George Orwell, invented both the language “Newspeak” and, at the heart of the state’s thought-control policy, “doublethink”. Doublethink (a Newspeak word) means the ability to hold two mutually contradictory beliefs. I think this is what the Society has been doing for nearly 20 years.

Since reunification with the Institution of Geologists in 1991, the Society has represented both the science and profession of geology – a fact proclaimed in its strapline *Serving science and profession*.

Many people see this as important, something that puts the Society ahead of most of its counterparts in other countries. I share this view. Yet, while science and profession may appear to be equal, one – science – is decidedly more equal than the other.

This is easy to understand. The Society has been promoting science for the last two centuries, whereas its experience of supporting the profession goes back barely two decades and is still developing. The Society promotes the profession largely through the professional qualification Chartered Geologist (CGeol), which the Society can do because it is a “Chartered” body.

The Society devotes a great deal of effort to setting and maintaining standards in its professional qualification. Since my involvement with the Chartership Panel I have been very impressed with the organisation and structures for this process, and the hard work and dedication of all involved. Yet today only about 2250 Fellows are Chartered, from a total membership of almost 10,000. By my own reckoning this means that around two thirds of those Fellows earning their living as professional geologists cannot be bothered to become professionally qualified.

This is where “doublethink” comes in. The Society has established and accepts the need for a UK professional qualification for geologists. Yet it is happy for the vast majority of its members who work as professionals to ignore it! This makes the Society the only official UK professional regulator that affords equal status to qualified and non-qualified practitioners. Eric Blair would surely have loved that.

So what is to be done? Ruling out the (truly) unthinkable notion that the Society should give up being a professional regulator, which would

downgrade professional geoscientists to technician status beside their regulated colleagues in other professions, what options remain?

I believe the only viable option is to move forward and develop support for professional practice (while at the same time continuing the Society’s excellent work supporting science). This is not simply a matter of “promoting” the Chartered Geologist qualification, important though that is. First and foremost it is about promoting, developing and growing the whole Society – as both a champion for science, and as a UK professional regulator. I believe this would ultimately raise both the Society’s public and scientific profile. It would also result in a



greater proportion of professional geologists supporting the Society by joining - thereby justifying the claim we make to represent both science and profession.

So - we should have a debate, across all the members of the Society, to decide how this can be achieved – a debate which I hope this article will prompt through the Letters section of *GeoscientistOnline*. Here are a few ideas of my own, to get the process started. I propose a two-part strategy to increase awareness of the Society's existence in the outside world and its role in representing the whole of British geology to grow the membership (including Corporate Affiliates). The second part of my strategy would be to promote the Society's dual role to its Fellows, and encourage *all* professional geologists to become Chartered.

Employer recognition of CGeol is an important part of promoting us in the outside world. The Society's Professional Committee already endorses company training schemes. This could be taken further by a proactive approach to large employers of geologists - starting with our Corporate Affiliates. The Society also accredits university degree courses and we should be proactive in developing this area, too.

Through membership of the European Federation of Geologists, the Society is able to grant the title European Geologist (EurGeol) to Chartered Geologists - a qualification recognised by the EU and which has equal status across all EU countries. The Society has also developed mutual recognition agreements with two similar organisations in other countries – namely the Institute of Geologists of Ireland and the American Institute of Petroleum Geologists. Clearly there is enormous potential to extend such relationships in other Anglophone countries

(USA, Canada, Australia and South Africa) let alone Russia, India, China, or South America.

It is important for the Society to find more ways to encourage and facilitate chartership applications. Regional Groups already play a role here but this could be strengthened if each group had a designated committee member to co-ordinate support for applications and organise meetings to assist younger geologists in preparing for chartership.

Here's another idea. One consequence of doublethink is that it makes CGeol an "optional extra". This arrangement is topsy-turvy compared with most, if not all, other professional bodies, where being chartered enjoys higher status than basic membership (which our "Fellowship" anomalously is). In my view, raising the status of chartership and offering real incentives (such as higher discount rates) will encourage people to apply. Another practical benefit would be to provide discounted Professional Indemnity Insurance through a broker, as many other professional institutions do.

Existing Bye-laws and Regulations would allow us to undertake these measures. Council and the Standing Committees should take a lead, but members of the Society should now make their views known, and join the debate and help us make changes that are essential, I believe, for the Society's continued wellbeing. Finally, in 1984 Orwell's anti-hero Winston Smith fully accepts doublethink. There is no obligation on us to do so. Let us resolve this anomaly once and for all and use the opportunity to strengthen the Society and ensure that it enters its third century truly representing both science and profession. ☀

WILLIAM SMITH 2010

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The Geological Society

## PAST CARBON ISOTOPIC EVENTS AND FUTURE ECOLOGIES:

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2nd and 3rd November 2010  
The Geological Society, Burlington House

The biosphere and many of its ecosystems are currently changing due to global warming in a manner unprecedented for many million years. Research shows that abrupt environmental perturbations of the late Palaeocene to early Eocene some 55 million years ago, and also of some earlier periods, might be used as biospheric and ecological palaeoanalogues for present-day and future global change.

This two-day discussion meeting sees invited presentations from internationally renowned geoscientists and ecologists in environmental and palaeoenvironmental change. The meeting will bring together scientists and policymakers from a range of disciplines to explore how current geological and ecological synergies illuminate our understanding of what planet Earth might be like 100 years or more in the future.

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# Bewitched by fossil web

*Scientists have confirmed that threads found within amber deposits from the Sussex coast are the world's oldest known spider webs, dating back to 140 million years ago, writes Sarah Day.*

The amber containing the fossil threads was found by amateur fossil hunters searching for dinosaur remains. "This amber is very rare", Oxford palaeontologist Professor Martin Brasier told *Geoscientist*. "It comes from the very base of the Cretaceous, which makes it one of the oldest ambers anywhere to have inclusions in it".

As well as threads of spider webs, the amber was also found to contain plant matter, insect droppings and ancient microbes trapped when the world was a much warmer place, and *Iguanodon* and *Allosaurus* were in their prime. The scientists also found the earliest evidence of Actinobacteria – a tiny group of organisms that break down wood and resins into soil particles - potentially rewriting the geological history of soil formation.

Analysis of the threads has shown that they were spun by spiders closely related to modern day orb-web, or garden spiders. "These spiders are distinctive and leave little sticky droplets along the spider web threads to trap prey" says Brasier. "We actually have the sticky droplets preserved

within the amber. These turn out to be the earliest webs that have ever been incorporated in the fossil record to our knowledge".

The webs became trapped in resin emitted by trees, probably as a response to fire damage. The amber was then deposited in a large lake bed, until it was exposed by uplift and erosion along the shoreline. Experiments using modern cherry trees have demonstrated that a very similar result can be obtained by trapping modern spider webs in resin.

Only a tiny proportion of the deposits have so far been examined, and Brasier believes they have the potential to yield many more exciting finds, largely due to the development of increasingly powerful imaging techniques. "It's a very exciting time to be a palaeontologist, because of all these wonderful techniques being developed. We're able to view things and see detail in ways that we've never been able to before." ☀

## Reference

*Journal of the Geological Society, London, Vol. 166, 2009, pp. 1-9. As the subject of a Society news release timed for Halloween, considerable coverage was obtained including: 'Spider web confirmed as 'oldest' - BBC News; '140-million-year-old spider's web discovered frozen in time' - The Times 'Fossil hunter finds 140-million-year-old spider's web' - Telegraph. To view these articles, please see the web (sorry) version of this story.*



The re-evaluation of a dinosaur specimen has provided stronger evidence for a link between birds and dinosaurs. A team from the Shenyang Normal University's Palaeontological Institute in China have reclassified *Anchiornis huxleyi* as a troodontid, a bird-like dinosaur, rather than a bird, based on newly discovered specimens.

*Anchiornis*, a genus whose name literally means 'nearly bird', was first analysed from a specimen found in lake-bed deposits of Middle Jurassic age from Yaolugou, in Western Liaoning. The species name was given in

# Nearly bird

*Ian Randall describes new research that brings birds and dinosaurs closer together, just as TH Huxley first envisaged.*

honour of Thomas Henry Huxley, an early convert to Darwinian evolution, who first suggested the possibility of a close connection between birds and dinosaurs.

The 34cm-long creature displays impressions of feathers on both its limbs and head. *Anchiornis* was originally believed to be a true basal bird. However, studies of a more complete specimen, which has a preserved skull, causes *Anchiornis* to be now considered a non-avian dinosaur; one that is close to birds.

On his blog, palaeontologist David Hone of the DinoBase public forum explains that up to half of the characteristics used to analyse dinosaur specimens are located in the skull; the overall similarity of troodontid and birds caused problems in firmly diagnosing the initial specimen. Further samples helped to remove this issue and give a more precise diagnosis.

