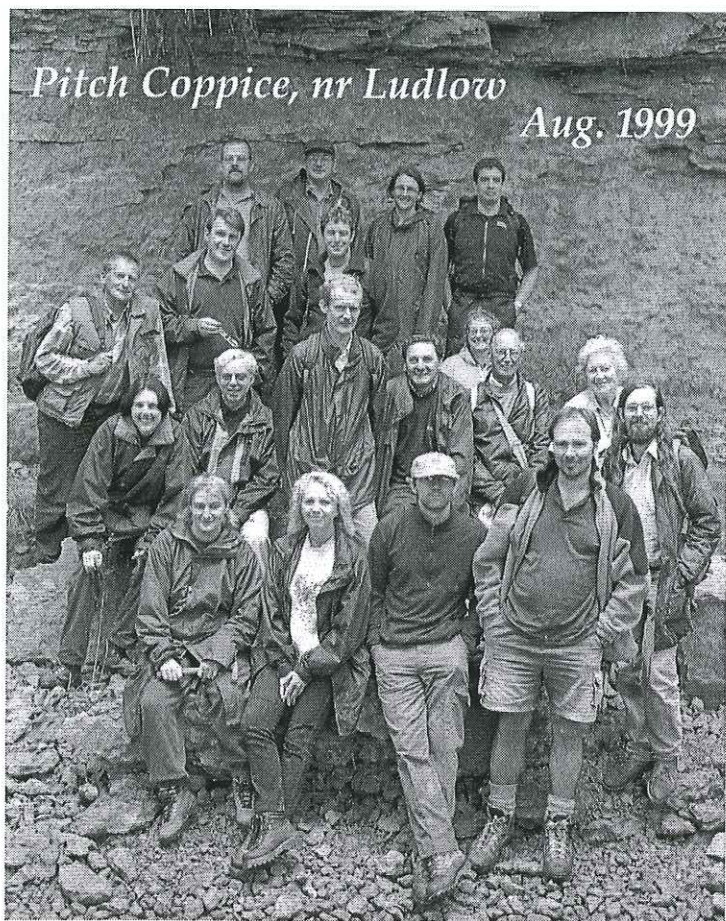


CHARNIA



**The newsletter of the Geology Section
(C) of the Leicester Literary &
Philosophical Society**

www.charnia.org.uk

September 2007

Editorial September 2007

Autumn is the traditional time for taking stock, looking back and looking forward, and certainly it seems that at this time of year it is relatively easy to fall into a melancholy mood. But as far as the Geology Section goes, there is nothing whatsoever to be melancholy about. We have enjoyed a splendid summer programme, as yet incomplete with two trips still to come as I write these words, and can anticipate a cornucopia of pleasures in the winter programme. Looking backward first I will reflect on the summer programme, not to give a factual chronicle, that can be found elsewhere in this issue, but more from a philosophical point of view.



Lunch at the Fox & Hounds, Harlestone

Starting with an ecclesiastical theme in May we visited several churches in south Nottinghamshire with Albert Horton, to look at the variety of building stones from which they are constructed. While the stones themselves have much of interest, especially as personal favourites were on view, the abiding memory is of the atmosphere in the churches themselves and that peculiar redolence of the past that shrouds them. I always drift into thinking of the thousands of folk, both the great and the not-so-great, who have partaken in the services, both happy and sad, over many centuries. Some perhaps mused on the stones of the fabric that surrounded them, much as we do.

The buildings theme was perpetuated with our next trip, with Diana Sutherland to see the use of building stone in and around Northampton. While for most people the main memory of the summer of 2007 will be the dreadful rain, we can look back on our good fortune as we enjoyed some of the nicest days of that otherwise bleak period, and June 9th was certainly one of those. That trip demonstrated one thing to me and that was the great sense of companionship that our society engenders, although there were but nine participants (10 with Diana) the 'vibes' were excellent all day. We are not just a group of like minded people, we also become good friends, and that imparts another level of pleasurable experience to our outings. Geology is not normally associated with jokes and humour, but look at the shot taken in the Fox & Hounds on the Northampton excursion, and it can be seen that laughter features strongly when we're all together. The weekend field trip expresses these qualities of friendship and camaraderie better than any, and Cromer at the end of June demonstrated those aspects particularly well. Having celebrated our good fortune in dodging the rain, it is necessary to record that for an hour or so on the afternoon of June 23rd at Overstrand we experienced one of the most intense storms of the summer.

