

Geoscientist

The Fellowship magazine of The Geological Society of London | www.geolsoc.org.uk | Volume 21 No 10 | November 2011

SCORCHED EARTH

The geological history
of Earth and fire

YOUNG HOPEFUL

Society's first
publication 200
years old

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PROTECT AND DIE

UK palaeontologist slams collecting ban



Carbon Capture & Storage

22 and 23 November 2011

The Geological Society, London

A joint meeting between the Geological Society and AAPG

A scientific conference bringing together geoscientists and reservoir engineers seeking to understand and quantify capacity, integrity and injectivity of CO₂ storage processes.

Speakers include:

Stuart Haszeldine, *University of Edinburgh*

Bryan Lovell, *Geological Society/University of Cambridge*

Peter Styring, *University of Sheffield/CO₂ Net*

Mercedes Maroto-Valer, *University of Nottingham*

Dermot Roddy, *University of Newcastle*

John Kaldi, *CO2CRC Australia*

Convenors:

Jon Gluyas, *University of Durham*

Peter Kukla, *RWTH Aachen University*

John Kaldi, *CO2CRC Australia*

Hannes Leetaru, *ISGS, Illinois*

Michael Stevenson, *BGS*

Martin Blunt, *Imperial College*

Richard Worden, *University of Liverpool*

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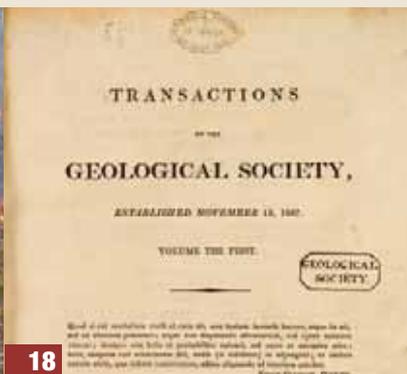
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ONLINE SPECIALS

DYNAMIC TOPOGRAPHY Philip Allen (Imperial College, London) reports from a meeting (Burlington House, September) to look at how movements deep within the Earth affect its surface

BOOKS & ARTS Ken McNamara reviews *Incoming – or why we should stop worrying and learn to love the meteorite* by Ted Nield, now out in paperback

Water Futures

6-7 March 2012
Burlington House, London,
United Kingdom



Pressures on groundwater are ever increasing in terms of resources and quality, particularly from population increases and demographics, new technologies, pollutants and climate change. The interdependency between groundwater behaviour and a broad spectrum of earth system processes of significance to environmental scientists is throwing a spotlight on the interfaces between hydrogeology and its neighbouring Earth Science disciplines. This two day conference will follow four broad themes which aim to address interactions and influences between groundwater and the wider Earth Science environment.

- Groundwater and Energy
- Groundwater and Climate
- Groundwater and Basin Scale Processes
- Future Directions and Societal Challenges

Keynote speakers:

Rand Maxwell, Colorado School of Mines, USA (Groundwater and Climate)

Grant Garven, Tufts University, USA (Groundwater and Basin Scale Processes)

Johannes Grab, Austrian Environment Agency, Austria (Future Directions and Societal Challenges)

Invited speakers:

Job Ward, British Geological Survey, UK (Future Directions and Societal Challenges)

Joe Firth, Centre of Ecology and Hydrology, UK (Groundwater and Energy)

Kevin Hinzock, IFA, 2077 Whitaker Medallist, UK (Groundwater and Climate)

Holly Michael, University of Delaware, US (Groundwater and Basin Scale Processes)

Jacob Tompkins, Waterwin, UK (Future Directions and Societal Challenges)

Call for papers and posters

Conference paper and poster contributions are welcome. Please email your 250 word abstract to Steve Whalley by 1 December 2011

For further information about the conference, or to submit a paper/poster abstract, please contact:

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Rock deformation from field studies, experiments and theory:

A meeting in honour of the work of Prof. E.H. Rutter

30-31 May 2012
The Geological Society,
London



This meeting will be held in honour of Professor E.H. Rutter. His significant contribution in the field of Rock Deformation has inspired a wide range of geoscientists. He has made seminal contributions on a range of topics, including the rheology of calcite rocks, pressure solution, grain size sensitive flow, the interrelationships between deformation and metamorphism, the structure and properties of the lower crust, the rheology of partially molten rocks, and the structure, microstructure and properties of brittle fault zones. We wish to focus particularly on the marrying of field studies, experimental studies and modelling in the field of rock deformation, as that has been Professor Rutter's approach throughout his career. This multidisciplinary approach has provided numerous new insights into how rocks deform and continues to do so. The meeting will have aspects of reflecting on where we have come over the past 40 years, and where approaches in the field should go in the future.

Confirmed speakers:

Professor Rick Sibson (Dunedin, New Zealand)

Professor Chris Spiers (Utrecht, Netherlands)

Professor David Mainprice (Montpellier, France)

Meeting conveners:

Dr. Dan Faulkner (Liverpool)

Dr. Julian Mckenzie (Manchester)

Dr. Betty Marais (Liverpool)

Dr. Steve Crump (Manchester)

Special Publication

There is a planned Special Publication of the Geological Society of London for this meeting.

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In Association with the Stratigraphy Commission

High Fidelity: The Quest for Precision in Stratigraphy and its Applications

16-17 May 2012

The Geological Society, Burlington House, Piccadilly, London

Conveners:

Mike Stephenson
BGS

Mike Simmons
Nuffic

Stewart Molyneux
BGS



Call for Abstracts – Deadline 14 December 2011

A primary question for any earth scientist in correlation (for example, of a local event to the global record) is "what age is it?". How precisely can stratigraphers now answer this question? Local endemic biostratigraphic schemes are now routinely being correlated to global schemes. Recent advances in radiometric (FISH U-Pb dating of zircons and computer based methods of quantitative biostratigraphy now make it possible to produce sub-100 k.y. resolution as far into deep time as the Palaeozoic. The application of orbital cyclicity has been demonstrated in the Cenozoic and Mesozoic and may be possible in the Palaeozoic, allowing age calibration using the 40-400ky cycles. With ongoing dating of the entire Phanerozoic timescale using orbital forcing cycles, plus the assembly of a Phanerozoic record of isotope stratigraphy, can we look forward to the potential of routinely correlating on the scale of 100-500ky? How are these new dating resolutions and techniques being used in the study of earth events and in practical and applied biostratigraphy, from basin scale to reservoir scale in the oil industry or in other subsurface studies? This conference will bring together chronostratigraphy specialists, biostratigraphers and applied geologists to explore new synergies to bring the "new dating" into wider applied and practical uses.

For further information and registration, please contact:
Steve Whalley, Event Co-ordinator: +44 (0)20 7432 0980 or email: steve.whalley@geolsoc.org.uk

Conference Sponsor:



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Corporate Supporter:



Registration Now Open

Sediment Provenance Studies in Hydrocarbon Exploration and Production

5-7 December 2011

The Geological Society, Burlington House, Piccadilly, London

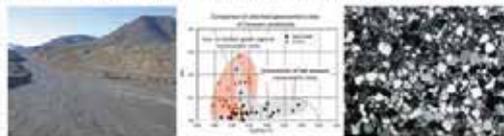
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Robert Scott
CASP

Helen Snyth
CASP

Andy Morton
IMA Research Associates

Nick Richardson
Marck Oil



Sediment provenance studies concern the origin, composition, transportation and deposition of detritus, and are therefore an important part of understanding the links between basin sedimentation and hinterland tectonics and unroofing. Such studies can add value at many stages of hydrocarbon exploration, from identifying regional-scale crustal affinities and sediment dispersal patterns during the earliest stages of exploration to detailed correlation in producing reservoirs. This conference will showcase the wide variety of techniques available, using examples and applications from all aspects of sediment provenance research.

Conference Sponsors:



Confirmed keynote:

Andy Carter (Birkbeck College)

Steve Bergman (Shell)

Andrew Hurst (University of Aberdeen)

Bill Heins (ExxonMobil)

Robert Hall (Royal Holloway)

Eduardo Garzanti (University of Milan Bicocca)

For further information and registration, please contact:
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“BANNING FOSSIL COLLECTING APPLIES A FALSE ANALOGY WITH LIVING THINGS. FOSSILS ARE DEAD, AND PROBABLY EXTINCT, ALREADY”

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Bernhard Richter

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SAVE THE FOSSILS

To whom do fossils 'belong'? Measures aimed at protecting them can easily achieve the complete opposite.

The value of a natural object was something I first confronted face to face in the 1970s, while trying to export palaeontological specimens from my field area in Sweden to the UK. I had been working on Gotland, even then a protected site where only authorised collection was allowed. A colleague had already been confronted at outcrop by a local journalist, demanding to know by what right he, a foreigner, was removing the nation's blessed patrimony.

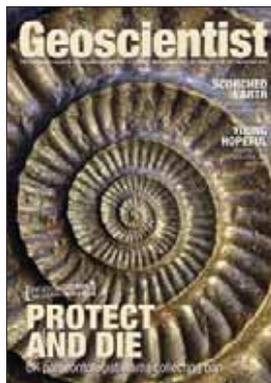
Later we faced a slightly different problem, shipping our (legitimately obtained) samples home - when we were asked by an official what they were "worth". As the official pen hovered over an empty box on the form, we looked blankly at one another. In one sense, they could be said to be worth all the expense of getting ourselves there and back; of the tuition and maintenance of two PhD students; of having obtained the necessary previous qualifications... where did it end?

No. Why not define value by what someone would pay for them? That seemed a good idea until we realised that as roadstone they were effectively worthless. We had no knowledge of the commercial fossil market. "So" said the helpful official - "what are they worth to you?" That was easy. "Priceless" we said. It didn't help. So I asked: "What figure would give rise to as little curiosity as possible?" He suggested a few hundred Kronor. "Fine" I said.

Concepts of value invoke those of property; but to whom do fossils 'belong'? Ultimately, you might say, the question is meaningless; but then ultimately most questions are. In the here and now, with competing claims of landowners, finders, nations jealous of their heritage and so on, we must contend with a welter of competing interests - and false analogies. As Dave Martill points out in this month's feature, notions adapted from biology and aimed at protecting living things, cannot sensibly be transferred to things that are not only dead, but probably extinct already.

At the end of September consultation closed on the *Review of the West Dorset Coast fossil collecting code of conduct and recording scheme*. Such codes have, in the UK, for the most part been a model of balance and pragmatism, recognising that collecting bans only make rare fossils even rarer, and may lead to irrevocable loss, denying equally the right of local people to make livings, and of scientists from all over the world to study what, in the end, is the property of everyone.

DR TED NIELD EDITOR



Scorched earth policy

We have inherited an inflammable planet, warn researchers at Royal Holloway, University of London. **Sarah Day** reports on the science behind a burning issue

PALAEOENVIRONMENT

It is easy to think of fire as something caused by humans, and which primarily affects us. But fire has an ancient geological history as well, with natural fires influencing biological evolution and global biogeochemical cycles.

An international team of 18 researchers has now published a study in the *Journal of Biogeography* which explores the history of fire on Earth, in an attempt to understand mankind's relationship with it.

"Unravelling the nature of fire before any human influence is an important element of the current debate" says Professor Andrew C Scott from the Department of Earth Sciences at Royal Holloway, one of the paper's authors.

Fire plays a leading role in "an ancient narrative about how humans and the Earth have interacted", researchers claim. This makes it an ideal subject through which to explore how humans and their environment have interacted throughout evolutionary history. The research forms part of a wider debate on the role of 'background' natural processes (independent of humans) and the role of people in driving environmental change.

“OUR FOSSIL-FUEL DEPENDENT ECONOMY IS YET ANOTHER EXTENSION OF OUR DEPENDENCE ON COMBUSTION”

Jennifer Balch

IGNITION SEQUENCE

The team has identified four 'fire phases' that characterise how humans have made use of fire: natural fires that happen without human interference; tame fire used by hunter gatherers to manage landscapes; agricultural fire to clear land, grow food and burn fallow; and industrial fire to power modern societies. It is hoped that the research will help distinguish beneficial fires from those that should be considered natural disasters.



Above: We associate fire with human agency; but it has played a crucial role in Earth history from the earliest days

"Human use and misuse of fire has been so prevalent in our evolutionary history, and the evolution of cultures, that we've forgotten how dominant a force fire really is" says Dr Jennifer Balch, Postdoctoral Associate at the National Centre for Ecological Analysis and Synthesis, University of Santa Barbara, another author of the paper.

Charcoal in the sedimentary record reveals that there has been continuous fire activity on Earth since the late Silurian, roughly 400 million years ago. Since then, fire has been an important selective factor in plant evolution, and has shaped the development of some biomes. It affected the development and spread of global savannas in the late Cenozoic, in which habitat our own ancestors evolved.

It is difficult to pinpoint when fire began to be employed by hominins, but archaeological evidence suggests controlled use of fire was already being made in the Middle Pleistocene, 690 – 790 thousand years ago. Since then, humans have continued to increase the amount of ignitions relative to the 'background rate', to the point where we regard fire as almost entirely

human caused.

