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Circular 525

YORKSHIRE GEOLOGICAL SOCIETY

President: John Powell Ph.D.

OPEN QUESTIONS IN EAST YORKSHIRE GEOLOGY: 100 YEARS AFTER LAMPLUGH

G.W.Lamplugh in the 1880's

A JOINT MEETING WITH THE HULL GEOLOGICAL SOCIETY

SPEAKERS: PETE RAWSON, RORY MORTIMORE, JOHN CATT, MIKE HORNE

FIELD EXCURSION LEADER: MIKE HORNE

1400 to 1650 SATURDAY 8th OCTOBER 2005
SCHOOL OF GEOGRAPHY, UNIVERSITY OF HULL

1030 to 1700 SUNDAY 9th OCTOBER 2005
EXCURSION: FLAMBOROUGH AREA

NON MEMBERS WELCOME

OPEN QUESTIONS IN EAST YORKSHIRE GEOLOGY: 100 YEARS AFTER LAMPLUGH

1400-1650 SATURDAY 8th OCTOBER

The meeting will be preceded by a Special General Meeting of the Yorkshire Geological Society, and will be followed on Sunday 9 October by a field excursion (details below).

1400-1415 Special General Meeting

To seek approval for several changes to the Rules of the Society. The current Rules were published in the Directory of Members issued in June 1996, and are available on our web site **www.yorksgeolsoc.org.uk.** The proposed changes to the rules and the reasons why they are needed were published in Circular 523 for March 2005 and copies will be available at the meeting.

Open questions in East Yorkshire Geology

During the later part of the 19th century, G. W. Lamplugh's seminal work on the Speeton Clay, Chalk and Pleistocene sequences of East Yorkshire laid a firm foundation for future research. Most of it was carried out while he was an amateur, before he joined the Geological Survey in 1892. A few years later he gave a fascinating lecture to the Hull Geological Society entitled 'Some open questions in East Yorkshire Geology". This was then published in the Society's Transactions and is now available on the Society's website **www.fortunecity.com/greenfield/ecolodge/25/hg149.htm** and will be reprinted in Humberside Geologist. The lecture forms the basis of this joint meeting, which will consider: how many of Lamplugh's questions have been answered; how many remain to be answered; and, after a century of research, have we found new questions to ask?

1415-1420 Introduction and Society announcements
John Powell (President)

1420-1445 Speeton: 'a section that is impossible to exhaust'
Pete Rawson (University College London)

1445-1520 Open questions on the Yorkshire Chalk
Rory Mortimore (University of Brighton)

1520-1550 Tea and Coffee

1550-1625 The work of G.W. Lamplugh in understanding the Quaternary history of East Yorkshire
John Catt (University College London)

1625-1645 Open questions in East Yorkshire Geology - answers from the amateurs.
Mike Horne (Hull Geological Society)

1645-1650 Closing remarks

FIELD EXCURSION: IN THE FOOTSTEPS OF LAMPLUGH

Leader: Mike Horne

1400-1650 SUNDAY 9th OCTOBER

The excursion will visit Speeton and Dane's Dyke, to examine some of the sites described by Lamplugh. Participants should meet either in Hull at 0930 or near Speeton at 1030. Please book in advance by contacting Mike Horne, email: m.j.horne@hull.ac.uk, or phone 01482 345784 (evenings), who will give final details of meeting places and advice on safety.

SPEETON: 'A SECTION THAT IS IMPOSSIBLE TO EXHAUST'

Pete Rawson, Department of Earth Sciences, University College London

It is frustrating that in his 1898 talk Lamplugh observed that "the open questions that [the Speeton clays] supply would make too long a tale for one night" so said relatively little about them! But he stressed that the Speeton section 'is impossible to exhaust'. Despite the wealth of information that has been obtained since, that statement remains as true today is it was in 1898. The transient nature of the exposures, especially of the higher beds, and the occasional sweeping clean of parts of the section means that it is continuously changing and we may still make new discoveries. We can also look at it afresh in the light of broader geological discoveries made since Lamplugh's time, such as the effects of Milankovicz astronomical cycles on sedimentation.

The middle C beds, Speeton, with fallen blocks of C7/C6 on the left.

Lamplugh's (1889) seminal work on the subdivision of the Speeton Clay had established the main, fourfold division into the A to D beds (based on the belemnite sequence) and by 1898 he could claim that the succession from the D beds to the 'Cement Beds' (middle B) was fairly well known. But he noted in his 1898 talk that knowledge of the remaining part of the succession and its faunas remained 'indefinite'. The gaps began to be filled by Lamplugh himself, together with the local workers Danford and Stather, so that by 1924 he could suggest, in his Presidential Address to our Society, a provisional correlation with the Lower Greensand and Gault sequences of southern England. Members of the Hull Geological Society also focused on the poorly known higher beds in the 1930s and 40s. But it was not till the 1990s that good temporary exposures allowed Mitchell and Underwood to produce a detailed stratigraphy of these higher levels, though the patchiness of exposure and degree of disturbance of these beds suggests that much more remains to be gleaned.