Cloud Hill Quarry near Breedon in early July was an especially notable visit, as for many years getting a party in there has been very difficult, and it is perhaps appropriate here to celebrate the work of the 'fixers' in our society, those who work behind the scenes to open doors for us. We owe each year a debt of gratitude to our officers, chiefly the chairman, secretary and field secretary, for making our expansive programmes feasible. Our latest completed field excursion, up to this issue of Charnia, was to the borders of Staffordshire and Derbyshire in early August to see the Carboniferous geology of Cauldon and the Dove Valley. Two factors came out of this trip for me. The first was the slow but inexorable march of Health & Safety based restrictions which will surely eventually keep us out of working quarries altogether if continued unchecked. We are all responsible adults correctly attired in appropriate clothing, yet at Cauldon Low Quarry we were lucky to get into the quarry at all. The manager was entirely blameless and stretched the rules that bound him as far as he could to at least get us close to the rocks, but once there we were very restricted in our freedom of movement. Everyone knows the importance of H & S, but the responsible geological society must be allowed continuing access to active geological workings. The second factor is altogether more trivial, but useful to know nonetheless, and that was that we, for the first time in my years with the Section, successfully ran an excursion on a weekday as opposed to the usual weekend. Duly noted for the future.

So what can we expect in the winter programme? Well, lots of good stuff, that's plain. We should be very proud of our winter series of lectures, it has to be one of the best in the country, both in quantity and quality, and the Saturday Seminar's star continues to rise. Add to that the high status speaker we always seem to pull out of the hat for the Parent Body lecture, and you have a programme that is the envy of most other societies. In addition, we remain privileged to enjoy the facilities at Leicester University. Without that fine lecture theatre we should be a much poorer society. Personally I'm looking forward to the opening talk on forensic geology on October 3rd, a fascinating offshoot of 'traditional' geology and increasingly used by the forces of law and order. I can recall a few years ago when a lawyer approached me, as a micropalaeontologist, to process samples from a murder scene, with the idea that any evidence gleaned from the samples would then be used, if helpful to the defence case, to oppose the official forensic evidence. There's a lot of money in this type of thing, but I felt that the responsibility of holding, in part, a person's fate in my hands was more than I could live with in such a serious case. It's the old 'have I made a mistake?' syndrome that would have been the hardest to deal with.

Later in the programme two of my pet interests are due to be expounded upon. One is the Pleistocene of East Anglia with Jonathan Lee in November, with an added bonus that another interest, early man, will be featured. Then in January next year I can look forward to another hominid lecture from Ian Candy on the advent of humans into the East Midlands. I can hardly wait!

Having had good cause to scour the pages of early issues of the LLPS Transactions over the years, I am always impressed by the illustrations of geological subjects in these pioneering issues. Thus, I thought it would be nice to reproduce some of these archival shots in Charnia, and you will find a couple in these pages, one forming the centre spread.

Finally before I draw this editorial to a close, I was pleased to receive a follow-up to my editorial in the May issue wherein I expounded upon the new female-dominated regime at the head of our society and speculated that nothing like it had been seen before in the Geology Section. The erudite and well-read Mr Bruce Harris then sent the following excerpt from 'The Naturalist in Britain' by David Elliston Allen (Penguin 1978), to indicate that women's importance in the professional field was recognised right back in the early days in Leicester:

'At Leicester, when in 1886 it was at last decided to admit women to full membership, thirteen were elected immediately. 'The present change of practice' read the report, 'appears to be a natural outcome of the alteration

which is taking place in the English mind with regard to position of educated women'. (p. 169)

Also from the same publication comes the following brilliant snippet which illustrates that geological excursions needn't be dull, in fact quite the opposite. It is clear that in the old days they didn't do things by halves, but who's going to pay for the band for our next excursion?

'....in a local paper.... a picnic to Bradgate Park....

