



# Number 82, February 2012

www.norfolkgeology.co.uk

## This issue:

Mystery Geology Object

Another geological conundrum for you to solve

Citizen Science Your chance to help record geological data

Find us on Facebook Plus: Paper abstract, geological notices, and much more ...

#### The Society

*The Geological Society of Norfolk* exists to promote the study of all aspects of the geology of Norfolk (and farther afield when appropriate). As an amateur society, special emphasis is placed on providing lectures and field trips that are designed to appeal to members of the public.

#### **Membership fees**

Ordinary: £10 Student in full-time education: £5 Institutional (libraries, councils, businesses, colleges, universities, *etc.*): £28 Subscriptions are due annually on 1<sup>st</sup> February

#### Payment

Cheques should be made out to *The Geological Society of Norfolk* and sent to the Treasurer Dr Jenni Turner (see back page for details).

#### **Instructions for Authors**

Material intended for publication in the *Newsletter* should be submitted electronically (either on a CD or by e-mail) to the Editor (Dr David Waterhouse, inside back cover for details). It should be in Times New Roman font size 12. A single-page article is typically around 650 words long. Please supply all images separately, not embedded in the document. Ideally, images should be as JPG or TIFF files, at 300 dpi. All references must be given in full. The Editor reserves the right to refuse or alter articles for publication.

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### Editorial

In this issue the *Editorial* section is given over to publicising the Society's *Facebook* pages. At present we have 27 people who (to use the *Facebook* terminology) 'like' the page. It would be great if more of our members took a look and 'liked' it too!

For those of you who are unfamiliar with *Facebook*; our page is a great way of keeping up-to-date with geological events throughout the county. Committee member Nigel Larkin kindly set the page up and maintains it regularly, but anyone can contribute by posting comments, adding links and even uploading photographs and videos.

The page is designed to work alongside our webpage, giving additional information on the Society's lectures, as well as information on new relevant books, and other societies' talks and lectures. But the difference with a *Facebook* page is that members can also give instant feedback and comments, as well as acting as a quick and easy-to-use discussion forum. Facebook is also a great way to share geological photographs - both technical (if you wish to point out an important feature, or ask a question about something) and social (field trips, group photographs, etc.). So if you've never used a 'Social Networking Site' before, make the Geological Society of Norfolk's page your first attempt and post a comment or photograph!

Find the GSN Facebook page at: www.facebook.com/pages/Geological-Society-of-Norfolk/160211420712550

David Waterhouse General Secretary and Newsletter Editor The Geological Society of Norfolk The GSN *Newsletter* needs articles, and we rely on our members to write these. You don't have to be a committee member to submit an article or idea. So, if you have something interesting to write about Norfolk geology, have a relevant recent book that you would like to review, or have any suggestions for article abstracts that we could publish, please get in touch with me (contact details below). 'Instructions for Authors' are provided on the inside front cover.

Dr David M. Waterhouse Curator of Natural History Norfolk Museums and Archaeology Service The Shirehall, Market Avenue Norwich NR1 3JQ, Norfolk E-mail: <u>david.waterhouse@norfolk.gov.uk</u>

We also need interesting pictures for the front page of the *Newsletter*. I would be very grateful for submissions of Norfolk geology pictures, to be sent to me at the above e-mail address (small jpgs of less than 500KB initially please – larger file sizes can be sent later if accepted).



### **Paper Abstract**



Long, P.E. and Zalasiewicz, J.A. 2011. The molluscan fauna of the Coralline Crag (Pliocene, Zanclean) at Raydon Hall, Suffolk, UK: Palaeoecological significance reassessed. *Palaeogeography, Palaeoclimatology, Palaeoecology* 309, 53–72

This study assesses the environmental implications of a quantitative study of the unusually well preserved molluscan fauna of over 200 species (about 47% extinct) from six samples from both the Ramsholt and Sudbourne Members of the Coralline Crag Formation at a British Geological Survey borehole at Raydon Hall, near Orford, Suffolk, UK. It reveals a shallow shelf fauna locally transported from a variety of habitats dominated by infaunal species (*Spisula, Turritella, Abra, Amyclina*) from relatively fine sediments, plus epifauna (especially *Heteranomia*) possibly in part originating from nearby bryozoan communities as well as dead bivalve shells. There was a small but consistent component of deeper water elements, such as *Limopsis*, and a lack of strictly littoral species. Overall, a water depth of about 50 m is suggested, with bottom temperatures at times perhaps warmer than the present southern North Sea (but not as high as the modern Mediterranean), and a more oceanic setting. This is in contrast to inferences from previous nineteenth century studies of Coralline Crag molluscs, which viewed it as largely Mediterranean in character, but understated the regular presence of boreal forms such as *Arctica*. Current interpretations still have to account for the coexistence of some Lusitanian or Mediterranean molluscan taxa alongside the cooler water elements.