Renewed research on the main part of the sequence was stimulated by John Neale and his research students at the University of Hull in the 1960s. This led to documentation of many of the microfaunas, and renewed investigation of the ammonite and belemnite faunas. Since then Speeton has become a key section for comparison with the offshore North Sea area - the development of an oil industry there is something that Lamplugh could not foresee but would have been fascinated with. Nor could he foresee the many non-biological methods of correlation that are so important now. For example, Milankovicz-scale cycles are recognised in parts of the section, while the belemnite guards that are so common there provide important material for isotope stratigraphy. But despite all this work, Lamplugh's comment that 'whenever there happened to be a good exposure I never failed to find some detail of the stratigraphy or some fossil which was new to me' remains as true today as it did in 1898, and that is what makes the Speeton section so fascinating.

WHAT HAVE WE DONE TO THE YORKSHIRE CHALK?

Rory Mortimore, School of the Environment, University of Brighton

In March 1898 Lamplugh identified the inadequacy of information regarding the Chalk of Yorkshire as positively surprising. Despite the immense advances in knowledge in stratigraphy, linking many parts of the Yorkshire Chalk-column to a regional, national and international litho- bio- and chemo-stratigraphical framework, and the work on sedimentology, tectonics and hydrogeology, there are still some surprising inadequacies. These include explanations for the hardness of the Yorkshire Chalk, the origin of many of the marl seams and the precise relationship between the Yorkshire Chalk and the southern chalks of England at various levels.

This paper first explores some of the contributions to the advances in knowledge in stratigraphy and tectonics made by many amateur and professional geologists over last 100 years and then investigates some of the areas still to be explored, supporting Lamplugh's observation that nothing is exhaustive or final.

The Welton Chalk Formation at Great Thornwick Bay, Flamborough.

THE WORK OF G.W.LAMPLUGH IN UNDERSTANDING THE QUATERNARY HISTORY OF EAST YORKSHIRE

John Catt, Department of Geography, University College London

Brought up and initially employed in Bridlington, G.W.Lamplugh took an early amateur interest in local Quaternary deposits, such as the tills and erratics, the shelly Bridlington Crag, the Ipswichian interglacial raised beach at Sewerby and the Speeton Shell Bed. His understanding of the Holderness till sequence was based on Wood and Rome (1868, Quart. J. Geol. Soc. Lond. 24, 146-184), though he correctly realized that their Basement Clay included two slightly different units, which he termed the Basement and Lower Purple (the Basement and Skipsea Tills in modern nomenclature). Lamplugh's detailed accounts of these two tills and associated deposits exposed in the cliffs on either side of Bridlington Harbour (before they were obscured by concrete sea walls) and in Filey Bay were more careful than any published in Britain or elsewhere for almost a century. Consequently they are valuable even today.

In his 1888 report on the Sewerby raised beach (Proc. Yorks. Geol & Polyt. Soc. 9, 381-392), Lamplugh tentatively identified the till exposed above the raised beach as the Lower Purple (= Skipsea), and this has been corroborated by all who have subsequently studied the exposure and analysed the till. However, in later papers (starting with Rept Brit. Ass. Adv. Sci. for 1888, published 1889, 328-338), he repeatedly asserted that this till is the Basement. Various unlikely stratigraphic reasons were given for this change of mind. However, the most probable (though unstated) reason was his conviction that there was only one Pleistocene glaciation in Britain,

implying that the beach was 'preglacial' and not interglacial. In his 1898 talk his conviction became clear; Lamplugh's 'vital question' is whether there is evidence for an 'Interglacial Period', which he considered unproven.

In view of the widespread evidence for several glaciations and numerous interglacials in the British Quaternary sequence, Lamplugh's monoglacialist views are now untenable. Also in 1963 temporary shore exposures between Sewerby and Bridlington showed that the Basement Till underlies the Sewerby interglacial beach and later deposits (Marine Isotope Stages 5e and 2), and is therefore attributable to MIS 6 (Late Wolstonian) or an earlier glaciation.

OPEN QUESTIONS IN EAST YORKSHIRE GEOLOGY - ANSWERS FROM THE AMATEURS

Mike Horne, General Secretary, Hull Geological Society

There is a long history of quality geological research in East Yorkshire by amateur geologists. G. W. Lamplugh carried out most of his research in the area as an amateur, before taking a job with the Geological Survey in 1892. He worked on three main areas of interest - the Speeton Clay, the Chalk and the Quaternary deposits around Flamborough.

The Speeton Clay continues to attract many amateur collectors and some have published papers about its fossils including Danford, Ennis and Thompson. In the 1970's Lynden Emery studied the bivalves and gastropods for an unpublished thesis.

Lamplugh provided an early lithostratigraphy of the Chalk, this was followed by Rowe's biostratigraphy. A succession of Hull Geological Society members worked on the inland exposures. D W Toyne started a survey of the Chalk pits of the Wolds and when he died in a road accident the young Ted and Willy Wright continued the work until their research was interrupted by WW2. Felix Whitham and the Hull Geological Centenary Project produced a lithostratigraphy of the whole sequence in the 1980s and 1990s.

The East Riding Boulder survey recorded the erratics of the region and W. S. Bisat's research included an accurate survey of the Tills in the Holderness Cliffs.