The proceedings started about three o'clock, when some seventy or eighty members and their guests assembled at the gates and, after officially being welcomed by the mayor, marched into the Park with the Volunteer Rifle Band at their head. Following a short address by the president and inspection of a ruin, lemonade, apple wine and sherry were freely distributed, the band struck up a lively air and a number of the company danced. An open-air lecture on the 'geology of Leicestershire' came next, for which the speaker was given three cheers. An excellent tea was then 'partaken of with vigour' at a near-by inn, after which there was another lecture (three cheers again) followed by more dancing; until finally, towards dusk, no doubt thoroughly exhausted, the party broke up and the members made for home.' (p. 165)

Andrew Swift

Winter Programme, 2007-2008

Except where stated, all meetings will be held at 7.30pm in Lecture Theatre 3, Ken Edwards Building, University of Leicester campus.

**Details: Chairman Dr. Joanne E. Norris, 0116 2833127,
j.e.norris@ntlworld.com**

2007

Wednesday October 3rd

Dr Laurance Donnelly (Halcrow Group Ltd., Handforth): **Forensic Geology – how do geologists help police solve crimes?**

Wednesday October 17th

Professor Simon Knell (Department of Museum Studies, University of Leicester): **"That's another fine mess ...!" How the conodonts got in a pickle.**

Wednesday October 31st

Dr Mark Williams (Department of Geology, University of Leicester): **Fire and ice on the Antarctic Peninsula: unravelling the geological history of James Ross Island.**

Wednesday November 14th

Dr Mike Widdowson (Department of Earth Sciences, Open University): **An armchair guide to volcanism on the Earth and terrestrial planets.**

Wednesday November 28th

Dr Jonathan Lee (British Geological Survey, Keyworth): **Life on the Costa-del-Cromer during the Pleistocene – evidence of climate change and early humans in Eastern and Central England.**

Wednesday December 12th

Christmas Meeting, New Walk Museum, Leicester.

2008

Monday January 7th

Parent Body Lecture, New Walk Museum, Leicester

Professor Cynthia Burek (Department of Biological Sciences, University of Chester): **Where are the women in geology?**

Wednesday January 16th

Dr Ian Candy (Department of Geography, Royal Holloway, University of London): **Finding their way into the East Midlands; the earliest Britons, their landscapes and climates.**

Wednesday January 30th

Dr Cheryl Jones (Department of Applied Sciences, Geography & Archaeology, University of Worcester): **The Abberley and Malvern Hills Geopark.**

Wednesday February 13th

Members Evening, New Walk Museum, Leicester.

Wednesday February 27th

The Palaeontological Association Baldwin Lecture.

Professor Nigel Trewin (Department of Geology, University of Aberdeen): **The Early Devonian ecosystem preserved in the Rhynie chert of Aberdeenshire, NE Scotland.**

Wednesday March 12th

Dr Tony Waltham (Geophotos, Nottingham). **Into the Danakil; some geology in the Afar Triangle.**

Saturday March 15th

Annual Saturday Seminar, University of Leicester, 9.30 am – 5.00 pm

Dynamic Dinosaurs - cutting edge approaches to ecology and behaviour

Wednesday March 26th

Annual General Meeting, and Chairman's Address

Dr Joanne Norris (Halcrow Group Ltd., Peterborough). **An introduction to soil bio-engineering for slope stabilisation.**

Abstracts for the first part of the Winter Programme

October 3rd

Forensic Geology – how do geologists help police solve crimes?

Laurance Donnelly, Halcrow Group Limited, Handforth

This presentation provides a general overview of how geologists have helped the police with certain types of criminal investigations including rapes, murders, robbery, terrorism and the search for graves, weapons, money & drugs.

There are a number of geologists in the UK, and internationally, who currently work with, or have recently worked with the police, other law-enforcers, environmental agencies and humanitarian organisations to help bring some types of crimes to successful conclusions. Some geoscientists have also been involved in forensic investigations in the mining, engineering, minerals and water sectors of industry, or during the investigations of geohazards (also known as natural disasters). The common ground for all these sub-disciplines is that geoscience practice and results may end up as part of a public, international or legal enquiry by government or in courts of law.

Forensic geoscientists may be broadly divided into two principal fields, depending on their skills, expertise and capabilities. Firstly, there are the laboratory-based geologists who may include for example; geochemists, mineralogists, petrologists, micro-palaeontologists and isotope specialists. These may be involved with forensic investigations to provide physical evidence for use in court, assist in an investigation, provide intelligence or identify the location of a crime scene. In short, geoscientists may link an offender (or object) to the scene or link the victim to an offender. Secondly, there are field-based geologists, who use their skills in exploration (including for example; geophysics, geochemistry, geomorphology, hydrogeology, environmental geology, remote sensing and geotechnics) to search the ground (to locate murder victim's graves, weapons and other objects). Geologists who work on multidisciplinary forensic investigations must professionally collaborate and effectively communicate with other scientists. These may include archaeologists, anthropologists, palynologists

and ecologists, and other specialists such as victim recovery dog handlers, search advisors, victim recovery specialists and police officers.