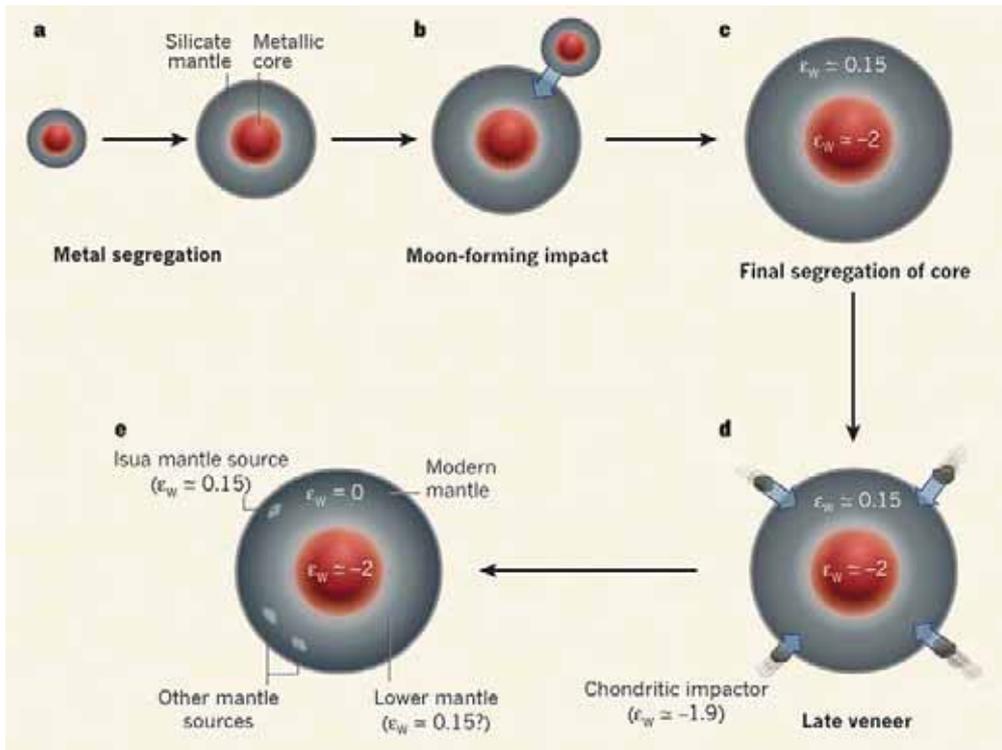
"Our fossil-fuel dependent economy is yet another extension of our dependence on combustion" says Balch. "We have effectively put fire in a box. The result of massive dependence on this one use of fire may ultimately overwhelm human capacities to control landscape fire, given more extreme fire weather and more production of fuels."

The research is intended to provide a historical framework to help other researchers understand the role of fire in natural ecosystems, and plan for future risk.

"Some only see fires in terms of human causation and impact" says Scott. "Understanding the ways that humans have and are altering natural wildfire systems has profound political and economic significance."

REFERENCES

- 1 David M J S Bowman et al. *The human dimension of fire regimes on Earth*, *Journal of Biogeography*, published online 14 September 2011



Dr Matthias Willbold and Professor Tim Elliott (Bristol Isotope Group, Bristol University) analysed rocks from Isua, Greenland collected by Professor Stephen Moorbath (University of Oxford). The Isua rocks are nearly four billion years old, and were formed after the Earth developed its nickel-iron core but before the proposed late bombardment that is thought to have delivered a late addition of siderophiles. With unprecedented accuracy, they measured tungsten (W) isotopes against the average signatures found in rocks today.

ADD METEORITE AND STIR

Experimental work had already predicted that adding 0.5-1% primitive meteoritic material to the mantle would produce current proportions of crustal gold. Willbold *et al.*, measuring W concentrations more precisely than ever before, have been able to demonstrate that the Isua rocks are indeed slightly W-depleted. In fact, the observed 15ppm decrease in the relative abundance of the isotope ¹⁸²W relative to modern day crustal averages is exactly as predicted by the “meteoritic addition” theory. Willbold believes this “shows that most of the precious metals on which our economies and many key industrial processes are based have been added to our planet by lucky coincidence when the Earth was hit by about 20 billion billion tonnes of asteroidal material.”

The gilding of the Earth

A late bombardment, after core formation, may have enriched the depleted mantle and crust in gold, reports **Harriet Jarlett**

GEOCHEMISTRY

Despite being among the most precious of metals, gold is tens of thousands of times more abundant in the Earth’s crust than it should be. This heavy element, together with the other iron-loving (siderophile) elements, should have sunk into the Earth’s core, long ago. In fact, there are enough precious metals in the core to pave the entire surface of the Earth with a layer of gold four metres thick. New research, published in *Nature*, lends new support to the theory that, had it not been for a late bombardment of meteorites being folded in to the terrestrial mix, there would be hardly any siderophile elements in Earth’s mantle and crust today.

Earlier attempts to explain the abundance of siderophile

elements in the modern day crust and upper mantle have suggest that, when the Earth collided with large objects (such as the mars-sized “Giant Impactor” thought to have resulted in the formation of the Moon), melting caused iron and other metals to separate out. At the pressure and temperatures found beneath the resulting magma ocean, it has been suggested that siderophiles might lose affinity for iron and instead rise up through the mantle. However, this mechanism would not have worked for all siderophile elements.

“MOST OF THE PRECIOUS METALS ON WHICH OUR ECONOMIES ARE BASED HAVE BEEN ADDED WHEN THE EARTH WAS HIT BY 20 BILLION BILLION TONNES OF ASTEROIDAL MATERIAL

Matthias Willbold

Above: Earth's accretion and effects of late veneer. a-c, Accretion and core formation (4.567-4.5Ga): a: Siderophiles removed from silicate mantle to metallic core. B: Moon-forming impact. C: Final segregation of core: mantle depleted of highly siderophile elements; εW (ε¹⁸²W) denotes tungsten-isotope enrichment as parts per 10,000 relative to modern terrestrial mantle. d,e: Late accretion (c.4.5-3.8Ga) following core formation: d: Highly siderophile elements replenished in mantle by late veneer of meteorites. E: Addition of late veneer reduces mantle ¹⁸²W enrichment to an εW of zero. Willbold et al.2 propose that rocks from Isua have the same ¹⁸²W enrichment (εW0.15) as the mantle had before the late veneer formed.

REFERENCES

- 1 Matthias Willbold, Tim Elliott, Stephen Moorbath 2011: *The tungsten isotopic composition of the Earth's mantle before the terminal bombardment.* Nature, 2011; 477 (7363): 195. See also *News & Views* in same issue: Klein T *Earth's Patch Late Veneer* p 168.
- 2 Bottke W F, Walker R J, Day J M D, Nesvorny D, Elkins-Tanton L 2010: *Stochastic late accretion to Earth, the Moon, and Mars.* Science, 330, 1527-1530.
- 3 Brenan, J M & McDonough, W F 2009: *Core formation and metal-silicate fractionation of osmium and iridium from gold.* Nature Geoscience 2, 798-801.



SOCIETY NEWS

ELECTION – FELLOWS

The following names are put forward for election to Fellowship at the OGM on 30 November 2011.

AGBEBI-AFOLAYAN, Olanrewaju Johnson; **ALLEWELL**, Thomas Robert; **ARENDT**, Nicolai Peter; **AVERALL**, Gordon Richard; **BARR**, Claire Louise; **BAZYKIN**, Dmitry; **BEAUMONT**, Richard Joe; **BEERS**, Elizabeth Alice; **BEHENNA**, Sarah Elizabeth; **BEVAN**, Miles; **BRAIDWOOD**, Lauren; **BRIDGES**, Kate Philippa; **BUDGE**, Edward; **BURDETT**, Mark Nigel; **BURGESS**, Christopher John; **BURRIDGE**, Diane Luella; **CHEUNG**, Arthur Ka Chun; **COLLINGS**, David Andrew Thomas; **CONNELL**, Richard James; **CONWAY**, Jeremy John; **COZEN**, Nicholas William James; **DAVIES**, Gareth Ian; **DAVIS**, Grant Leighton; **DAWBORN**, Toby Christian; **DEISSMANN**, Guido; **DE JONG**, Koenraad; **DOBMEIER**, Christoph Joachim; **DONOVAN**, Amy Rosamund; **DRURY**, Russell John; **DUERR**, Herb; **EDWARDS**, Deborah Jane; **ENTICKNAP**, Rachel; **FARRELL**, Natalie Jane; **FINIGAN**, James William; **FISHER**, Andrew David; **FSK**, Stephen Joseph; **GERRARD**, Leon Christopher; **GOLIGHTLY**, Christopher Robert; **GORDON**, Stephen Michael; **GRANT**, Richard; **GRIFFITHS**, Richard Matthew; **GRIMES**, Hannah Lomax; **HAGUES**, Christopher Dominic Neame; **HANSEN**, Birger; **HAWKINS**, Thomas David; **HEELEY**, Martyn Richard; **HELBY**, Sarah; **HEWITT**, Troy Richard; **HILDICK-PYTTE**, Margaret; **HODGSON**, Jonathan; **HOPKINSON**, Laurence James; **HOSEIN**, Karize; **INGERSON**, Natalie Vivienne; **JACKSON**, Rachel; **JAMES**, Daniel; **JIANG**, Shu; **JONES**, Laura Elizabeth; **KARAPANOS**, Ilias; **KENNELLY**, Christine Mary; **KITSON-BOYCE**, Darcy; **KONG**, Sze-Wah; **LANE**, Richard Allan; **LANSLEY**, Richard John; **LAU**, See Yeung; **LAUNDER**, Michael John; **LEES**, Thomas Robert; **LEUNG**, Ka Wing Dickson; **LIGHTFOOT**, Andrew Mark; **LIVESEY**, Matthew; **LUI**, Waiyin; **LYNN**, Gwilym James; **MALKOVETS**, Vladimir Grigorievich; **MARTIN**, Michael Andrew; **MATHESON**, Hamish; **MATON**, Clive Richard; **MAWSON**, Matthew; **MCALLISTER**, Laura; **MCDADE**, Linzi; **MITCHELL**, Andrew James; **MOORE**, Patrick; **MORRISON**, Justin; **NAIRN**, James; **NELSON**, Catherine Elizabeth; **NEWTON**, Richard Arthur Wilfred; **NICHOLSON**, Isobel; **NORMAN**, Claudia Patricia; **NORWOOD**, Patrick; **OKYUNLOLA**, Olugbenga Akindeji; **OLIVE**, Verity-Rose Avril; **O'SULLIVAN**, John Mario; **OTREBA**, Pauline Elizabeth; **OWEN**, Matthew; **PARKER**, Adam Nicholas; **PARKER**, Sylvia Sarah Penelope Southcombe; **PAUL**, Tiffany Jane; **PENN**, Lauren Sarah; **PITCHER**, James Robert; **PRICE**, Carl Edward; **ROBERTS**, Oliver James; **ROBERTSON**, Andrea Marie; **ROOHNAVAZ**, Changiz; **RUDALL**, Sian; **SAVORY**, James Alexander Neil; **SHOLLEY**, Michael Gene; **SIMMONDS**, Sarah-Jane; **SMART**, Jeremy David Charles; **SMITH**, Howard James; **SPOFFORTH**, David John Andrew; **SOUBEYRAND**, David Jerome; **STEELE**, Joanne; **STEWART**, Margaret Anne; **STRANSA**, Alena; **SUNDERLAND**, Damon Michael; **TAMBO**, Nhlanhla Darlington; **TANKARD**, Anthony; **TAYLOR**, Ronald; **TOTAKE**, Yukitsugu; **VAN DEN BERG**, Maurits Arie; **VAN DER MEER**, Douwe George; **VAN LEEUWEN**, Theodoeus Marius; **WALCOTT**, Rachel Clare; **WALLACE**, Ian; **WALLIS**, David; **WHITE**, Jonathan Derek; **WILSON**, Andrew; **WOOD**, Matthew Philip; **YOUNG**, Paul Ivor.



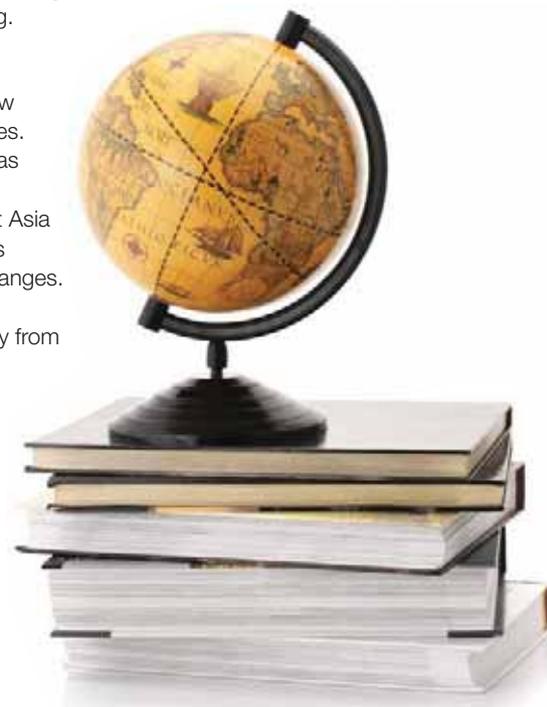
Honorary Fellowship

Edmund Nickless writes: Following a proposal from the Awards Committee, Council recommends Dr Zhongli Ding for election to Honorary Fellowship at a future Ordinary General Meeting.

DR ZHONGLI DING

Dr Zhongli Ding is one of the few leading scientists in loess studies. For the past two decades he has focused his research on the palaeoclimatic evolution of East Asia during the late Cenozoic and its linkage to global ice-volume changes. His achievements and many innovative results derived mainly from the Chinese loess have been published in highly ranked international journals and are widely cited. In recent years Dr Ding has made a particularly important contribution to the strengthening of the broad field of geosciences in China; his leadership in launching a number of national research programmes has served to advance the country's sustainable development efforts with benefits for society as a whole.

Among other positions, he is Vice President of the Chinese Academy of Sciences, a member of the Standing Committee of the 11th National People's Congress, President of the Chinese Association for Quaternary Research and Chairman of the Chinese National Committee for the International Geosphere-Biosphere Programme.



