

Geoscientist

The Fellowship magazine of The Geological Society of London | www.geolsoc.org.uk | Volume 23 No 1 | February 2013

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early and often

HONG KONG MAPPING

Military geology in World War II



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Making the Himalaya: Oozing, squashing or sliding?

17 FEBRUARY Matt Kohli (Bain State University)

As well as being Earth's highest mountain range, the Himalayas, the collision between India and Asia has caused the collision between geologists about how continental crust has been sliding past each other. Matt Kohli will look at the various models for how the middle of the mountain range, the 'backbone' like the Himalayas, developed and how it has changed. He will discuss the different models of continental plate tectonics and how they can be used to understand the Himalayas and the Tibetan Plateau.

Time:
Friday 17 February 2012

Time:
The lecture will begin at 10am and finish at 11am. There will be a 15-minute break at 10:45am. The lecture will be held in the Lecture Theatre, which will be held in the afternoon. Please see the website for more information.

Venue:
The Geological Society of London, Burlington House

For further information please contact: Emma Darnley, Events Coordinator, The Geological Society, Burlington House, Piccadilly, London W1J 0BT. Tel: 020 7647 4800. Email: emma.darnley@geological.org.uk







Registration Open

Microbial Carbonates in Space and Time: Implications for Global Exploration and Production

19-20 June, 2013
The Geological Society, Burlington House, Piccadilly, London

Organising Committee:

Gemma Vining
Senior Lecturer

Kate Goldstein
Water Institute

Dill Morgan
Lecturer

Alan Rose
Royal Holloway University of London

Alan H. Hirst
Royal Holloway University of London

Francis Le Tissier
Royal Holloway University of London



Microbial carbonates occur globally throughout the rock record, from the Precambrian to the present day. They constitute principal reservoirs of the recent growth of offshore oilfields. Reservoirs derived from microbial activity are the targets of the growth play offshore Angola. Reservoirs derived from microbial activity are also the targets of the growth play offshore Angola. Reservoirs derived from microbial activity are also the targets of the growth play offshore Angola.

Over the 2 days conference we invite geologists, petrophysicists, geochemists and petroleum engineers to examine challenges in exploration, appraisal and production associated with microbial carbonates in some key fields. The rock record is extensive.

Key themes to explore include:

- Marine vs. non-marine microbial facies and textures
- Reservoir characteristics:
 - o Scaling up - from microbial processes, textures to facies and geobodies
 - o The nature of evaluation - indicators in data acquisition and evaluation
 - o Reservoir scale versus imaging and data interpretation
 - o Diagenesis and preservation
- Reservoir and production:
 - o Why this is important - systems, imaging, and work in hydrocarbon reservoirs and associated with hydrothermal activity
 - o Microbial carbonates analogues - ancient to modern

For further information and to book, visit www.geological.org.uk/conferences/2013 or contact:

Event Staffing, The Geological Society, Burlington House, Piccadilly, London W1J 0BT. Phone: 020 7647 4800. Email: staffing@geological.org.uk

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THE OXFORD COLLOQUIUM

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Oxford University Museum of Natural History

Six eminent speakers in one day

Professor Peter Burgess
Numbers, models and beyond: what can we learn from numerical modelling of sedimentary systems?

Professor Simon Conway Morris
The Cambrian "explosion" and re-running the tape of life: what really happens?

Professor Martin Siegert
Exploration of sub-glacial Lake Ellsworth, West Antarctica

Professor John Tellam
Nanoparticles in sandstone groundwaters

Dr. Richard Walker
Earthquakes in an urban world: challenges for the 21st Century

Dr. Dave Waters
Building Mount Everest: the inside story.





www.oxgg.org.uk

Financial Support for Research in Earth Sciences

The Geologists' Association can provide financial support to individuals for

Attendance at meetings (up to £250)

– GA Meetings Award

Research projects by undergraduate and postgraduate students (normally up to £600)

– New Researchers' Scheme

Research projects in any area of Earth Sciences (normally up to £600)

– GA Research Awards

Applicants should normally be members of the Association, although limited funds are available for non-members.

Deadlines for applications are 15 February and 15 September each year.

Details of the award schemes and how to apply are given on our website:

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<http://www.geologicalassociation.org.uk/Awards.html>

GA Meetings Award
<http://www.geologicalassociation.org.uk/GAMeetingsAward.html>

New Researchers' Scheme
<http://www.geologicalassociation.org.uk/NewResearchers.html>

GA Research Awards
<http://www.geologicalassociation.org.uk/GAResearchAwards.html>



“ FAULTED COLUMNAR BASALTS, HONG KONG GEOPARK ”

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VOTE EARLY, VOTE OFTEN

This is a plea. Not a rant, not a puff, but
a plea. I plead with you to take a few
moments, and vote.

Unusually, because of timetabling
difficulties, this year's Council
elections (which include an election for
President-Designate) are opening
'online first' (see p.6). The usual full statements
from all candidates will be printed in the March
issue, with which we shall also circulate *ye olde
ballotting papyrus*. However, all that information is
already available on our new website, and all
Fellows are able to vote.

Here at BH, the days are gone when balloting
envelopes would be opened in sepulchral reverence
in a sealed basement room. Nowadays, any postal
ballots are simply entered into the online ballot on
the sender's behalf – staff performing the mouse-
clicks we would prefer you to make yourself. (It
may sound faintly ludicrous that we still do this, but
we recognise that not everybody has access to the
interwebs, and nobody should be disenfranchised,
either by their geographical isolation, arthritis or
even Luddism.)

Not so many years ago, I recall, the Society
sometimes found it hard going to scare up enough
candidates to fill the available positions on Council.
Those days are also, happily, gone; but the Society's
efforts to make serving its Board of Trustees more
attractive, and to increase the diversity of candidates
to include traditionally under-represented groups
(women, ethnic minorities, applied geologists), will
be brought to nought if a wider section of the
Fellowship does not actually then turn out and *vote*.

Governments know well that pensioners are the
most diligent voters. But while no-one would deny
pensioners their say, we would not wish to subject
ourselves to a government of pensioners by
pensioners for pensioners. Analysis of the Society's
voting pattern suggests that its more diligent voters
tend not only to be older, but by inclination, more
academic - and male. Indeed, when I last looked at
any voting statistics, I felt I might be forgiven for
thinking we were a Gentlemen's Society of London
for the History of Geochemistry. As people, we
tend, alas, to vote for other people most like
ourselves. Thus the cause of diversity is only served
when suffrage truly is universal.

Participation in Society plebiscites has never
much exceeded a fairly miserable (though by the
standards of other learned societies or Mutual
Building Societies, a rather respectable) 10%.
We can do better than this. It has never been
easier, or cheaper!

Do it now. Vote for Mickey with your mouse.

DR TED NIELD EDITOR



SOCIETY NEWS

EGU GENERAL ASSEMBLY 2013



Austria Center Vienna

The European Geosciences Union General Assembly 2013 takes place in Vienna from 7-12 April and will be attended by the Publishing House. We will be at booth #59, displaying a range of new and recent geoscience publications at 30% off list price, plus competitions, giveaways, journals and much more. Visit www.egu2013.eu.

Start the CLOCKSS

The Geological Society Publishing House has partnered with CLOCKSS to ensure that all 26,000 articles available on the Lyell Collection are stored safely and securely online. CLOCKSS ('Controlled Lots of Copies Keep Stuff Safe') is a not-for-profit venture between the world's leading scholarly publishers and research libraries whose mission is to build a sustainable archive of scholarly publication for the benefit of the global research community. *Read more about this online.*

Online First for Journals

Online First, the Society's publish-ahead-of-print feature, is being rolled out for our journal publications from January 2013. The process has been welcomed by Lyell Collection users and has many benefits for authors and researchers. New journal volumes from January 2013 will adopt this approach. Visit www.lyellcollection.org. *Read more about this online.*

FUTURE MEETINGS

Dates for meetings of Council and Ordinary General Meetings until June 2013 shall be as follows:

- 2013: 6 February (1500)
- 2013: 16 April

Elections to Council 2013-2014

The October issue of *Geoscientist* invited Fellows to nominate new members of Council, including the President-designate. A preliminary ballot will be conducted, the results of which will determine the list for the formal vote at the Annual General Meeting, to be held on 5 June 2013.

By the time you receive this issue, full details of all the candidates will be available on the Society's website at www.geolsoc.org.uk/vote2013, where you will also be able to vote. (It was not possible to include this information with this issue because the copy deadline was before the closing date for nominations.)

The March issue will include full details, including a postal ballot paper; but Fellows are encouraged to vote online by logging onto the Fellows-only part of the website to register their vote. Please follow the instructions.

▶ Closing date for voting, online and postal, is 31 March 2013.

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 £55 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.

■ 2013: 20 February; 13 March; 10 April (Burlington House); 15 May.

▶ Fellows of the Society wishing to dine should send cheques, payable to 'Geological Society Club', to: **Cally Oldershaw**, c/o Shashu Lalji, Department of Earth Sciences, Natural History Museum, Cromwell Road, London SW7 5BD. E: cally.oldershaw@btopenworld.com DR

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Don't forget that the Geological Society Library can usually supply photocopies more cheaply than other providers e.g. British Library & the publishers. Remember - our journals have been bought with your money, and are here to be used!

PICK OF THE CROP

To see what other books, maps & serials the Library has acquired, why not register to receive a copy of Recent additions to the Geological Society Library, either by post or email? Contact Wendy Cawthorne on wendy.cawthorne@geolsoc.org.uk.

POSTAL LOANS

We use Royal Mail's Special Delivery to send all loans to borrowers, in order to guarantee next-day delivery and more particularly, so that the packages are insured in case of loss. Many books are now very expensive and if lost are difficult to replace. Please will borrowers ensure that all loans are returned to the Library by this means, or by a reputable courier who can guarantee the same protection.

WIFI ACCESS

WiFi (wireless fidelity) access to the Internet is now available to all readers visiting the Library.

[LECTURES]

Shell London Lecture Series



Landslides and Subsidence: Engineering Geology in an Age of Austerity

David Shilston

President, Geological Society

27 February 2013

Subsidence of buildings, the collapse of old mine workings, the movement of landslides, and other problems in the ground can affect us all, as householders and as users of our complex national infrastructure that is built on or in the ground. David Shilston's lecture will take a broad overview of these ground problems within the UK and internationally.

David Shilston has some 35 years' experience of civil engineering and geological projects in the UK and many countries overseas. David is the first engineering geologist to have been elected President of the Geological Society of London.

■ **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/shelllondonlectures13. Entry to each lecture is by ticket only. To obtain a ticket please contact the Society 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: **Naomi Newbold**, The Geological Society, Burlington House, Piccadilly, London W1J 0BG, T: +44 (0) 20 7432 0981
E: Naomi.newbold@geolsoc.org.uk



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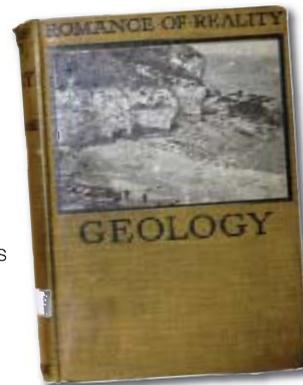
Rare book of the month!

Geology by Arthur R. Dwerryhouse. 1919 [?]

"It is very strange, but nevertheless true, that most people are content to go on living in this world without attempting to find out anything about the world itself." So begins Arthur Dwerryhouse's *Geology*, part of the Romance of Reality series of titles published in the 1910s and 20s under the editorship of Ellison Hawks. The series covered different aspects of science and technology, and was "ostensibly written for adults, but some were pitched more at the level of the teenage reader."¹

Dwerryhouse (1867-1931) was well-known for his research into glaciation in northern England and Ireland, and this book contains a thorough chapter on 'Glacier Action', as well as covering all the basics of the science, from lead and gold mining to volcanoes and hot springs.