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# IN Brief



*Reports of Venusian tectonics, slowly rising oceans and backward exoplanets excite our reviewer's curiosity...*



## Venusian volcanicity? Are ancient continents and plate tectonics on Venus a supposition too far?

Venus enjoys scorching temperatures, crushing pressures, and a toxic atmosphere of carbon dioxide and sulphuric acid clouds, yet suggestions are being aired that its past was very different<sup>1</sup>. ‘Venus Express’ has charted the first map of Venus’ southern hemisphere at infrared wavelengths. Nils Müller<sup>2</sup> of the University of Münster’s Joint Planetary Interior

“While we already knew that troodontids had feathers, including on their legs, this is a particularly good example and does extend our knowledge of how these evolved.” Hone said. This is significant because of its effect on the so-called ‘temporal paradox’, which concerns the fact that the most bird-like dinosaurs known to science, the maniraptorans, are found in the Cretaceous, after the time at which birds evolved in the Late Jurassic; supporters of the BAND hypothesis (Birds Are Not Dinosaurs) argue that if these were the predecessors to birds, then we should expect to see them earlier. It has been argued, however, that the paradox is non-existent, as maniraptoran remains have been uncovered from the Jurassic. The reclassified *Anchiornis*, now known to be a feathered dinosaur appearing before birds, helps to fill this gap, weakening the argument.

Hone told *Geoscientist*: “We do have a clear progression of the bony anatomy and the evolution of feathers running from pretty basal theropods right up to modern birds so that whole area ...is very solid.”

### Reference

- *Nature* 461, 640–643 (1 October 2009) Published online 24 September 2009  
*A pre-Archaeopteryx troodontid theropod from China with long feathers on the metatarsus Dongyu Hu, Lianhai Hou, Lijun Zhang & Xing Xu*

Physics Group, suggests the new map hints at an Earth-like system of continents, plate tectonics and even an ocean of water. The lowlands are believed to be basaltic, but the highlands are believed by this team (because their low radiation of heat, captured by the Visible and Infrared Thermal Imaging Spectrometer [VIRTIS]) to be granitic. Though eight Russian landers only found basaltic rocks in the highlands, the Phoebe and Alpha plateaux in the new map are reportedly light-coloured. The team makes the rather surprising claim: “if there is granite on Venus, there must have been an ocean and plate tectonics in the past”.

Müller admits that this is not proof, but says that it is ‘consistent’ and urges sending a lander to search for it. But to invoke plate tectonics is surely a speculation too far at this early stage. Highly silicic rocks may not necessarily be granitic – many small bodies are evident in the radar imagery of Venus that look like silicic volcanic ‘tholoids’ – and the nature of Venus is strongly against plate tectonics ever having operated there. Taylor and McLennan conclude that the Earth is the only planet in the solar system with a ‘Tertiary’ (in their classification) continental crust<sup>3,4</sup>. Venus has almost no magnetic field, for which reason it is supposed to have lost its hydrogen, an essential ingredient for water, stripped away by solar wind<sup>5</sup>. Water is surely necessary for plate tectonics to operate. Also, Venus rotates very slowly (1 Venus day = 243 Earth days!). This would prevent the formation of an Earth-like dynamo generated by circulation of the liquid-metal core<sup>6</sup>; though the planet may once have rotated faster. However there is nothing in the radar-generated imagery of Venus that even hints at the pre-existence or existence of continents<sup>3</sup>.

I have lately suggested that not only is the Earth the only planet in the solar system that has developed plate tectonics, but also that plate tectonics is a secondary complication of an early development (probably as far back as the Hadean) of a sialic crust, dominated by alkaline feldspars, unlike the early thick anorthositic crust of the Moon. Plate tectonics, on the scale of the Proterozoic and Phanerozoic, involving deep oceans and mid ocean ridges, only initiated at the end of the Archaean, when the crust cooled sufficiently for deep fracturing to allow plates to separate and move laterally along with Mantle convection<sup>6</sup> – whatever the mechanism that moves the plates, which I consider to be as yet unresolved.

Müller<sup>2</sup> notes that the infra-red observations are sensitive to temperature and the plateau rocks yield temperatures far too low for them to be products of recent volcanic activity. Ivanov and Head<sup>7</sup> make no mention of active volcanism, and despite past eruptions, no active eruptivity has been detected. ☈

### References

1. Gramling, C. 2009. Venus’ gentler Earth-like past. *Earth* 54(10), 16.
2. [http://www.esa.int/esaMI/Venus\\_Express/SEMULCLXOWF\\_0.html](http://www.esa.int/esaMI/Venus_Express/SEMULCLXOWF_0.html)
3. Taylor, S.R., McLennan, S.R. 2008. *Planetary Crusts*. Cambridge University Press, 378pp.
4. McCall, G.J.H. 2009. Planetary Crusts (Review). *Geoscientist* 19.10 p9.
5. Mojzsis, S.J. 2005. Atmosphere evolution. In: Selley, R.C., Cocks, L.R.M. & Plimer, I.R., eds., *The Encyclopedia of Geology*, Elsevier, Amsterdam, 197–207.
6. McCall, G.J.H. (in press) 2009. A new paradigm for the early Earth. *Australian Journal of Earth Sciences*.
7. Ivanov, M.A., Head, L.W. 2005. Solar System: Venus. In: Selley, R.C., Cocks, L.R.M. & Plimer, I.R., eds., *The Encyclopedia of Geology*, Elsevier, Amsterdam, 244–264.

## Down-under doubts

*Pacific sea levels may not be rising as they should.*

It has been proposed that sea-levels on Australia's eastern seaboard are actually rising at less than a third of the rate that the NSW government is predicting, as it overhauls its planning laws and bans thousands of landowners from developing coastal sites<sup>1</sup>. The Rees government has warned that coastal waters will rise by 40cm on 1990 levels by 2050, with potentially disastrous effects. However, the Bureau of Meteorology's National Tide Centre reported in June an average yearly increase of only 1.9 mm in the combined net rate of relative sea level at Port Kembla, south of Sydney - a figure which is consistent with a historical global sea level rise during the 20<sup>th</sup> Century of about 20cm (or an average of 1.7mm per year). This means that it will take to 2200 to achieve the predicted effect.

The figures have been greeted in two different ways. Bill Kininmonth, former head of the National Climate Centre, has doubts about the modelling: he believes that only a thin layer of the ocean is actually warming – about 200mm – making it unlikely that the oceans are expanding to any degree. He said there was little evidence that the polar caps were melting, causing sea level to rise. Computer models tend to underestimate the way evaporation regulates temperature, thereby exaggerating future temperature predictions. He sees little reason to think that the little bit of extra heat generated by greenhouse gases will make a difference.

On the other hand CSIRO's John Church, an expert on sea level rise, remains convinced that the rise on Australia's eastern seaboard will be in line with global averages predicted. He also noted that the Australian continent was rising slightly – about 0.3-0.4mm per year around Sydney, which would partially offset increases in sea-levels.

It is apparent that a considerable number of reputable scientists in Australia are raising doubts about climate change models, which are now widely accepted in political circles. Ian Plimer's recent controversial book<sup>2</sup> stating the opposing view has done little to clarify the position, and according to many experts, is at variance with well established fact. What is now needed is a concise statement of the reasons for their disquiet, and a concise reply from an acknowledged expert.

### References

1. Warne-Smith, D, Madden, J. 2009. Science is in on climate change sea-level-rise: 1.7 mm. From *The Australian* November 7.
2. Plimer, I.R. 2009. Heaven & Earth: global warming the missing science. Taylor Trade Publishing. Lanham, New York, Boulder, Toronto, Plymouth (UK), 504 pp.

## Retro-exo

There are an estimated 10 billion planetary systems in our galaxy alone, and WASP (Wide Angle Search for Planets) is a method of detection based on transits, which dim a star's luminosity<sup>1</sup>. This method, operated by a consortium of British universities, and involving a battery of cameras that monitor thousands and thousands of stars, has so far discovered 17 exoplanets.

Close-orbiting gas giants known as "Hot Jupiters" are easiest to detect. A South African University has lately discovered such a planet, named WASP-17, 1000 light years away, estimated at twice the size of Jupiter, but only half its mass<sup>2</sup>. It is the least dense planet so far discovered. The big surprise, however, is that it orbits in the reverse direction to all other known planetary bodies.

Planets are born from the same ball of rotating gas that creates the parent star and spin in the same direction as the star. Venus does spin backwards (very slowly – see above) but still does not have a retrograde orbit. Such aberrations are attributed to collisions or near-collisions; but, in truth, the more we study the universe, the more surprising anomalies are apparent. Our understanding of the processes of the universe is far from complete, and there may be another explanation of this extraordinary discovery?

One more thing to bear in mind: WASP observations require very careful checking by the sensitive spectrographs of the Geneva Planet Search before they can be confirmed, because there are a large number of phenomena that can change stellar brightness.

### References

1. <http://www.superwasp.org/how.htm>
2. [http://www.nydailynews.com/news/national/2009/08/13/2009-08-13\\_scientists.disco...](http://www.nydailynews.com/news/national/2009/08/13/2009-08-13_scientists.disco...)