As well as continuing the research on the Chalk in recent years Hull Geological Society members have informally revived the Boulder Committee and have investigated the Quaternary deposits around Flamborough and the 'rafts' in the Holderness boulder clays. Members have also undertaken 'rescue geology' - recording and collecting from temporary or threatened exposures.

But is local amateur research now under threat? Inland exposures are being filled (including fly-tipping in RIGS), university geology departments have been closed, libraries are replacing books and periodicals with computers and Hull Museums have just 'deleted' the post of Keeper of Geology and will no longer be 'pro-active' in the science. What can geological societies do to reverse these trends, and encourage amateurs to carry out research and put their important specimens and data into the public domain?

A WORD FROM THE PRESIDENT

The summer break from indoor meetings was more than made up for by our excellent field meetings - with, at the time of writing, the Glacial Geology of the Vale of York to still come on 17th September, and an additional field excursion on Sunday 9th October to follow on from the Hull meeting on East Yorkshire Geology and the influence of Lamplugh (see details in this Circular).

The Society was involved with Yorkshire Geology Month in May, which was deemed a great success; Trevor Morse contributed to YGM by leading an excursion to the Whin Sill and upper Teesdale. I attended two excellent YGS field excursions at Cresswell Crags and Canonbie. The former was a joint meeting with the William Pengelly Cave Studies Trust, and was convened by Patrick Boylan. Following an introduction to the archaeology and setting of the caves by Ian Wall (Cresswell Crags Trust), the party was guided on a fascinating tour of the Cresswell Crags caves and their Ipswichian to Devensian stage deposits. We were also grateful for an impromptu discourse on the local geology from Tony Benfield. On a hot June day it was a delight to visit the cool caves! Many of the caves are closed to the public, and the highlight of the day to was an opportunity to see the recently discovered cave art in Church Hole Cave. Here, the images, carved in bas-relief, but also utilising the natural features of the 'Magnesian Limestone' and flowstone, was described by cave art expert Dr Paul Bahn. Under Paul's guidance the outline of ibex, ibis, bison, horse and bear gradually came to life with cries of 'yes, I can see it now!' from the party. This site represents the first cave art discovered in Britain, and provides cultural links with similar Quaternary cave art in France and Spain. It is fascinating to envisage our ancestors occupying caves at Cresswell during the Late Devensian (c.12, 000 yrs BP) as the Vale of York ice sheet was waning around the moraines at Escrick and York, about 70 km to the north.

The Society strayed across the border on the weekend of the 16-17th of July, 'chaperoned' by Andrew McMillan of the Edinburgh Geological Society. Neil Jones and Doug Holliday led a fascinating excursion on the poorly known Late Carboniferous and Triassic red-beds along the banks of the River Esk (see Doug's report). This was prime example of how detailed fieldwork, integrated with geophysical logs, can offer new insights into sedimentology and basin evolution.

We were blessed by good weather during the field excursions, but the floods around Thirsk and the Hambleton Hills on June 19th were a tragedy for local inhabitants. I have written a short article in this circular on the flood event and local geology. This is by way of encouraging members to contribute short, newsworthy articles for publication (see Circular 524 for details).

Finally, I look forward to seeing you at the East Yorkshire Geology meeting on 8th October at the University of Hull; this will be preceded by a Special General Meeting (see Circular 523 (March) page 9, for details).

John Powell

ANNUAL DINNER

The Annual Dinner will be held on Saturday 3rd December 2005 at 6.00 pm for 6.30 pm after the AGM. As usual. it will be at the King's Manor, York University. The cost of the tickets will be £27.00 (please note the increase is not a "get rich quick scheme" by the YGS Council, but is King's Manor's minimum charge). Please inform Stuart Ogilvy of your interest and any dietary needs, cheques should be payable to Stuart Ogilvy (not the YGS) and sent to the following address Mr Stuart Ogilvy, c/o Yorkshire Museum, Museum Gardens, Museum Street, York YO1 7FR. The menu will be published in the next circular.

YGS NEEDS YOUR HELP: OUTREACH OFFICER

YGS Council is conscious of the need to publicise our meetings as widely as possible, particularly to raise the profile of the Society and to encourage new members to join us. Attendance at indoor meetings has been very good of late, but we noted that attendance at the Scarborough Meeting on 'William Smith and Early Geologists on the Yorkshire Coast' benefited from publicity generated through an article in the local Scarborough press. Council is, therefore, seeking an Outreach Officer from the current membership to act as a publicity link to the local press at our major meeting centres - Leeds, Durham, Sheffield, Nottingham (Keyworth), Hull and York, and other venues. The Outreach Officer, in collaboration, with the Programme Secretary and local convener, would be responsible for generating publicity through short articles advertising the meetings, to be targeted at the local press. Ideally you will have some experience of dealing with the press, but we would like to hear from anyone willing to be involved. Please contact Trevor Morse (see contacts on the back page of the circular) or John Powell by e-mail: **jhp@bgs.ac.uk**.