Given the author's opening statement, the irony of Dwerryhouse's book is that it distils this geological knowledge via an imaginary field trip through the mythical country of 'Geologica', taking in the towns of Lyell and Smithfield via the Hutton River. There are accounts of the geologists



on this fantasy expedition sheltering from storms with a Troglodyte, conducting various experiments, gathering samples, and having humorous run-ins with local bureaucracy.

The conceit is wonderfully maintained by Dwerryhouse, and

the book is a thorough and expert introduction to geology from an experienced academic who is clearly enjoying letting his hair down. It is unclear how popular the book was when first published, but it remained in print for many years and has recently been made available to new readers as print-on-demand (with a striking new cover) from Lightning Source UK.

References: 1. Peter J. Bowler *Science for All: The Popularization of Science in Early Twentieth-Century* (University of Chicago Press, 2009) p126

▶ The Library operates a sponsorship scheme to help preserve and restore its rare books. For more information, contact **Michael McKimm** in the library, or see the *Sponsor A Book* page on the Society's website:
www.geolsoc.org.uk/sponsorabook

Journals cancelled

In line with the 2010 Library Review's recommendations, Council has agreed to reduce Library costs by a further £35k in 2013, writes Fabienne Michaud.

The savings will be achieved through a combination of income generation and reduced expenditure. In order to achieve this, the Library identified 26 journals for cancellation which:

- were duplicate subscriptions
- would be gifted in future

- would be received on exchange in the future
- received fewer than three uses per year
- are free online
- the relevant specialist group indicated it did not wish to retain.

The candidate journals were reviewed by Council and their cancellation approved in November 2012. For a full list, please see www.geolsoc.org.uk/libraryreview.



Shell London Lecture Series

Stranger than Fiction: Worlds around and beneath us

2013 Programme

The Shell London Lecture Series is a collection of public talks which aim to introduce modern Earth science and its relevance to society to the attention of a diverse and broad audience, many of whom will have an interest in science, but who are not necessarily trained in Earth science.

The Geological Society has again secured excellent speakers, covering a wide range of topics, and you will be able to watch all of them online shortly after they have been given, at the below shortcut links!

To watch the talks visit www.geolsoc.org.uk followed by the links below:

Title	Speaker	Date	Affiliation	Web Address
Reconciling past and future worlds: Geology and ground engineering	Jackie Skipper	9/01/2013	Geotechnical Consulting Group	www.geolsoc.org.uk/groundengineering
Landslides and subsidence: Expecting the unexpected - engineering geology in an age of austerity	David Shilston,	27/02/2013	CSL President	www.geolsoc.org.uk/landslides
Exceptionally preserved fossils: Windows on the evolution of life	David Siveter	27/03/2013	University of Leicester	www.geolsoc.org.uk/preservedfossils
Rivers under the sea	Jeffrey Peakall	17/04/2013	University of Leeds	www.geolsoc.org.uk/undersea
TBC	TBC	29/05/2013	TBC	Shell
TBC	Sanjeev Gupta	3/07/2013	Imperial College	TBC
Dwarfism in animals on islands	Victoria Herridge	11/09/2013	Natural History Museum	www.geolsoc.org.uk/dwarfism
New discoveries of life at deep-sea hydrothermal vents	Adrian Glover	9/10/2013	Natural History Museum	www.geolsoc.org.uk/hydrothermal
TBC	TBC	20/11/2013	TBC	Shell
Lakes Beneath the Ice	Martin Siegert	18/12/2013	Edinburgh University	www.geolsoc.org.uk/beneathice

For further information, please contact:
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E: registrations@geolsoc.org.uk
W: www.geolsoc.org.uk/shelllondonlectures13
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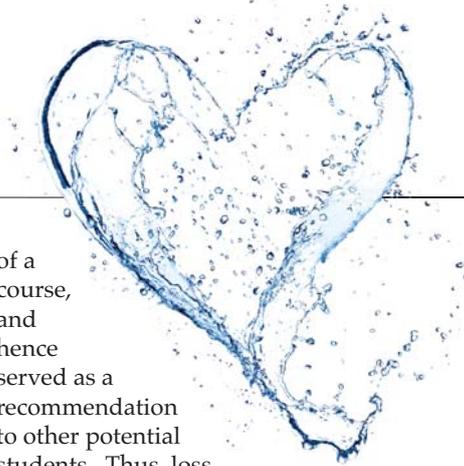


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Water, but not on the brain

WRITTEN BY BRUCE MISSTEAR

Hydrogeology taught master's courses are under threat, says **Bruce Misstear***



For the past 40 years, taught master's courses in hydrogeology have played a vital role in the education of UK hydrogeologists, providing much of the groundwater expertise for the Environment Agency, water companies, consultants, contractors, universities and research institutes. The taught master's programmes have also educated many hydrogeologists from outside the UK (including myself) and are held in high regard internationally – with all of the associated benefits to 'UK plc'. Yet the future of the taught master's courses is uncertain.

NERC

The first taught hydrogeology master's course in UK was introduced in UCL in the 1960s, but closed down in 2001. In the past 20 years, hydrogeology master's programmes have come and gone at Reading, East Anglia, Leeds and Cardiff universities. Still running are the hydrogeology master's course at Birmingham (which started in the early 1970s), together with the more recent hydrogeology course at Strathclyde, the MSc in Contaminant Hydrogeology at Sheffield and an Applied Hydrogeology master's in Newcastle.

The UK Natural Environment Research Council (NERC), which previously funded a number of hydrogeology studentships, has withdrawn its support for such master's courses, and currently gives priority to funding of doctoral students. While funding of research students is clearly important, there is also a need to support applied taught master's programmes that produce well-rounded hydrogeologists with a broad skill-set in hydrogeology. The loss of funded studentships for taught master's degrees means that even the long-established and highly-regarded Birmingham course could be vulnerable in the future. Aside from the importance of funding *per se*, the award of studentships was an indicator of the status

of a course, and hence served as a recommendation to other potential students. Thus, loss of funding has far-reaching implications for the viability of a course.

UNCERTAIN

The uncertain future for these courses is exacerbated by the increasing numbers of master's-level 'add-on' primary degree courses (partly stimulated by the requirements of the Bologna Declaration, a 3+2-year two-cycle master's being the norm in continental Europe, or 3+1-year MSci programme in UK) and also by the significant fees charged for primary degrees. Graduates are naturally more reluctant and less able to self-fund further education.

If we reach the point where insufficient hydrogeologists are graduating with high-quality master's qualifications to supply the job market, the implications for the profession will be serious. Hydrogeological tasks, in government agencies and consultancies, may then increasingly be carried out by unqualified staff, resulting in poor quality work. We may see a continuation of a modern trend whereby field-data collection and drilling are not properly prioritised, or supervised, with greater reliance being placed on desk-bound studies, including the application - or misapplication - of hydrogeological software.

We cannot rely on market forces alone to support taught master's programmes, as the industry is too fragmented. Government backing is essential to ensure the future of high quality hydrogeology education in this country.

* **Bruce Misstear** Hydrogeologist and Associate Professor, Trinity College Dublin

SOAPBOX CALLING!

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).

“ IF WE REACH THE POINT WHERE INSUFFICIENT HYDROGEOLOGISTS ARE GRADUATING WITH HIGH-QUALITY MASTER'S QUALIFICATIONS TO SUPPLY THE JOB MARKET, THE IMPLICATIONS FOR THE PROFESSION WILL BE SERIOUS ”
Bruce Misstear

We have already seen (*Geoscientist* 22.3, April 2012) how, in WW1, groundwater and engineering geology maps compiled for the Western Front in Europe helped pioneer militarily applied geology in the British Army. WW2 however was a more mobile conflict, fought over a greater range of terrain and stimulated geologists to compile new types of map for military use. Such maps were generated in the USA by the Military Geology Unit of the US Geological Survey, for many parts of the world¹. Other maps were generated in the UK for the Allied liberation of Normandy², and operations elsewhere in Europe and the Far East^{3,4}. Maps of Hong Kong, preserved in London in the libraries of the Geological and Royal Geographical societies conveniently illustrate two of the major types of this innovative mapping, at an unusually detailed scale.

Hong Kong lies on the southern coast of China. A rugged terrain of fiords, islands and mountains, it comprised about 1000 km² in total land area before major reclamation projects. Restored to Chinese sovereignty on 1 July 1997 as the Hong Kong Special Administrative Region, components of the territory had been ceded or leased to the UK from 1842 onwards. By WW2, it had been progressively developed as a British naval base and fortified against southerly seaborne attack. However, early on 8 December 1941, the day after Japanese attack on Pearl Harbor, Japanese forces in China attacked from the north, by air and land. The garrison

of British and Canadian plus local defence forces was finally overwhelmed on 25 December, and Hong Kong was to be under Japanese occupation for nearly four years. However, as the tide of war changed in the Far East, the British Army began to formulate plans to return.

THEMATIC MAPS

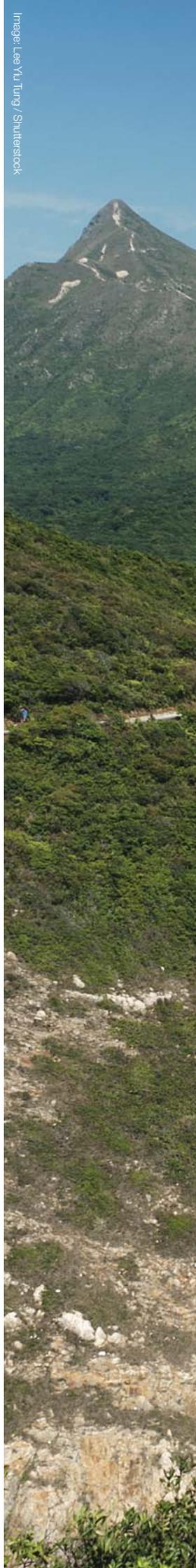
To guide British military planning in the later years of World War II, thematic maps and reports were compiled remotely in the UK for many areas of potential military operations. Compilation was by the ISTD: the Inter-Service Topographical Department^{3,4}. Founded in London in May 1940 as part of the [Royal] Naval Intelligence Division, the unit transferred to Oxford in October 1940, and in October 1941 became ISTD with a role to provide topographical intelligence for the British armed forces as a whole. It was to expand by the end of the war to an organisation of about 300: over 700 including regional branches and specialist sections.

The nucleus of a Geological Section was created in November 1943. This comprised two geologists, both recently granted 'emergency' commissions as officers in the Royal Engineers (RE) and (on appointment to ISTD) 'acting captain' status because of their age and professional standing.

One was 'Tom' Phemister (1902-1982), an alumnus of the universities of Glasgow (BSc) and Chicago (MSc), had been a research student at Cambridge until appointed Associate Professor of Geology and Mineralogy at the University of British Columbia in ►

WARTIME GEOTECHNICAL MAPS

Applied geology and airfield construction suitability maps compiled remotely for Hong Kong in WW2 illustrate techniques pioneered by military geologists, says **Ted Rose***





On the southern coast of China, Hong Kong presents a rugged terrain. (Hong Kong Global Geopark, Sai Kung District, New Territories.)

► Vancouver, Canada, in 1926. He returned to the UK in 1933, to a demonstratorship at Cambridge prior to promotion in 1937 as Professor and Head of the Department of Geology and Mineralogy at the University of Aberdeen. In 1943 he was (after earlier refusal) eventually accepted as a volunteer for military service – and selected for assignment to ISTD while serving at the RE Survey Training Centre.

The other was 'Jack' Farrington (1906-1982), born in Sydney, Australia, to English parents, who had graduated from the University of British Columbia as a Bachelor of Applied Science in May 1928 – having been taught by Phemister. After graduation, he became a field and mining geologist in sub-Saharan Africa. He too had to wait for changed admission criteria (in his case, poor eyesight) before acceptance for military service; but at the end of 1942, he too was posted to the RE Survey Training Centre - before assignment to a Corps Field Survey Company RE. He returned to the Training Centre for more specialized courses from 18 July to 12 October 1943, and was thereafter assigned to ISTD.