October 17th

"That's another fine mess...!": How the conodont got in a pickle

Simon Knell, Dept of Museum Studies, University of Leicester

The conodont entered the world of science in 1856 and immediately caused a stir as its finder, Christian Pander, claimed it as the remains of a fish and the earliest known vertebrate. (The University of Leicester's current conodont workers have adopted a similar position and also found themselves embroiled in controversy). It was for the first 130 years of its existence the greatest enigma in palaeontology as no one truly knew what it was but everyone had an opinion. The nineteenth century saw various attempts to kill the vertebrate but it was reborn in the early twentieth century at a time when the US was beginning to use microfossils in oil exploration. The conodont was drawn into this world of utilitarianism, and emerging biological truths were denied significance in order to develop the fossil for business. By the mid 1950s, the science was in a mess - it had invented a fossil which to all intents and purposes had the taxonomic and biological simplicity of a foraminifera yet which everyone knew belonged to a complex organism. It was then that the modern era of conodont research was born. Before long some 300 people around the world were devoting their lives to these microscopic tooth-like fossils and soon putting the house back in order. In this talk I will discuss the early controversy, but then concentrate on how the science got into a mess and why. We might then ask whether the mess was inevitable or necessary and whether it had any benefits. This comes from a book due to be published in 2008 called Pander's Tooth.

October 31st

Fire and ice on the Antarctic Peninsula: unravelling the geological history of James Ross Island

Mark Williams, Dept of Geology, University of Leicester

James Ross Island lies near the northern tip of the Antarctic Peninsula at 64 degrees latitude south. To reach the island you need the support of the British Antarctic Survey in Cambridge. Departing the Falkland Islands, the Royal Navy's ship Endurance speeds you across the Drake Passage, the final leg of your journey being a quick hop by lynx helicopter to the island. James Ross Island records a geological history extending back to the Cretaceous

but its great peaks are volcanic. The more recent rocks of the island record a monumental struggle between fire and ice, the volcanoes and ice sheets that covered them. The glacial sediments that are interspersed with the volcanics contain fossils which suggest that at times over the past 6 million years the climate was much warmer, with the ice retreating. Studying these fossils and the sediments in which they are contained may help us to understand the changing pattern of climate and ice cover on the Antarctic Peninsula as Earth's climate warms.

November 14th

An armchair guide to volcanism on the Earth and terrestrial planets
Mike Widdowson, Dept of Earth Sciences, Open University

November 28th

Life on the Costa-del-Cromer during the Pleistocene – evidence of climate change and early humans in eastern and central England
Jonathan Lee, British Geological Survey, Keyworth

At a time when the topic of climate change is both a political and scientific hot potato, it is important to focus not just on the present and future, but to also look back in time to examine climate changes that have occurred within the recent past. This lecture will present and discuss the evidence for climate change spanning the past 2.5 million years outlining and explaining just how cold and hot it got, how the landscape evolved, and when early humans arrived.

Monday January 14th 2008 Parent Body Lecture, New Walk Museum, Leicester

Where are the women in geology?
Professor Cynthia Burek, Dept of Biological Sciences, University of Chester

This can be explored in several different ways: historically, academically or geographically. Each of these areas gives us an insight into the role that women have played and still do play within the field of geology. Historically several different case studies will be explored in detail using four female figures from across time. Academically some interesting details emerge of the move away from palaeontology through time. Geographically across Europe, public perception of women and the place of geology within science are described based on over 600 questionnaires. One person

transcends all others and she is not a geologist which should be no surprise. The position of women within the modern field of geology is summarised.