### Winter Lecture Reminder

#### **Cannibalism in Palaeolithic Britain**

Dr Silvia Bello (The Natural History Museum, London) 7.30pm, Thursday 16<sup>th</sup> February 2012 *N.B.* Teas and coffees will be available before the lecture for just 50p. ZICER Lecture Room (top floor of the ZICER building), School of Environmental Science, UEA, Norwich, NR4 7TJ (see maps on pages six and seven for directions)



Dr Silvia Bello ©The Natural History Museum

Cannibalism (the act of eating any type of tissue from another individual of its own kind) amongst *sapien* and pre-*sapien* humans has been suggested, rejected, accepted and criticized since the 19<sup>th</sup> Century. Whilst cut-marks on faunal remains are usually seen as a direct manifestation of butchery activities, those on human remains are not considered unequivocal evidence of cannibalism. This is mainly because cannibalism among humans has always been a taboo topic, and because cut-marks on human remains can be the product of ritual practices (such as defleshing) without consumption of the body.



14,700 year old human remains from Gough's Cave in Somerset – showing clear signs of butchery by other humans.

The identification of nutritional cannibalism is hard to prove through osteological analyses. One often-used criterion to demonstrate cannibalism is the similarity of butchery traces (frequency and location) on human and animal remains from the same archaeological context.

In this talk, Dr Bello will present cases of cannibalism from around the world and how it has been recognised. She will pay particular attention to the Upper Palaeolithic site of Gough's Cave (Somerset, England), which has revealed interesting human behaviour associated with cannibalism. Here, not only human bodies were cannibalised, but the skulls of some individuals were fashioned into drinking cups. The combination of cannibalism and skull-cup production at Gough's Cave is so far unique in

the European Upper Palaeolithic. Direct determinations on two of the vaults (~14,700 cal BP) make these the oldest dated examples of skull-cups in the archaeological record.





The car park operates by a system of keeping the token dispensed at the entrance barrier until you are ready to leave. When returning to the car park feed the barrier to leave the carpark. The meeting venue is on the top floor of the ZICER building (accessed by stairs or a lift), signs will guide you from the car park coin into the car park ticket machine, pay the car park fee of £1 and your validated token is returned to you. Feed the validated token into slot at the exit ticket machine to the lecture theatre.









# **Presidential Address and Annual General Meeting**

### The investigation from subglacial processes from modern and Quaternary glacial sediments

Prof. Jane K. Hart (University of Southampton) 7.30pm, Thursday 12<sup>th</sup> April 2012 Music Room, The Assembly House, Theatre Street, Norwich NR2 1RQ

Norfolk not only has some of the best exposed glacial geology in the UK, but data from these sites have been an important component in many glaciological models over the last 30 years. The response of modern glaciers to climate change is poorly understood, and numerical models have failed to predict the rapid ice loss observed. This is probably because there are so few data concerning the nature of the subglacial environment, which is a key driver of glacier dynamics. The study of the subglacial from modern glaciers is logistically difficult, so a combination of modern *in situ* studies with Quaternary till studies (from key sites such as those in Norfolk) is needed.

This talk will demonstrate results from subglacial wireless probe experiments from Norway and Iceland, combined with sedimentology, micromorphology and CT scanning from Norfolk to discuss the following subglacial processes:

- Models of the subglacial deforming bed field and microscale structures, till fabric development, rheological changes, and till genesis.
- Models of subglacial rafting.
- Models of rapid retreat associated with a subaqueous margin.



### **Annual General Meeting**

The AGM will immediately follow the Presidential Address Thursday 12<sup>th</sup> April 2012 Music Room, The Assembly House, Theatre Street, Norwich NR2 1RQ

Brief summary of the agenda for the evening:

- Minutes of the 2011 AGM
- Matters arising therefrom
- Officers' reports
- Election of Officers for 2012–2013
- Any other business

### **Mystery Geology Object**

This *Newsletter's* mystery object, as usual, was found in Norfolk.