LEADERSHIP

Appointed to work separately, the two quickly arranged to work together, forming the leadership of a group that in September 1944 was formally established as a 'Geological Section' (including soil scientists as well as geologists), comprising an RE major plus three captains. Phemister had been released from the Army back to his university role in August 1944, so Farrington was duly promoted Major and Section leader.

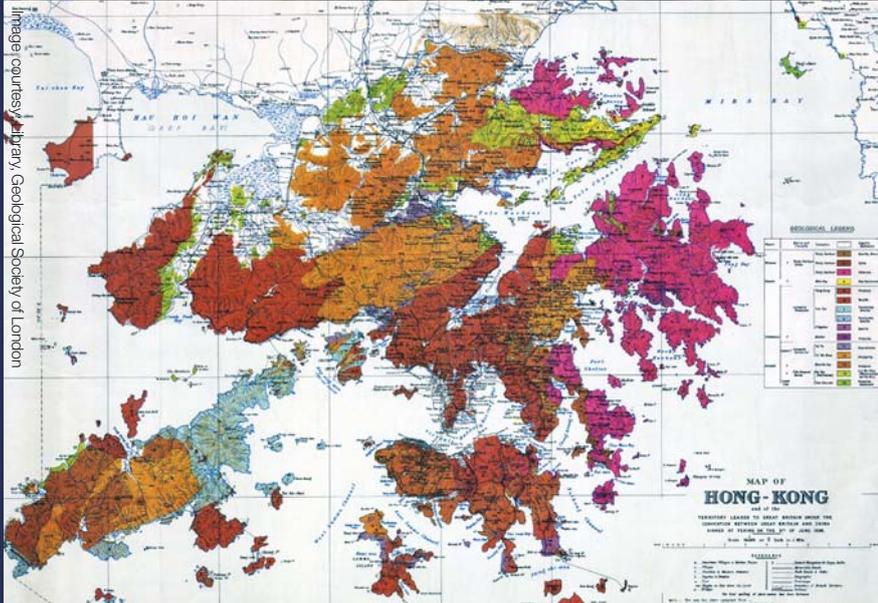
To ease pressure of work, the Section was progressively enlarged with geoscientists and engineers from other units. The number of ISTD 'geologists' actually working together rose to a peak of 12 by the end of the war in August 1945 - before the Section was reduced in strength and finally, in June 1946, disbanded. By that time 19 'geologists' in total had served within it, including three Americans, one Canadian, and (very briefly) Dutch sedimentologist Philip Henry Kuenen.

MAP WORK

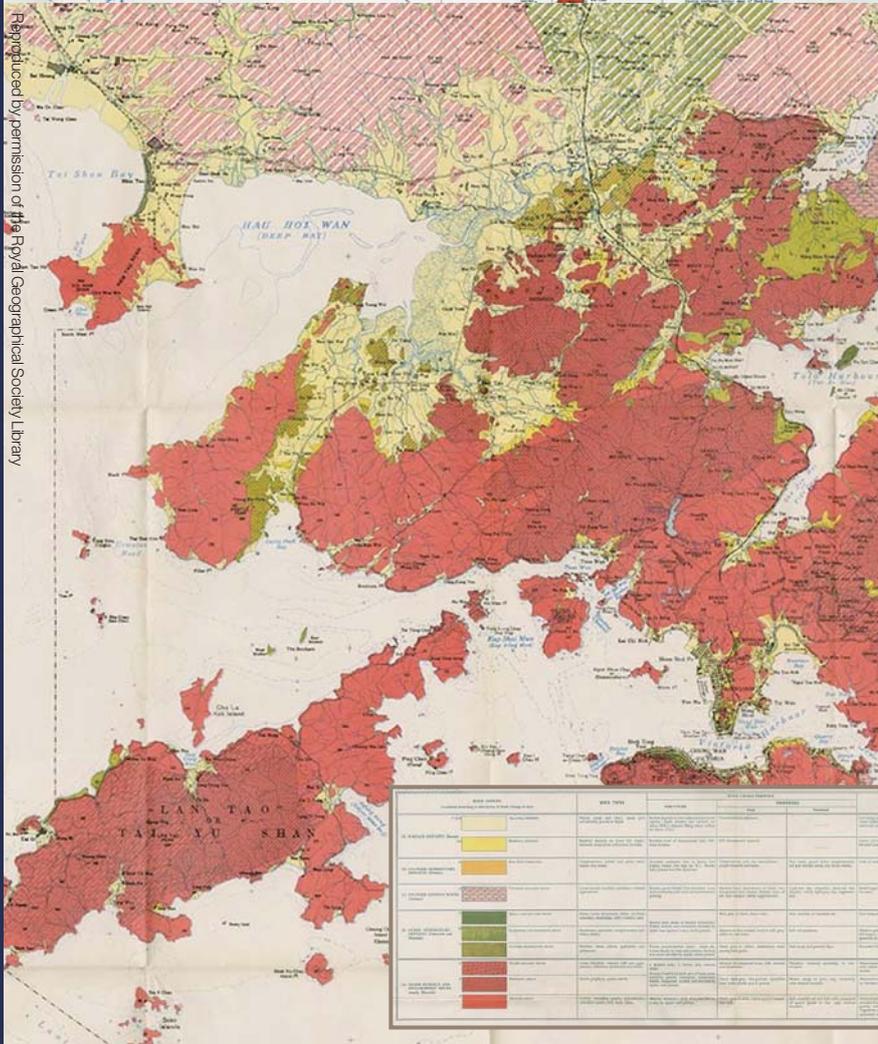
In 1944 and 1945, the Section contributed to 10 major reports and 14 'special tasks' for Europe, and 21 reports and 17 tasks for the Far East - all illustrated by at least one specialist geotechnical map.

The earliest reports included published geological maps (e.g. a 1:756,720 geological map of Malaya),

The Geological Section ISTD, March 1945 behind the ISTD huts near Mansfield College, Oxford. Most geologists appointed or attached to the Section came from the Royal Engineers (For details regarding the sitters' names please see online)



'Geological Survey of Hong Kong,' original scale 1:84,480, by R W Brock, S J Schofield, M Y Williams and W L Uglow of the University of British Columbia, Canada, printed 1936 by the Ordnance Survey, Southampton, on 1932 revision of GSGS 1393 as a topographical base map



Simplified geological map of Hong Kong, original at scale of 1:80,000, prepared by ISTD geologists in 1944 for report BR 1208D(2) issued January 1945 Inset: Key to rock categories

Photograph courtesy: Dr Albert Ludford

Image courtesy: Library, Geological Society of London

Reproduced by permission of the Royal Geographical Society Library



Courtesy: School of Geosciences, University of Aberdeen

Professor T C Phemister, founder of the Geological Section ISTD in World War II. Postwar photograph, from Rose & Clatworthy (2008)



Image © University of British Columbia

Professor R W Brock (1874-1939), who enlisted in the 72nd Seaforth Highlanders of Vancouver, Canada, on the outbreak of World War I, and later served in Palestine in the rank of major



reprinted for the War Office by the Geographical Section, General Staff (GSGS). Later reports, dealing with countries for which no suitable geological map existed (typical in the Far East), included new maps hastily compiled from published and oil-company sources. Uniquely, Hong Kong had a geological map already printed in GSGS style. Since the territory was small, this was at the scale of 1:84,480 (3/4 inch: 1 mile) – unusually detailed for the Far East at that time.

Geological investigation had begun early in the period of British administration, but this first geological map was printed only in 1936. Files WO 181 and CO 129/576/3 in the UK's National Archives at Kew record the background. On advice from the British Geological Survey and the Colonial Office, London, the Hong Kong Government asked the Geology Department in the University of British Columbia, at Vancouver in Canada, to undertake a geological survey. The University then provided four geologists (R W Brock, S J Schofield, M Y Williams and W L Uglow) to map the territory⁵. The final map, a geological overprint on the GSGS 1393 topographical base map, was printed by the Ordnance Survey at Southampton – like geological maps for the Western Front in World War I – and a version with a reference grid superimposed received by GSGS in July 1936.

The map showed that Hong Kong was clearly an area of predominantly extrusive Jurassic volcanics, intruded by an extensive complex of granites; its bedrock partly covered with a deeply weathered regolith or (in the valleys) Quaternary alluvium. However, during 1944 it had become apparent that such maps were of little military use without an interpretation readily intelligible to non-geologists.

APPLIED GEOLOGY

Following the precedents of WW1, one of the ISTD geologists' tasks was to generate geological maps in which technical data were reduced to a minimum and the military significance of geological features was made clear.

In 1944, ISTD geologists generated two such maps for Hong Kong, adopting military metric scales: a single sheet at scale of 1:80,000, and two sheets, including part of nearby China, at 1:250,000. Examples of the 1:80,000 maps are now elusive (one copy is preserved in ISTD report BR 1208D(2) in the Royal

Geographical Society library), but several copies of the 1:250,000 maps are preserved in London, notably in the British Library and the libraries of both the Geological and the Royal Geographical societies.

Maps at both scales group rocks by use of three principal colours, with colour intensity varied so as to increase to five the main units depicted:

- pale yellow (surface deposits: Recent)
- deep yellow (younger sedimentary deposits: Tertiary)
- pale red (younger igneous rocks: Tertiary)
- green/blue (older sedimentary deposits: Palaeozoic and Mesozoic)
- deep red (older igneous and metamorphic rocks: mostly Mesozoic).

The coloured 'rock groups' are subdivided by shading or overprint to differentiate a larger number of categories: 10 in the key to the 1:80,000 map, 18 on the 1:250,000 map. An extensive key to the maps tabulates data for each of these categories in six principal columns: rock types, rock characteristics (3 sub-columns: structure, properties fresh, weathered), terrain, soils, underground water, and construction materials. For the 1:80,000 map, a final column provides notes on undifferentiated rock groups, reliability, and sources.

January 1945 brought completion of report BR 1208D² to accompany the maps. The report notes specifically that the 'large scale [1:80,000] geological map ... is reproduced from the map by the Government of Hong Kong Colony, slightly modified so as to conform to the system of rock groups on plan 55 [the 1:250,000 map], and transferred to a more recent topographic base'. 'Local stratigraphical names of formations have been avoided as much as possible [on the maps], but have been supplied in the stratigraphical table in Appendix B [of the report]'.

GO, NO GO, SLOW GO

The report was generated remotely, based on the existing information available in the UK. Publication of a monograph to accompany the 1936 geological map had been delayed by the deaths of Uglow in 1926 and Brock in 1935, and its first draft was lost in wartime Hong Kong. Associated publications did not begin to appear until late in the war, the first by Williams in 1943, the second (including contributions by Phemister ▶

► and, posthumously, by Brock) in 1945⁶.

Use of only a few colours made it easier for non-geologists to appreciate key features 'at a glance': red, green/blue and yellow tints gave an initial impression of 'go', 'slow go' and 'no go' areas for usages specified in the key's columns. Thus for 'construction materials', areas coloured yellow were 'no go' for sources of good roadstone but potentially 'go' for sands or clays; red areas were in contrast 'go' for quarrying good road aggregate; and green/blue areas were likely to yield rocks of more variable properties, so 'slow go'. Use of few colours also made the maps cheaper and easier to print.

Such maps showing ground characteristics of military engineering significance were compiled by ISTD geologists for several areas of the Far East: Sumatra, Indo-China, the Kra Isthmus of Burma (now Myanmar) and Siam (now Thailand), Siam, and Java in similar coloured style, Borneo and Formosa in monochrome. However, all were at much smaller scale, most of them at 1:1 million. The Hong Kong maps were the most detailed maps of this type printed for wartime Allied use – precursors of 'terrain engineering characteristics' maps developed for military use in other countries postwar.

AIRFIELDS

A map showing 'suitability of country for rapid construction of airfields' was included in the 1945 report. A grey topographical base map was overprinted in only two colours. Blue indicated the permeability of ground, red its flatness – following the precedent set in 1943 by a map for NW France (*Geoscientist* 22.3, April 1942). Printed together these were shaded to define 12 categories of terrain, of which areas left blank were the most suitable for rapid construction of airfields, those in dense purple the most unsuitable.