► Fellows may nominate candidates for Honorary Fellowship at any time. To find out how to do this, please go to www.geolsoc.org.uk/honoraryfellowship

Christmas and New Year Closure

The Society (London and Bath) will be closed from 28 – 30 December inclusive, re-opening on Tuesday 3 January 2012.



FUTURE MEETINGS

■ **Council & OGMs:** 30 November; Council 1, 2 February (residential); OGM 1 February 2012 (6pm); 11 April.

[LECTURES]

Shell London Lecture Series



Image © Alexey Zaytsev / Shutterstock

New Hydrocarbon Development Challenges and the Impact on Production Geosciences

Speaker – Hans Goeyenbier, Shell

16 November 2011

The talk will describe current Production Geoscience processes for conventional oil and gas developments, and will then go into the challenges posed by "difficult" hydrocarbons - and other unconventional businesses, such as carbon capture and storage (CCS).

These new business areas provide new challenges for production geoscientists and require changes in all aspects of the business, ranging from basic skill-sets and training to IT infrastructure and research focus.

■ **Programme – Afternoon talk:** 1430 Tea & Coffee: 1500 Lecture begins: 1600 Event ends.

■ **Programme – Evening talk:** 1730 Tea & Coffee: 1800 Lecture begins: 1900 Reception.

FURTHER INFORMATION

Please visit www.geolsoc.org.uk/shellondonlectures11. Entry to each lecture is by ticket only. To obtain a ticket please contact Ellie Duncanson-Hunter around four weeks before the talk. Due to the popularity of this lecture series, tickets are allocated in a monthly ballot and cannot be guaranteed.

► **Contact: Ellie Duncanson-Hunter**, The Geological Society, Burlington House, Piccadilly, London W1J 0BG,
T: +44 (0) 20 7432 0981
E: ellie.duncanson-hunter@geolsoc.org.uk

In association with



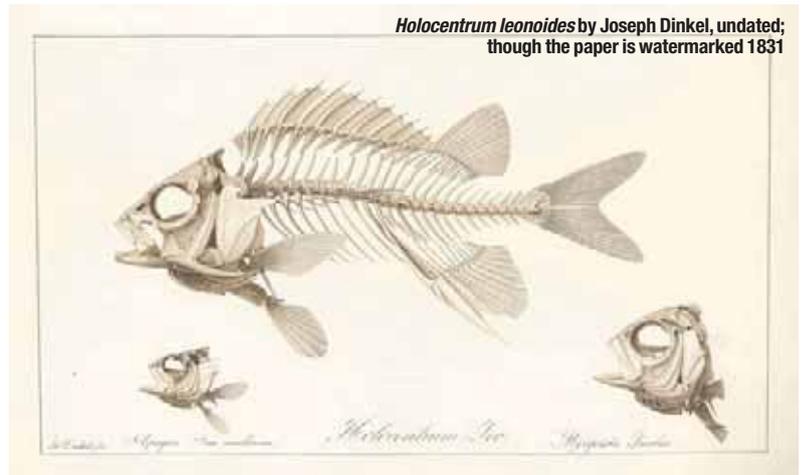
FROM THE LIBRARY

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

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

Sponsor-a-Fish update

Holocentrum leonoides by Joseph Dinkel, undated; though the paper is watermarked 1831



Appeal goes swimmingly, but there remains a mountain to scale...

Many thanks to everyone who has so far donated to our appeal to conserve and digitise the two thousand watercolours from the fossil fish collection of Louis Agassiz writes Michael McKimm.

These watercolours and drawings, dating from the 1830s-60s, were copied from private and public collections around Europe, principally by the German artist Joseph Dinkel. The Library and Archive wish to make this unique portfolio accessible to researchers by cleaning and digitising the entire collection.

A brilliant £1200 was raised in the

first month of the appeal: but there is still a long way to go to reach our target. If you would like to sponsor one of our fishes, please send a cheque for £20, made payable to 'The Geological Society', or contact the Library to pay by card. More information about the appeal can be found at www.geolsoc.org.uk/sponsorafish

► The Library also operates a sponsorship scheme to help preserve and restore its rare books. For more information, contact **Michael McKimm** in the library, or go to www.geolsoc.org.uk/sponsorabook

Research Funds

The 2012 round of Society Research Funds is now open for applications.

Applications for support from any of the Society funds must be made on the form which can be downloaded from www.geolsoc.org.uk/awards.

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. In order to

be considered at the next available committee meeting, applications and supporting documents should reach the Society no later than 1 February 2012. The average award has been about £1000.



SOCIETYNEWS...

Open House 2011



Visitors queue in Reception

The Society opened its doors to a curious public for the second year.

On Saturday 17 September the Society once again opened its doors to the public as part of the Open House celebrations across London. Staff volunteers provided nearly 500 visitors with tours of the Society's apartments, including the Council Room, Library and Lyell Room, and of course there was the opportunity to see the ever-popular William Smith 1815 map. Bob Sandford (Julian Harrap Architects) was on hand to talk to visitors about the 2007 Bicentennial renovations. *Michael McKimm*



Wendy Cawthorne explains the Library to visitors

The Geological Society Club

The Geological Society Club, successor to the body that gave birth to the Society in 1807, meets monthly (except over the field season!) at 18.30 for 19.00 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 £50 for a four-course meal, including coffee and port. (The Founders' Dinner, in November, has its own price structure.) There is a cash bar for the purchase of aperitifs and wine.

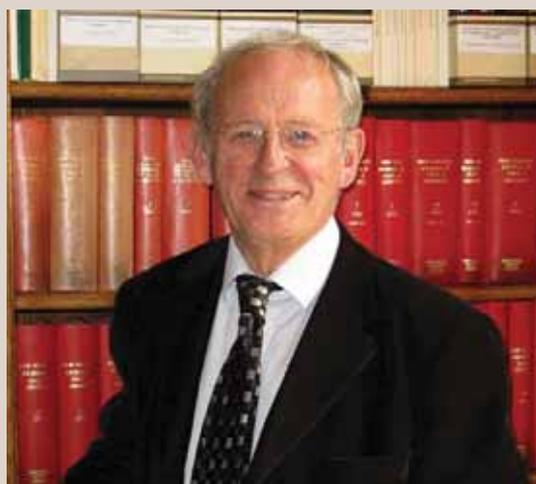
2012: 25 January; 29 February; 28 March; 11 April (Burlington House); 23 May.

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 - from whom further details may be obtained. *DR*

[ACCREDITATION NEWS]

Accredited Degree Course List Grows



Bill Gaskarth reports on some new addition to the Society's Accreditation scheme for university courses in Earth sciences.

The following MSc degrees from Portsmouth University School of Earth and Environmental Sciences have recently been Accredited: *Engineering Geology*, and *Geological and Environmental Hazards*. Graduates from these degrees in 2012 will be eligible to apply for Chartership a year earlier than applicants from non-accredited degrees. Previously the Society has Accredited MSc courses at: Manchester University School of Earth, Atmospheric and Environmental Sciences. *Petroleum Geoscience*; Newcastle University School of Civil Engineering and Geosciences *Engineering Geology Petroleum Geochemistry*, *Environmental Biogeochemistry*, and *Environmental Biogeochemistry with Consultancy Skills*.

ST ANDREWS

The Panel welcomed news that St Andrews University has invested in Earth Sciences and has re-established a distinct Department of Earth Sciences, by decoupling the previously merged departments of Earth Sciences and Geography. Four new staff have been appointed. The recently accredited BSc in *Geosciences* has now been renamed *Geology* and has been re-submitted to ensure its continuing accreditation. It has been restructured to reflect the new status of the department and to give more emphasis on geology.

► For information on all the degrees accredited by the Society go to www.geolsoc.uk/accreditation

BGS – Ejecting the core?

BY MARTIN CULSHAW AND MICK LEE

In the words of the song, you don't know what you've got till it's gone, say
Martin Culshaw and Mick Lee

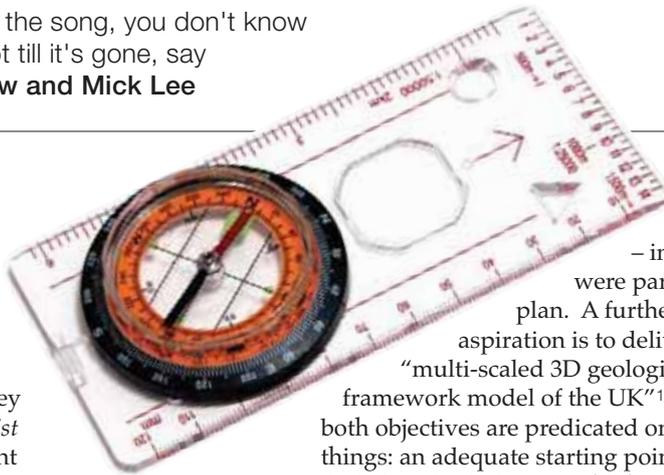


In January 2009 we expressed concerns regarding the core 'national survey' mission of the British Geological Survey (BGS - *Geoscientist* 19.1, p17). Recent developments have reinforced these concerns.

Public expenditure is being squeezed and, inevitably, BGS has to cut its science programme. Core activities of BGS are being merged with those of other NERC institutes into a single 'National Capability' programme - with a much-reduced budget. The main focus of cuts in BGS will be in baseline onshore geological and geochemical mapping and in data management. BGS acknowledges this will affect the quality of information it provides but claims that the geological map coverage of Britain is now 'fit for purpose'.

BGS had indeed planned to upgrade baseline geological coverage to an acceptable standard (fit for modern applications) for all of England, Wales and Scotland by 2011. However, erosion of funds for mapping, even before the latest cuts, caused that target to be missed, in spite of many efficiency gains through new technology. In reality, most professional geologists would judge at least 20% of the coverage still to be of inadequate quality for the modern age. Some is based on desk compilation of archive material; superficial deposits are often not mapped to modern standards; and coverage of some urban areas needs updating to include artificial deposits.

After 2011 the 'onshore mapping programme' was to move from 'systematic' to 'responsive' mode, whereby the geological information in each area would be upgraded using a combination of fieldwork and advanced digital methods only in response to specific development needs or research priorities. We have no



quarrel with this – indeed we were party to the plan. A further aspiration is to deliver a “multi-scaled 3D geological framework model of the UK”¹. However, both objectives are predicated on two things: an adequate starting point (a 2D digital geological map of high and consistent standard); and sufficient on-going funding for responsive revision to keep the geological database refreshed.

In the 1980s BGS was (rightly) criticised for not fulfilling its primary function of providing up-to-date geological maps. This situation has since been turned around through major initiatives in mapping, digital technology and digital data delivery. The user community was critical in 1990 and remains so today. The BGS Board has been abolished, depriving BGS of direct advice on priorities and scrutiny by eminent non-executive directors. The incorporation of the core 'national survey' mission into a NERC-wide National Capability programme further distances core activities from users.

All public organisations must change. But even in straitened times priority choices remain. We urge users of BGS information from industry, academia and government to engage with BGS/NERC to reinforce the need for up-to-date baseline geological information (sensu lato, including geochemical, geophysical and geotechnical data onshore and offshore). If the arguments are not heard as loudly as those for other areas of NERC science, then those making difficult decisions on funding priorities will assume that up-to-date baseline information is not important, and the core function of the BGS will be emasculated.

REFERENCES

- 1 BGS strategy document 2009-14

SOAPBOX

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. Copy can only be accepted electronically. No diagrams, tables or other illustrations please.

Pictures should be of print quality – as a rule of thumb, anything over a few hundred kilobytes should do.

Precedence will always be given to more topical contributions. Any one contributor may not appear more often than once per volume (once every 12 months).

“ WE URGE USERS OF BGS INFORMATION FROM INDUSTRY, ACADEMIA AND GOVERNMENT TO ENGAGE WITH BGS/NERC TO REINFORCE THE NEED FOR UP-TO-DATE BASELINE GEOLOGICAL INFORMATION

Martin Culshaw and Mick Lee ”



I was delighted to read a response by Langer *et al.*¹ to comments regarding the collection of fossils in Brazil in an earlier feature I had written² about the Crato Formation. The authors seem very proud of their laws, but I think they do a grave disservice to science and to their own people. Let me explain why.

Sadly, Brazil as a country suffers from endemic corruption, which is a way of life in parts of the country - a pragmatism that 'oils the wheels' of a well established system. Some of the pettiest operates in rural Ceará, a fossil-rich state of Brazil's semi-arid north-eastern corner. This corruption permits a global fossil-exporting industry worth millions to flourish.

Some people (Langer *et al.* doubtless among them) think such a trade is "a bad thing" and want it stopped. I don't: I want to see it expanded. I want it to thrive. I want to see so many fossils flooding out of Brazil (and China and Argentina) that the prices come tumbling down. I want to see quarries all along the fossiliferous outcrops of Brazil's Chapada do Araripe with people digging night and day. I dream of fossil shops around the World stuffed with Brazilian fishes, pterosaurs, dinosaurs, insects and plants in abundance.

Oh wait a minute... they already are. You see, to protect Brazil's fossil heritage from commercial dealers, as some would advocate, you need to stamp out Brazil's grass-root corruption and that will never happen. The illegal export of Brazil's fossil heritage will

continue for as long as there is a market.

Don't get me wrong; the law can and will be applied, but only to squeeze out competition, and a commercial monopoly will be the reward of whoever pays the biggest bribes. When a pterosaur skull can go for US\$300,000, those bribes can be substantial. The law can also be used to exclude foreign scientists (like me) from 'competing' with Brazilian scientists.