Field Excursion Reports

Geology of churches in south Nottinghamshire, May 12th 2007
Leader: Albert Horton

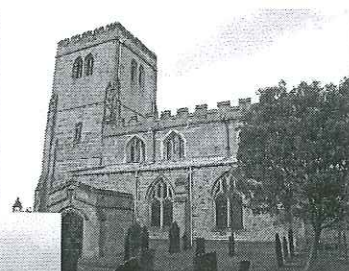
This was our first outing of the 2007 summer programme and it started the new series in style. We met at Colston Bassett old church (St Mary) on a day that was initially fine but which gradually deteriorated to light rain in the latter stages. Leader Dr Albert Horton greeted us and explained the geology of the building stones used in the church's construction to our group of eight members. Two more joined at lunchtime to raise the number to 10, but what we lacked in numbers we made up for in enthusiasm! The old church (a much later Victorian church stands in the village itself) is presently a roofless ruin, a result of having its roof removed in the late 1800s, but the structure has been stabilised by local enthusiasts with the support of English Heritage. It stands anomalously apart from the village, on a scarp of Lower Jurassic limestone. Perhaps a group of buildings was originally associated with it, but evidence for these has never been found. Needless to say, a significant part of the structure is composed of the local Blue Lias, but on closer inspection the walls contain a variety of other stone, including Marlstone Rock Bed Formation, some Triassic sandstone, and ironstone from further afield. The Permian Bulwell Stone may have arrived at the site as part of a carter's return load. It was interesting not only to note the diversity in the quality and type of stone but also how the different stones had weathered over time. Some details of the interior remain including two piscinas used to hold holy water, and a fragment of presumed Anglo-Saxon masonry. The most intriguing aspect of the building apart from the geology is the architecture, which reflects changing fashions in building from the church's foundation in 1293 on the site of an earlier building, through modifications made in the medieval period, to changes undertaken right through to the church's abandonment in the 1800s.

We next drove to Holy Rood in Edwalton, founded in the 12th century, with its fine brick built Tudor tower. The other parts of the building comprise mainly local stone, including Triassic Hollygate Sandstone and Permian marginal facies from the Cadeby Formation. With a busy schedule we didn't linger and were soon en route for Plumtree and its church of St Mary the Virgin. Again the Hollygate Sandstone was well in evidence along

with Jurassic Lincolnshire Limestone. Also present were blocks of very local porcellanous 'White Lias' limestone from the latest Triassic Penarth Group and quartzite erratics brought with the Anglian glaciation. The church had been repaired somewhat unsympathetically with Millstone Grit, some of it still sooty from its previous location as part of an old bridge over the Trent. A strong Norman influence could be seen in the main door and the blank arcading. On leaving Plumtree we adjourned to The Plough at Normanton-on-the-Wolds for a most pleasant interlude over lunch.



Colston Bassett old church (St Mary)



St Mary the Virgin, Plumtree

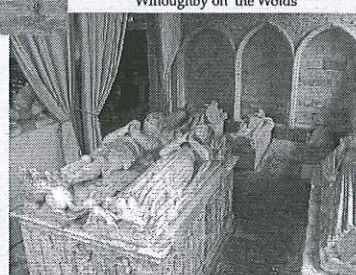
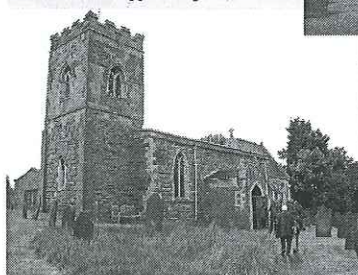


St Luke, Upper Broughton



The field party at St Mary & All Saints
Willoughby on the Wolds

Alabaster tombs in St Mary & All Saints,
Willoughby on the Wolds



After lunch we moved on to the unpretentious little church of All Saints at Stanton-on-the-Wolds, a structure built of a mixture of erratics, Bunter (Triassic) quartzites, a little 'White Lias', and shelly and dolomitic limestones. The main stone used was a littoral sandstone, the Permian Mansfield Stone. The brachiopod *Lobothyris* was evident in blocks of Marlstone. The picturesque ferruginous sandstone church of St Luke at Upper Broughton was our next call, and we speculated about where the stone had originated, most seemed to be local from the Marlstone Rock Bed, but it was clear that some Northampton Sand ironstone had also been employed. At that point some rain began so we adjourned to the interior

where Albert took the opportunity to explain the area's geology with the aid of geological maps. In the porch was a marvellous fragment of Norman or possibly Saxon tympanum, with a most unusual ornament. Our last stop of the day was at St Mary & All Saints at Willoughby-on-the-Wolds, an imposing edifice whose crowning glory is its collection of alabaster tombs, mostly of members of the Willoughby family, coldly mysterious and so very evocative of their time in the sculpted clothing on the figures. The church's structure was a familiar one of mixed stones, including ferruginous sandstone, limestone and sandrock.