YGS COUNCIL MEMBERS

Jonathan Ford

Born in Middlesbrough in 1973, my career in geology began in the early 90's when I spent a gap-year working as a trainee geologist for an opencast coal producer in County Durham. In 1995 I graduated from Leicester University with a degree in Applied Geology and joined the South America division of an international mining company as an exploration geologist. Based in Bolivia and Ecuador, I was involved in the discovery of several new areas of copper-gold mineralisation. In 2000 I returned to the UK to study an MSc at Newcastle University where I investigated digital systems for the capture, visualisation and modelling of geological information. Since 2001 I have worked with the British Geological Survey based in Nottingham. I am involved in the ongoing resurvey of the Selby and York areas, as well as international work in West Africa. I joined the YGS Council in 2004 and I am pleased to serve on the Membership, Finance and Services Working Group Committees.

SCIENCE WEEK - 10TH to 19TH MARCH 2006

Peter Kennett informs us that National Science Week looms again from the 10th to 19th March 2006.

The organisers are based at Sheffield Hallam University and are looking for titles and presenters and wondered if YGS members would be interested in getting involved? If so please contact Pat Brunskill at Sheffield Hallam University, p.brunskill@shu.ac.uk

Past events have included investigating churchyards and working with fossils, for which the Palaeontologial Association offer funding.

One point worth mentioning. As Science Week involves working with children leaders of events will have to be CRB cleared, an often lengthy process, so start now if you are interested.

FORTHCOMING YGS EVENTS

As there some slight changes to the usual programme, we would like to remind members of these changes. As usual these dates will be confirmed as the programme moves forward.

January Meeting (21.01.2006)	in Leeds
February Meeting (18.02.2006)	in Sheffield
March Meeting (18.03.2006)	at the BGS, Keyworth
September (was October) (30.09.2006)	Scarborough
October (was November) (28.10.2006)	Hull
November (was December) (25.11.2006)	York (AGM & Annual Dinner).

CANONBIE FIELD EXCURSION REPORT

Field Excursion to examine the Carboniferous to Triassic redbeds of the area around Canonbie, led by Neil Jones, Doug Holliday & Andrew McMillan (BGS), July 16-17, 2005.

Not only were the weather conditions ideal for this excursion, but also the river levels were lower than any of the leaders had witnessed previously in the area. Thus those members attending were doubly privileged, as the strata in the rivers Esk and Lyne were much better exposed than normal and access to them very much enhanced. This allowed the lithological and sedimentological similarities and differences between the Carboniferous to Triassic red beds around Canonbie to be clearly exhibited. This was in stark contrast to the gloomy, flood conditions experienced by the leaders on some former visits.

Seventeen members attended on July 16 to view the results of some recent preliminary work on the previously little studied Late Carboniferous Warwickshire Group strata in the River Esk at Canonbie. Much lively discussion ensued as members ascended the succession on the lithological and sedimentological similarities and differences between these beds and the much better known strata of the same age in the English Midlands. The cliff of Permian aeolian dune sandstone at Dead Neuk, on the opposite side of the river, was later visited and contrasted with the fluvial Carboniferous strata. A small exposure in the river at [NY 3976 7569] showed probable basal Permian breccia resting on Warwickshire Group.

Twelve members assembled on July 17 and visited three localities in the Triassic Sherwood Sandstone Group. At Cove Quarry, the lower part of the St Bees Sandstone was examined and shows the transition from sheet-flood dominated deposition to a more widespread channelised form. Among the numerous sedimentary structures were some possible trace fossils. In the River Lyne, near Kirklinton, lithologically similar sandstones of inferred mixed fluvial (sandflat) and aeolian (sandsheet) origin were examined and discussed. These strata, included in the original mapping of the Kirklinton Sandstone, were the subject of some animated debate. They were later contrasted with outcrops of somewhat coarser aeolian dune bedded sandstone at Cliff Bridge, which have also been mapped previously as Kirklinton Sandstone. The excursion ended as it began, in sunshine, after some further inconclusive discussion on the status and validity of the term Kirklinton Sandstone.

GEOLOGICAL ASSOCIATION LECTURE

The first GA Regional Lecture is to be held at Keele University on Thursday 10th November 2005. Details are as follows.

If you would like a ticket for the Richard Fortey Lecture (free) and Buffet on Thursday 10th November 2005, contact Carol Fereday, 28 Brookside Close, Newcastle-under-Lyme, ST5 2HX. Telephone: 01782 713227 www.esci.keele.ac.uk/nsgga. The free lecture starts at 7.30pm, the buffet (£3.00) at 6.30pm.

You will need to forward your payment for the buffet if you are not a member of the GA (application needs to arrive before Tuesday 25 October)

Early booking for the BUFFET is essential as numbers have to be pre-booked with the caterer.

FLOODS IN NORTH YORKSHIRE: THE INFLUENCE OF GEOLOGY AND TOPOGRAPHY

During the summer break, many of you will have seen the media reports on the thunderstorms and flood event on the 19th and 20th June in the Hambleton Hills and Helmsley area, North Yorkshire. I joined a BGS geohazards team comprising engineering geologists Pete Hobbs, Helen Reeves and Andy Gibson, and geologist Jon Ford (YGS Council) who were despatched to the area to review the damage and assess the potential for new and reactivated landslides. Having re-surveyed the area in the early 1980's as part of the Thirsk Sheet (52) revision, I was anxious to see if the storms and run-off had initiated the ancient (mostly post-Devensian) landslides located below many of the escarpment and in the steep sided interior valleys.