INEFFECTUAL

That the laws aimed at protecting Brazil's fossils are hopelessly ineffectual is not actually the point. Even if the law did deter, what is the point of protecting fossils? This question applies not only to Brazil; it can be posed to all countries with draconian rules on fossil collecting and exporting, (including China, where even the death sentence seems no deterrence, and Australia, where they are nevertheless happy to sell Brazilian and Moroccan fossils in the gift shops of their national museums).

The palaeontological resource of the Chapada do Araripe Geopark is vast. It is approximately 150km by 50km with an outcrop of the Crato and Santana formations around its flanks extending for more than two thirds of the perimeter of the chapada. Thus, there are around 450km of outcrop of the fossiliferous nodule-bearing Santana Formation.

The thickness of the concretion-bearing outcrop varies from as little as two or three metres in some places, but it maybe as thick as 10 metres. Even with a conservative outcrop width of as little as 50m, there are at least 250km² of ►

PROTECT — AND DIE

David M Martill* thinks that draconian anti-fossil collecting laws, like those that have been enacted in Brazil, are stifling research and should be scrapped





Pyritised ammonites like this one wash out of the Lias in their hundreds of thousands every year along the "Jurassic Coast". (See Books & Arts, p23)

► outcrop, and everywhere it is full of fossils. It is possible to estimate the abundances of some fossil species with back-of-envelope calculations.

Take the little fish *Dastilbe* sp. from the Nova Olinda Member of the Crato Formation. It is extremely common, occurring as isolated specimens and as mass mortality accumulations. In the region between Nova Olinda, Santana do Cariri and Tatajuba on the north side of the Chapada, the Nova Olinda Member is, on average, about eight metres thick. Approximately one specimen of *Dastilbe* occurs per metre of bedding plane exposed, and the limestone is bedded on a millimetre scale.

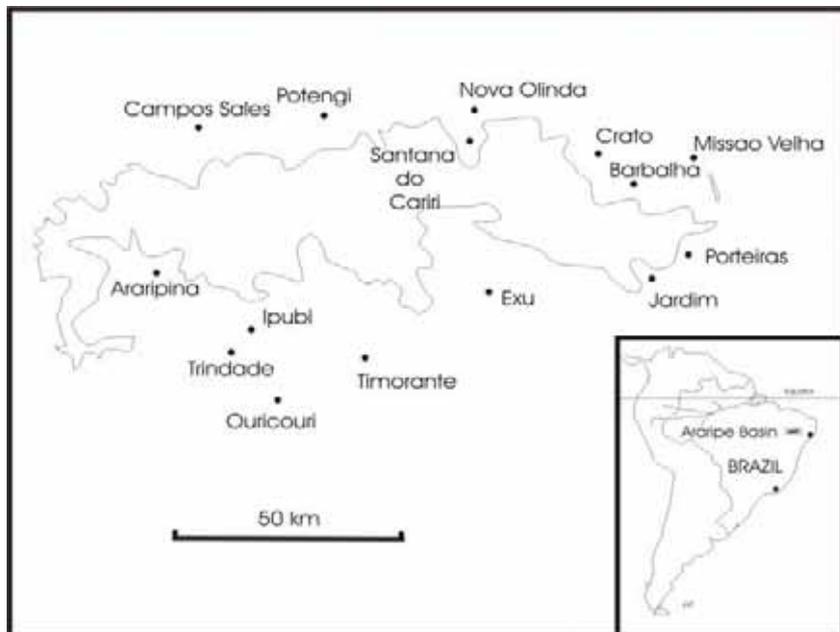
To keep the numbers simple, assume one *Dastilbe* per square metre for every 10cm of vertical section thickness; each square metre of exposure will yield approximately 80 *Dastilbe*. Some slabs will have more, some may have none; but the figure is a reasonable average, and of course only every tenth centimetre of the succession is considered here. The Nova Olinda Member has a continuous exposure around the flanks of the valley of the Rio Cariri of c.17km from Nova Olinda to Tatajuba *via* Santana do Cariri, and Araporanga. Assuming an average outcrop width of 100m, this gives 1,700,000m² of accessible exposure. With 80 per square metre, this means that around 136 million specimens of *Dastilbe* are being 'protected' by ineffectual legislation.

ILLEGAL

Of course, these laws are designed to protect very rare, scientifically 'important' fossils (leaving aside how, and by whom judged). But rare fossils stay rare if no one is allowed to dig for them. All these laws are quaintly naïve, none of them protecting Brazilian fossils. They make it illegal to collect Brazilian fossils for a private collection and export them without a licence and are detrimental to international palaeontology.

I don't condone the blatant breaking of the law, but here is the reality. In the Araripe Basin fossils are collected by 'fossil diggers', poor farm workers prepared to dig deep and dangerous excavations to collect fossils that they sell for just a few dollars. They are also collected by quarry workers excavating limestone slabs in the Nova Olinda district (if they didn't, the fossils would be thrown away and lost forever). They are then sold to middlemen who pass them on to European, American and Japanese traders, often through dealers

Outline of the Chapada do Araripe in Brazil and the main population centres of the region



The Crato Formation Geotope south of Nova Olinda in Ceará. Display boards explain the palaeontological and commercial importance of this finely laminated limestone in both Portuguese and English



View of the Chapada do Araripe above Santana do Cariri, showing the Cancau Geotope. This site provides a spectacular vista of the Chapada. The restaurant serves excellent lunches at weekends





Outcrop of the Romualdo Member of the Santana Formation, showing fossil-bearing the early diagenetic carbonate concretions at Sobradinho



based in São Paulo, Fortaleza and elsewhere in Brazil. The price increases (almost exponentially) from discovery to the large Arizona (Tuscon), German (Munich) or Japanese (Tokyo) fossil fairs. This trade has not stopped, and appears to be increasing, especially for the more spectacular fossils such as pterosaurs and other, even rarer tetrapods.

From Ipanema market and the tourist shops of the Copacabana in Rio de Janeiro, fossils have 'disappeared'. But a quiet word in some of the larger gem dealers showrooms might still get you a large Cretaceous coelacanth (I know – I was offered such rare fossils at a 'good price'). Occasionally the Brazilian police intercept consignments of fossils destined for export. Dr Andre Herzog, formerly Rector of the Universidade Regional do Cariri (URCA), has shown me what happens to such confiscated fossils. Intercepted at the ports, the contraband is transported to Crato and held by the DNPM (the Departamento Nacional Produção Mineral), an agency more or less equivalent to a national geological survey. They are left to rot.

So we must assume that all of the wonderful Brazilian fossils offered for sale around the world are either exported with a licence, or collected before 1988, or illegal. Many commercial dealers state on their web sites that fossils for sale are from old collections (this is mostly nonsense, given away by the fact that some of the sites yielding characteristic fossils were not discovered until after 1988). The fossils must therefore be illegal. But so what?

Consider this - The Chapada do Araripe is mineral-rich. Strata between the fossiliferous Crato and Santana formations contain evaporite seams more than 10m thick - the richest source of gypsum in South America. To extract this, multinational mining companies (such as French-owned Holcim) as well as smaller national companies in extensive quarrying operations around Ipubi and Araripina, remove overburden to extract the gypsum. This overburden includes the Santana Formation nodule beds, and each overburden removal operation destroys thousands of wonderful fossils. I have walked over the spoil dumps picking up broken fishes in nodules rescuing them from reburial under another dump truck full of dirt.

OBSCENE

I find it obscene that a mining company can legitimately destroy perhaps ►

► millions of fossils annually, while a Brazilian cannot keep a fossil collection without a licence, and a *bona fide* scientist must get permission to collect a few samples that they are later forced to give up (I am still awaiting a reply following a visit to the Brazilian Embassy in London to discuss permission two years ago). In Britain we are aware that every year huge numbers of fossils are destroyed or damaged by the heavy machinery that relentlessly excavates our raw materials. Enlightened quarry owners allow amateur collectors to salvage some. Thus was the fish-eating theropod dinosaur *Baryonyx* discovered.

In Britain we are aware that amateur collectors make a valued and significant contribution to our science. Indeed, our premier palaeontological scientific body, the Palaeontological Association, annually awards a prize to amateur fossil collectors as a way of acknowledging their very significant contributions to our science. This *laissez faire* attitude to collecting dates back a long way. Mary Anning, darling of British 18th Century vertebrate palaeontology is considered one of the 10 most significant women in 19th Century science. She was a commercial fossil dealer.

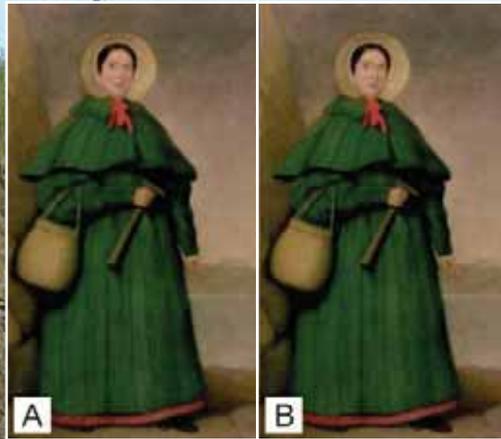
The UK's lack of laws "protecting" fossils permits young and old alike to build extensive collections, even from our World Heritage Jurassic Coast. This surely is the best approach. The small army of amateur and professional collectors have unearthed such delights as *Baryonyx walkeri*, a spectacular spinosaurid dinosaur discovered by amateur fossil hunter William Walker; *Caulkicephalus trimicrodon*, a toothy pterosaur similar to the Brazilian *Anhanguera* found by school boy Dan Davies (age 7) on his holidays, and 'Lizzie' (*Westlothiana lizziae*), perhaps the oldest reptile yet discovered, found by Scottish commercial palaeontologist Stan Wood. To name but three.

Britain's fossil-rich coastline is regularly beaten by Atlantic tempests and icy Arctic storms. While this reveals millions of new fossils every year, it also destroys millions too. Our amateur collectors save many before they succumb to the wave. To outlaw collecting would banish them for ever. The Araripe Basin, while far from the sea, nevertheless has its own climatic problems affecting its fossils. Rapid erosion from tropical downpours and deep tropical weathering hardly enhance the fossils. On the ground, concretions are superabundant with perfect fossils,

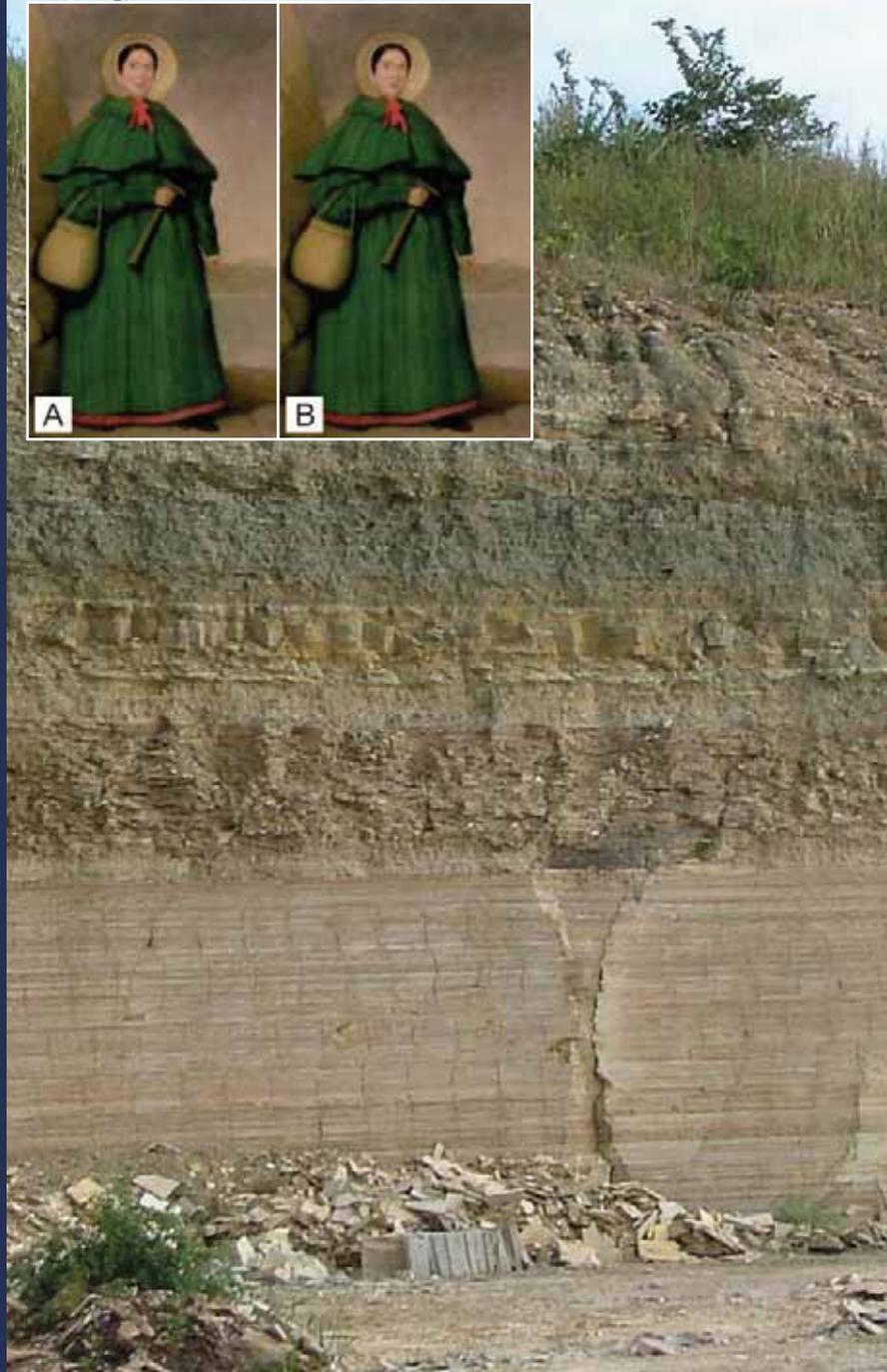
Quarry workers extracting paving stone from the Nova Olinda Member limestone. They find hundreds of fossils every day. Brazilian law does not allow them to sell them, so many simply get thrown onto waste dumps



Double-take A: Mary Anning, a filthy fossil dealer raping Dorset's geological heritage for profit. B: Mary Anning, Heroine of British palaeontology and one of the ten most influential women in British 19th Century science



The Nova Olinda Member limestone (laminated unit at base of quarry face) - one of the most productive horizons for Mesozoic insects anywhere in the World





often with preserved soft tissues.