The obligatory 'family' photograph taken, it only remained for us to thank our most knowledgeable leader for an enjoyable and instructive day, and then the party dispersed at around 3.30pm.

Helen Jones & Andrew Swift

Building Stones of Northamptonshire, June 9th 2007 Leader: Dr Diana Sutherland

As for almost all our 2007 excursions, the weather was kind to us and we had a super summer's day for our outing to Northamptonshire to see examples of the use of building stone in that county. We were led by Diana Sutherland, and this trip was by way of a corollary to the one she led for us in July 2004, so successful was that day. The 10-strong party was small but keen and we began by assembling at Bennie's Pitsford Quarry, a working Northampton Sand ironstone (Middle Jurassic) pit. Younger Rutland Formation beds overlay the ironstone, with a significant gap between the two which represents the missing Grantham and Lincolnshire Limestone formations. The faces were small but with Diana's expert guidance we were able to see the details of the succession. From Bennie's we drove a short distance and parked in order to rationalise cars for the restricted locality we were to see next, an historic conserved quarry at Duston Wildes, also in the ironstone with overlying Rutland Formation. For many years it was believed that the white sands now attributed to the Rutland, were in fact Grantham Formation, but palynological evidence now suggests otherwise. Despite the rather overgrown aspect of the quarry, the party readily ventured into the undergrowth to view the faces.

With lunchtime now upon us we retreated to the Fox & Hounds at Harlestone to eat. The pub was nouveau olde English posh, and reflected the proximity of Althorpe, the Spencer (viz. Princess Diana) ancestral home and the burgeoning tourist industry associated with it. But, despite that, and us



The north face of the pit at Wigston Junction (Glen Parva) Brick & Tile Works, from a photo reproduced in the 1901 LLPS Transactions

feeling a mite uncomfortable in our field gear, we enjoyed a most affable lunch and good food. Thus restored, we were ready for the first post-lunch item, which was a delightful walk through Harlestone village environs and countryside, ending up at the picturesque ironstone church. In the churchyard were many interesting gravestones and memorials, including, most appropriately for our day's subject, stonemasons tombs. Our next port of call was Dallington village and this was chosen to show how a typical ironstone village was swallowed up by urban sprawl, in this case the town of Northampton. We went to the old village centre and saw mellow ironstone almshouses and other old buildings, also the rustic ironstone church with its rubble-built tower.



Clockwise from top left: Bennie's Quarry, Pitsford; Duston Wildes Quarry; The Wheatsheaf at Dallington, built of two different types of ironstone; at the Fox & Hounds, Harlestone

To end our excursion we drove to another settlement almost engulfed by Northampton, but thankfully Kingsthorpe still retained much of the atmosphere of a village. We looked first at the abandoned and melancholy shell of Kingsthorpe Hall, most unusually built of stone from the Rutland

Formation. Locally a harder sandstone occurs in this formation, and that was what was used for the hall. Many of the blocks showed excellent examples of rootlets. From the Hall we walked the short distance into Kingsthorpe centre and were shown how another local facies, this time of the Northampton Sand ironstone, had been used in many of the buildings, including the church. It took the form of a type of concretionary development, although the true origin may be more obscure, perhaps connected to bioturbation. But in any case it made a most attractive stone with a rusty ironstone groundmass with paler elongate 'concretions'. Sadly, that concluded the locations for the day so we expressed our grateful thanks to Diana for a splendid tour. As per usual, scouts reported the presence of a nearby pub, ironstone-built of course, so a good percentage of the party retired thence. Purely for exploratory and scientific reasons naturally.