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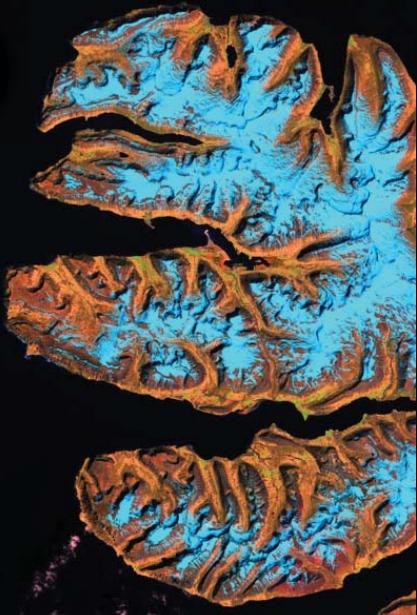
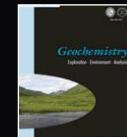
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**And finally...**

## Serpentine tale

Ian Randall writes: Seismic anisotropy (the occasional ability of seismic waves to travel through rocks at different speeds in different directions) generally reflects the preferred orientation of crystals that have undergone deformation. In the upper mantle, this is commonly dominated by the preferred crystallographic orientation of olivine.

In subducting systems, large variations in the relative retardation between the two sets of shear waves are observed across different subducting systems. In north-east Japan, for example, relative delay times are 0.1–0.2 seconds, while in the Ryukyu Arc to the southwest (picture), they increase to one or two seconds.

Many hypotheses have been put forward to explain this variation; yet the difference (especially at the higher end of the range) remains hard to attribute solely to the mineral properties of olivine. A team from Hiroshima University led by Ikuo Katayama has now proposed instead that the hydrous mineral serpentine might be exerting the primary control over strong trench seismic anisotropy.

Serpentine is commonly found in subduction zones where water is driven off from descending plates and their burden of oceanic sediment. Katayama's team performed laboratory experiments to test the mineral's response to deformation. Antigorite, a high temperature form, was subjected to a constant simple shear at mantle-wedge conditions, at temperatures and pressures of 300–400°C and 1 GPa. The results show not only that the c-axis of serpentine rotates to align itself normal to the plane of shear (lowering seismic wave speed in this direction) but also that serpentine anisotropy can be up to five times greater than that of olivine.

The team believes that the observed alignment, occurring in a steeply descending, hydrated slab, could explain anomalously strong trench-parallel anisotropy. The varied nature of strong trench isotropy is therefore likely to be a reflection of the non-uniform distribution of serpentine.

### Reference

Nature 461, 1114–1118 (22 October 2009) Trench-parallel anisotropy produced by serpentine deformation in the hydrated mantle wedge Ikuo Katayama, Ken-ichi Hirauchi, Katsuyoshi Michibayashi & Jun-ichi Ando.

**Geological Society of America Global Meeting**

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# Water, sandstone and climate change

*Hydrogeologist Martin Shepley\* considers the past use of the Permo-Triassic sandstone aquifer for public water supply in the Midlands of England and predicts that its golden age is about to begin.*

The Permo-Triassic Sandstone (PTS) is the second most important aquifer in the United Kingdom - second only to the Chalk. Interestingly, despite its much smaller outcrop, the PTS holds a lot more usable fresh water - which makes it the biggest strategic store of potable water in the UK. Almost two years ago in these pages, Mike Price discussed the importance of groundwater storage and how it could be critical in adapting to the impacts of climate change. Perhaps therefore it is about time that we had a closer look at this aquifer, and the opportunities it provides to secure water supply for the future.

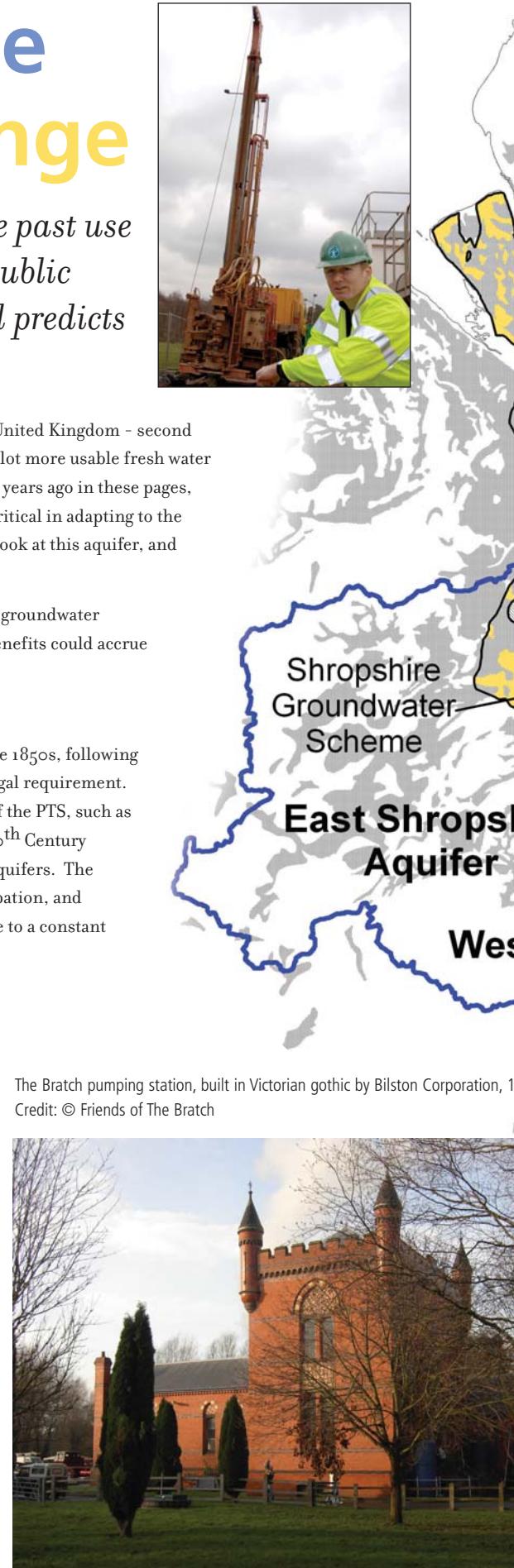
Before thinking about the future, it is worth looking back and seeing what changes groundwater abstraction has made to the surface water environment. Is it possible that other benefits could accrue from changing the way the PTS is used, and particularly in the Midlands?

## Public health

The PTS has been in extensive use for public water supply in the Midlands since the 1850s, following the 1848 Public Health Act when the provision of clean drinking water became a legal requirement. The early pumping stations are a notable architectural feature across the outcrop of the PTS, such as The Bratch (www.thebratch.org) near Wombourne. Most of these 19<sup>th</sup> and early 20<sup>th</sup> Century pumping stations are located on the West Midlands, Lichfield and East Midlands aquifers. The main areas of supply were Nottingham and large parts of the West Midlands conurbation, and also smaller towns like Lichfield. These pumping stations abstracted water at close to a constant rate all year round - as many still do today.