There are numerous sites (hundreds) where stream beds are littered with concretions, all containing fishes. The only reason that I have not collected them is because I could not carry them all. In ploughed fields on the outcrop of the Romualdo Member, the ground is littered with concretions. Where farmers do not tolerate boulders in their fields, concretions have been piled up, making collecting even easier! I have mapped the Romualdo Member on the southern flank of the Chapada by sitting on a hill and using my binoculars to look for brash-covered fields.

PALAEOKLEPTOPHOBIA

These brash fossils are weathering away, as the tropical climate causes the concretions to break down physically and chemically. Sao Paulo journalist Cristina Amorim, to whom I showed this phenomenon, flatly refused to collect one perfect 3D specimen of *Rhacolepis* (out of hundreds) in a stream-bed at Cajazeiras - in case she got caught with it by the Federal authorities. So we left it - for the next rain storm to flush downstream and smash to pieces. This fear of owning a fossil - palaeokleptophobia - clearly does *so much* to protect Brazil's palaeontological patrimony.

Every day, hundreds of tonnes of fossiliferous laminated limestone are quarried by hand from the Crato Formation. Many eyes see many fossils and, as the fossils have monetary value, quarrymen pop them into little cloth bags and pass them to dealers for a few Reais. What happens if the market disappears? In one quarry near Tatajuba the owner has instructed his workers not to collect, to avoid trouble with the authorities. Instead they are simply tipped from a wheelbarrow down a 10-metre slope, never to be seen again.

One Saturday lunchtime I was at the gate of the stone quarries of the Rio Jacu, about three kilometres south of Nova Olinda. Several of the quarrymen were eagerly awaiting their pay packets and as I rolled up most of them clamoured to show me the fossils they had collected that morning. I was offered an amazing assortment of fossil insects and fishes and began to examine them under the hand lens. Some were exquisite, quite fresh, and with no crude preparation marks.

I was examining a specimen when an man, eager to get his fossil bought before my cash ran out (admissions such as this

have brought me into conflict with Brazilian authorities), thrust a specimen under my nose. I gestured that I would look at it in a moment, but he assumed was waving it away as worthless and threw it as far as he could. Yet from the brief glimpse I had, I could tell it was a stunning beetle: beautifully preserved, and quite rare. This is what happens if the commercial market disappears.

INFLATED

Wildlife is protected because if enough are killed, the species ceases to be. Most people can understand the sense of that. Fossils are already dead. So why are they protected? Most people will say because some are very rare and of scientific value, or that while they are *in situ* they are in context, and hence more useful. But blanket legislation preventing the collecting of fossils helps *make* fossils rare. Many fossils are known from only one example. Stopping people collecting prevents more from being discovered. In fact, were I an illegal fossil dealer with scant regard for the law, I might want things to stay that way, just to keep prices inflated.

'Protecting fossils' criminalises palaeontologists. Laws banning fossil collecting and private fossil collections deter amateur palaeontologists, drive them underground and stifle curiosity. Fossils left in the ground weather away and are lost. Banning commercial collecting loses tax revenue.

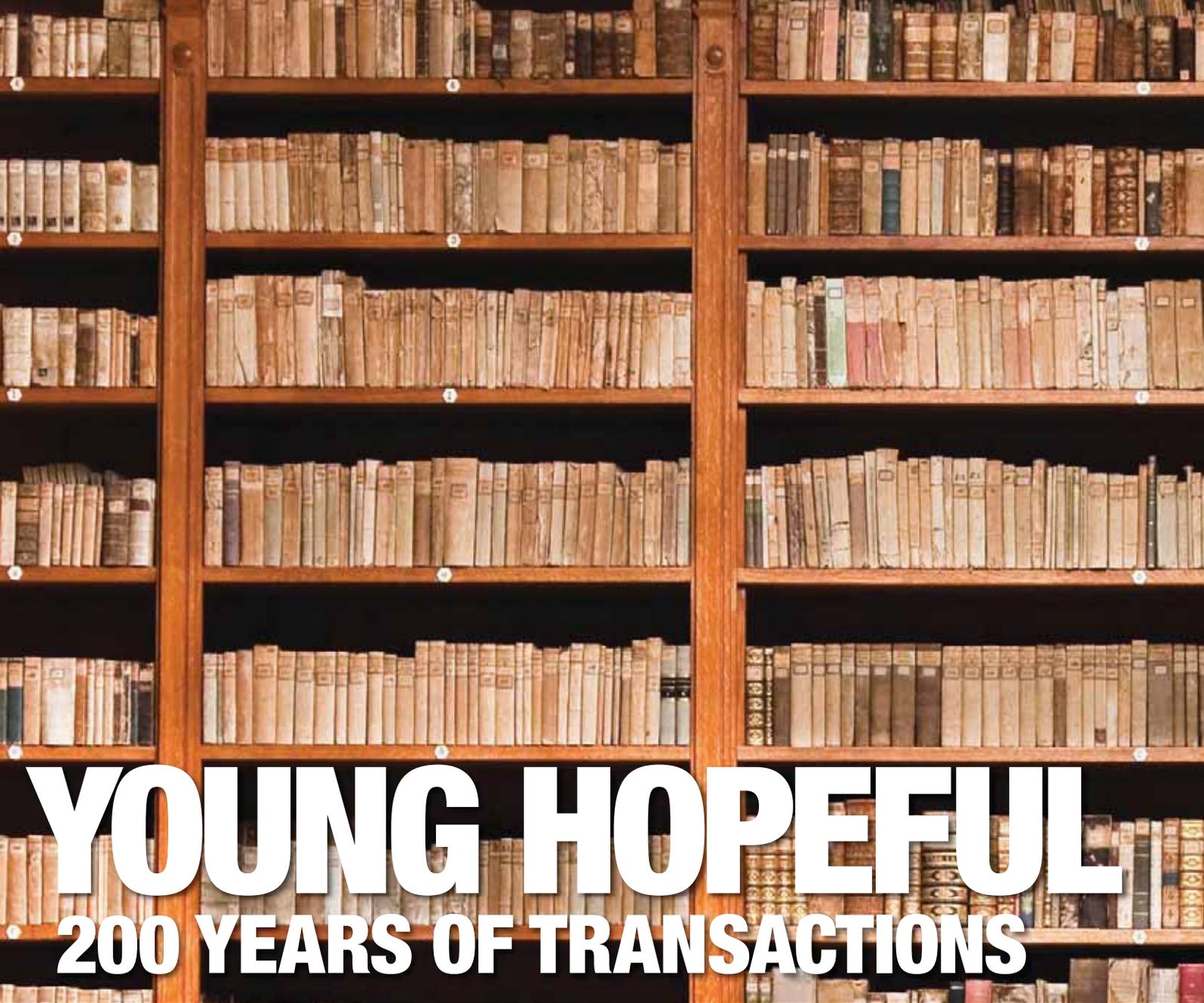
Fossils are for everyone. Most private collections of any merit eventually find their way into a museum, bequeathed or sold into the public domain. They have been hidden for millions of years; we can afford to wait a few more. After all, there is another generation of palaeontologists coming up behind.

May the more enlightened palaeontologists in countries with draconian laws lobby to have them repealed. Then we can all get some science done. ■

* Palaeobiology Research Group, School of Earth and Environmental Sciences, University of Portsmouth, Burnaby Road, Portsmouth PO1 3QL UK E: david.martill@port.ac.uk

REFERENCES

- 1 Letter, *Geoscientist* 21.01 February 2011, p22.
- 2 Martill, D M & Heads S, S 2010: Out of Eden *Geoscientist* 17.11 pp20-24



YOUNG HOPEFUL

200 YEARS OF TRANSACTIONS

Dr Cherry Lewis* marks the 200th birthday of the Society's first serial publication, and recounts some of its labour pains

Following the birth of the Geological Society in November 1807, membership rose rapidly from 13 founders to almost 200 gentlemen by the end of 1809¹. Leonard Horner (1785-1864) and James Laird (1779-1841) were the Society's secretaries and Horner was a hugely enthusiastic geologist, writing to President George Greenough (1778-1855), how he had "seen a rock with the most indubitable proofs in its structure that *four* worlds must have existed before the formation of the present".

He considered this to be "decisive of the truth of the fundamental position of the Huttonian Theory". However,

Above: Publish or perish: the young Society needed to establish itself as a presence on the shelves

Horner felt that unless published, "the results of our labours, their usefulness will be of very limited extent". And so, in another letter to Greenough, dated 4 April 1809, he proposed that the Society consider publishing a journal:¹

"The idea of a periodical work, like the *Journal des Mines* of France, has struck me as very possible, ... [and a] great benefit to this branch of Science. There is nothing of the kind in the country and there is no country where a publication of this kind would be more useful. To do this, however, it would be necessary to have a stock of papers. ..

"[Geology] is a subject studied more and more every day and I am satisfied there are a great many

valuable papers which are only withheld from the public for want of some such publication. With respect to the funds, I would propose that such of the members of the Society who are anxious to promote this object should agree among themselves to run the risk of printing the first number. It might, and indeed ought to be finished in as cheap a manner as is consistent with neatness – an octavo number similar to Nicholson's journal would I think be very suitable, and these you might bring out as often as you have material for ... Should it sell, as I think there is every probability it would, it might prove a very useful addition to the revenue of the Society."



IMPLEMENTED

And so the idea was born, passed by Council and implemented. About 20 members subscribed in order to cover printing costs, on the understanding that they would make five per cent on their investment. The journal had a long gestation; but on 7 August 1811, Horner was finally able to write to Greenough with good news about *Young Hopeful*, as they dubbed it: "My Dear Greenough,

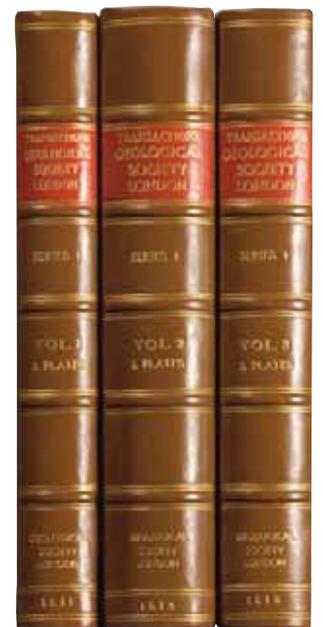
"At length may the hour when *Young Hopeful* will be delivered into the world be declared. Violent throes indicate his approach and in another week I hope my labour pains will cease . . . for they have been violent and incessant. I trust

Right: The first three volumes of *Transactions*, from the Society Library's collection

no accident will happen to it as it issues from the womb, for the whole responsibility now rests with me, my brother Doctor [Laird] having gone to visit his Mother at Weymouth."

Despite the formation of a 'Committee of Papers' to oversee the publication of *Young Hopeful*, Horner and Laird appear to have done most of the work; and it seems likely they were also the editors. Horner's letter continues:

"On Friday last I summoned all the members of the Committee of Papers in town to attend [a meeting] in order to settle the price of the volume. I particularly requested their attendance but no one came but Laird. So we had all to do . . . the volume cannot be ►



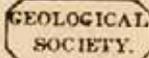
TRANSACTIONS

OF THE

GEOLOGICAL SOCIETY,

ESTABLISHED NOVEMBER 13, 1807.

VOLUME THE FIRST.



Quod si cui mortalium cordi et oculis sit, non tantum inventis habere, atque illi usi, sed ad ulteriora penetrare; atque non disputando adversarium, sed opere naturam vincere; denique non belle et probabiliter opinari, sed certo et intemere scire; tales, tanquam veri scientiarum filii, nobis (si videbitur) se adjungant; et omnia natura astris, quae insidii contriverunt, aditus aliquando ad interiora patiantur.

Necum Organum, Prefatio.

LONDON:

PRINTED FOR THE SOCIETY BY WILLIAM PHILLIPS, GUDFROG-YARD, ABBERS-STRUT.

AND SOLD BY T. LARKE AND W. HAPLES, STRAND.

1811.



I have happily procured in a specimen about four pounds weight. Not to keep you in suspense I shall endeavour to give you an idea of it - I have no time to enter on a subject that would require some study to put in a proper form, so as to be rightly understood - My specimen is taken from one of the rounded masses of a puddingstone rock - itself a puddingstone - both matrix & nodules limestone - the nodules composed of red primitive limestone some of them (distinguished thus ) of coralline limestone the whole intersected by veins of calcareous spar, which divide many of the nodules in two - I leave you to make out the four worlds - these are obvious to every one -



► sold to the Public for less than £2. 0. 0. – we have fixed the price at that and if the 750 copies are sold by the end of four years, there will be a balance in the Society's favour of £117."