Andrew Swift

Weekend excursion to north east Norfolk, June 22nd – 24th 2007

Director: Andrew Swift

Leader: Martin Warren (Norfolk Museums & Archaeology Service)

Nowhere in the UK can Pleistocene glacial geology be better appreciated than north east Norfolk, and a visit to the spectacular cliff and coast localities in that part of the world is a must for every self-respecting geologist. Thus, a weekend excursion by the Geology Section was, if anything, overdue. We were very fortunate to secure the services of Martin Warren of the Norfolk Museums & Archaeology Service, one of the foremost experts on the succession, and he ensured that we saw some classic geology, and learnt much about it too. We were most conveniently based in the Sandcliff Hotel, Cromer, in the heart of the 'glacial belt' and generally we were well served by that establishment. However, I was somewhat taken aback when checking in on Friday before the main party to discover that ownership of the hotel had changed within the last few days and the new regime seemed largely unaware of the arrangements I had made with the previous one! Keeping the increasingly bewildered châtelain placated and ensuring that everyone got a room roughly equivalent to that which they expected required much diplomatic skill. But at last we were settled and our minds could turn to the traditional pleasures of being 'by the seaside' and away from the routines of home. Thus it was that advance parties had already explored the public establishments of the alcohol-dispensing variety and other groups soon joined the trend. Cromer is a most congenial and

traditional English resort and there are few more rewarding, yet simple, delights than sitting in a seafront café or pub to observe the play of the waves and the sweep of the gulls.



Top: Wild & broken cliffs near Overstrand. Bottom: everyone on West Runton beach

The real business of the weekend began at 8.00pm in the bar of the Sandcliff, hastily rehabilitated for our use, when the 25-strong party convened formally. After a brief welcome the leader was introduced and he proceeded to give a summary of the geology we would see and the places we would visit. Then it was back to more socialising and catching up of news for the rest of Friday evening.

Naturally, with any outdoor activity the weather is of paramount importance, and we nervously watched the skies for signs of rain as Saturday dawned. But it remained dry, if rather dull, as we set off for our first stop of the day, at Trimmingham. This stretch of coast is bleak and windswept, and very quiet, but the geology is superb. After a somewhat testing descent onto the beach we set off westwards towards Overstrand observing the many changes of facies in the glacial succession. Contrary to

common belief the variety of rock types is considerable, the succession is not simply an expanse of tills, there are outwash gravels and sands, lake and other water-lain beds, rafts of detached chalk and many other variations on those themes. In addition, glacio-tectonics have folded and thrust the succession into myriad contortions, making an understanding of the succession very difficult. The terrain was also difficult once off the level of the beach, and one unfortunate member who shall remain cloaked in anonymity, found themselves enmired in a sticky expanse of mud and had to be rescued. The leader's initial plan was to push on to Overstrand, but time constraints and fatigue resulted in us returning from whence we came, and ascending the steep and slippery ramp to regain the cars. Then we returned along the coast road to Overstrand to forage for lunch.



The wide horizons of the north Norfolk coast

There were a few choices as to what and where to eat, but most people opted for the Cliff Top Café. At that point, the weather had given us no cause for concern and after lunch we set off eastwards along the sea front and under the cliffs with light hearts. However, we were in for trouble as ominous dark clouds built up and the light levels fell alarmingly. It could only mean a storm, and within minutes we were engulfed in it. Several of us had no wet weather gear at all and umbrellas were at a premium. Only those

who experienced the storm know exactly how fierce and tumultuous it was, but in a word it was horrendous. The clay underfoot rapidly assumed the characteristics of ice and the already rough ground became almost impassable, especially for the less nimble amongst the party. A small scale version of the retreat from Moscow ensued and by the time we regained the Cliff Top Café we were a sorry looking, bedraggled crowd. But top marks to all for getting back under such trying conditions. And it says an enormous amount for the keenness of the members of the Geology Section that the majority of the party voted unhesitatingly to carry on, despite being completely soaked, to the next locality.

That locality was, arguably, the main attraction of the weekend for most of us. It was the site at Happisburgh where recently a hand axe was discovered which indicated the presence of man in this area 700,000 years ago. It is one of the oldest human artifacts yet recorded from Europe, and as well as this spectacular find, cut bone and flakes have also been found as well as 'loose' hand axes from the beach. Sadly, no-one in the party was able to add to the tally of finds on this occasion.

The climax of the weekend was scheduled for the Saturday evening at the neighbouring Cliftonville Hotel, when we enjoyed the Geology Section dinner. As hoped, the venue was suitably imposing and 'posh' and we were excellently catered for and received a first class meal. Everything went like clockwork and it was pleasing that the leader was able to join us on our celebratory occasion. It was a small way we could pay him back for his time and knowledge. Chairman Joanne Norris said a few words and thanked the leader and director, and then we toasted the Section in time-honoured style.