Maps of similar style had been printed in 1944, first for Malaya at 1:380,160, then Sumatra, at 1:750,000, and for the Kra Isthmus of Burma/Siam, at 1:1,000,000. The maps for the Hong Kong – Canton

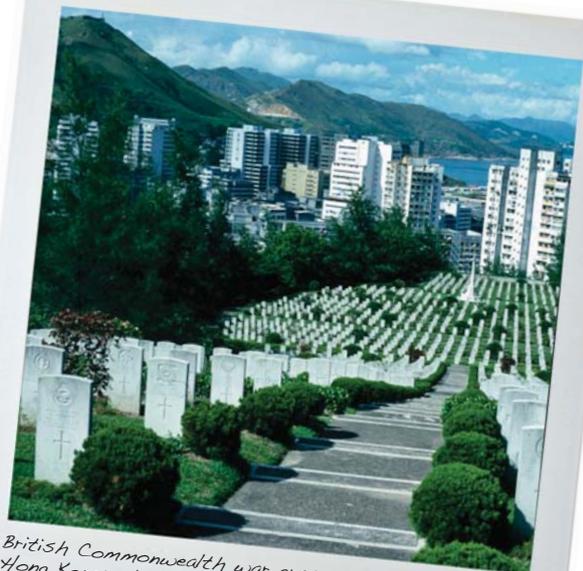
region at 1:250,000 were thus larger in scale than these earlier maps: consistent with 1:250,000 Hong Kong maps prepared by other ISTD sections, for roads and waterways, and main telecommunications.

Notes beneath the two final columns of the key: 'may be inundated in wet season, largely dried out in dry season' and 'water table above or very near the surface all the year round' take account of criticism that the earlier maps did not indicate sufficiently clearly the importance of seasonal rainfall to airfield construction. Later maps (for Siam and Indo-China at 1:1 million, and for the Chinese island of Hainan and for Java at 1:500,000) distinguish 15 rather than 12 categories: the 'waterlogged' column being divided into two – seasonally waterlogged (pale blue) and permanently waterlogged (dark blue).

None of these maps was intended to indicate specific sites for potential airfields. Rather, their purpose was to give planners an overall appreciation of possibilities for rapid construction, and to indicate the most likely areas for future ground reconnaissance. Postwar criticisms held that the maps, being of small scale, were inadequate except for the broadest generalisations, and that users tended to expect too much from them – probably because they were, in many cases, the only source of engineering information available.

POSTWAR MAPPING

Allied military operations focused primarily on Burma, Indonesia and the Philippines, and Hong Kong remained in Japanese hands until the war in the Far East ended on 14 August 1945. Terrain assessments by the British

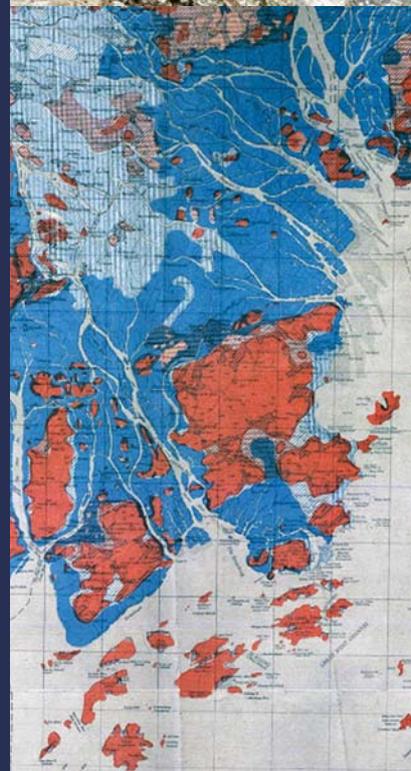


British Commonwealth war graves, Hong Kong; photographed about 1977

Part of geological map of Hong Kong and Canton, south sheet (of two), original at scale of 1:250,000 (GSGS Miscellaneous map 192A), compiled and simplified by ISTD geologists in 1944



Granite quarry (at Anderson Road), photographed about 1977



Part of map of Hong Kong and Canton showing suitability of country for the rapid construction of airfields, south sheet, original at scale of 1:250,000 (GSGS Miscellaneous map 192B), prepared by ISTD geologists in 1944 partly on the basis of geological data



Courtesy: Library, Geological Society of London



Courtesy: Library, Geological Society of London

military geologists were never put to operational test.

After British troops and administration returned to Hong Kong, local civilian studies, notably by S G Davis and later B P Ruxton, demonstrated the need for a new survey. Carried out between January 1967 and March 1969 by geologists seconded from the UK Institute of Geological Sciences (as BGS was then known), this generated a new geological map at 1:50,000, contained within a substantial report⁷: the standard work of reference for the next decade, as major urban development rapidly gathered pace.

Also postwar, the British Army disbanded ISTD and its Geological Section. From 1947 geological expertise was provided by a few officers appointed to serve in the reserve army, in the 'Geologists Pool' (1967-1987, re-constituted as the 'Engineer Specialist Pool') of the Royal Engineers. These geologists were used to support military or civilian communities by brief assignments in many countries⁸. Some were used on Hong Kong to assess potential new well-sites for groundwater abstraction and aspects of quarrying, and to assist with studies of slope stability. Deemed to have acquired sufficient local and general experience to be useful, yet to be free of any potential commercial interest, Specialist Pool geologists were invited in 1981 by the Geotechnical Control Office of the Hong Kong Government to review the need for a new geological map and survey. With the foundation, as recommended in their report⁹, of a Hong Kong Government geological survey unit, British military geological association with the region came finally to an end.

HONG KONG SURVEY

Effectively founded in 1982, the Hong Kong Geological Survey has generated an extensive revision of the geology of Hong Kong^{10, 11} accompanied by a range of new maps. Moreover, a thriving Regional Group of the Geological Society of London now addresses the professional and learned needs of Hong Kong geologists (www.geolsoc.org.uk/hkrg).

Long-obsolete military associations with local geology are thus now but minor footnotes to a rapidly increasing and impressive history of published research, both 'pure' and 'applied'. However, they serve to illustrate a wartime phase in the history of engineering geology that is largely

unknown to both historians and geoscientists: work that was initially 'secret', but may now be put in the public domain. The mapping techniques illustrated here were to prove their value in combat areas far distant from Hong Kong. ■

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AGASSIZ'S FOSSIL FISH



The Society's appeal to conserve and digitise the Louis Agassiz fossil fish portfolio has raised over £10,000. **Caroline Lam** and **Michael McKimm** report

As all avid *Geoscientist* readers will know, in 2011 (*Geoscientist* 21.07 August) the Society's Library and Archive launched a fundraising project to conserve and digitise one of its most important collections – the fossil fish portfolio of the Swiss naturalist Louis Agassiz (1807–1873). Thanks to the generosity of Fellows and Friends of the Society, as well as many members of the public, by the end of 2012 the appeal has raised over £10,000.

The Society's collection comprises more than 2000 watercolours and drawings of fossil fish specimens taken from private and public collections around Europe in the 1830s–40s. In recent months, Society archivist Caroline Lam has been collaborating with curators and volunteers at the Natural History Museum to match up our drawings with some of the original specimens, now held in row upon row of metal cabinets in the Department of Palaeontology on Cromwell Road.

In these labyrinthine rooms, Caroline and Senior Library Assistant Michael McKimm were treated to a rare glimpse of these important fossils, ranging from metre-long sharks to boxes crammed with tiny teeth. The chance to compare the original specimens with the drawings has created the opportunity to gain a further understanding about the circumstances in which Agassiz's seminal texts *Recherches sur les Poissons Fossiles* (1833–1843) and its follow-up work *Monographie des Poissons Fossiles du Vieux Grès Rouge* (1844–1845) were created.

WOLLASTON

George Bellas Greenough, in his Presidential address of 21 February 1834, announced that the Wollaston Fund [totalling £32 10s 4d] for that year was to be awarded to “Mr Agassiz of

Neuchâtel, in promotion of his work on the ‘General History of Fossil Fishes’.

As well as placing his confidence in Agassiz's qualifications and competency to complete the important geological work, Greenough publicised the Swiss naturalist's request for more specimens: “I cannot better close the announcement of a testimony of approbation which I trust will be gratifying to his feelings, than by requesting the Fellows of the Geological Society to aid the progress of this important work, by giving or lending to its author any drawings and specimens of fossil fishes which they may either possess or obtain.”

Later in 1834, the Society laid aside a room in its apartments (then at Somerset House) for Agassiz's principal artist, the Austrian-born Joseph Dinkel (c.1806–1891), to copy the specimens that were sent. Dinkel initially split his time between the Society and the British Museum, drawing specimens such as the Lower Jurassic fish *Dapedius coleii* Agassiz.

For the next decade, Agassiz continued to travel around the palaeontological collections of Britain and Europe seeking out new specimens for his work. Those that were not sent to the holding centre of the Society or his publishing base at Neuchâtel, Switzerland, were drawn *in situ* by one of Agassiz's commissioned artists. Wealthy collectors such as Lord William Willoughby Cole (1807–1886), later the Earl of Enniskillen, and Sir Philip de Malpas Grey

Left: Louis Agassiz, 1860s

Below: Sir Philip de Malpas Grey Egerton, 1850s

Egerton (1806–1881) offered to defray Agassiz's costs by having specimens from their fossil cabinets drawn by Dinkel at their own expense – the drawings becoming their property, once Agassiz had had them copied onto lithographic stones.

A large proportion of the surviving specimens at the NHM that tally with the Agassiz drawings come from the collections of Enniskillen and Egerton, which the Museum acquired in 1882. The two men, who were lifelong friends and Fellows of the Society, had been inspired to collect fossil fish after becoming acquainted with Agassiz during a trip to Neuchâtel around 1830. Although each man kept his own, distinct fossil cabinet, they would share acquisitions – frequently tossing a coin to see who would get which half of a prized specimen.

ACQUISITION

From the beginning of the project, Agassiz had suffered acute financial problems, principally due to the expense of employing a number of full-time artists and lithographers to complete his various works and enterprises. Having already been forced to sell his entire natural history collection to the Neuchâtel district authorities, by the late 1830s the only things of value Agassiz had left were the original drawings of the fossil fish.

Egerton had at first offered the drawings to the British Museum on Agassiz's behalf, but when this was unsuccessful, he persuaded his wealthy elder brother Lord Francis Egerton (1800–1857), later the Earl of Ellesmere, to purchase the lot for £500, on the understanding that once Agassiz had made use of them, they would then be donated to the Geological Society. This first batch of around 450 sheets of drawings arrived in 1843. In 1858 Agassiz gave the Society a further 568 sheets of ▶





Dapedius colei, Agassiz Watercolour by Joseph Dinkel, drawn c.1834-1835. British Museum collection



Dapedius colei, Natural History Museum. Found in the Lower Lias at Lyme Regis. Original British Museum collection



Far left: *Diplacanthus striatulus*, Agassiz Watercolour by Joseph Dinkel, drawn c.1840-1844. From the collection of Sir Philip de Malpas Grey Egerton

Left: *Diplacanthus striatulus* Natural History Museum. From Lethen Bar, Nairnshire. Egerton collection, purchased in 1882

► unpublished drawings to join the others, and finally in 1876 the Earl of Enniskillen presented the 135 sheets of drawings made by Dinkel and others at his and Egerton's expense to complete the collection.

DRAWING VS FOSSIL

A number of clear differences emerge between the drawings and the fossils as they are now. Slavish copying, or what would today be referred to as photo-realism, was not the aim of the illustrative work. Rather the intention was to show each fossil fish from a scientific, structural point of view. Frequent handling has taken its toll on some specimens such as the *Dapedius cole* Agassiz. Since Dinkel drew the original specimen in the mid 1830s, the delicate and fragile scales around the eye as well as the pectoral fin have been damaged or worn away. Fortunately the classification system which Agassiz devised was based on dermal features such as these, so the (now lost) elements are recorded in the drawing.