The storms and flood event were triggered by moist air rising orographically as it passed from the Vale of York over the Middle and Upper Jurassic escarpment of the Hambleton Hills on the afternoon of Sunday 19th June. Torrential rainfall resulted in flooding at Thirsk, Sutton-under-Whitestonecliffe, Boltby, Hawnby, Rievaulx, Helmsley and surrounding villages. Rivers and small streams had swollen and broken their banks causing local, but severe flooding adjacent to the alluvial tracts. Local residents told of waters reaching 2-3 metres height in their houses situated adjacent to Gurtof Beck at Boltby and Sutton Beck at Sutton-under-Whitestonecliffe; one resident recounted returning to his house in the afternoon to find his dogs drowned in his kitchen, and stone outbuildings swept away. Bridge parapets at Sutton had been undercut, and at Hawnby the force of the flood had destroyed the formidable stone bridge. The damage at Hawnby was severe (Figure 1), with many animals reported drowned at kennels located adjacent to he floodplain of the River Rye. The road bridge was destroyed by both the force of the water and by uprooted trees that acted as 'battering rams' (Figure 1). A farmer, nearby, said that he had found cattle perched in trees by the rising flood. At Boltby Reservoir the sudden rise in water level resulted in overflow and severe damage to the stone-built spillway, which was partially destroyed and scoured back to underlying Jurassic sandstone bedrock (Saltwick Formation); the authorities were carrying out remedial action when we visited on 21st June. At Boltby village the stream is normally little more than a trickle, but the flood spate had destroyed stone farm buildings and swept a car downstream (Figure 2). Elsewhere, small ephemeral streams had been turned into torrents, resulting in debris flows depositing fans of loose rocks and boulders (Figure 3). No evidence for re-activation of the many 'mature' landslides in the area was observed during our visit; we attribute this to rapid run-off with little infiltration of rainfall into soil and bedrock rock.

The geology of the area played an important part. Most of the lower ground around Boltby, Thirsk and Sutton-under-Whitestonecliffe comprises Devensian clay-rich till overlying impermeable Lower Jurassic Lias

Group mudstone. Around Hawnby, the bedrock consists of mudstone-dominated Long Nab Member (Scalby Formation; Middle Jurassic) overlain by the Osgodby Formation and Oxford Clay. These relatively impermeable superficial deposits and bedrock led to rapid run-off and channelling of the floodwaters into the small streams and tributaries that were unable to cope with the torrential rainfall. Another significant factor is the topography of the area. Orographic uplift caused by the Jurassic escarpment was a causative factor, but Boltby -Felixkirk area also has a natural 'half-bowl' shape that feeds run-off from the small streams into the Boltby Reservoir and the tributaries of Cod Beck (Thirsk) and Cod Beck and Sutton Beck. In a similar manner, the narrow, steep valleys cut into the Middle and Upper Jurassic rocks around Arden Moor and Hawnby divert all their flow to the relatively narrow Rye Valley where the most severe damage was caused to bridges and buildings between Hawnby and downstream at Helmsley.

There has been much discussion in the media and scientific press linking such extreme weather events to global warming and rising levels of greenhouse gases. However, Paul Simons ('Weather Eye') penned a salutary note in The Times on 22 June 2005, pointing out that these Yorkshire hills have a long history of flash floods. He describes a record of "a great and terrible flood of water came with such vehemence that it drove to the ground eight houses (in Helmsley)"; that event was in October 1754 and it also destroyed several houses and bridges, washed away cattle and killed 13 people. Fortunately, no one was killed in the 2005 flood. The absence of previous historical damage to solid stone built bridges and farm buildings located adjacent to floodplains suggest that locals in the 19th and 20th centuries were not aware of a history of catastrophic floods, and built close to, but not on the floodplain. So, perhaps we are witnessing freak weather events of about a 250-year periodicity, reinforced by the local geology and topography, rather than an indicator of increasing storminess as a result of global warming. Geological maps showing limits of alluvium and river terrace deposits undoubtedly have a role to play in predicting the likely extent of flash floods, and are a useful tool for planners. Let's hope the regularity of these events is not increasing.

Dr John Powell, British Geological Survey

Editor's Note: we would be pleased to receive short newsworthy articles on geological topics from members for the Circular (see Circular 524 for details).

Figure 1. Flood damage to the bridge at Hawnby. Note the brown 'tide mark' (arrow A) of debris in the middle distance indicating the level of the Rye floodwaters; this coincides with the mapped alluvium boundary on the geological map. The dashed arrow indicates the direction of flow and a flatted field of small conifers.
Photo: Pete Hobbs/Helen Reeves. (BGS)

Figure 2. Damage to farm buildings and cars washed downstream at Boltby. Note the 'tide mark' of floodwaters just below the ground floor windows. Gurtof Beck is located a few metres to the right of the outbuildings.
Photo: Pete Hobbs/Helen Reeves. (BGS)

Figure 3. A fan of sandstone boulders washed out of minor stream marked by the line trees in the middle distance. Photo: Pete Hobbs/Helen Reeves. (BGS)

Figure 4. The bridge down stream from Hawnby, closed due toundercutting of the stone parapet. Note the flood gauge in the river, although the floodwaters topped the gutters of the adjacent flood gauge building. Photo: Pete Hobbs/Helen Reeves. (BGS)

BOOK REVIEW

Please note, reviews of books and publications reflect the view of the individual reviewer and in no way necessarily reflect the views of Council or the Society as a whole.