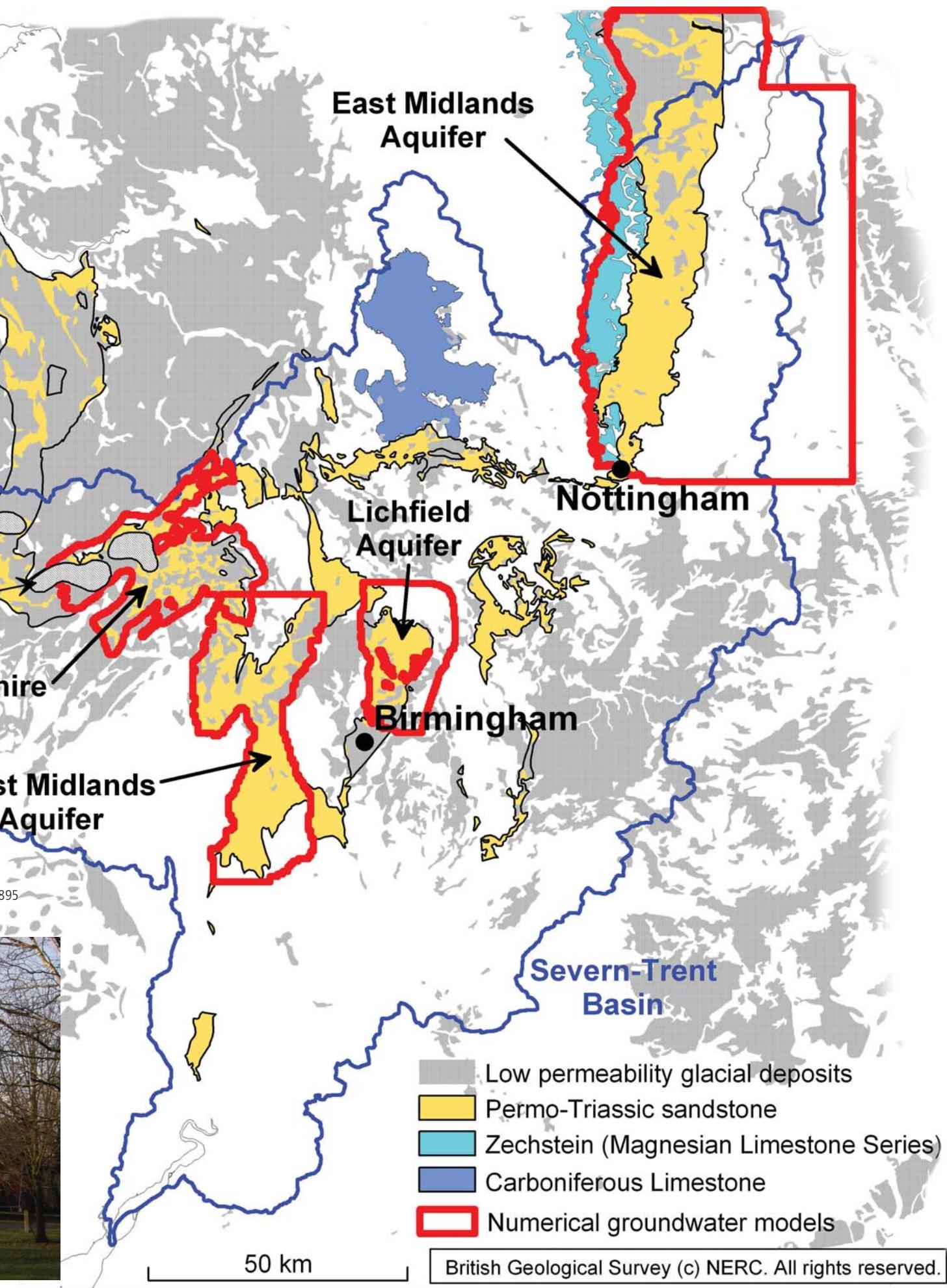


Vertical triple expansion steam engine at The Bratch  
Credit: © Friends of The Bratch

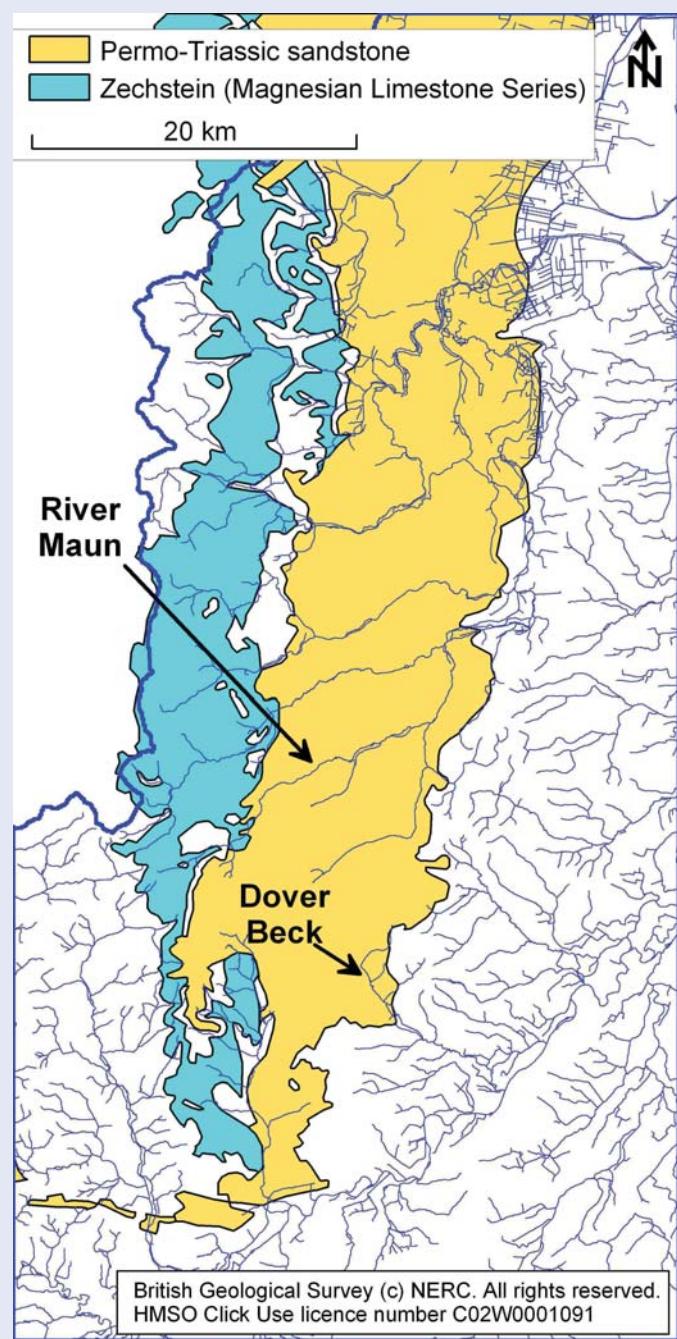
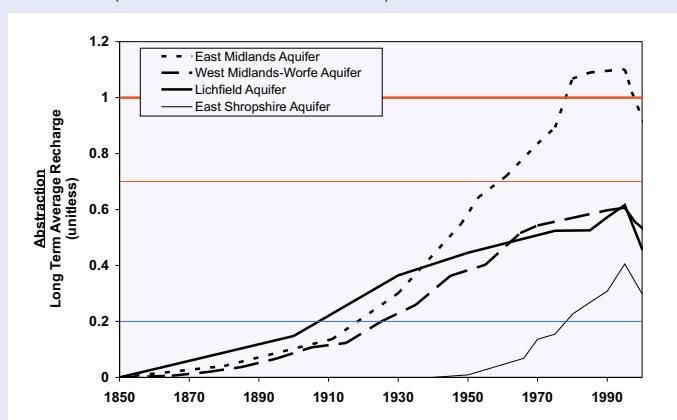


The Bratch pumping station, built in Victorian gothic by Bilston Corporation, 1857  
Credit: © Friends of The Bratch





Historic abstraction development in the East Midlands, Lichfield, West Midlands-Worcester and East Shropshire Permo-Triassic Sandstone aquifers



East Midlands aquifer

The abstraction histories of the main PTS aquifers are shown in the diagram as a percentage of the recharge that the aquifers receive from rainfall. All show a steady increase up to the early 1990s. Currently, abstraction forms a high percentage of recharge (>50%) for most aquifers, and in the case of the East Midlands aquifer has exceeded recharge in the recent past.

At first glance the historic impact of this abstraction is not obvious. Let us look at the East Midlands aquifer in more detail; it is a behemoth in terms of water supply. At its peak it produced over 400,000 m<sup>3</sup>/day - enough to supply two million people. The present impact of abstraction can be deduced from surface water gauging stations, such as those on the River Maun. Flow records of the upstream gauging station on the edge of the Zechstein (formally the Magnesian Limestone Series) outcrop and at the opposite side of the PTS outcrop are remarkably similar. The long-term average surface water accretion across the PTS deduced from the gauge records is only 21 mm/year. Without groundwater abstraction this would be a lot closer to the 227 mm/year calculated for the effective rainfall, the amount of rainfall available for recharge once evaporation and transpiration from crops is accounted for. The River Maun is perennial only because of surface water flowing off the Zechstein outcrop and effluent returns.

What about streams rising on the PTS? Dover Beck, just to the south of the River Maun, is an example. There is some historical documentation which shows that the stream extended far further up the topographic catchment in the 19<sup>th</sup> Century than it does today. Nowadays, most of this catchment is dry and current groundwater levels are largely much below the streambed.

There are many similar examples across the Midlands, and these occur where groundwater abstraction has greatly exceeded 50% of the recharge from rainfall. Elsewhere, the impacts of PTS abstraction on surface water are less evident - particularly to the north, where surface watercourses are protected by low-permeability glacial deposits. The absence of glacial deposits over much of the Midlands PTS means that vast quantities of meteoric recharge water can flush through these aquifers.

### Set in stone

The current situation was set in stone by the 1963 Water Resources Act, which required the licensing of most abstractions greater than 10m<sup>3</sup>/d. However, 'Licences of Right' were granted, with no environmental assessment, at rates that were often well in excess of what could actually be pumped from the boreholes.

Did the impacts all go unnoticed before 1970? Well yes apparently they did - which highlights the key point I wish to make. The PTS is simply a fantastic aquifer, albeit a bit misunderstood in the past. It has withstood the burden of this abstraction, and shown little visible impact. This is the hallmark of an aquifer with a large amount of storage, where the hydraulic signal moves very slowly. The impacts have occurred, but imperceptibly over decades - something you can only really pick up with systematic hydrometric monitoring and sophisticated analysis (particularly using numerical groundwater models).