If you think you recognise what it is, send an e-mail, with the subject title 'GSN Mystery Object', to the Editor at:

#### david.waterhouse@norfolk.gov.uk

or, alternatively write to:

Dr David M Waterhouse Curator of Natural History Norfolk Museums and Archaeology Service The Shirehall Market Avenue Norwich NR1 3JQ

The first person to answer correctly will have their name published along with the answer in the next issue of the GSN *Newsletter*.



Scale bar equals 50 mm

The previous mystery object (see right) was once again not correctly identified by anybody! One suggestion was that it is a gastrolith from a seal or sea lion. But, I was being a little unfair as it was a bit of a trick-question – the answer is not certainly known by anyone!

The object came from the Geology Handling collection at Norwich Castle Museum, and so by its very nature is not an accessioned object with provenance and full data (we mainly use unaccessioned, replaceable objects for public handling). It is almost certainly a specimen derived from the London Clay and subsequently preserved in the Red Crag deposits of Norfolk/Suffolk. Although our records describe it (and similar objects) as 'shark coprolites', it could also be a pseudocoprolite or something like a spiral burrow in-fill. Certainly skates, sharks and dogfish produce very similar



*Newsletter N<sup>o</sup>.* 81 mystery object: shark coprolite/pseudocoprolite

looking faeces, due to the odd spiral valve in their compressed small intestine.

However, the pseudocoprolites of the Coralline Crag and Red Crag are quite similar in appearance to the mystery object. Originally thought to be real coprolites (fossilised animal dung), these phosphatic nodules have been used as fertilizers since at least the 1840s.

It just goes to show that you can't always trust what's recorded about an object; my colleagues and I have to be wary of object identifications that may well be open to interpretation.

If you do have any more information about coprolites and/or pseudocoprolites or similar objects, I'd be very glad to hear from you (see contact details in *Editorial* section/back cover).





### **Company Profile**

*ResearchGate* (www.researchgate.net) was founded by researchers who wanted to build a platform to facilitate their and others' research. Described as 'Facebook for Scientists', *ResearchGate* aims to provide these resources to scientists for free. With over 1.2 million members, they are the world's largest professional network for scientists and researchers. *ResearchGate* members can:



- Gain access to over 45 million abstracts and download thousands of full publications for free
- Ask questions and get answers from specialists in discipline-specific topics
- Create or partake in work groups specific to their research
- Search through thousands of conferences and jobs in science
- Share their research data and negative results
- Blog about scientific issues and read about the latest developments

*ResearchGate* also encourages societies to promote their conferences and events to the wider scientific community. They have over 5,000 conferences listed worldwide. However, the geosciences conferences listed at the following web address will probably prove most useful to GSN members:

#### www.researchgate.net/conferences/550\_Geoscience/

Those of you who are *Facebook* members (see *Editorial*, page four) will know that you are able to adjust 'Privacy Settings', so that only selected 'friends' can view your details. *ResearchGate* works in a similar way, so that researchers who need to be careful about what information they're sharing, can block third parties from seeing what they've posted. However, *ResearchGate* doesn't work in exactly the same way as *Facebook* – for example, it doesn't bombard its users with advertisements!



www.geologistsassociation.org.uk/

A space has become available on the GA Bordeaux trip. If any member of the Geological Society of Norfolk is interested in attending, please contact the GA directly: Sarah Stafford (Executive Secretary, The Geologists' Association), 020 7434 9298 or <a href="mailto:sarah@geologistsassociation.org.uk">sarah@geologistsassociation.org.uk</a>.

#### **Geology of the Bordelais**

March  $10^{\text{th}}$ – $14^{\text{th}}$ , 2012 (six nights)

Leaders: Jean-Pierre Tastet of the University of Bordeaux and Dr Graham Evans of Imperial College

This trip has the full title 'Geology of the Bordelais: the control on the siting of vineyards and the character of the coastal zone'. The geology of various vineyards will be demonstrated and illustrated by wine-tastings in the different chateaux! Also, the evidence of the evolution of the coastline during the last 6,000 years and the impact of man will be examined by visits to the coastal dune systems and estuary marshes. Visits to some local museums will provide opportunities to understand the history of human occupation of the area during the Holocene.

Transport will be by coach, and the approximate maximum cost will be €770, to include six nights' hotel accommodation (extra for single occupancy), breakfasts and lunches (with Bordeaux wines). A geological tour of the city of Bordeaux and its building stones will be included.



### **Geologists' Association Lectures**

The Geologists' Association organizes a series of illustrated evening lectures on a wide range of geological topics. These take place on the first Friday of the month and are held in the lecture theatre of the Geological Society of London, in Burlington House, Piccadilly.