THE EVOLUTION OF CLASTIC SEDIMENTOLOGY

Hakuyu Okada with Alec J Kenyon-Smith

Dunedin Academic Press, Edinburgh. Published in the UK at £45 or Euros 65. ISBN 1-903765-49-8

A first glance at the title suggested that this was an ambitious project and would probably be a rather dry account of its subject. My initial reaction was, therefore, to have a quick thumb through to see which important names had been left out! However, now having read the book I found that this was anything but the case and I could not come up with even one name that I thought had been missed from the list of luminaries on the subject painstakingly covered in the text.

As a geologist who has had a 35 year career based principally on the study and description of sediments and sedimentary rocks, I found that the book managed not only to keep me interested from a geological perspective, but also brought back memories of the long forgotten names (and faces - the book has an interesting photographic 'rogues' gallery) of people who taught me at university, several former colleagues from both inside and outside the Survey, past and present members of the Society, friends working in the same geological fields, and many others who I had both the pleasure (and pain) of listening to in lectures at long forgotten conferences or on many fascinating field trips. I am sure that anyone else reading the book, wherever they have worked in the world, will inevitably succumb to the same nostalgic reminiscences. The very readable style should also make the book a useful reference for any amateur geologists with in an interest in how clastic sedimentology has developed, particularly in the last 50 years.

The term sedimentology was first used, the text suggests, by Wadell in 1932. The prologue of the book states that it has, in the broadest sense, evolved from much earlier studies of sediments and sedimentary rocks. Many of the seminal names in the development of the geological sciences are rightly considered 'giants' on the shoulders of whom the subject has indeed evolved. The text is more than just a dry history of sedimentology but is also a succinct introduction to the evolution of many fundamental geological principals.

If you have moved away from the subject in retirement or are at the beginning of a geological career, the book is, if nothing else, an easy to read analysis of the growth and development of its subject and a valuable compendium of the principal references of the 'movers and shakers' of the sedimentological world. I defy anyone with a spark of interest in geology when reading this book not to be drawn into reliving both the good and bad memories of their past careers in geology and I would certainly recommend it to anyone interested in the historical development of geological science in general.

The review volume will be deposited in the near future, as a reference volume, at the Society's Library, Edward Boyle Library, Leeds University.

Dr Graham Lott
British Geological Survey

CURRENT GEOLOGICAL ACTIVITIES IN THE SCARBOROUGH DISTRICT

"Everyone is very fond of talking on Geology" wrote William Smith on the occasion of his first visit to Scarborough, and that is now coming to pass once again as both residents and visitors to the town look forward with great interest to the plans for the Rotunda to come to fruition. Also the Dinosaur Coast events, which are very popular, and designed to offer something for all ages over the summer season from beach activities, mini dino days, evening strolls to fossil hunting and expert trips are a source of much interest. The North-East Geology Trust now provide a programme of events throughout the year which include guided walks, lectures, fossil displays and activities for all ages and abilities. Geology is now well and truly in the minds of the public of Scarborough once more.

Out of the public eye much is being done to secure Regionally Important Geological Site status for a number of important geological localities in the Scarborough District. Over one hundred and thirty sites have been visited and identified as potential R.I.G.S., but it is a slow process gaining agreement from owners and planning authorities for each site before surveying and drawing up the proposal forms and site management plans.

At present four sites are being worked on:
1. The Castle Hill Scarborough Cornbrash Site (TA.0470.8925)
2. The Crosscliff Forest Road Cutting (SE.895.915 to SE.890.917)
3. Collier's Quarry, Love Lane Pickering (SE.803.852)
4. Wydale Quarry near Snainton (SE.930.825)

The Scarborough Castle Hill Cornbrash Site (TA.0470.8925)

This is a classic exposure, the site of which was lost in the development of the Marine Drive and the establishment of a putting green. After the putting green building was destroyed by a rock fall the site was re-discovered by Richard Mayerscough. This exposure forms a key horizon in the determination of the main Castle Hill Fault by matching it with a higher outcrop of the Cornbrash below the Castle Keep on the upthrust side of the fault.

The Crosscliff Forest Road Cutting (SE.895.915 to SE.890.917)

The section concerned is approximately four hundred metres in length and consists of an artificial cutting formed during the process of establishing a forest ride in the early 1950's down Crosscliff Brow along a route now open to public access from Dargate Dykes to the forest edge south of Old Keepers House.