Additionally, although much effort was expended by the artist to draw a fossil in detail, the

supporting matrix appears to have been of secondary value, so accuracy in this respect was not important. Indeed it was not uncommon for the surrounding rock shown in a drawing to be trimmed or removed entirely for the final lithographed version, generally to fit more neatly onto a page.

Nevertheless, there are more obvious reasons for differences between the supporting rock in the drawings and the fossil specimens. Fossils are frequently removed from their matrix for more detailed scientific study. In the case of the Early Devonian specimen *Cephalaspis Lyelli* Agassiz, parts of the rock have been mechanically chipped away. The NHM curator Arthur Smith Woodward noted in 1890 that since Agassiz's original description the tail of the fish had been further extricated from the surrounding matrix, but unfortunately the crude process managed to destroy its opercular folds (gill covers).

COLLECTIONS' FATE

While the private collections of figures like Enniskillen, Egerton

Below: *Cephalaspis Lyelli*, Agassiz Watercolour by Joseph Dinkel, drawn c.1836-1837. From the collection of Charles Lyell

***Cephalaspis Lyelli*, Agassiz Natural History Museum. Found in Glamis, Forfarshire. Presented to the Museum by Sir Charles Lyell in 1846**

William Willoughby Cole, 3rd Earl of Enniskillen (1865-1877)

and Gideon Mantell are now held by the Natural History Museum, the fate of other collections that provided specimens for Agassiz's work has been mixed. For instance, the Geological Society's own Museum collection was split up in 1911, and the French palaeontologist Eugène Eudes-Deslongchamps' (1830-1889) collection was destroyed during WW2.

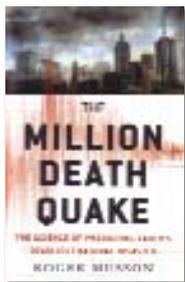
Even Enniskillen's collection did not escape unscathed. On its way to the soon-to-be-opened Natural History Museum in December 1882, thieves broke into the packing crates at Crewe railway station. The miscreants, disappointed by what they found, threw some of the collection into the River Dee.

This means that where a fossil no longer survives, Agassiz's original artwork is an important and unique record. ■

► FURTHER INFORMATION

If you would like to help the Geological Society to conserve and digitise this valuable collection, or for further information about the fundraising appeal, please visit www.geolsoc.org.uk/sponsorafish





The Million Death Quake

This is a wonderful book, easy to read and very informative about what earthquakes are, how they occur, the consequences of building in earthquake zones, and how we can protect ourselves from the worst impacts. It is an avowedly popular introduction, and a great read for geologists or engineers who are not themselves specialists. It is also extremely readable, by anyone, regardless of science background.

Musson's opening line is a real grabber: "Imagine a city screaming". He then presents a dramatisation of the Haiti earthquake (12 January 2010). These first pages capture you immediately. I could not stop reading until I had finished the first chapter.

So what is so interesting? It is the combination of scientific explanation and historical information, much of it gleaned from ancient scripts and subject to all the mistranslation and misinterpretation of the past. The author sets out how our understanding has evolved from ancient times; from a time when we could only conceive of earthquakes as a sign of God's anger, through to the last century, and the acceptance of continental drift as the fundamental driver shaping our globe.

Musson's explanation of seismic waves using a 'Slinky' toy is effortlessly handled. From this, he goes on to describe seismometers, and explains how atomic bomb-testing gave us a global network that hugely benefited humanity by increasing the information available on earthquakes too. I was fascinated to read there is a complete seismic record of the London Blitz because one seismometer was recording throughout!

Tsunamis feature as the consequences of certain types of earthquake. Some of Musson's descriptions are bizarrely comic (houses floating down an inlet in Maine as a fisherman returns home) but the visions we all saw on TV of the 2004 Sumatra tsunami, and Japan in 2011, were both terrifying and horribly compulsive viewing.

The last chapters set out how we can protect ourselves. Our inability to

'predict' earthquakes is fascinatingly set out, with examples from around the world of different methods, and of examples where we apparently managed to predict one earthquake and save many lives, and others where we failed. Musson goes on to discuss earthquake-proofing, and identifies those places currently most likely to suffer the title's 'million death quake'. Riveting. A must-read.

Reviewed by James Montgomery

THE MILLION DEATH QUAKE

ROGER MUSSON, Published by Palgrave Macmillan
ISBN 978-0-230-11941-3. 272pp.

List price: £16.99, <http://www.palgrave.com/products/title.aspx?pid=527038>



Practical Engineering Geology

This book is aimed at engineering geologists and geotechnical engineers entering the profession and summarises the things that the author wished he had known when starting out on his career. Indeed, this begins with considering what an engineering geologist needs to know, and touches on the issues facing the young professional given the structure of higher education. Clearly there is a need for integrating topics across the spectrum of Earth science and engineering, yet undergraduate degrees alone are not structured to achieve this. Meanwhile the intensive postgraduate one-year Master's course has become virtually extinct with the upsurge of four-year MSci/MEng degrees focused more on developing research skills (see Soapbox, p.9).

The book is therefore structured to focus attention on what an engineering geologist needs to know, professional qualifications and training, engineering practice, ground models and site investigation, geotechnics (soil and rock mechanics), and unexpected ground conditions (hazard assessment) and how to avoid problems.

The author is Director of Halcrow China, but also holds academic appointments as Professor of Engineering

Geology at the University of Leeds, UK and as Honorary Professor at the University of Hong Kong, and is therefore extremely well placed to provide guidance from the interface between professional practice and academe.

Early on he develops his view: that Engineering Geology is the scientific study of the Earth as it relates to engineering practice (principally civil, mining and petroleum). It follows that Soil and Rock Mechanics are tools to be used within Engineering Geology, yet curiously does not similarly encompass Hydrogeology - even though the author clearly believes that 'water is critically important to many geotechnical projects'. He nevertheless argues that you cannot have soil mechanics without soil and similarly for rock, although the distinction between 'soil' and 'rock' is artificial for the continuum that makes up geological material; engineering geologists need to recognise this and have a basic understanding of the principles of both.

Chapters are then devoted to ground models and site investigation. Rather than taking a textbook approach, the emphasis is on what the trainee engineering geologist needs to know that they may not have been taught. Herein lies the great value of this book: providing a readable and accessible digest of tips and prompts to raise awareness of the issues that may adversely affect the site under consideration.

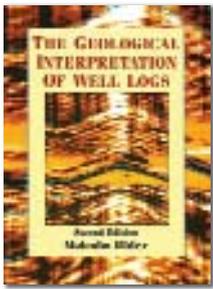
Case histories are drawn from the author's own experience, largely in SE Asia and the UK; but this apparently parochial consideration is an advantage rather than a drawback since the author is speaking from first-hand experience and not recycling the studies of others. The two regions encompass a range of geological conditions found across the world, introducing a variety of geomaterials, histories and environments that help bring the earlier chapters to life. Furthermore, the author is refreshingly frank about mistakes as well as successes while successfully avoiding the appointment of blame.

As an antidote to standard texts, this publication is a valuable contribution to the armoury of all budding engineering geologists.

Reviewed by Mike Rosenbaum

PRACTICAL ENGINEERING GEOLOGY

STEVE HENCHER, Published by: Spon Press, 2012.
ISBN: 978 0 415 46909 8 (paperback) ISBN: 978 0 415 46908 1 (hardback) ISBN: 978 0 203 89482 8 (eBook)
450 pp. List price: £45.00 (paperback), £120.00 (hardback) www.routledge.com/books/details/9780415469098/



The Geological Interpretation of Well Logs

This third edition contains new material to update the reader on some of the advances in this field. Previous editions of this book have been well received by the industry and academia – the improvements in this edition, including an expanded chapter on image logs, a chapter on Logging While Drilling and the inclusion of colour diagrams and headings should make it even more welcome.

The book is very comprehensive in its coverage of the various well logging tools and helpfully explains the theory, principles and how well log data is used and interpreted, in a way that is easy to follow and understand. I can recall struggling to understand very technical well-logging manuals in my own well-site geologist days (1980s). If only this publication had been available to me then!

The book begins with a brief history of well-logging and explains the purpose of the manual. This is followed by an excellent and very relevant explanation of the logging environment and how drilling can affect the formation and its effect on well-log data.

Subsequent chapters deal with individual logging tools, the information they produce and how it can be used to determine lithologies and facies. Each chapter follows a logical sequence and the consistent structure makes reading and following the topic very easy indeed. While each chapter goes into some detail, the emphasis is on what is necessary to explain the principles, uses and application of the tools. To support the explanations there are comprehensive colour diagrams, actual logs and illustrations.

Overall, the structure of the volume lends itself, by design I suspect, to use as a course text, and will be useful to the novice and the experienced alike. Well-logging can be a very esoteric subject but the authors have tried to keep it as simple as possible. To this end the use of acronyms is kept to a minimum

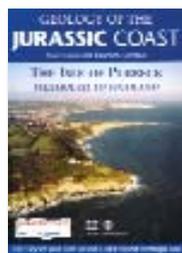
and where they are used they are clearly explained.

What really impressed about this book was the inclusion of the chapter on sequence stratigraphy and, in the concluding chapter, how well logs can be used in purely geological context by explaining how they can be used to identify geological events lasting only a few hundred years.

In conclusion, a highly recommended book - whether your interest be academic, professional - or just curiosity.

Reviewed by Andrew Southworth

THE GEOLOGICAL INTERPRETATION OF WELL LOGS
MALCOLM RIDER & MARTIN KENNEDY, Published by Rider-French Consulting Ltd., Scotland 2011 ISBN: 978-0-9541906-8-2. 432 pp.
List price: £60.00, www.riderfrench.co.uk



Geology of the Jurassic Coast

This book is suitable for anyone interested in the geology of Dorset, from GCSE to professional level. It has many excellent plates and is very good value for the list price of £9.95

It begins with a brief introduction to World Heritage Sites and the work of UNESCO before moving on to consider the rocks of the Isle of Purbeck. It considers the many rock types in Dorset (largely Jurassic and Cretaceous) and the associated fossils - ranging from microfossils, trace fossils and ammonites to the large vertebrates. It carries a wealth of detail about many unusual and perhaps unexpected features of the region - such as Dorset's oil deposits and the organic-rich rock that was used as a sort of 'coal' in the past - and of course the famous burning cliffs of Kimmeridge.

After a general description of the rock sequence, the book moves on to consider specific areas of interest in Purbeck - focusing on landscapes, geomorphology and wildlife. It then considers features such as caves, arches, stacks, coves, landslides and their evolution - many of course linking into a continuum which will be a revelation to many younger or less scientifically trained readers.

After the geology in general, the authors move on to a field itinerary, which allows several sections of the coast to be considered in detail. Each section comes with clear maps showing footpaths and car parking areas. It also mentions any non-geological as well as geological highlights to look out for. This section also describes the coast as it is seen from a boat just offshore, and even suggests where to embark on boat trips (e.g. from Poole, Swanage, Lulworth Cove or Weymouth). The authors do not omit reference to rocks, reefs and races and give a description of the seabed from an integrated survey and even (briefly) discuss the sea life there.

Plenty of annotated photographs help explain the geology, coastal features, folds, faults and the landscape. The book describes various local fossil collections and where to see them and mentions several important Victorian geologists. It also talks of various paintings (e.g. by Turner) depicting the area. Economic history is not neglected, especially the local quarrying industry (e.g. Portland and Purbeck stone, clays and lime). The authors also describe some more notable architectural features, including local cottages and castles. Handy on holidays!

Reviewed by Steve Rowlett

GEOLOGY OF THE JURASSIC COAST - THE ISLE OF PURBECK, WEYMOUTH TO STUDLAND
PAUL ENSOM AND MALCOLM TURNBULL, Published by Coastal Publishing, 2011 (Softback) ISBN 978-1-907701-00-9. 128pp List price: £9.95, www.coastalpublishing.co.uk

REVIEWS: COPIES AVAILABLE

We have received the following books. Please contact ted.nield@geolsoc.org.uk if you would like to supply a review. You will be invited to keep the review copy. See Geoscientist Online for an up-to-date version of this list.