In fact, the *Transactions* sold for only thirty shillings (there were 20 shillings to a pound). The 18 papers, accompanied by a separate volume of plates and maps, were predominantly either geological 'sketches' or mineralogical examinations. They were prefaced with five pages of explanation about the Society's origins and objectives, which reveals its members' zeal for this very young science:

"It will be superfluous to enumerate the many advantages which may be derived from Geology: it is sufficient to observe that it offers to scientific research a field of inquiry, rich in the beautiful and sublime productions of nature; and that, practically considered, its results admit direct application to purposes of the highest utility."

Only the paper by James Parkinson discussed fossils. In this seminal publication² Parkinson extols the work of William Smith (1769-1839) – yet to publish his now famous map – insisting that a study of fossils and the strata in which they were found provided information about former worlds in a way that no other geological observation did. He concludes by comparing the strata in the London Basin with those in the Paris Basin, and notes that some of the differences can be explained by the "existence of fresh or salt water lakes, at the period of the drying up of a former ocean. ... But the occurrence of such variations can hardly be considered as interrupting the continuity of the stratification [between the two basins]". These were remarkable deductions at a time when many geologists, including Parkinson, were struggling to come to terms with a new science that challenged their religious beliefs.

Little is known about the immediate success of this first volume, although more than 600 copies sold over the following decades. But in 1834, more than two decades later, Laird wrote to

Left (clockwise from top left): Title page of the first *Transactions*, from the Society Library

The lily ecrinite. Plate XIV from volume 2 (1808) of James Parkinson's *Organic Remains of a Former World*

Extract of a letter from Leonard Horner to George Greenough, 26 May, 1809, with illustration and interpretation of a 'puddingstone' which Horner considered demonstrated the existence of four former worlds

Right: A letter typical of those written by James Laird to George Greenough in the 1830s



Greenough about 113 unsold copies, noting there had been no sales for two years:

"I fear from the tenor of [Caddell's] letter that my not complying with his recommendation to sell our remaining copies of *Transactions* Vol. 1 ... has given rise to some feeling which it was far from my wish to produce. ... I hope that I was justified in declining a sale where the maximum Mr. Cadell led me to hope for was 15s per copy, and the minimum, I presume, left open for the moment of sale to decide."

NO DISCOUNT

He also refused to allow new members to buy the volume at a discount: "I cannot see how our recent members should expect to get at a guinea what in common with all our members I paid 30/- for, [and] I do not think it would be right to divide the unsold copies among the subscribers and their representatives", half of whom were already dead.

Nevertheless, Laird recognised that geology had moved on significantly during those 23 years: "Our first volume is interesting as shewing the very imperfect state of Geological Science at the commencement of our Society's proceedings". And as he closed his letter to Greenough, he wistfully recalled those early days: "When I

revisit London it will be to me a great pleasure to be permitted to resume the friendly habits which prevailed in our relations as President and Secretary, ... and to rejoice with you in the great prosperity of the Society".

Today, a first volume of *Transactions* will set you back around £1000. Take a look at it sometime; you can find the real thing in the Society's library, or a PDF at Google Books which you can download free.

I don't imagine Laird would have approved. ■

*Honorary Research Fellow, Department of Earth Sciences, University of Bristol
Cherry.lewis@bristol.ac.uk

REFERENCES

- 1 Lewis, C L E 2009. Doctoring geology: the medical origins of the Geological Society. In: Lewis, C. L. E. & Knell, S. J. (eds). *The Making of the Geological Society of London*. The Geological Society, London, Special Publications, 317, 49–92.
- 2 All letters in this article quoted with kind permission: The Greenough Papers (AD7981), UCL Library Services, Special Collections.
- 3 Parkinson, J 1811: Observations on some of the Strata in the Neighbourhood of London, and on the Fossil Remains contained in them. *Transactions of the Geological Society*, 1, 324–354.

► *Geoscientist* welcomes readers' letters. These are published as promptly as possible in *Geoscientist Online* and a selection printed each month. Please submit your letter (300 words or fewer, by email only please) to ted.nield@geolsoc.org.uk. Letters will be edited. For references cited in these letters, please see the full versions at www.geolsoc.org.uk/letters

VOLCANOES AND INNOCENCE



Sir, Your Editorial and piece by Colin Summerhayes (*Geoscientist* 21.08) contained comment and uncalled-for hyperbole that were partial in the extreme. It would have more even-handed to also refer to 'Volcanic Carbon Dioxide' (Tim Casey – May 2010) which addresses this issue directly.

There is no CO₂ fingerprint that identifies anthropogenic carbon dioxide from that produced by volcanism. So how can they be measured accurately as was unequivocally implied in your respective critiques? Secondly the Summerhayes summary of Terry Gerlach's EOS paper cites the usual 'friendly' references (IPCC, Plimer & Gerlach) all known AGW proponents.

Gerlach's paper does not support the previous IPCC data. Human activity was said to contribute seven gigatons of CO₂ per annum within a four-yearly life cycle (28 gigatons) - the EOS paper now claims 35

gigatons for 2010 alone! Previously agreed natural outputs from volcanoes, organic decay and ocean outgassing was 97% of the atmospheric total. Gerlach now claims this is 0.44 gigatons or 1%. Again Gerlach's EOS paper cites like-minded references with not a hint of objectivity from other papers on this issue whereas Casey refers to Gerlach in depth.

Finally, the EOS paper concludes that we live in a time of volcanic quiescence and therefore anthropogenic outputs are said to far exceed volcanic outgassing of carbon dioxide. On the other hand, as we geologists know due to the fluid nature of the Earth's surface and observable heat loss, outgassing of CO₂ gas occurs continuously from oceanic fault lines and across volcanic regions even when volcanoes and vents are dormant or quiescent.

John G Gahan

Sir, When I wrote my letter of 1 April 2010 in support of fellow sceptics such as Cliff Ollier and Ian Plimer, I had not realised the extent to which the Society has been taken over by global warming alarmists. Your September cover headline (*Geoscientist* 21.8) confirmed my worst fears. Ian Plimer¹ considers not only CO₂ but also chlorofluorocarbons (CFCs). He

cites evidence² that volcanoes such as Mt Pinatubo emit "very large quantities of CFCs, the gases that destroy the ozone layer". I trust that Professor Plimer would not have misrepresented this paper. In editorial you conclude, "It's time to own the gas". Whether you mean CO₂ or CFCs, I beg to differ. (Name & Address Supplied)

Colin Summerhayes replies: With regard to Gerlach's paper on volcanic CO₂ emissions, I note that Mr Gahan writes: "the usual friendly references (IPCC, Plimer, Gerlach) all known AGW proponents". Leaving aside the IPCC, Plimer is a prominent AGW sceptic, while Gerlach is a well known expert on volcanic gases.

Mr Gahan goes on to note that annual human emissions were said to contribute seven gigatons of CO₂ per annum, and contrasts that with the 35 gigatons (for 2010) mentioned in Gerlach's paper. I am sorry to have to point out that Mr Gahan is confused. The 'seven gigatons' refers to emissions of carbon, not CO₂; Seven gigatons of carbon would give us about 26 gigatons of CO₂. That was the human output of carbon in the late 1990s. We are now up to nine plus gigatons of carbon per

year, which explains Gerlach's 'human emissions' figure of 35 gigatons (multiply C by 3.67 to get CO₂).

Mr Gahan then goes on point us to a blog by a Mr Tim Casey. Mr Casey describes himself as a consulting geologist, but does not admit to being an expert on volcanic gases, unlike Dr Gerlach. It begins: "A brief survey of the literature concerning volcanogenic carbon dioxide...". Could we not accept that experts are more likely to be right than part-time bloggers carrying out "brief surveys"?

If we are not to believe Gerlach, then how about Marty and Tolstikhin¹ or Williams et al.,²? These experts have published comprehensive studies agreeing that volcanic emissions worldwide provide only a tiny fraction of the total amount of CO₂ entering the atmosphere annually.

COGNITIVE DISSONANCE

Sir, Neil Chapman, Julia West and Jordi Bruno are spot-on in seeing commonality between the problems of disposing of both radioactive waste and carbon dioxide underground. They are also right to highlight the urgency of any action to do the latter (if it is to be done at all). The reasons for my scepticism are twofold. First, it is technically questionable – let alone morally – to plan to dispose of such waste. Second, disposing of carbon dioxide underground is a device to make the dirty burning of coal seem clean – treating the symptoms of a problem rather than tackling the cause.

Martin Lack

Martin Lack writes the blog: Lack of Environment - a truly biospheric blog on the politics of the environment.

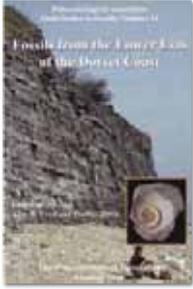
THORNTON UNEARTHED

Sir, I enjoyed reading about Richard Thornton's contributions to African geology and Livingstone's Zambezi Expedition. Readers may be interested to know that Thornton's grave in the Shire Valley was 'rediscovered' in the 1960s. Appropriately this fell to an English geologist carrying out systematic mapping for the Geological Survey of Malawi! I was shown the grave in the early 1970s during a secondment from BGS. By that time the grave had been adopted by the Malawian authorities, and a headstone with an explanatory inscription erected. Perhaps another reader may know whether it is still being tended?

Peter Bennett



► All references cited above may be inspected in the Online version www.geolsoc.org.uk/letters



Fossils from the Lower Lias of the Dorset Coast

Lyme Regis and adjacent coast are among the most famous fossil localities in England. Two centuries of collecting have yielded numerous spectacular ammonites, vertebrates and other fossils of high scientific importance and often of great beauty. Amazingly, this is the first relatively comprehensive account of the fossils of this area. 28 specialists cover almost every group, from trace fossils and foraminiferids (not exactly field fossils!) to coprolites and dinosaurs. Several hundred species are described and illustrated on 78 high-quality plates, with many important specimens adequately illustrated for the first time.

I was, however, disappointed by the ammonite chapter. It is a comprehensive summary, but with some quite common species illustrated by rather poor specimens. These compare unfavourably with the well-preserved and well-prepared specimens offered for sale and in some museum collections (and in some cases I can collect better specimens in an hour on the beach).

A chapter on 'previous palaeontological work' provides interesting non-geological information on prominent Victorian and later collectors, including Thomas Hawkins (with 'a serious but mysterious personality disorder') and the Earl of Enniskillen; the British Museum deducted £25 from their payment for his collection for specimens thrown into a river en route by thieves! The chapter surprisingly omits more recent prolific collectors such as J W Jackson and Martin Foster, and recent important finds.

A 'promotional' chapter on the Jurassic Coast World Heritage Site sits slightly uneasily; very remarkably it does not cite The Collecting Code, the aspect most relevant to this book (see www.jurassiccoast.com). A glaring weakness is the effective absence of a lithostratigraphic framework (only 3 ½ pages, compared to 17 pages of ammonite biostratigraphy). W D Lang's bed numbers are cited throughout the book, and related

minutely to ammonite biostratigraphy, but there is only the briefest lithological summary and no outcrop maps. Reference is made to relevant publications, but one is stated to be out of print, and that cited for 'good summary sections' costs £90 - this is not the way to encourage stratigraphically constrained collecting!

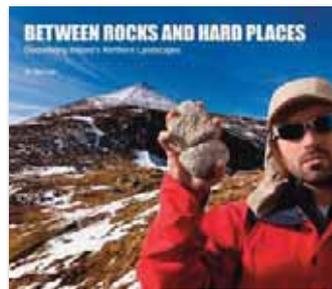
Production quality is mostly high, but a number of minor errors in the text, and one poor figure, suggest haste in the final stages of production. This is however much more than a field guide. Despite imperfections it is essential for anyone interested in Lower Jurassic palaeontology.

Reviewed by Chris King, Bridport

FOSSILS FROM THE LOWER LIAS OF THE DORSET COAST - FIELD GUIDES TO FOSSILS NO. 13

ALAN R LORD AND PAUL G DAVIS (eds), Published by: The Palaeontological Association 2010, ISBN: 978-1-4443-3774-7 436 pp

List price: £18.00, www.palass.org



Between Rocks and Hard Places

The northern part of Ireland, despite being only a portion of a small island, boasts a wide range of rock types and wide variety of fascinating landforms and scenery. Lyle has already written about the north of Ireland in the classic *Geology of Europe* series. GSNI has updated *The Geology of Northern Ireland*, and one third of Holland's 2003 *The Irish Landscape - A scenery to celebrate* was justifiably devoted to the north of Ireland. Albeit fascinating, do we need another book on the geology of this area?

Between Rocks and Hard Places came as a pleasant surprise, in part because of its size - small 'coffee-table' 27cm x 30cm. I had been expecting something that might fit in the glove compartment, so while it might not be useful on a trip, it certainly is worth consulting for planning. The casual reader can open at any page and enjoy the mythology and geology or skim through the marvellous photographs. Most pages have illustrated information boxes labelled "Mythology and Geology" or

"Did you know?" with items of applied geology. The book lives up to its dust-jacket hyperbole: "there has been no Earth Science book like this on the island of Ireland".

The format allows for large, high quality colour photographs, carefully selected to enhance the prose, which is aimed not just at geologists but also at a wider readership. The main areas of the northern landscape ('northern' is used in the geographical sense, three extending into the Republic) are reviewed and placed in the context of the plate tectonic evolution of the island, with analogies from present-day plate margins and processes. The chapter on forces that shaped the landscape - especially Tertiary volcanic eruptions and ice ages - provides a delightful precursor to the arrival of humans and their interactions with the landscape. Archaeology and anthropology are viewed from a geological perspective. Settlers started to change the landscape through farming, with the rocks supplying the raw materials for tools and early monuments and dictating their location. Now in the 21st Century the Tellus Project is helping to identify natural resources, but at the same time the environment must be managed and protected.