Tea is served from 5.30pm and the lectures begin at 6pm. Wine and nibbles are available after the meetings. Non-members are very welcome to attend for an introductory visit – to book a place please telephone 020 7434 9298 or email <u>sarah@geologistsassociation.org.uk</u>.

March 2<sup>nd</sup> 2012 Necks for sex? No thank you, we're sauropod dinosaurs Dr Darren Naish April 13<sup>th</sup> 2012 Dudley Geoconservation – engaging public interest at Wrens Nest Graham Worton May 4<sup>th</sup> 2012 Presidential Address Glamorous gravel: it has much to reveal Professor David Bridgland June 1<sup>st</sup> 2012 Isthmus of Panama: molluscs, nutrients and 5 million years of environmental change Dr Jon Todd July 6<sup>th</sup> 2012 Geological versus Biological approaches of telling evolutionary time Rachel Warnock October 5<sup>th</sup> 2012 Outcrops to Paintbox: mineral pigments in artists' paints Dr Ruth Siddall December 7<sup>th</sup> 2012 The Paleocene-Eocene Thermal Maximum: rapid global warming and its impact on the biosphere Dr Phil Jardine

### **Geologists' Association Field Trips**

The Geologists' Association organizes a number of day-long and weekend field meetings. If you would like further information on any of the events below, please contact Sarah Stafford at the GA Office on 020 7434 9298 or by e-mail: sarah@geologistsassociation.org.uk.

Saturday March 17<sup>th</sup> 2012 *The Chalk of the Seaford area* Leader: Geoff Toye

Saturday April 28<sup>th</sup> 2012 *The geology of Dundry Hill* Leader: Simon Carpenter

A Saturday or Sunday during April (date to be confirmed) *The chalk of the Sussex coast* Leader: Rory Mortimore

Saturday May 12<sup>th</sup> 2012 *The geology of Early Middlesex churches* Leader: Prof John Potter



# *GeoExposures*: an opportunity for GSN members to get logging with the citizen science website hosted by BGS

John Powell<sup>\*1,2</sup>, Gemma Nash<sup>1</sup> and Patrick Bell<sup>1</sup> (<sup>1</sup>British Geological Survey, <sup>2</sup>Geological Society Stratigraphy Commission) \*jhp@bgs.ac.uk

#### Here today – gone tomorrow

The geological community in the UK has long recognised that scientifically important information revealed in temporary exposures of bedrock and superficial Quaternary deposits is frequently 'lost to science'. This is largely due to the ephemeral nature of the exposures and the inability of the geoscience community to respond at short notice. This will be very apparent to members of the Geological Society of Norfolk, especially those interested in the Quaternary deposits of the region.

The Geological Society Stratigraphy Commission has, for many years recognised that geological information seen in temporary exposures may provide highly valuable information that is not recorded, archived and made available to all. In discussions at the Commission, we recognised that a vehicle was needed to expedite recording and storing information observed in pipeline trenches, shallow excavations, road cuttings and embankments. This initiative was taken forward at the British Geological Survey (BGS). Our geological imperative coincided with the wish of the BGS web development team – Patrick Bell and Gemma Nash - to develop a 'citizen science' website – GeoExposures. It is powered by the new Ushahidi crowd-sourcing software that was



GeoExposures web page: www.britishgeologicalsurvey.crowdmap.com

developed to assist with communicating events during major emergencies, such as the Haiti earthquake (*'ushahidi'* is Swahili for 'testament').

*GeoExposures* (www.bgs.ac.uk/citizenScience/geoexposures.html) is concerned only with the recording of temporary exposures and is not aimed at documenting natural exposures (*e.g.* inland and coastal cliffs, disused quarries, *etc.*), nor with the conservation of geological sites (for further information see the *Natural England* (www.naturalengland.org.uk/), and *GeoConservationUK* webpages (wiki.geoconservationuk.org.uk/). The BGS Citizen Science website (www.bgs.ac.uk/citizenScience) also incorporates reporting of landslides, flood events and soils.