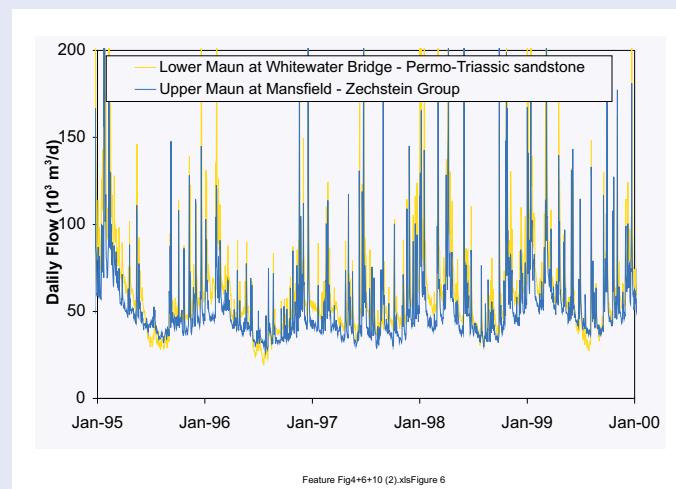
Of course, some people suspected something was amiss and complained to the authorities; but alas they could be easily fobbed off with bogus explanations involving unusual weather conditions. At the time, the water authorities, in their role as both regulator and water supplier, had little incentive to reverse the situation. Groundwater supply was cheap as it then required little treatment and was close to the demand that was ever increasing. As most monitoring only began after about 1970, for many watercourses it was too late and they, together with their dependent habitats, quietly disappeared - possibly for ever.

By the early 1970s, as water demand was predicted to increase, there was a lot of pressure to increase groundwater abstraction even further. Professional hydrogeologists had begun to appreciate the impacts of constant-rate abstraction, and began to consider different ways of using the aquifers - leading to the development of 'conjunctive use' schemes. These combine surface water and groundwater use: the former used during wet periods, and the latter during dry ones when surface water flows are low. Long-term impacts on surface water from groundwater abstraction are thereby much reduced, as groundwater is only used when surface water sources cannot supply during dry periods. The Shropshire Groundwater Scheme (SGS), the largest and one of the best conjunctive use schemes in the UK, takes water from the PTS and is currently operated by the Environment Agency. The reason it works so well is because of the storage capacity of the PTS.

## Notable exception

But sadly the SGS is a notable exception. Many other schemes never got past the investigation stage. The Nottingham conjunctive use scheme was planned to alleviate surface water conditions on the East Midlands aquifer, by combining groundwater use with use of water from the River Derwent. However, conservative attitudes among water supply engineers and real concerns about the impacts of the differing quality of surface water and groundwater mixing in the water supply system meant that this scheme was never adopted.

River Maun gauged flows across the Permo-Triassic sandstone



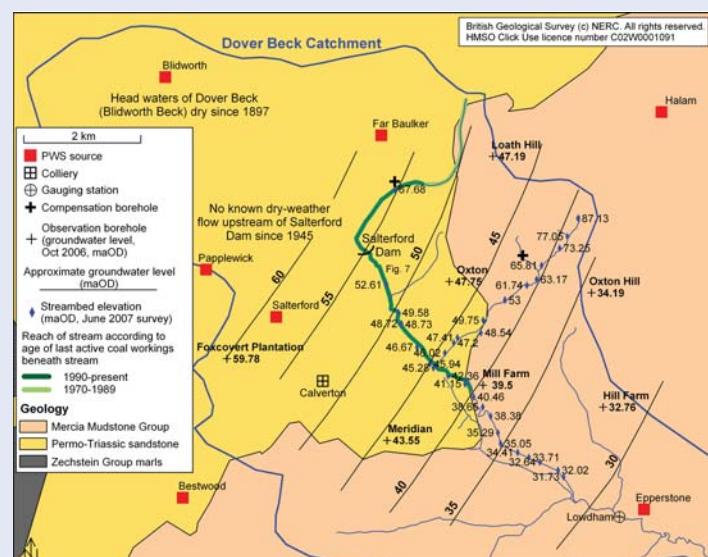
Shropshire Groundwater Scheme, in phased development since 1984  
Credit: © Environment Agency



The 'Dover Beck' in 1975 Credit: © Environment Agency



Present and past hydrological conditions of the Dover Beck catchment



The advent of the National Rivers Authority (NRA) in 1989 saw the split of regulator and water undertaker. The NRA immediately took measures to reduce licences and abstraction, particularly in heavily stressed PTS aquifers such as East Midlands. Progress has been modest, because of the limited powers of the NRA and Environment Agency, its successor organisation, to revoke the old Licences of Right. This was highlighted at the turn of the Millennium by the introduction of the Water Framework Directive (WFD) by the EU and the Catchment Abstraction Management Strategies (CAMS) by the Environment Agency. The latter consigned any traces of previous resource assessments done by the old water authorities to the dustbin for good.

Current levels of abstraction are now much greater than the resource assessment - the real legacy of the 1963 Water Resources Act. It is no surprise that almost all PTS groundwater bodies in the Midlands Region have 'poor quantitative status' and are at risk of failure for 2027, the target date currently for 'good status' for the WFD. It sounds pretty desperate, as demand is still predicted to increase. This has raised the stakes considerably, as we now have either to tackle this problem, or do some careful explaining, or face infraction proceedings from the EU.

### Climate change

So what about climate change? As Mike Price discussed, current predictions generally say that evapotranspiration will increase in summers, while both total rainfall and rainfall intensity will increase in winters, with increased variability. The balance between the first three factors generally amounts to "less recharge": although there are some differences in predictions. As a percentage, the impact on groundwater discharge to surface watercourses will be several times greater on the hard-pressed watercourses on the PTS aquifer outcrop, because groundwater abstraction will take its share regardless.

Could it be that by tackling the WFD targets we can also adapt to the impact of climate change - a "win-win"? Well, yes; and the likely answer has been known since the 1970s, namely, conjunctive use, coupled with large-scale reduction of the constant rate abstractions. The Midlands boasts quite the best aquifer for such schemes, as the performance of the SGS has already

demonstrated. What is more, because of the low diffusivity of the PTS, the predicted variability in the recharge will be smoothed out and groundwater abstraction will remain secure - even during very long droughts. The SGS is under utilised, and there are other opportunities across the Midlands. The Environment Agency is currently changing CAMS policy statements to promote conjunctive use, but it also requires action from the water companies.

The Environment Agency now has large groundwater models, the ideal tools for exploring the options, covering most of the PTS. The 1990s saw a decline in abstraction, partly associated with licence reductions that the Environment Agency and the NRA negotiated with the water companies, and partly with pollution problems, both point source and diffuse (particularly from nitrates). Predictions using groundwater models show that improvements in surface watercourses are occurring slowly, as seen in the Dover Beck. They also show that flows are much below natural levels.

To have any impact on the 2027 WFD deadline we need to get our skates on. But some care is also required as so little is known about the natural state of the catchments as land use (and sometimes the physical characteristics of the aquifer itself) have changed with time. For example, the Dover Beck catchment has suffered from extensive subsidence associated with coal extraction from the concealed fields beneath the PTS. Local inundation is already a problem on the Dover Beck and this also threatens existing habitats. In other cases urban expansion has covered dry headwaters of catchments.

So, time and care are needed to prevent unwanted inundation, with incremental reductions in groundwater abstraction, careful monitoring and reassessment of our predictive models and their underlying conceptual models. As outcomes will not be immediate, this requires a sustained level of engagement across water companies, regulators and government. That is a real challenge for us geoscientists, while not forgetting the other problem - diffuse pollution.

### Further reading

- Environment Agency, 2006. The State of Groundwater in England and Wales. Environment Agency, Bristol.
- Mather, J.D., 2004. 200 Years of British Hydrogeology. Geological Society Special Publication 225.
- Price, M., 1998. Water storage and climate change in Great Britain – the role of groundwater. Proc. Instn. Civ. Engrs. Wat., Marit. & Energy, 130, 42–50.
- Price, M., 2008. The wrong sort of rain. Geoscientist 18(2), 22–26.
- Skinner, A.C., 2008. Groundwater: still out of sight but less out of mind. Quarterly Journal of Engineering Geology and Hydrogeology, 41, 5–19.
- Shepley, M.G., Pearson, A.D., Smith, G.D. & Banton, C.J., 2008. The impacts of coal mining subsidence on groundwater resources management of the East Midlands Permo-Triassic Sandstone aquifer, England. Quarterly Journal of Engineering Geology and Hydrogeology, 41, 5–19.

\* Environment Agency, Midlands Region, Solihull, United Kingdom

### Acknowledgments

The author thanks John Aldrick, Mike Price and Andrew Skinner for comments on the article and Dick Downing for a useful discussion on the 1963 Water Resources Act. Some of the photos and figures have been provided by Kevin Voyce, Alastair Black and The Friends of The Bratch. The views expressed in this article are those of the author and not necessarily those of the hydrogeologists acknowledged above or the Environment Agency.