So sure am I that this delightful and thoroughly enjoyable book will appeal to a wider readership, that I have ordered copies for the friends who have provided hospitality during my many visits to Ireland so that they too can further appreciate their northern landscapes.

Reviewed by Brendan Caulfield, Kew, Surrey

BETWEEN ROCKS AND HARD PLACES: DISCOVERING IRELAND'S NORTHERN LANDSCAPES

PAUL LYLE, Published by: Geological Survey of Northern Ireland 2010, ISBN: 978-0-337-09587-0 (hbk) 120 pp

List price: £16.99,

www.betweenrocksandhardplaces.com

REVIEWS: COPIES AVAILABLE

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.

- **Thermodynamics of the Earth and Planets**, Douce, A P (2011), Cambridge.
- **Planetary Surface Processes**, Melosh, H J (2011), Cambridge.
- **Earth in 100 Groundbreaking Discoveries**, Palmer, D (2011), Quercus.
- **The Geological Interpretation of Well Logs (3rd Edition)**, Rider, M & Kennedy, M (2011), Rider-French.

PEOPLE

► Geoscientists in the news and on the move in the UK, Europe and worldwide

CAROUSEL

All fellows of the Society are entitled to entries in this column. Please email ted.nield@geolsoc.org.uk, quoting your Fellowship number.

MARTIN WHITEHOUSE



Martin Whitehouse, senior research fellow, Director of NORDSIM (Swedish Museum of

Natural History) and adjunct Professor, Stockholm University, has been elected as a foreign member of the Royal Swedish Academy of Sciences.

Sheila Meredith, Chief Librarian, retires

Sheila Meredith, Chief Librarian, has announced that she will be retiring at the end of this calendar year.

Sheila, who worked previously at Goldsmiths, University of London, joined the Society staff as successor to Mrs Nutt in 1987. She told *Geoscientist*: "When I arrived there was just one computer - which no one used - and an incomplete card catalogue of our holdings. In the ensuing years the Library has spread into more rooms and we have entered the electronic age, with all our collections listed in

our online public access catalogue and we are now totally reliant on the internet".

Sheila plans to join U3A, redecorate and go travelling - to such far afield



places as Kwa Zulu Natal. Messages and donations should be addressed via **Wendy Cawthorne**, Senior Assistant Librarian, at the Society E: wendy.cawthorne@geolsoc.org.uk

IN MEMORIAM WWW.GEOLSOC.ORG.UK/OBITUARIES

THE SOCIETY NOTES WITH SADNESS THE PASSING OF:

Allen, Anthony William*
Anderson, Michael M *
 Carmichael, Ian Stuart Edward
Dickinson, John Hawthorne
 Edwards, Wilfrid Thomas*
Humphreys, Adrian *

Kwolek, Julian Kenneth*
 Oates, Francis *
Price, Ivor C*
 Uko, Suzuki*
Young, Roger Andrew*

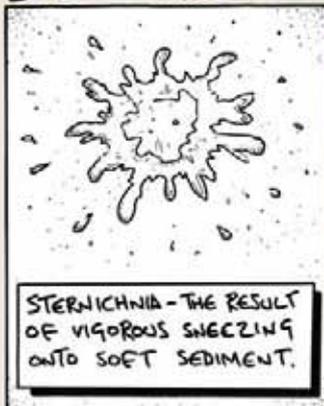
In the interests of recording its Fellows' work for posterity, the Society publishes obituaries online, and in *Geoscientist*. The most recent additions to the list are in shown in bold. Fellows for whom no obituarist has yet been commissioned are marked with an asterisk (*).

If you would like to contribute an obituary, please email ted.nield@geolsoc.org.uk to be commissioned. You can read the guidance for authors at 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 at www.geolsoc.org.uk/obituaries

STICKS AND STONES - REJECTED TRACE FOSSIL CLASSIFICATIONS.





HELP YOUR OBITUARIST

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

DISTANT THUNDER

Water works

Nina Morgan discovers that in the search for truth you sometimes have to dip your toes in the water

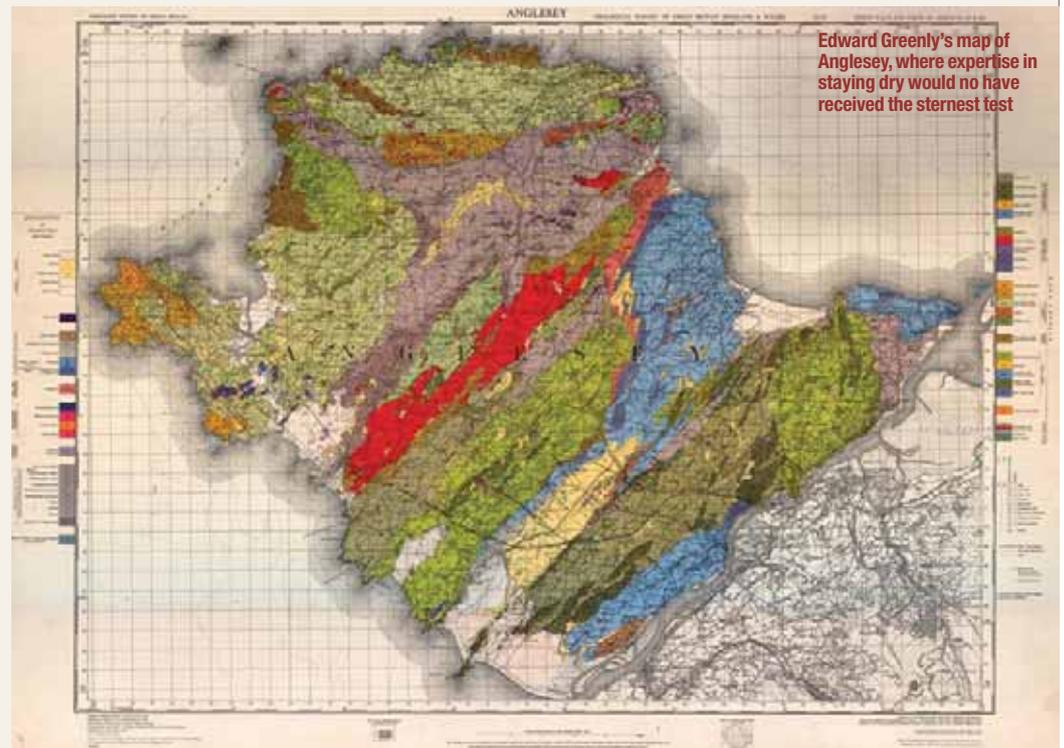
As surely as omelettes mean broken eggs, so you can't expect to do fieldwork without getting your feet wet – at least some of the time. Edward Greenly (1861–1951), a geologist who enjoyed a long and eventful career in the Geological Survey (which included a spell in the late 19th Century mapping alongside Benjamin Peach and John Horne in the NW Highlands) recalled a clever method of dealing with water in the wilds in his book *A Hand through Time*.

"The two chief obstacles, in Strath-na-Sheallag" he wrote, "were the rivers and the distances". (Interestingly, midges are not mentioned.) He further noted how "the men of the glen used to surmount the first by fording the rivers upon stilts." Unfortunately, this method didn't suit Greenly, who – after "one or two humiliations" – turned to "a more excellent way" of fording rivers – on a pony. Less exciting, perhaps, but at least he kept his feet dry.

MILLER'S TALE

The self-taught geologist and prolific writer Hugh Miller (1802 – 1856) was obviously made of sterner stuff – or at least, more waterproof material. Miller had no hesitation in getting his feet wet when

Right: Edward Greenly (1861–1951)



Edward Greenly's map of Anglesey, where expertise in staying dry would no have received the sternest test

he was on to some interesting geology. "Oftener than once", he recalls in *The Cruise of the Betsey*, he simply dived in and swam off with "my hammer in my teeth, and with my shirt and drawers in my hat," in search of fossils. But even Miller was defeated when, having discovered Plesiosaur bones near the Bay of Laig on the northern coast of the Isle of Eigg, it came to swimming through a "a tall brown forest of kelp and tangle, in which even a seal might drown" to try to "discover the bed from which they had been detached".

Discretion being the better part of valour, Miller reasoned that it was best, "... on the whole that the discoveries I had already made should be recorded, than that they should be lost to geology, mayhap for a whole age, in the attempt to extend them." Sensible advice!

ACKNOWLEDGEMENT

The sources for this vignette include *A Hand Through Time: Memories – Romantic and Geological; Studies in the Arts and Religion; and the grounds of Confidence in Immortality*, by Edward Greenly, (published in 2 vols) Thomas Murby & Co. 1938, and *The Cruise of the Betsey*, or *A Summer Holiday in the Hebrides with Rambles of a*

Geologist or Ten thousand Miles Over the Fossiliferous Deposits of Scotland by Hugh Miller, first published by Thomas Constable and Co., Edinburgh 1857 (and later editions)

► 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 website at www.geolsoc.org.uk/hogg where the programme and abstracts from the Conference on Geological Collectors and Collecting are available as a pdf file free to download.

* **Nina Morgan** is a geologist and science writer based near Oxford.

OBITUARY



BRUCE WILCOCK 1927-2011

Former Assistant Secretary of the Geological Society of London, and Editor

Bruce Wilcock, a long-standing Fellow and former Assistant Secretary and Editor of the Society, died peacefully in his sleep following scoliosis on 2 August 2011, aged 83.

Bruce was born on 26 November 1927 and as a schoolboy (early in WW2) returned from evacuation eventually to join the SE London Emergency Secondary School in Lewisham, London. There he came under the influence of one of the teachers Dr H A Baker DSc, a former Government Geologist to Newfoundland. On leaving school and after industrial experience he proceeded to read Geology at Chelsea Polytechnic (as it then was),

graduating with a BSc (Hons) London, with ancillary Chemistry and Physics, in 1953.

As a senior student, he was elected a Fellow of the Society on 26 November 1952, his application signed by W F Fleet, (Head of Department), W E Smith and Judith Cohen, all staff at Chelsea. He had an interest in cartography and design and worked first as an Information Scientist at the British Iron and Steel Research Association (BISRA) headquarters.

Pending the retirement on 30 April 1961 of Arthur Greig, in post for many years, Wilcock was appointed Assistant Secretary and Editor (Designate) on 13 February 1961, taking up full office (now styled 'Executive Secretary')

on 1 May 1961. Under the then rules, he had to relinquish his Fellowship, regaining it on leaving the Society's employ. While in post Bruce served under Presidents S E Hollingworth, O M B Bulman and F W Shotton; Secretaries J M Edmonds, P A Sabine and W B Harland; Treasurers P Evans and W Bullerwell; and Foreign Secretaries O T Jones and O M B Bulman. (In those days Secretaries, two in number, overlapped for a few sessions to ensure continuity).

Bruce was of course closely involved with all aspects of the Society's administration; but throughout his period in post many developments took place, some of which would come to fruition after he had left. In all of these he worked closely with the Officers and with the numerous standing committees (about 10 in number) that reported to Council, and frequently played a dominant role. He commented on some aspects of these activities in recent years in *Geoscientist*, and in a fuller paper in the History of Geology Group Newsletter.

Major new matters during this time were the expansion of the accommodation in Burlington House following the departure of the Royal Society, the institution of a preliminary 'straw poll' for Council, the first Society meetings outside London, the establishment of the Volcanic Studies Group, and especially the Engineering Group, which had an important effect upon the scope, expansion and finances of the Society, and the

publication of the 'Phanerozoic Time Scale' - a prototype for the Special Publications series.

The far-sightedness of the Society in setting up the Engineering and other specialist groups was especially praised by R Glossop in his comprehensive foreword to the 25th anniversary publication of the *Quarterly Journal of Engineering Geology*.

Bruce resigned in May 1966 to join the Clarendon Press (Oxford University Press) as editor for sciences in Oxford. The form to confirm his re-election as a Fellow of the Society on 12 October 1966 was signed by W B Harland, W Bullerwell, J Sutton, P A Sabine (all officers), J A Farnaby and A Greig. He was later elected to the Society Club.

In retirement he was much concerned with the *Oxford Companion to the Earth* (OUP, 2000) and also with the Oxford University Press series on the Birds of the Western Palaearctic.

Bruce was a man of charming presence who had a delightful sense of humour, as evidenced by his contribution to the *History of Geology at Chelsea* (Blundell 2005). He leaves the Geological Society very much in his debt. Bruce is survived by his widow Anne, a son and three grandchildren.