"At Crosscliff, a largely unbroken succession of 41.5m. of Tennants' Cliff Member is displayed, resting on the flaggy, calcareous siltstone of the Oxford Clay. The succession is only subdivisable in general terms, however. The lower two fifths are again less resistant, consisting of irregularly fracturing, sandy siltstone. Several beds of

massive, spicular sandstone commencing at 17m. mark the incoming of true calcareous grit and well bedded, highly spicular sandstone continuing to the top of the section. The quartz sand content increases gradually from 20% near the base to 50% at the top. Bivalves *(Pinna, Nanogyra, Chlamys)*, brachiopods *(Rhynchonelloidella)*, ammonites *(Cardioceras, Goliathiceras)* and trace fossils *(Rhizocorallium)* are all quite common from the middle of the succession upwards. Including an allowance for the unexposed Saintoft member, the total thickness of the lower Calcareous Frit at Crosscliff must be at least 50m".
(Wright. J.K. 1983. Proc. Yorks Geol Soc Vol. 44. Pt 3. p.258.)

Collier's Quarry, Love Lane Pickering (SE.803.852)
This disused privately owned quarry has been excavated into the top quarter of the west facing wooded edge of the lower reaches of the glacial outwash channel of Newtondale on the outskirts of Pickering. The greatest vertical succession may be seen in the north east face. The quarry face exposes virtually the full succession of the Malton Oolite which, when matched with the Trigonia Bed and Middle Calcareous Grits exposed in the lower quarries of Love Lane, presents a unique opportunity for public access to the Middle Oxfordian of North Yorkshire. The fossil content of the Malton Oolite can easily be demonstrated in the outcrops and fallen rocks forming the base of the south-east slope of the quarry.

Wydale Quarry near Snainton (SE.930.825)
A disused quarry which was excavated into the lower reaches of the dip slope of the North York Moors plateau overlooking the low lying carrs of the Vale of Pickering. The quarry also cuts into the east facing slope of the lower reaches of Wydale; a moderately steep sided glacial outwash valley that drained meltwater from the upland to the north into the post-glacial waters of Lake Pickering. J.K. Wright (1992 Proc. Yorks Geol Soc Vol. 49. Pt 2 pp155-168) states "The quarry shows an important sequence of the Passage Beds / Hambleton Oolite boundary along the northern edge of the Vale of Pickering... The boundary between the Passage Beds and the Hambleton Oolite has no type section designated... The type area of the Passage Beds is... the Scarborough District of King (1965), based in O.S. Sheet 93. All outcrops of the Passage Beds with the underlying Lower Calcareoous Grits and/or the overlying Hambleton Oolite within the Scarborough District are of scientific importance".

In addition to all these activities the North-East Yorkshire Geology Trust has established Geological Trails in the Love Lane area of Pickering, at May Beck near Whitby, at High Brow Wood above the Vale of Hackness, along a part of the Cleveland Dyke on Fylingdales Moor, at Wykeham Ings and Burton Riggs in the Vale of Pickering and at Waitcliff End in Dalby Forest. The latter being designed in conjunction with Forest Enterprise for wheelchair access.

NEW MEMBERS

Mr Maurice Campbell, BSc	Lobley Hill, Gateshead
Mr Mark J Gibson, BSc, MA,Cert HSM, MIHM	Little Preston, Swillington, Leeds
Mr Glen M Matthews	Forest in Teesdale, Co Durham
Mrs C Lund	North Yorkshire
Miss Sally Brambles, BSc, PGDip	Newcastle upon Tyne
Mrs Brit Jacobsen Spencer, MA	Norway
Mr Christopher Dodds	Chapelthorpe, Wakefield
Mr Allan Hall, BEd(Hons)	Ramsbottom, Lancashire
Mr John R Lonergan, MSc, B Eng	Storrington, Pulborough, West Sussex

DEATH
Mr B J Taylor died 30th April 2005 - He lived in Stonehouse, Gloucs. and had been a member since 1952.

CORRESPONDING SOCIETIES

Contact society representatives for the latest information.

CRAVEN & PENDLE GEOLOGICAL SOCIETY

Yvonne James. Tel: 01282 813 772 or www.cpgs.org.uk

Volcano-ice-water-interaction on Mars — Friday, 21st October
Speaker: Alistair Bargery BSc., University of Lancaster

Fire and ice: A geological and social perspective on volcanic activity in Alaska — Friday, 18th November
Speaker: Diana Roman Ph.D., University of Leeds (formerly of the University of Oregan, USA)

CUMBERLAND GEOLOGICAL SOCIETY

Nigel Courtman. Tel: 01229 861 478 or www.cumberland-geol-soc.org.uk

Volcanic earthquakes - signs of unrest — October 26th
Speaker: Dr Hugh Tuffen, University of Lancaster
Friends Meeting House, Cockermouth

Stalagmites and climate change — November 9th
Speaker: Dr Andy Baker, University of Birmingham
Westlakes Institute, Whitehaven

EAST MIDLANDS GEOLOGICAL SOCIETY

Janet Slatter e-mail: sec@emgs.org.uk or www.emgs.org.uk.

Rocks down the Trent in a Bronze Age logboat — Saturday, 15th October
Speaker: Daryl Garton, University of Nottingham. Start: 6.30pm.

Gas hydrates - a geological killer in our midst? — Saturday, 19th November
Speaker: Dr John Rees, British Geological Survey. Start: 6.30pm.