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- Volcanology

# Society Business

## Council meetings and OGMs

The dates for meetings of Council and Ordinary General Meetings until June 2010 shall be as follows:

**Council: 27/28 January (residential); 21 April**

**OGMs: 28 January; 21 April**

## Elections

The following names are put forward for election to fellowship at the OGM on 28 January, 2010.

AGBODLA Adedayo; ALSOP David Barry; AMANZE Michael; BARBULLUSHI Roland; BARKER Katharine Elizabeth; BARNES Gina Lee; BAXTER Anne Maureen; BECK Gareth Richard; BINNEY Heather Alexandra; BOURNE Michael John; BRAIN David Andrew; COLEMAN Christopher George; COTTRELL Anita; COWARD Richard; COWBURN Andrew John; CULWICK David John; DAKIN Helen Elizabeth; DAVIES Hywel Gwrthefyr; DAVY Rialynn Rosario Jeodezza Teepee; DOBIECKI Raymond; DOHERTY Helen Mary; ESEGBUE Onoriode; FAIRS Timothy Hugh; FELLOWS Paul; FERGUSON Alison Denise; FLEMING Campbell George; FOWLER John Douglas; GIBBS Jennifer Ann; GIERÉ Reto; GRAY Timothy Mark; GREEN Adrian Richard; HARRIS Colin Stuart; HARTAlwyn James; HAUFF Katie Amelia; HIRST James Philip Parkinson; HO Chau Man; HULMSTON Gavin; HURST Neil Walker; HYDE Siobhan Patricia Mary; ISHERWOOD Patrick James Michael; JOHNSON Richard Michael; KENNEDY Joseph William; KYLE Andrew John; LEAN Daniel Mark; LOW Caroline; LUSTY Paul Alan James; MACKENZIE Jamie; MACPHEE Colin John; MARTIN Simon Anthony; McCUSKER James Patrick; McKEATING Andrew Philip; MEAKIN Christopher; MEARNS Iain Edwin; MOORE Natalie Elizabeth; NUNN Elizabeth Victoria; O'DRISCOLL Ross William; O'KEEFFE Jimmy; O'LEARY David; O'Rourke Simon David; PARKINSON Amy Rebecca; PATTENDEN Oliver; PERRY Gillian Louise; PRICE Victoria Mary; RAMSCAR Matthew Charles; ROBERTS James Phillip; ROBINSON Edward James; ROBINSON Paula Jane; ROGERS Barrington Peter; ROGERS Steven Leslie; SALMON Andrew John Michael; SCRASE Antonia Mary; SHAW Elizabeth Mary; SHREEVE James William; SIMPSON David John; SINK Charles Gordon; SMEATHERS Christopher; SMITH Christopher Patrick James; SMITHHELLS Rose Alison; SPINKS Samuel Charles; SPREADBOROUGH Alison Clare; TEGEGNE Fikadu Kassa; THOMAS David Andrew; TRANTER Nicholas; WARNER Robin Giles; WELCHMAN Rebecca Anne; WESTLAKE Katie; WHACHA Knowledge E M; WHITE Lloyd Paul; WILLIAMS James Peter; WONG Euphrasia Zin Ching; WOOD Jonathan Michael; WORSLEY Thomas Matthew.

## Research Funds - reminder

The 2010 round of Society Research Funds is now open for applications. Applications for support from any of the Society funds must be made on the appropriate form, which can be downloaded from the Society Awards and Research Grants page on the website - [www.geolsoc.org.uk/grants](http://www.geolsoc.org.uk/grants). The form must be completed in full and accompanied by two letters of support from Fellows of the Society. Please send to the Awards Secretary at the Geological Society. Applications and supporting documents should reach the Society no later than **1 February**. The average award has been about £1000.

**Mike Coward Fund:** For fieldwork in structural geology as applied to regional tectonics. **William George Farnsides Fund:** To advance geological science. **Edmund Johnson Garwood Fund:** For the encouragement of research in stratigraphy, with palaeontology, and in physical geology. Must be between 28 and 51 years of age. **Glyne**

**Outdoor Geological Research Fund:** For the prosecution of outdoor research preferentially of a palaeontological or stratigraphical character, and preferentially within the limits of the British Commonwealth. **Annie Greenly Fund:** For detailed geological mapping. **Timothy Jefferson Field Research Fund:** Must be under 28 years of age; for a field project for research in Earth science. Not for military activity or development. **Elspeth Matthews Fund:** For members of the Society for geological field-based research anywhere in the world. Preference for those under 30 years of age. **Daniel Pidgeon Fund:** To promote geological original research. Must not be more than 28 years of age.

**Jeremy Willson Charitable Trust:** The Jeremy Willson Charitable Trust, and the Willson family, generously supports the Geological Society Grants programme, in memory of their son and brother, Jeremy Willson, who died of new variant Creutzfeldt-Jakob Disease (vCJD) in March 2006. The Jeremy Willson Award supports field-based projects with a focus on the physical environment. To find out more visit [www.jwct.org.uk](http://www.jwct.org.uk).

**Joseph Burr Tyrrell Fund:** To assist geologists of Great Britain and Ireland to travel to and in Canada; or to assist in the publication of meritorious papers by geologists of Great Britain and Ireland upon the geology of Canada; or to assist such geologists in any other way best adapted to further this object. **Distinguished**

**Geologists' Memorial Fund:** To a geologist under the age of 30; in the form of travel bursaries to enable recipients to broaden their experience and for professional development.

## Council nominations - reminder

Fellows received, with the October issue of *Geoscientist*, a nomination form for the election of new Council members. Details of the process are on the forms and also in the Governance section of the website.

The closing date for receipt of nominations is **8 January 2010**.

Nominations will NOT be valid unless they are fully completed, signed and accompanied by a statement by the nominees. Forms should be returned to Prof. Edward Derbyshire c/o Executive Secretary, The Geological Society, Burlington House, Piccadilly, London W1J 0BG. EN

# Sir Peter Kent Lecture

## *Climate Change as a Global Shifting Force by Sir David King*

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18.00

Tea / Coffee 18.30 Talk 19.20 Q&A 19.50

Reception.



Sir David King

The 21st century will be dominated by the challenges posed by a mid-century population of around nine billion people. Ecosystem services are already under threat as our need for food, fresh water, energy sources, minerals etc.

grows to meet unfettered demand. Climate change provides the biggest challenge of all, since it requires a collective response of the global population, to mitigate the effect and to manage the growing impacts upon our societies.

The socio-political challenges in directing such a collective response are beyond anything previously managed. This may well lead to a mid-century slide into conflict on a scale not previously experienced. Meeting these challenges will require a global cultural and technological transformation on much the same scale as the Renaissance or the Industrial Revolution, and a clear understanding of the need to adapt and strengthen global governance procedures.

Sir David King is the Director of the Smith School of Enterprise and Environment at the University of Oxford. He was the UK Government's Chief Scientific Adviser and Head of the Government Office of Science from October 2000 to December 2007.

The Sir Peter Kent Lecture is the Geological Society's flagship annual lecture on science policy matters.

- Further information at [www.geolsoc.org.uk/spkl](http://www.geolsoc.org.uk/spkl). Those wishing to apply for places should contact [registrations@geolsoc.org.uk](mailto:registrations@geolsoc.org.uk).

# Honorary Fellows – nominations

*Edmund Nickless, Executive Secretary, writes:* The following names have been put forward by Council for election as Honorary Fellows of the Society. These are the first names to come forward following the redefinition of the category earlier this year. Fellows may comment in writing to [edmund.nickless@geolsoc.org.uk](mailto:edmund.nickless@geolsoc.org.uk). The names will go forward for voting at the OGM on 28 January 2010.

The names that have been put forward following nomination to Council are: Prof. Aubrey Manning (University of Edinburgh); Prof. Sospeter Muhongo (Tanzania); Prof. Iain Stewart (University of Plymouth).

Brief biographical details of the nominees are available at [www.geolsoc.org.uk/honoraryfellowship](http://www.geolsoc.org.uk/honoraryfellowship).



## The Geological Society Club

The Geological Society Club, the successor to the body that gave birth to the Society in 1807, meets monthly (except over the field season!) at 6.30 for 7.00 in the Athenaeum Club, Pall Mall. Once a year there is also a special dinner at Burlington House. New diners are always welcome, especially from among younger Fellows. Dinner costs £45 for a four-course meal, including coffee and port. The Founders' Dinner has its own price structure. There is a cash bar for the purchase of aperitifs and wine. Next year two meetings will be held at new venues yet to be arranged.

Please note – you should keep checking dates here as they may be subject to change without notice.