- **NEW! Mechanics of Fluid Flow** by Basniev, Dmitriev and Chilingar. John Wiley, Scrivener hbk., 568pp
- **NEW! Petroleum Accumulation Zones on Continental Margins** by Grigorenko, Chilingar, Sobolev, Andiyeva and Zhukova. John Wiley/Scrivener hbk, 440pp
- **South of Scotland** (4th Edn.) BGS British Regional Geology series - Stone et al., 247pp + bedrock geology map
- **Disaster Deferred - a new view of Earthquake Hazards in the New Madrid Seismic Zone** (2012) by Seth Stein. Columbia University Press pbk, 282pp
- **Continuum Mechanics in the Earth Sciences** by William I Newman Cambridge University Press

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.

STEPHEN FOSTER



Stephen Foster, BGS Divisional Director 1991-99 and William Smith Medallist 2006, has

completed 10 years as Director of the World Bank–Groundwater Management Advisory Team. The documentation produced may be downloaded at www.worldbank.org/gwmate. Stephen now acts as a Senior Adviser to the Global Water Partnership, dealing with groundwater policy issues at the interface with agricultural food production and urban infrastructure development. www.worldbank.org.

MIKE PETTERSON



Mike Petterson, late of BGS and until recently Professor of Applied and Environmental

Geosciences at the University of Leicester, has been appointed Director of SOPAC (South Pacific Applied Geoscience Commission). SOPAC is based in Fiji with 22 member countries and 7 donor countries. Mike took up the new position at the end of January. See www.sopac.org.

HUGH TORRENS



Hugh Torrens, Emeritus Professor of the History of Science and Technology at the University of Keele, UK, has been awarded the inaugural V V Tikhomirov Award for the History of Geology by the International

Calling Sheffield Geologists!

2013 marks the centenary of the opening of the Geology Department at the University of Sheffield, writes **Phil Gibbard**



The home of Sheffield University's Geology Department until 1989, now known as the Sir Frederick Mappin Building

Photo: Alison Hunter 2011

A book, covering the department's history, achievements and eventual closure, is being prepared to commemorate this influential institute. However, following an appeal for information, it became clear that there was a

strong demand from both ex-staff and alumni for a full-scale reunion - and a 'Centenary Celebration' seemed most appropriate.

This event will take place on 21 September 2013 in Firth Hall, University of Sheffield.

If you are a Sheffield Geology or an associated graduate, your department needs you!

▶ Further information and booking forms can be downloaded at: www.geologyatsheffield.co.uk

Union of Geological Sciences. The award, for which he was nominated by the Board of INHIGEO, was received in his absence by his daughter Rebecca during the 24th IGC in Brisbane last August.

CAROLINE LYNN

Caroline Lynn, Production Geologist with Shell UK, has been named 'Professional Woman of the Future 2012'. The 'Women of the Future' Awards, in association with Shell, are 'a platform for successful young women in Britain today'. Now in their seventh year the awards have highlighted the achievements of over 300 women.



Caroline Lynn named 'Professional Woman of the Future 2012'



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.

Glossop Lecture, Award 2012

The Glossop Lecture 2012 was given by Dr Ruth Allington (GWP) who spoke on 'Engineering geology and geomorphology in the design, operation and rehabilitation of quarries' at the Royal Geographical Society, on Wednesday 21 November.

The lecture was preceded by the winning Glossop Award presentation, by Thomas Clifford (Aggregate Industries Ltd.) on 'Assessment and Design Mitigation for Rockfall in Quarries'. Dave Giles (Portsmouth University) received a Dartington crystal tankard engraved with the EGGS logo, and a hammer bearing the inscription "To a man with a hammer, every

rock is a shale (with apologies to Mark Twain)".

The award was made in recognition of Dave's work organising EGGS field trips for the last 15 years. The vote of thanks to the Glossop Lecturer was proposed by Professor Jim Griffiths (University of Plymouth, ex-Chair of EGGS) who is also the 2013 Glossop Medallist and lecturer.

The ceremonies were introduced by Helen Scholes, Chair of EGGS, and the Glossop Medal (Ruth Allington) and Award (Thomas Clifford) presented by Emma Slack, daughter of the late Rudolph Glossop.



Thomas Clifford, Emma Slack (née Glossop) and Ruth Allington



Helen Scholes presents Dave Giles with hammer and tankard

IN MEMORIAM WWW.GEOLSOC.ORG.UK/OBITUARIES

THE SOCIETY NOTES WITH SADNESS THE PASSING OF:

Bailey, Kenneth *
Blackburn, James Kirk *
 Bowler, Christopher Michael Lance *
 Chapman, W T *
Gardner, Alastair
Jones, Brian Lloyd *

Middleton, John *
Million, Ronald *
 Scott, Robert A *
 Williams, Colin L *
Zwart, Hendrik *

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 shown in bold. Fellows for whom no obituarist has yet been commissioned are marked with an asterisk (*). The symbol § indicates that biographical material has been lodged with the Society.

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.



Mystery mugshot

Can you throw any light on this curious item?

Stuart Baldwin has acquired two pewter (we think) mugs with the Society's initials entwined above the Society's motto (picture). The item turned up when Stuart was purchasing the library and some effects of a deceased Fellow. Inquiries have so far drawn a blank. Does anyone recognise this mug, and if so can they shed any light on when and for what reason it was made? The mug is 125mm tall; the diameter of the mouth is 90mm, maximum width including handle is 130mm. Base diameter 80mm.



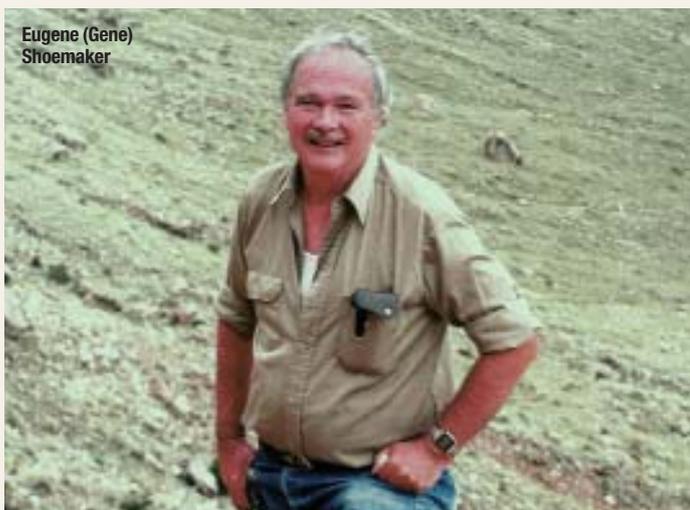
▶ Contact Wendy.cawthorne@geolsoc.org.uk

PEOPLE...

DISTANT THUNDER

Man in the moon

Geologist and science writer Nina Morgan* discovers a new twist to an old Sinatra song



Eugene (Gene) Shoemaker



Athena-2 rocket with Lunar Prospector

By NASA (Public domain) via Wikimedia Commons

Fly Me to the Moon was a great hit for Frank Sinatra back in the 1960s. But although the Ol' Blue-Eyes may have gazed upward, his feet remained firmly on the ground. Not so for Eugene (Gene) Shoemaker (1928-1997). A geologist with a life-long passion for studying impact craters, he brought together geological principles to the mapping of planets, founded the US Geological Survey Branch of Astrogeology in 1961 and established its field centre in Flagstaff, Arizona in 1963.

COMET

'SuperGene' retired from the USGS in 1993, and in the same year, along with his wife Carolyn and collaborator David Levy, discovered the Comet Shoemaker-Levy, which crashed into Jupiter in 1994, providing new insights into the dynamics of comets and the planetary science of the greatest of the gas giants. He was tragically killed on 18 July 1997 as the result of a car accident in Alice Springs Australia while carrying out field

work on impact craters. One of his last public appearances had been at a Society Fermor Meeting on meteoritics, just a few months before.

Recalling how Shoemaker once mentioned that 'Not going to the Moon and banging on it with my own hammer has been the biggest disappointment in life', his colleague and former student Dr Carolyn Porco (now a Senior Research Scientist at the Space Science Institute in Boulder, Colorado and an Adjunct Professor at the University of Colorado at Boulder) proposed and set in motion a fitting tribute – a scheme to send some of Shoemaker's ashes to a final resting place on the Moon.

Permission from Shoemaker's family and NASA administrators came quickly, and a tiny polycarbonate capsule – just 1.75 inches long and 0.7 inches in diameter – containing some of Shoemaker's ashes was packed inside a vacuum-sealed flight-tested aluminium sleeve and loaded onto the Lunar Prospector spacecraft. This was

launched at 02:28:44 GMT on 7 January 1998 from the Kennedy Space Center in Florida and 105 hours later it entered Lunar orbit. On 31 July 1998, Shoemaker's ashes reached their final resting place when the Lunar Prospector (mission accomplished and having found no water) was deliberately crashed onto the surface of the Moon in a seismic experiment.

CAPSULE

Wrapped around the capsule is a piece of brass foil carrying images of the comet Hale-Bopp and of Meteor Crater in northern Arizona, along with the passage from Shakespeare's *Romeo and Juliet*:

*And, when he shall die,
Take him and cut him out in
little stars,
And he will make the face of
heaven so fine
That all the world will be in love
with night,
And pay no worship to the
garish sun.*

A truly inspirational end for a geologist who made a real impact.

ACKNOWLEDGEMENT

Sources for this vignette include: Information about the Lunar Prospector on the websites: solarsystem.nasa.gov/missions/profile.cfm?MCode=LunarPr&Display=ReadMore and nssdc.gsfc.nasa.gov/planetary/lunarprosp.html; information about Hale-Bopp and Shoemaker-Levy at www.ninesplanets.org; Shoemaker's ashes at www2.jpl.nasa.gov/s19/news82.html; Wikipedia, and an obituary at astrogeology.usgs.gov.rpif/gene-shoemaker.

► 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: 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 based in Oxford.

READERS' LETTERS

► *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

'BLACK TIE' DINNERS



TIES THAT BIND

Sir, I think Sue Treagus misses the point of dinner jackets. A dress code simply ensures that the men attend in uniform - and in the same uniform - leaving the ladies to provide the sartorial sparkle and glamour.

Without a dress code I, as a member of the working class, might turn up in a costermonger's apron and find myself sitting next to a duke in ermine robes and coronet. Which might make both of us feel uncomfortable. A dress code actually removes any sense of elitism or snobbery.

Of course, one can always walk out early, but I feel that on one point Sue is right; there is no need to drag the event out to midnight. A well organised evening can finish at 22.30 - as do Livery Company dinners. This enables those of us living south of the river to get back to darkest Dulwich at a reasonable hour!

Robert Freer

HELL ON HEELS

Sir, As a female geologist who moved to London several years ago, I have never attended one of the 'Black Tie/Dress' events for exactly the reason raised by Ms Treagus. As much as I would like to network & meet other geologists it sounds like I would feel completely out of place.

For men it's simple; 'black tie' equates to popping down to the nearest rental place & hire a standard issue suit and maybe having a shave. As a woman, the expectation is posh dress chosen from a vast array in a multitude of shops; tights, stockings, sunbeds/fake tan, shoes, heels of correct colour, matching handbag, necklace/other jewellery, not to mention the hair and makeup. All great if you love all that. I don't.

If I was interested in dressing up I would have studied fashion or read *Cosmo* instead of *Geoscientist*. As a geologist I'm not too fussed if I break a nail. I tried a black tie event once. I even got myself a personal shopper to assist with the attire. In the end I gave up. The trauma and the stress I can happily live without. Must be nice to just hire a suit & turn up for a few drinks with the guys. Black tie event says to me "well-to-do London gentlemen" and their wives who can catch up on the latest goss & skin care tips, while the guys talk shop.

When the next 'jeans & t-shirts (preferably sporting extracts from "Sticks and Stones" for a laugh & ice breaker) down to earth day' is on I'll pop along for sure.