HUDDERSFIELD GEOLOGY GROUP

Julie Earnshaw (Secretary). Telephone: 01484 311 662 or e-mail: earniehome@ntlworld.com

Geological evangelism among young people - what part can I play? — October 10th
Talk and demonstration by Peter Kennett. Be a kid for the evening!
Sand and Water play in the teaching of Geology.
A wax volcano, a "Ferrero-Rocher" fold mountain range and other enjoyable activities.

Kilimanjaro and the East African Rift Valley: — November 14th
About an expedition to Kilimanjaro in August 2005
Speaker: Bob Appleyard. Bob will be talking about the broader setting of Kilimanjaro in the East African Rift Valley and the causes of rifting and volcanism in the area

HULL GEOLOGICAL SOCIETY

Mike Horne. Tel: 01482 346 784 (after 7.30 pm)
or e-mail: m.j.horne@hull.ac.uk or www.go.to/hullgeolsoc

Professional collecting of Rare Minerals and Fossils in Bolivia — Thursday, October 10th
Speaker: Bob Maurer. Evening lecture.

Flamborough Research Meeting — Sunday, October 23rd
Led by Ian Heppenstall and Mike Horne.

LEEDS GEOLOGICAL ASSOCIATION
Anthea Brigstocke (General Secretary). Tel: 01904 626 013.
E-mail: abrigstocke@hotmail.com or www.leedsgeolassoc.freeserve.co.uk

The Gulf of Corinth Rift in Central Greece — October 20th
Speaker: Dr R. Collier, University of Leeds

The Silverpit Impact Crater: a Geological Controversy Revisited — November 10th
Speaker: Kevin Smith, BGS Keyworth

LEICESTER LITERARY & PHILOSOPHICAL SOCIETY
Chairman: Andrew Swift. Tel: 0116 252 3646 or e-mail: as48@le.ac.uk

Weirdoes of the Wenlock Limestone — Wednesday, 5th October
Speaker: Dr Liam Herringshaw, University of Birmingham

Volcanism in the Earth System, Past, Present and Future — Wednesday, 19th October
Speaker: Dr David Pyle, University of Cambridge

MANCHESTER GEOLOGICAL ASSOCIATION
Jane Michael. Tel: 0161 366 0595, e-mail: jammyjane@aol.com or www.mangeolassoc.org.uk

The Ivrea Zone (Italy): A Window on the Lower Crust — Wednesday, 19th October
Speaker: Dr Kate Brodie, University of Manchester

Evolution of the Cheshire Basin — Saturday, 12th November
The Tectonic Setting: Dr Dave Evans, British Geological Survey
Sherwood Sandstones: Dr Geoff Warrington, British Geological Survey
Mercia Mudstones: Dr Albert Wilson, British Geological Survey
Diagenesis and Later Mineralisation: Dr Geoff Warrington, British Geological Survey

NORTH EASTERN GEOLOGICAL SOCIETY
Frank Trowbridge. Tel: 01642 582 786, e-mail: frank.trowbridge@care4free.net
or www.northeast-geolsoc.50megs.com

An aspect of Chinese Earth Science (precise title to be announced later) — October 21st
Speaker: Prof. Yaoling Niu

Origin of the submarine Ontong Java Plateau, the world's largest province — November 18th
Speaker: Prof. Godfrey Fitton, University of Edinburgh

WESTMORLAND GEOLOGICAL SOCIETY
Mrs P. M. Wilson. Tel: 01539 533 198 or www.wgso.fsnet.co.uk

Kendal Reference Library — October 19th
View the Library's collection of rare geological publications

Iceland - evolution of sub-glacial volcanoes — November 16th
Speaker: Dr Dave McGarvie, Open University

OTHER SOCIETIES OF INTEREST

EAST MIDLANDS REGIONAL GROUP OF THE GEOLOGICAL SOCIETY
Ed Hough e-mail: eh@bgs.ac.uk

SORBY NATURAL HISTORY SOCIETY
Ken J Dorning. www.shu.ac.uk/city/community/sorby/secgeo.shtml

YORKSHIRE REGIONAL GROUP OF THE GEOLOGICAL SOCIETY
Isla Smail. Tel: 0113 242 8498, e-mail: isla.smail@arup.com

SUBMISSION OF PAPERS

Manuscripts for publication in the Proceedings should be submitted to *'The Editors, Proceedings of the Yorkshire Geological Society, Geological Society Publishing House, Unit 7, Brassmill Lane Enterprise Centre, Brassmill Lane, BATH, BA1 3JN'*. Typescripts should be prepared using the updated instructions for authors given on the inside back cover of the latest issue (Volume 55 Part 3, May 2005).

Publication of manuscripts may be expected in the next, or next but one part, following acceptance. The proceedings will be abstracted and/or indexed in, *GeoArchive, GeoRef, Geobase, Geological Abstracts and Mineralogical Abstracts, Research Alert and Science Citation Index Expanded (SCIE)*.

COPY FOR CIRCULAR

The next indoor meeting will be held on 5th November 2005. Geohazards and Marine Geology, University of Durham.
Copy deadline for Circular 526 is the 10th October 2005.
Copy deadline for Circular 527 is the 1st November 2005.

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