**2010:** 13 January; 17 February (Venue tba); 17 March; 21 April (Burlington House)  
19 May (Venue tba)

Any Fellow of the Society wishing to dine should contact Dr Andy Fleet, Secretary to the Geological Society Dining Club, Department of Mineralogy, The Natural History Museum, Cromwell Road, London SW7 5BD. Email: [a.fleet@nhm.ac.uk](mailto:a.fleet@nhm.ac.uk) - from whom further details may be obtained. DR

## STICKS AND STONES



DON'T PLAY WITH YOUR FOOD.



# Chartership News



*Chartership is renewed, says David Manning, Professional Secretary.*

As 2010 approaches I think back to this time a year ago and the awful feeling of trepidation that started the year 2009. Had I sent in my Fellowship renewal or not? But like the best of bills, *Geoscientist* dropped on the mat, reminding me that all was well with the world. Then the real heartache began – 2009 was the year in which we started the new process for admission to Chartered Geologist and Chartered Scientist status, and it was all to be executed on my watch as Professional Secretary.

One year on, I look back to see what a huge amount the Society has achieved. We have processed a significant backlog of applications under the old system, thus clearing the decks. All applications received after 1 Jan 2009 have gone through the new process, with a set interview date, and with candidates knowing precisely when the award would be made were their application to be successful. We have received a record number of applications, with 152 successful awards of CGeoL or CSci in 2009. A small number didn't make it on the first attempt, but like salmon leaping the falls, these need to have another go once they have mustered new strength.

All of this could not have been achieved without a huge amount of voluntary work by Fellows acting as Scrutineers and as members of the newly established Chartership Panel. Our office staff (especially Janine Benn and Alison Douglas) have kept the show on the road, deftly directing George Tuckwell and me towards duties and tasks that we had hoped to skirt, as well as handling the associated correspondence. What is more, we recruited Bill Gaskarth as Chartership Officer, lit his blue touch paper, and set him on the task of making sure that the process works from the candidate's point of view.

At the heart of the process, of course, are our Scrutineers. We have held two Scrutineers' Days, bringing just over 100 to Burlington House (for some their first visit to our 'home'). This event involves explaining how the process works; but the real point of the exercise is to enable Scrutineers to share views, principally on how we judge the competences required for Chartership, and also on other matters. It is a wonderful opportunity for us to listen to what Scrutineers have to say – and they are not slow in coming forward. This dynamic discourse really gives the new system coherence and strength, and is something of which I think the Society can be proud.

So, a huge amount of energy has gone in 2009 into awarding over 150 of our Fellows Chartered status. That energy is well spent. Our Scrutineers are highly professional and responsible in the discharge of their duties, and those who pass through their hands can feel confident that their decision has been thoroughly considered.

I hope that 2010 brings in a similar or greater number of Chartership applications. In so doing, I realise that I might be asking our Scrutineers to do even more work. We hope that each Scrutineer will work at one event each year, handling two applications (each applicant faces two Scrutineers). But I don't want to ask our present Scrutineers to do more. Instead I want to ask more CGeols and CScis to become Scrutineers, to spread the load and increase the Fellowship's shared ownership of a process of which our Society, and our profession, can be proud.



For a list of **new acquisitions** click the appropriate link from  
<http://www.geolsoc.org.uk/gsl/info>

## From the Library

The library is open to visitors  
**Monday-Friday 0930-1730.**

### Have you paid up?

Fellows wishing to use the Library must ensure that their 2010 subscription has been paid. Fellows who are registered for Online Access to E-journals (Athens login) will be unable to use the service if their subscription is unpaid.

### Sponsor-a-Manuscript

So far £800 has been donated towards the Library's appeal to preserve the book containing some of the Society's earliest manuscripts. The manuscript book contains valuable essays and correspondence from the Society's founding members. Preserving these fragile pages is an expensive project and another £1700 is needed.



If you would like to contribute towards preserving this important document please contact Michael McKimm in the Library. Donations, large and small, are crucial to help us reach our target. The Librarian would like to thank all those who have so far contributed to the Sponsor-a-Book appeal for their generosity.

# Shell London Lecture Series 2010

## *Living with the rising tides*

**Speaker:** Lynne Frostick  
 (University of Hull and President of the Geological Society)  
**Date:** Wednesday 13 January 2010

Sea level has been rising since the end of the last major glaciations around 9700 BC. Our current coastline and our economically important major estuaries such as the Thames and the Humber have all been sculpted by this gradual but persistent inundation. The impact of this rise has been exacerbated in the SE of England by subsidence which has exaggerated the effect. This lecture will explore the causes and consequences of past sea level rise as well as the ways in which future climate change might alter our present coastlines and inhibit coastal living. Understanding how the 'rising tide' is likely to progress and change life on our blue planet is fundamental to adaptation and adaptation is essential to human survival.

## *Hot prospects in the cold: the new Geological Map of the Arctic*

**Speaker:** Marc St-Onge  
 (Canadian Geological Survey)  
**Date:** Wednesday 10 February 2010

The new Geological Map of the Arctic is the most complex document ever produced in the storied 168 year history of the Geological Survey of Canada (Natural Resources Canada). Compilation of the Canadian segment of the new map is based on data stemming from over four centuries of field observations in the Canadian Arctic, which range from those initially made by the English explorer Sir Martin Frobisher in the later part of the 16<sup>th</sup> Century to the most recent data generated by the current slate of partnered multidisciplinary mapping projects in Canada's three northern territories. By documenting the Arctic's unique 4 billion year old geological history and placing it within a planetary framework, the new polar map will guide the next generation of mineral and energy exploration programs in the North and, given it is done in an environmentally sustainable way, contribute to the future prosperity of all people in the circum-polar world.

- **Matinées:** Tea and coffee 14.30; Lecture 15.00 – 16.00
- **Evenings:** Tea and coffee 17.30; Lecture 18.00 – 19.00

### Further Information

Please visit our website [www.geolsoc.org.uk/shellondonlectures10](http://www.geolsoc.org.uk/shellondonlectures10). Films of all past lectures can be watched here also. Entry to each lecture is by ticket only. To obtain a ticket please contact Alys Hilbourne. Please note that due to the popularity of this lecture series, tickets are allocated on a monthly ballot basis and we cannot guarantee that you will get tickets when they are requested. A film of each talk will appear online shortly after the talk has been given. To view last year's presentations please visit [www.geolsoc.org.uk/shellondonlectures09](http://www.geolsoc.org.uk/shellondonlectures09). Please visit [www.geolsoc.org.uk/shellondonlectures10](http://www.geolsoc.org.uk/shellondonlectures10) or contact: Alys Hilbourne, Event Manager, The Geological Society, Burlington House, Piccadilly, London W1J 0BG, T: +44 (0) 20 7432 0981 E: [alys.hilbourne@geolsoc.org.uk](mailto:alys.hilbourne@geolsoc.org.uk).

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## Continuing Professional Development (CPD) Courses

- **2-3 February - ESI Ltd** - *Groundwater Risk Assessment of Contaminated Land*. Venue: Shrewsbury, UK. How to perform a detailed quantitative risk assessment for groundwater receptors, using generic and detailed methods, including hands-on guidance on relevant software tools. Contact: Course Administrator E: CoursesUK-ESI@esinternational.com

**W:** <http://www.esinternational.com/esi-courses.html>

A Professional School in Ground Engineering at the Building Research Establishment (Watford), First Steps Ltd. For reservations and information contact Christine Butenuth, info@firststeps.uk.com, 0207 589 7394, [www.firststeps.eu.com](http://www.firststeps.eu.com).

*Developing Geological Knowledge for CGeoL Status*, First Steps Ltd. For reservations and information contact Christine Butenuth, info@firststeps.uk.com, 0207 589 7394, [www.firststeps.eu.com](http://www.firststeps.eu.com).

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JANUARY 2010



- **4-6 January** – *Annual Meeting*. Venue: University of Glasgow. The Annual VMSG meeting aims to bring together geoscientists working on all aspects of volcanic and magmatic processes. Further details about the conference can be found through the VMSG website at [www.vmsg.org.uk](http://www.vmsg.org.uk).

**Contact:** Kate Dobson E: [Kate.Dobson@ges.gla.ac.uk](mailto:Kate.Dobson@ges.gla.ac.uk)



- **6-8 January** – *TSG 2010*. Venue: Birmingham University. Registration is now open. Please visit [www.gees.bham.ac.uk/tsg2010.shtml](http://www.gees.bham.ac.uk/tsg2010.shtml) and register through the online shop. Abstracts should be submitted to [tsg2010abstracts@contacts.bham.ac.uk](mailto:tsg2010abstracts@contacts.bham.ac.uk) no later than 11 December 2009.