Name and Fellowship Number supplied

PUMPKIN TIME

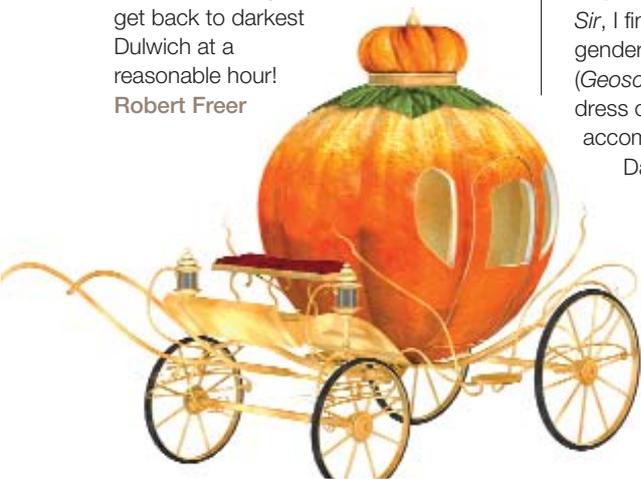
Sir, I find it regrettable that in the name of gender equality and modernity Sue Treagus (*Geoscientist* 22.11) takes umbrage at the dress code guidelines and timing that accompanied the invitation to the Founders' Day Lecture and Dinner.

If, as many Society members do, you live outside 'night bus' range, it is nice to know when events end so that travel or hotel arrangements can be made. The simple if somewhat archaic term "Carriages" provides all one needs to know

clearly and succinctly. In addition, it lets guests know what time to leave, so that our hosts do not have to spend even more time easing stragglers out of the door long after their welcome has run out!

The same applies to the guidance as to what should be worn at the event. "Dress: Black Tie" again is a very clear instruction - to both genders - as to the formality of the evening, preventing embarrassment for both guest and host when attending wrongly attired. "Dress: Black Tie" and "Carriages" are merely good etiquette.

Nigel Davis



OBITUARY



JOHN EDWARD GUEST 1938-2012

Volcanologist and planetary scientist who inspired generations of students at UCL over half a century

John Edward Guest was a pioneer in volcanology and planetary science. Born in London on 6 December 1938, he had an enthusiasm for the natural world - from geology to ornithology - that he used to inspire generations of colleagues and students. He died on 19 May 2012 at his Shropshire home in Church Stretton and leaves a widow, Mary, and two sons, Ben and James.

John saw his academic work not as a job, nor as a career, but as a vocation. Graduating from University College London (UCL) in 1962, he remained with the university for almost 50 years. In that time, he

established the emerging disciplines of planetary geology and physical volcanology at UCL and, in 1980, he founded the first NASA Regional Planetary Image Facility outside the USA.

FASCINATION

During his PhD with Sydney Hollingworth on Tertiary ignimbrites in the Chilean Andes, John honed his flair for field geology and confirmed a fascination for volcanoes that led him into research around the world, including Jan Mayen, Iceland, Bioko island, Hawaii, the Azores and, most notably, southern Italy. He was among the generation of scientists who recognised the

importance of transforming volcanology into a physical discipline and, even though he described himself as a field geologist, he vigorously promoted advances in quantifying the effusive behaviour of volcanoes.

In 1973, he led the UK contribution to a 10-year Anglo-Italian project on the evolution of Sicily's Mount Etna. The collaboration produced the first geological map of the volcano for 100 years and launched a new understanding of Etna's magmatic feeding system and eruptive dynamics.

“JOHN BECAME ONE OF THE FIRST NON-US CITIZENS ON NASA'S PROGRAMME FOR PLANETARY EXPLORATION”

Through his drive for extending traditional studies into new arenas, John pursued a postdoctoral project on the origin of lunar craters. Despite his passion for volcanoes, he argued against the prevailing wisdom that the craters were volcanic and supported the view that they were the result of meteorite impacts. He became one of the first non-US citizens on NASA's programme for planetary exploration and joined the science teams for missions to Mercury (Mariner 10, launched in 1973), Mars

(Viking, 1975) and Venus (Magellan, 1989). He also engaged with the Soviet Phobos mission to Mars (1988). For his contributions to planetary geology, he received the 1991 G K Gilbert Award from the Geological Society of America. In the same year, asteroid 1982 HL was named Guest by the International Astronomical Union.

INFLUENCE

An extremely quick 'thinker-on-his-feet', John had a formidable talent for grasping the logical core of an argument. He had also the ability to prevail in a debate without causing offence. This made him a considerable influence behind the scenes during project design and management and, at the same time, popular with colleagues whatever their views during discussion. He was a born raconteur and had a legendary fund of tales, some taller than others, from his long experience around the globe. For this alone, John was an ideal field companion, an arresting and inspiring lecturer and, to his co-workers, a friend, colleague and mentor.

► By Christopher Kilburn, David Chester, Angus Duncan, Rosaly Lopes, Derek McNally, John Murray, Ellen Stofan and Denis Timm. A longer version of this obituary may be found online



John on Etna

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Course	Date	Venue and details
Geomorphological Processes	28 January - 1 February	University of Sussex. Fees apply; Fellows' discount. See website for details and registration. Or apply online at www.sussex.ac.uk/geography/pgstudy
Forcing and Predictive Models of Change	18 - 22 February	University of Sussex. Fees apply; Fellows' discount. See website for details and registration. Or apply online at www.sussex.ac.uk/geography/pgstudy . Contact: Dr John Barlow E: john.barlow@sussex.ac.uk
Lapworth's Logs	n/a	'Lapworth's Logs' are a series of e-courses involving practical exercises of increasing complexity. Contact: info@lapworthslogs.com . Lapworth's Logs is produced by Michael de Freitas and Andrew Thompson

DIARY OF MEETINGS FEBRUARY 2013

Meeting	Date	Venue and details
Rock Idol Competition and AGM East Midlands Regional	TBC	Social Event. Check website for details.
Gully Incision Valleys and Glacial Lineations: Recent insights Central Scotland Regional	19 February	BGS Common Room, Edinburgh. 1740 for 1800 start. Speaker: Heather Stewart. Convener: Lesley MacLellan E: Lesley.McLellan@ls.glasgow.gov.uk
Making the Himalaya: Oozing, Squashing or Sliding? Geological Society	20 February	Burlington House. Speaker: Dr Matt Kohn (Boise State Uni) MSA distinguished lecturer 2012-2013. Please see website for details and registration. Talks at 1500 and 1800. Contact Naomi Newbould E: naomi.newbold@geolsoc.org.uk . Tickets allocated by lot.
Geology Rocks! 21st Birthday Event Southern Wales Regional	23 February	National Museum, Park Place, Cardiff, 1000 - 1500. Contact: Dave Jones E: David.Jones@environment-agency.gov.uk
Groundwater Dependent Ecosystems Hydrogeological Group	27 February	The Birmingham & Midland Institute. A one day meeting. See website for call for abstracts. Convener: Chris Jackson. E: crja@bgs.ac.uk

STICKS AND STONES



OBITUARY



ROBERT BRUCE KARIM KING 1923-2012

Geomorphologist who applied Land Systems to planning in South Africa, but was forced to leave

Bruce King died suddenly at his home in Esher in April. At his Muslim funeral the Imam accorded him the accolade of 'Sheikh', with its connotations of wisdom and learning.

Although born and schooled in England, Bruce opted to do his geology degree at Durban. Natal geology at that time was much influenced by geomorphologists, who were developing ideas on retreating pediments and stepped pediplains as the dominant processes shaping the South African landscape. This gave Bruce his lifelong interest and career in geomorphology. After

graduation he worked in Cape Town, with a group that was developing African applications of Land Systems. These are recurrent landscape patterns in which soils and natural vegetation vary systematically from crest to drainage line provided that the lithology and climate remain fairly uniform. Once characterised, Land Systems facilitate rapid identification and location of particular resources, and are also an excellent way of encapsulating complex distributions of land resources in large areas.

POLITICS

Although he found the work interesting, Bruce was uncomfortable with politics

and life in South Africa. After a (then illegal) marriage, conversion to Islam, and support for the ANC, he had to leave. He took a geomorphological doctorate at Edinburgh, and then joined the Land Resources Division of ODA, which was the technical branch for agricultural development in British overseas aid. His first major assignment was to co-found the Bureau for Land Use Planning in Tanzania, which applied Land Systems to map land resources. The Bureau made great use of aerial photographs and, later, satellite imagery, and this furthered Bruce's interest and expertise in remote sensing.

away from merely assessing and mapping land resources, and, particularly in Belize, became actively involved in the complexities of multi-disciplinary and multi-sectoral planning.

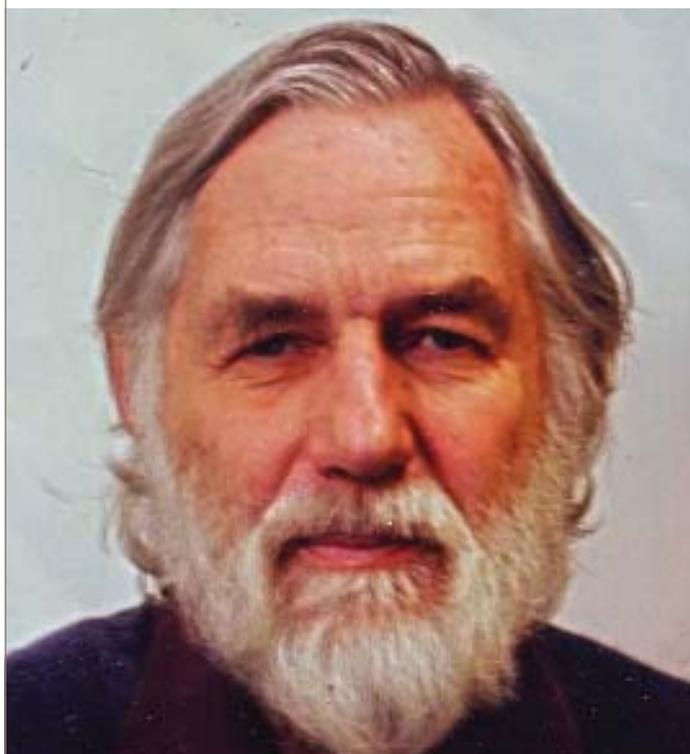
In retirement, the political changes in South Africa meant that Bruce could return to his interest in the South African landscape, and he embarked on a systematic geomorphological survey of the country. He was also working on a tropical geomorphology and remote sensing book.

EGALITARIAN

The whole of Bruce's life was influenced by his egalitarian ideals. After returning to England he became an active member of the Labour Party, and he was a staunch trade unionist within LRD. In retirement he gave much time and effort to the Fair Trade Movement. He was an engaging colleague and team leader - rigorous and meticulous but modest, gentle, humorous and helpful. He developed warm and mutually respectful ties with host country counterparts. He took a refreshingly lateral look at issues, as shown by his solution to the problem of remaining physically active in retirement - by becoming the oldest and best-qualified paper-boy in the Surrey stockbroker-belt.