► By Peter Sabine with thanks to Anne Wilcock, Professor Derek Blundell and Wendy Cawthorne





ENDORSED TRAINING/CPD

Course	Date	Venue and details
Introduction to Contaminated Land Management	5 October-9 November	Venue: Nottingham. This series of courses is directed at all those working for Local Authorities and consultancies who wish to improve their understanding of the fundamental subject matter relevant to land contamination issues. Land Quality Management Ltd T: 0115 951 8030 F: 0115 967 8798 E: administrator@lqm.co.uk W: www.lqm.co.uk
Choosing and Interpreting Soil Test	1 November	This course is intended for engineers who are involved in the design process or day to day site construction activities and need to understand ground investigation information, and be aware of ground condition risks. Contact: Sue Chatfield E: admin@symmonsmdage.co.uk W: www.symmonsmdage.co.uk
Ground Conditions - Identification and Interpretation	1 November	This course covers the basic principles of ground investigation techniques, explanation of factual data, interpretation of information, and design and construction application. Contact: Sue Chatfield E: admin@symmonsmdage.co.uk W: www.symmonsmdage.co.uk

DIARY OF MEETINGS NOVEMBER 2011

Meeting	Date	Venue and details
Geology and Medicine HOGG	1-2 November	Venue: Burlington House, Hunterian and Oxford Museums. Contact: Dick Moody E: rtj.moody@virgin.net; Chris Duffin E: cduffin@blueyonder.co.uk
Environmental and Geoscience Careers Evening Southern Wales Regional CIWEM	3 November	Venue: Viriamu Jones Gallery, Main Building, Cardiff University, CF10 3AT. Contact: Maria Clarkson E: swales.rg@geolsoc.org.uk
The London Basin Forum South West Regional	8 November	Venue: The Bell Inn, Godstone, Surrey RH9 8DX. Speaker – Mike DeFreitas. Time: 6pm for 6.30pm Contact: Ron Williams T: 01737 553740 E: rew182@btinternet.com
Founders' Day Lecture and Dinner 2011 Geological Society	10 November	Venue: Burlington House & Le Meridien. Speakers: Iain Stewart and Nick Petford. Contact: Georgina Worrall T: 020 7434 9944 E: georgina.worrall@geolsoc.org.uk
Frontiers Meeting 2011: The coupling between tectonics and surface processes, Geological Society	14 November	Venue: Burlington House. Contact: Georgina Worrall T: 020 7434 9944 F: 020 7494 0579 E: georgina.worrall@geolsoc.org.uk
Elland – Emergency Slope Remedial Works Northern Regional	15 November	Venue: Central Square, Newcastle Upon Tyne. Speaker: David Peck, Arup. Time: 17:30 for 18:30. Contact: Chris Wooff E: northernregiongeolsoc@gmail.com
Modelling to support the Water Framework Directive and integrated catchment management Geological Society, Groundwater Modellers' Forum	15 November	Workshop. Venue: Burlington House. Booking form online. Contact: Paul Hulme E: paul.hulme@pjhydro.co.uk
Scottish Minerals in the 21st Century Central Scotland Mining Institute Scotland	15 November	Venue: British Geological Survey, Murchison House, Edinburgh. Register Online. Contact: Steve Whalley E: steve.whalley@geolsoc.org.uk
2011 Fred Sherrell Award incorporating AGM South West Regional	16 November	Venue: Ley Arms, Kenn, Near Exeter. Followed by AGM. Buffet at 18.30; 19.00 meeting. Contact: Cathy Smith E: swrg@geolsoc.org.uk
New Hydrocarbon Development Challenges and the Impact on Geoscience Research, Shell London Lecture	16 November	Venue: Burlington House. See details P.09
Young Geoscientists Group Careers Evening 2011 Solent Regional	17 November	Venue: National Oceanographic Centre, University of Southampton. Time: 1700. Contact: Karen Allso T: 023 80817500 F: 023 880817600 E: karen.allso@gifford.uk.com
GSL Training Scheme and Chartership Accreditation Talk; 10th Anniversary Dinner, Hong Kong Regional	17, 18 November	17th: Talk. Venue: GEO, CEDD Time: 18:30-20:30 Speaker: Bill Gaskarth. 18th: Dinner. Venue: Hong Kong Football Club, Happy Valley. Time: 18:30-23:00, in the presence of David Shilston (President Designate, Guest Speaker) and Bill Gaskarth (GSL). Contact: philippa.halton@atkinglobal.com
Assessment and Remediation of Ground Gas Thames Valley Regional	22 November	Venue: Royal Holloway, Egham. Speaker: Hugh Mallett Time: 18.30 for 1900. Contact: Alex Carbray E: alexcarbray@hotmail.com
Carbon Capture and Storage, Geological Society AAPG	22-23 November	Venue: Burlington House. Register Online. Contact: Georgina Worrall T: +44 (0)20 7434 9944 E: georgina.worrall@geolsoc.org.uk
Edinburgh Careers Day, Geological Society Petroleum Exploration Society of Great Britain, Earth Science Scotland community	23 November	Venue: Our Dynamic Earth, Edinburgh. Contact: Ellie Duncanson-Hunter T: 020 7434 9944 E: ellie.duncanson-hunter@geolsoc.org.uk
Model Fusion Conference, Geoscience Information Group	28-29 November	Venue: Burlington House. Contact: Model Fusion Conference E: abstract-submission@Model-Fusion.org W: www.model-fusion.org



What is the Lyell Collection?

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New Developments for 2011

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All Lyell collection titles will have migrated to HighWire Press' enhanced hosting platform, benefits include:

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New titles

Two new journal titles launched on the Lyell Collection in 2010 will be included for all 2011 subscribers to Lyell Collection Complete (LCC):

- Journal of Micropaleontology
- Petroleum Geoscience

In addition, two new archival titles will be launched on the Lyell Collection in 2011 and made available to LCC subscribers at no additional charge:

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Adventurous geologist who made perilous expeditions in search of oil and enthused his students with his passion for discovery.

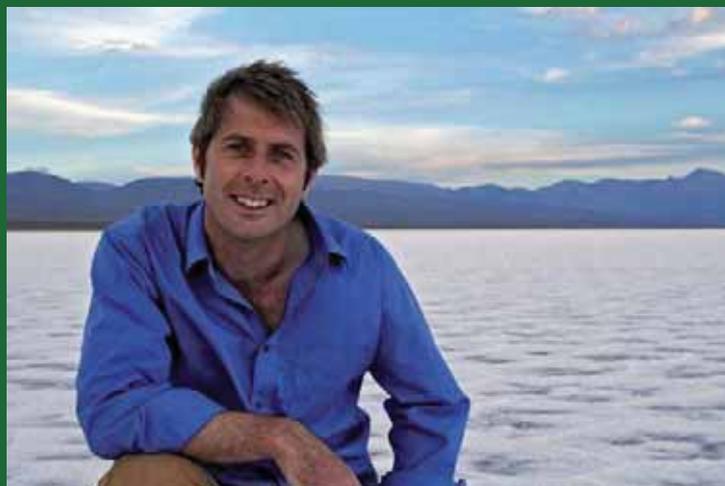
(The Times, Newspaper, 17 October 2008)

PES GB Stoneley Lecture Series

The PESGB are proud to announce the next lecture and date to continue our Stoneley Lecture Series in memory of Professor Robert Stoneley.



Date for your Diary



We have pleasure in announcing that Professor Iain Stewart will be the speaker at the next Stoneley Lecture.

To be held on Tuesday 13 March 2012, at Central Hall, Westminster, London.

Iain Stewart is professor of Geoscience Communication at the University of Plymouth.

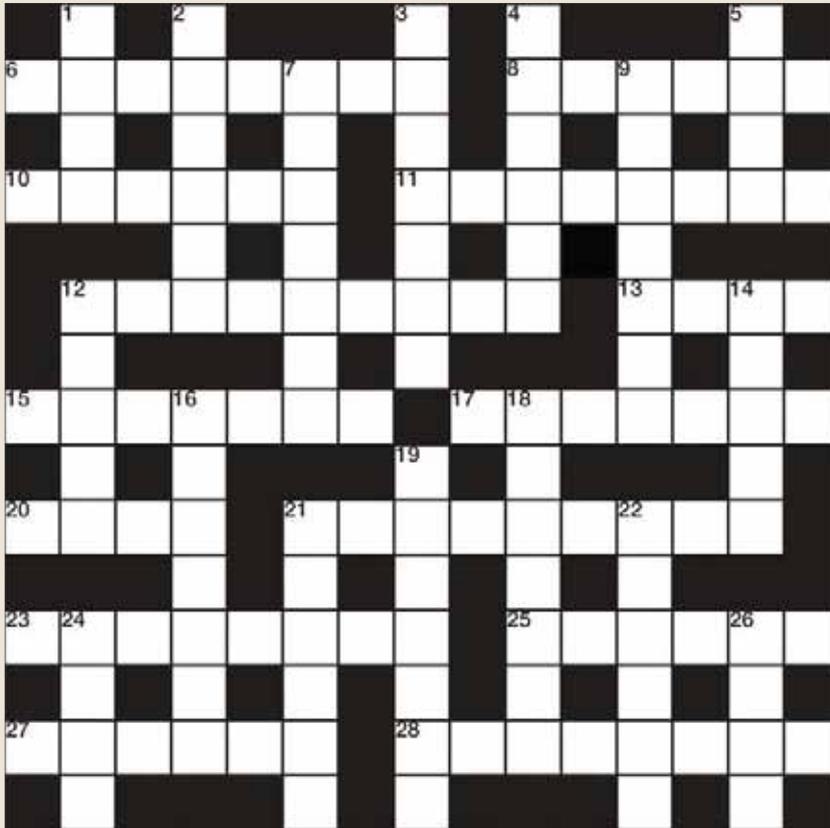
He is also a television and radio presenter, and has worked on a variety of programmes such as 'Journeys From the Centre of the Earth', 'Earth: The Power of the Planet', 'Hot Rocks', 'The Climate Wars' and 'How Earth Made Us'.

His more recent work includes; 'Making Scotland's Landscape', shown on BBC One in late 2010 and; 'Men Of Rock', a television series about pioneering geologists in Scotland.

for more information: www.pesgb.org.uk

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CROSSWORD NO. 152 SET BY PLATYPUS



ACROSS

- 6** Hydrated aluminosilicate minerals (8)
- 8** Ship or plane turning about a vertical axis (6)
- 10** Single animal units of a colony (6)
- 11** Developing gradually - or more likely punctuatedly - through time (8)
- 12** Before its proper time (9)
- 13** Straight edge - regulation that in Physics (or Cricket) would probably be a "law" (4)
- 15** Fused ash in a furnace (7)
- 17** Gorgeous Mississippian valley (7)
- 20** Oil producing nations' cartel (1,1,1,1)
- 21** Property exhibited by some elements of existing in several different molecular forms (9)
- 23** Aped (8)
- 25** Conducting vessels in vascular plants (6)
- 27** Internal tubing system possessed actually by certain animals and figuratively by the Earth (6)
- 28** Rocking motion of an axis of rotation (8)

DOWN

- 1** Nix, nada, zilch (4)
- 2** Most recent European orogenic episode (6)
- 3** Bony (7)
- 4** Initial cell formed by fusion of male and female gametes (6)
- 5** Biblical speller who wished to avoid 4 down (4)
- 7** With a written will (7)
- 9** Had second thoughts (7)
- 12** Coralline 10 across (5)
- 14** Of soil containing abundant organic matter (5)
- 16** Monoclinic polymorph of kaolinite (7)
- 18** Region of anomalously high geothermal heat-flow (3,4)
- 19** Action of a mass moving downslope under gravity (7)
- 21** Highly feldspathic sandstone (6)
- 22** Smartie-shaped (6)
- 24** Any old core element (4)
- 26** Small, riverine island (4)

WIN A SPECIAL PUBLICATION

The winner of the September Crossword puzzle prize draw was **Dr Keith Duff of Stamford.**

All correct solutions will be placed in the draw, and the winner's name printed in the February 2012 issue. The Editor's decision is final and no correspondence will be entered into. **Closing date - November 28.**

The competition is open to all Fellows, Candidate Fellows and Friends 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 scan the signed form and email it as a PDF to ted.nield@geolsoc.org.uk

Name

Membership number

Address for correspondence

Postcode

SOLUTIONS SEPTEMBER

- ACROSS:**
6 Lewisian **8** Uplift **10** Gluten **11** Ediacara
12 Damascene **13** Eyot **15** Bromide
17 Amanita **20** Gyre **21** Confluent **23** Denature
25 Spinel **27** Chasms **28** Theology
- DOWN:**
1 Peel **2** Diatom **3** Integer **4** Pumice **5** Afar
7 Ionised **9** Lectern **12** Damascene **14** Octet
16 Maenads **18** Molasse **19** Injects **21** Causse
22 Edible **24** Echo **26** Ergs

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Abstracts of suitable papers should be sent no later than 16th December 2011 to:

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Email: helen.floyd-walker@geolsoc.org.uk
Tel: +44 (0) 1225 445 046 Fax: +44 (0) 1225 442 836

Authors will be contacted in late-January 2012 to confirm the suitability of their abstracts. For those deemed suitable, full papers should then be prepared in accordance with the normal QJEGH Guidelines: http://www.geolsoc.org.uk/qjegh_authorinfo

And submitted for review (<http://qjegh.allentrack.net/>) no later than 30th June 2012.





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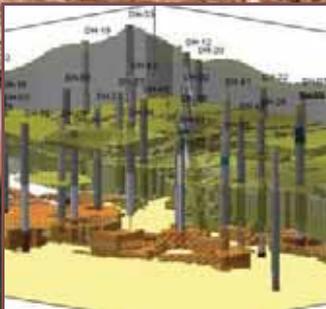
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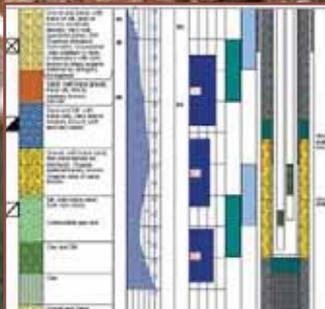


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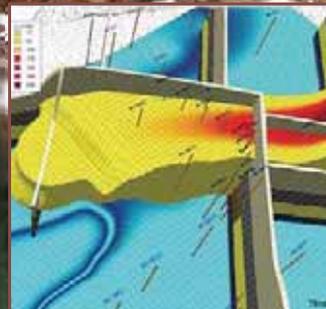


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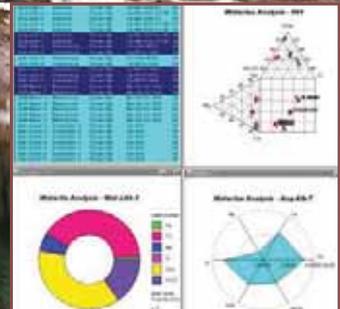
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