**Contact:** Carl Stevenson E: [c.t.stevenson@bham.ac.uk](mailto:c.t.stevenson@bham.ac.uk)



- **7 January** – *Sir Peter Kent Lecture: Climate Change as a Global Shifting Force*. Speaker: Sir David King. Venue: Burlington House. 18.00 Tea / Coffee; 18.30 Lecture; 19.20 Q&A; 19.50 Reception. Tickets free on application but limited in number. **Contact:** Georgina Worrall E: [registrations@geolsoc.org.uk](mailto:registrations@geolsoc.org.uk)



- **12 January** – *AGM* Venue: S H Reynolds Lecture Theatre, University of Bristol. **Contact:** Charlotte Woodhall-Jones E: [Charlotte.Woodhall-Jones@hotmail.co.uk](mailto:Charlotte.Woodhall-Jones@hotmail.co.uk)



- **13 January** – *Shell London Lecture Series: Living with rising tides*. Venue: Burlington House. Speaker – Lynne Frostick, University of Hull (President). The talk will be given twice, at 3pm and 6pm. Tickets free, by ballot. **Contact:** Alys Hilbourne T: 020 7432 0981 F: 020 7494 0579; E: [alys.hilbourne@geolsoc.org.uk](mailto:alys.hilbourne@geolsoc.org.uk)



- **18-19 January** – *Earth Sciences in the 21st Century*. Venue: Burlington House. If you are interested in participating in this event, please go to the *Earth Sciences in the 21st Century* website <http://www.bgs.ac.uk/ukgeoscience/> for further information. **Contact:** Dr Vicky Hards; E: [vih@bgs.ac.uk](mailto:vih@bgs.ac.uk)



- **19 January** - *Groundwater Management in Tunnelling*. Venue: Burlington House. Evening Meeting. **Contact:** Guy Cassidy; E: [guy.cassidy@jacobs.com](mailto:guy.cassidy@jacobs.com)



- **19 January** - *Engineering Geology of Karst (followed by AGM)*. Venue: Gatwick Manor Hotel. Evening Meeting, 1800 for 1830. **Contact:** Ron Williams; T: 01737 553740; E: [rew182@btinternet.com](mailto:rew182@btinternet.com).



- **20-22 January** - *Salt Tectonics, Sediments and Prospectivity*. Venue: Burlington House. Registration: Fellow £150.00 Non-Fellow £250.00 Student £50.00. This three day international conference aims to bring together academic and industrial geoscientists to review recent advances in our understanding of halokinetic processes and to explore the links between salt tectonics and sediments. **Office contact:** Steve Whalley; T: 020 7432 0980 F: 020 7494 0579 E: [steve.whalley@geolsoc.org.uk](mailto:steve.whalley@geolsoc.org.uk).



- **25 January** - *The Legacy of Past Mining - Stabilisation by Drilling and Grouting* – Venue: Dudley Museum. Evening meeting – 20.00. Speaker: Steve Rule. Joint with the Black Country Geological Society, in memory of Les Nichol of M & J Drilling. **Contact:** Adrian Jones; E: [adrian.a.jones@uk.mwhglobal.com](mailto:adrian.a.jones@uk.mwhglobal.com).



- **27 January** - *Practical Aspects of Groundwater Modelling*. Venue: University of Glamorgan. Speaker: Maria Clarkson (PB). **Contact:** Margaret McBride; E: [margaret.mcbride@jacobs.com](mailto:margaret.mcbride@jacobs.com)



# SHELL UNIVERSITY Lecture Series 2010

## Oceans and Climates

This series is a programme of 6 regionally-based lectures which will run November 2009 to March 2010 at approximately fortnightly intervals, and the umbrella theme for this is Oceans and Climates.

The programme, with lecture locations, speakers and the title of their talk is below and comprises established international speakers. Students will receive priority places, but we will also welcome anyone with an interest in Earth-science, so please contact us for further information if you would like to attend.

The lectures will begin at 5.30pm and last for about an hour. This will be followed by a reception which will enable those attending to meet the speaker and other members of the diverse audience. The lectures are free of charge to attend, but are by ticket only.

Please contact Alys Hilbourne for further details and to let us know that you would like to attend - groups and individuals are welcome.

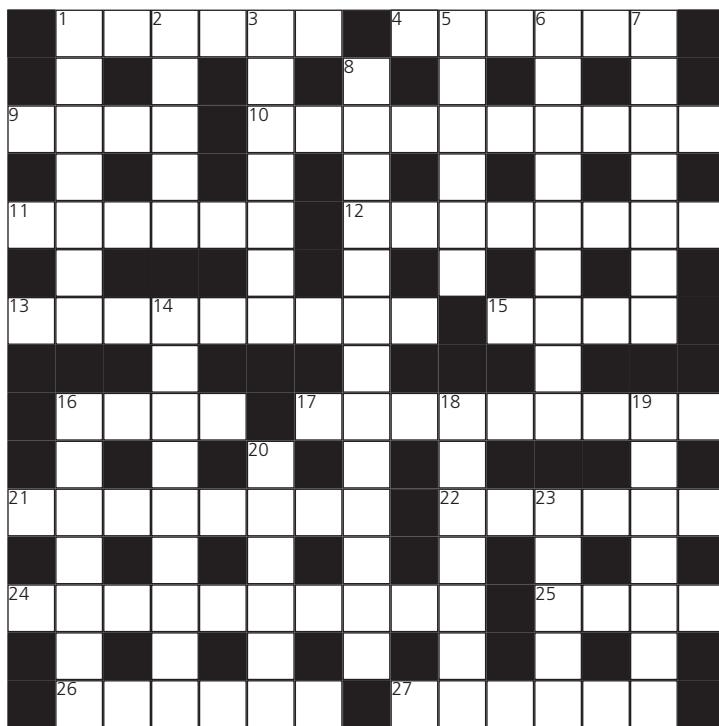
DATE	TOPIC	SPEAKER	HOST UNIVERSITY
18 November	Ocean circulation and climate	Helen Johnson, University of Oxford	Bristol
2 December	Reconstructing the history of the Antarctic ice sheet: Clues from the past for the future	Tina van de Flierdt, Imperial College London	Birmingham
3 February	Disposing of fossil fuel CO <sub>2</sub> : A test of our understanding of oceans and climates	Andy Ridgwell, University of Bristol	Oxford
17 February	Palaeo-perspectives on human-climate-environment interactions	David Hodell, University of Cambridge	Manchester
3 March	Corals, sea level and climate reconstruction	Sandy Tudhope, University of Edinburgh	Durham
17 March	Principles and applications of petroleum system analysis	Peter Nederlof, Shell	Aberdeen

**For further information please contact:**

Alys Hilbourne, Geological Society, Burlington House, London.  
email: [alyshilbourne@geolsoc.org.uk](mailto:alyshilbourne@geolsoc.org.uk); tel: 020 7432 0981  
web: [www.geolsoc.org.uk/shelllondonlectures10](http://www.geolsoc.org.uk/shelllondonlectures10)



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**Crossword no. 131 set by Platypus****Across**

- 1 Restful underwater lava lump (6)
- 4 Hennigian branches (6)
- 9 Member of the Arecaceae (4)
- 10 Siderite rock, Precambrianly banded (10)
- 11 1793-1794. It was the worst of times. (6)
- 12 Vigorous mountain streams (or Russian rivers in spring, according to Turgenev) (8)
- 13 Less bright star of a binary system (9)
- 15 Raised walkway over water (4)
- 16 What turbidites do distally (4)
- 17 One who allocates or divides a whole into parts (9)
- 21 Once a "force", now an "effect": the apparent deflection of moving objects when viewed from a rotating reference frame (8)
- 22 Ancient creek course within a fen (6)
- 24 Devices for measuring height (10)
- 25 Leave out (4)
- 26 Victorian policeman, colloquially (6)
- 27 Long winding ridge of stratified sand and gravel formed by subglacial streams (6)

**Win a Special Publication of your choice!**

All correct solutions will be placed in the draw, and the winner's name printed in the March issue. The Editor's decision is final and no correspondence will be entered into. Closing date – 20 January 2010.

The competition is only open to all Fellows and Candidate Fellows of the Geological Society who are not current Society employees, officers or trustees. This exclusion does not apply to officers of joint associations, specialist or regional groups.

Please return your completed crossword to Burlington House, marking your envelope "Crossword". Do not enclose any other matter with your solution. Overseas Fellows are encouraged to enter by scanning the signed form and emailing it as a PDF to ted.nield@geolsoc.org.uk.

Name .....

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**Down**

- 1 Sham intervention administered as an experimental control or in hope of cure by suggestion (7)
- 2 Prosimian and strepsirrhine primate, endemic to Madagascar (5)
- 3 Small "o", as opposed to the big one at the end (7)
- 5 Lights Amplified by Stimulated Emission of RadiationS (6)
- 6 Twelve leaves per sheet (9)
- 7 Industrial device for extracting metal from ore (8)
- 8 Subjects of great disagreement (13)
- 14 Unevolved, magmatically speaking (9)
- 16 Victorian slag, though more evident in gin houses than waste heaps from a 7d (7)
- 18 Low angle reverse faults (7)
- 19 Rocks derived from beyond the autochthon (7)
- 20 Different form of a gene (6)
- 23 Electronic component that conducts more easily one way than the other (5)

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