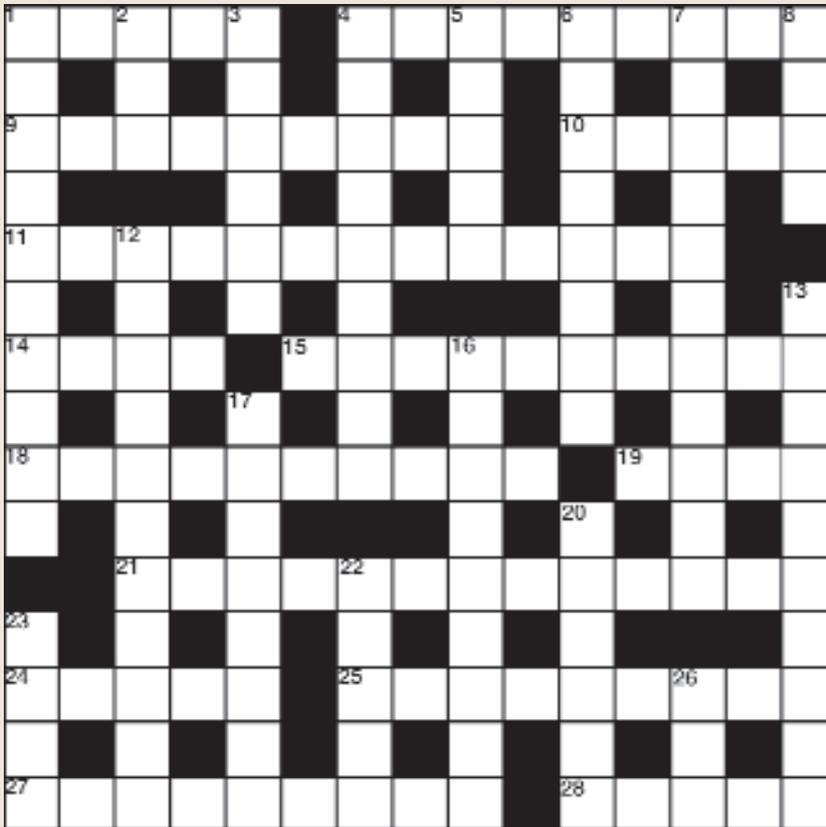
“ HE WAS AN ENGAGING COLLEAGUE AND TEAM LEADER - RIGOROUS AND METICULOUS BUT MODEST, GENTLE, HUMOROUS AND HELPFUL ”

After Tanzania, Bruce participated in major Land System environmental surveys for agricultural and forestry developments in northern Nigeria, the whole of Indonesia and the whole of Belize, initially as the geomorphologist and remote sensing specialist, but later as leader of multidisciplinary teams. By the end of his time in LRD, Bruce had moved



► By Ian Baillie

CROSSWORD NO. 165 SET BY PLATYPUS



ACROSS

- 1** Magnesium salt gives horses the runs (5)
- 4** Synclines (9)
- 9** Impermanent, as in streams for instance (9)
- 10** Soil bore (5)
- 11** Filling a former deficit, for example, in a reservoir (14)
- 14** Incorruptible metal (4)
- 15** Worshipful London Livery Company for hooch makers (10)
- 18** Gazelle-like lightness of foot (10)
- 19** Former UK trade union, which in 2007 merged with Amicus to form UNITE (1,1,1,1)
- 21** Descriptive of an argument possessing the properties of logical discourse (13)
- 24** Acronym, now a word, meaning a powerful form of light (5)
- 25** Endogenous purine nucleoside that modulates physiological processes within the cell (9)
- 27** No longer of use (9)
- 28** Fluorescent red dye much used in biological microscopy, produced by the action of bromine on fluorescein (5)

DOWN

- 1** Very large scale tectonic movement(10)
- 2** One beyond Fah (3)
- 3** Lithostratic grouping of beds (6)
- 4** Conforming to precepts laid out in the Origin in 1859 (9)
- 5** Renege on a bet, would you boyo? (5)
- 6** Whip-like propulstion strands seen in both prokaryotes and eukaryotes (8)
- 7** Lacking in substance, figuratively - or mass, literally (11)
- 8** Winnow by currents into uniform grain size (4)
- 12** What happens to monomers when they join to form chains (11)
- 13** Much-blotted heraldic device (10)
- 16** Sworn statement (9)
- 17** Small, steep-sided triangular mesa - or early New York skyscraper (8)
- 20** C₅H₁₀O₅ all hydroxyl groups on one side (in Fischer) (6)
- 22** Nebraskan city that gave its name to a Normandy beach (5)
- 23** To put out of focus (4)
- 26** The Tories' 'determined, quiet man' (1,1,1)

WIN A SPECIAL PUBLICATION

The winner of the November Crossword puzzle prize draw was **Michael Allen of Allestree Derby**.

All correct solutions will be placed in the draw, and the winner's name printed in the April 2013 issue. The Editor's decision is final and no correspondence will be entered into. **Closing date - 25 February.**

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 OCTOBER

- ACROSS:**
1 Beryl **4** Essential **9** Oldhamite **10** Upset
11 Impressionism **14** Rood **15** Congruence
18 Traversing **19** Etna **21** Characterised **24** Delhi **25** Replicate **27** Egyptians **28** Ewers

- DOWN:**
1 Biomicrite **2** Red **3** Leases **4** Emissions
5 Steno **6** Nautilus **7** Inseminates **8** Lots
12 Prosaically **13** Regardless **16** Genotypes
17 Medalist **20** Ursine **22** Aorta **23** Edge **26** Ale

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PESGB 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.



Geology and Me
Hugh Dennis
"Comedian and geology enthusiast"

Tuesday 12 March 2013
Central Hall, Westminster, London

PLSGB is pleased to announce that the speaker for the next Stoneley Lecture on 12th March 2013 will be well known comedian, actor and presenter Hugh Dennis.

While best known for *Mock the Week*, *The Now Show* and *Outnumbered*, Hugh is passionate about the outdoors and recently presented a BBC TV series entitled *The Great British Countryside* which examined the relationship of geology to the landscape and the industrial past. He says he is never happier than when at the top of a hill in the rain, looking at the landscape stretching away to the horizon.

Registration is now open, please invite your friends, family and work colleagues to attend.
www.pesgb.org.uk



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About us

Dealing with the past. Protecting the future.

The Nuclear Decommissioning Authority (NDA) has been appointed by the Government to implement geological disposal for higher activity radioactive waste. Our Radioactive Waste Management Directorate (RWMD) is being developed into a wholly owned subsidiary and a nuclear Site Licence Company (SLC), which will progress this vital work. RWMD will develop a Geological Disposal Facility (GDF) and associated transport system based upon a robust geoscientific understanding of a candidate site(s).

About the role

Joining us at a critical stage, you'll have the opportunity to help shape our ways of working. In this influential role, you will be responsible for specifying and obtaining data from geological investigations as appropriate. You will liaise extensively with specialist suppliers to provide information needed to undertake geoscientific work in support of the Government's siting programme for a geological disposal facility. Other external contacts include the Geological Society, British Geological Survey, expert advisory panels and international sister organisations. Your work will include the development of needs-driven plans for surface-based and underground investigations and geoscientific inputs to site identification and selection processes.

About you

Your keen understanding of geological investigations and site characterisation will be underpinned by a good first degree or equivalent in earth or physical sciences or engineering. You will hold, or be working towards, chartered membership status in a relevant professional institute. You will have significant experience and knowledge of the range of data acquisition and interpretation techniques available to characterise the geoscientific aspects of sites. You will also be able to demonstrate knowledge of the principles of data and records management. Excellent interpersonal and communication skills are vital to success.

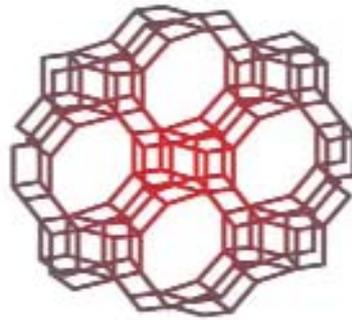
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To apply please forward your CV and a covering letter quoting reference RWMD: GIM01 to rwm.recruitment@nda.gov.uk by the closing date of 25th February 2013.

To find out more about the work of the NDA and RWMD visit www.nda.gov.uk



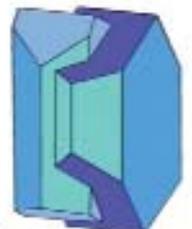
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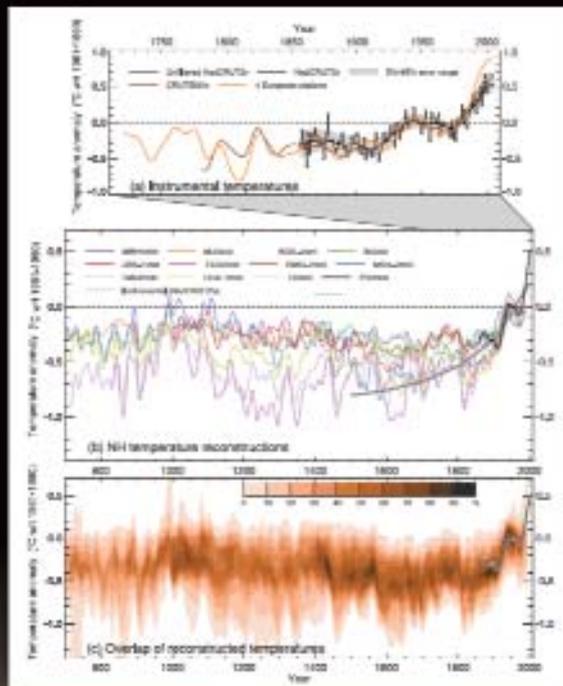
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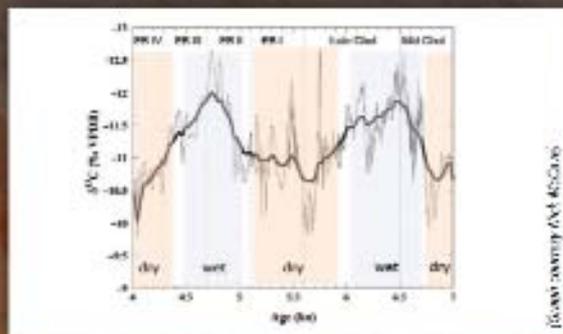
Holocene Climate Change

4-5 April 2013

Burlington House, London, United Kingdom



From IPCC AR4, Working Group II, Figure 5.10 – records of NH temperature variation from multiple proxies over the past 1000 years



delta 18O record from speleothem in Israel (from Ben Mattheus)



Above: cutting Antarctic ice core (Swansea)
Left: ice drilling in Antarctica
(both images courtesy Erik Wolff)

This meeting will examine high frequency climate changes reflected in the geological record, and the paces of change and their geological consequences, during the Holocene – the past 11,700 years. Despite the general stability of the Holocene climate, there have been distinct cool/dry events, for example at 8200, 6600, 5600, 4100 and 2700 years ago and in the Little Ice Age between roughly 1400 and 1850, and warm/wet periods like the Holocene climatic optimum, the Roman Warm Period and the Medieval Warm Period. To what extent were these events global rather than regional? What drove them? What produces roughly periodic changes at intervals of about 1500 years seen in marine records and speleothems? Resolving these kinds of questions will aid understanding the modern climate and the warming that has taken place since around 1970. Recent improvements in physical- and chemo-stratigraphy and modelling allow us to examine in much more detail than hitherto the effects of a wide variety of natural causes, natural cycles, and greenhouse gases, and to integrate results from different land and ocean areas in ways not formerly possible. The results of the meeting should help to inform the ongoing deliberations of the IPCC and to dispel some current misconceptions. The meeting will be divided into sessions on Ocean Change, Sea-Level Variability, Terrestrial Change, Ice Core Change, the Modelling of any or all of these, and the interaction between climate and humans.

Keynote speakers:

Graeme Barker, *Cambridge*
Ian Hall, *Cardiff*
Anthony Long, *Durham*
Ulysses Ninnemann, *Bergen*

Paul Valdes, *Bristol*
Bo Vinther, *Copenhagen*
Heinz Wanner, *Bern*

Special Publication

Papers from this meeting will be published in a Special Publication of the Geological Society of London.

Organising/Advisory Committee:

Colin Summerhayes (Chair); Nick McCave; Paul Valdes; Graeme Barker; Eric Wolff; Dan Charman

Registration and travel & accommodation grants

Registration is now open for this conference. You can register online via the weblink below or contact Georgina for a registration form.

There are a limited number of travel & accommodation grants available. Please contact Georgina before 28 February 2013 for further information.

Georgina Worrall

The Geological Society, Burlington House, Piccadilly, London W1J 0BG

T: 020 7434 9944 F: 020 7494 0579

E: georgina.worrall@geolsoc.org.uk W: www.geolsoc.org.uk/holocene13