Using the *GeoExposures* website, amateur and professional geologists will be able locate a temporary exposure on a *Google* map, briefly log the site's geology on a pro-forma, and upload JPEG photo images to the website, either via a smart phone or from their home or office computer. Some users may prefer more traditional methods to map, log and record – using notebook, Ordnance Survey maps, or BGS geological maps – and subsequently upload at their convenience from a computer. The essential ingredients will be accurate descriptions and good quality digital photographs as a permanent record. To assist recording, the website provides the user with links to background information on the geology and stratigraphy of the UK, such as digital BGS geological maps



(<u>maps.bgs.ac.uk/geologyviewer\_google/googleviewer.html</u>), the BGS *Stratigraphical Lexicon* (<u>www.bgs.ac.uk/Lexicon/home.html</u>) and the BGS *Timechart* 

(www.bgs.ac.uk/discoveringGeology/time/timechart/home.html). In addition, there is a converter (www.bgs.ac.uk/data/webservices/convertForm.cfm) to transfer latitude-longitude locations gleaned from a *Google* image to British National Grid. The pro-forma site description can be supplemented by additional information such as a site sketch map and geological log – these can be drawn freehand, and submitted as scanned JPEG images.

#### **First response**

During development of a 'beta' test site, we received an e-mail from Andrew Hunn, an archaeologist, who was logging a pipeline trench near Tirley, Gloucestershire. Andrew's images and site description became the first external *GeoExposures* record. Coincidentally, the faulted Mercia Mudstone (Upper Triassic) exposure is the same age and formation as our example site based on exposures of the foundations of the William Smith Building at BGS Keyworth. We hope the 'Father of English Geology' would approve of the latest format for recording geological information. Andrew Hunn reports that he has 14 years of pipeline records that may be of interest!



The first GeoExposures record submitted by Andrew Hunn showing minor faults in the Upper Triassic Branscombe Mudstone Formation recorded in a pipeline trench near Tirley, Gloucestershire (Worcester Graben).



GeoExposures website example showing the Upper Triassic Branscombe Mudstone Formation exposed in the excavations for the William Smith Building, BGS, Nottingham in 2008.

We are keen to see this as a geoscience community website and not an official BGS site – our vision is to deploy the software in a useable format for common access and as such Geoexposures is made available under a 'Creative Commons' licence. We hope that professionals in the civil engineering and quarrying industries will also be keen to submit records of short-lived exposures at their sites. BGS will monitor submissions for improbable records such as 'dinosaur footprints found in Cambrian rocks', but we do not intend to rigorously verify the records. There is an opportunity to send in comments and suggestions and we hope *Geoexposures* will generate vibrant discussions. We envisage any scientific publications arising from GeoExposures records will duly acknowledge the source material.

And finally – permission to enter onto sites is entirely the responsibility of the individual, as is your and others' health and safety. So, please give it a go – and get logging!



### Can you help advance the understanding of Norfolk geology?

Elvin Thurston (Norfolk Geodiversity Partnership)

The study of Norfolk's geology has contributed to our understanding of Quaternary palaeoclimate and associated changes in sea level, our knowledge of the world during the Cretaceous Period and much more besides. There are 'type localities' in Norfolk, but these exposures may be temporary and under-recorded. Those that have some permanence have been interpreted in the past, but our understanding has since increased, so many of these interpretations are now over-simplistic. Moreover, understanding the geology of eastern Norfolk from the few sites available is like trying to determine what's going on in the world by looking through keyholes! Archaeologists have a right to investigate temporary excavations – but geologists only have the right to borehole data (logged with the British Geological Survey). The result is that stratigraphy gets exposed, but then covered up and perhaps built on before it can be recorded.

The *GeoExposures* website (described by John Powell and colleagues on pages 12–13) provides an excellent means of recording temporary exposures in the County. The County Geodiversity Sites (CGS) group of the Norfolk Geodiversity Partnership wishes to encourage the use of *GeoExposures*, to gather and record information on temporary exposures in the County. That's where you can contribute – we need a group of alert, geologically aware people to participate in this project, logging and recording exposures and/or alerting the group to any new temporary exposures. Examples of the proforma records for the temporary exposure at the BGS in Nottingham (see Powell, Nash and Bell article, pages 12–13) are shown below. The CGS group needs helpers to be involved in a process we call 'Rescue Geology'. Recently a member saw a building site excavation that revealed very unusual strata. It was supposed to be marine Norwich Crag, but he has written up an alternative interpretation and has now submitted a paper for publication.

All levels of interest and expertise are needed for this project. You could be someone who reports that an exposure exists, or go on to participate in the recording and possibly the final interpretation. Geological Society of Norfolk members are invited to volunteer. You only need to be willing to contribute and don't need to commit to anything. If you are interested in helping, please register with the Norfolk Geodiversity Partnership describing the area you could cover, and how you would like to be involved:

#### elvin.thurston@btinternet.com or

Elvin Thurston, 32 Lenthall Close, Norwich, NR7 0UU



Example of a completed proforma:







### The Geological Society of Norfolk Officers

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