The elements were kinder to us on the Sunday, although again it wasn't exactly tropical. After checking out of the Sandcliff, we visited just one locality, the section at West Runton. Again, the sheer variety of rocks and the environments they represented, was most impressive. We were still in the midst of ice age deposits, but here there were tantalising glimpses of the pre-glacial beds of the earlier Pleistocene, and even the Chalk is revealed in foreshore exposures, overlain by pockets of the Quaternary Wroxham Crag Formation. These sequences give extremely important information on the environments and fauna and flora just before the onset of the ice. The most famous of these horizons is the Cromer Forest Bed, a pre-glacial sequence of freshwater beds here at West Runton around 600,000 to 700,000 years old, which yielded the famous West Runton elephant. We spent some time examining and searching these deposits (here known as the West Runton Freshwater Bed), but despite the presence of abundant fossil material, little could be extracted due to its fragile nature.

At last the time arrived that we all least liked, the end of the excursion, and time to turn homewards. Again we gave our thanks to Martin Warren, and I suspect most people, like myself, left vowing to return soon to see more of this fascinating sequence, a jewel in Britain's geological crown.

Andrew Swift

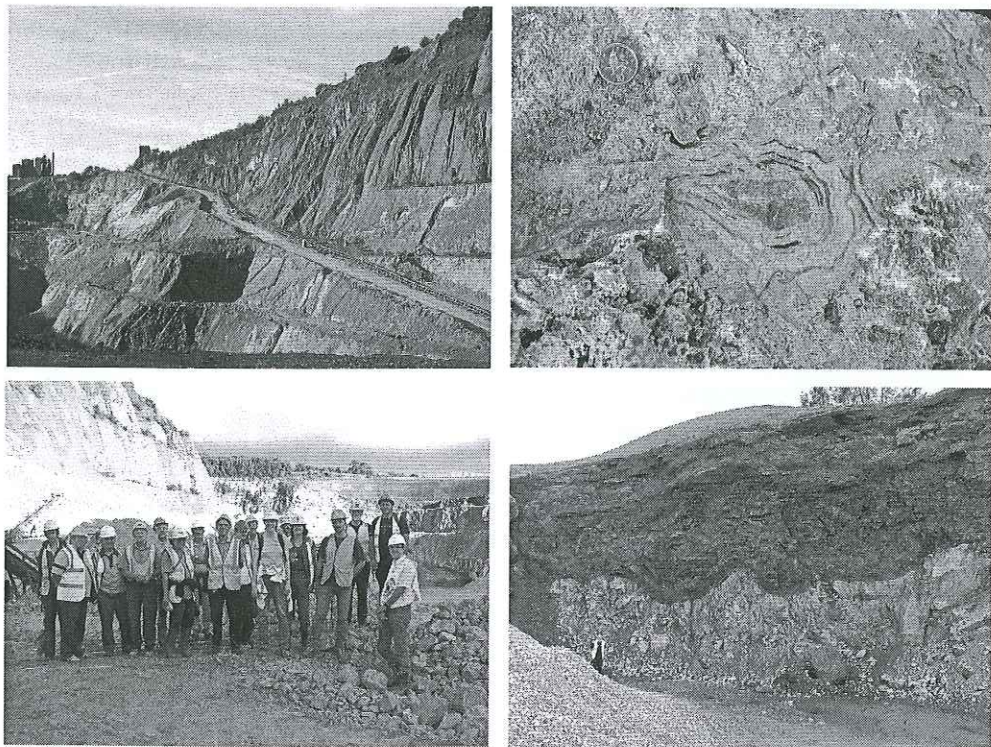
Cloud Hill Quarry, Breedon, July 12th 2007

Leader: Keith Ambrose (British Geological Survey, Keyworth)

On Thursday 12th July the Section enjoyed an evening visit to Cloud Hill Quarry, Breedon, led by Keith Ambrose of the British Geological Survey. The weather was kind, and fine sunshine prevailed as we assembled at 6.00pm. After the customary meetings and hellos at the quarry offices the 17-strong party was ferried in stages into the bowels of the quarry by Keith, using a heavy duty truck. The first thing to strike us was the sheer size of the quarry, unsuspected from outside, and the height of the walls. Then our eyes were drawn to the magnificent unconformity between the limestone and the overlying contrasting red mudstones of the Triassic Mercia Mudstone Group. The structure too was of great interest, with intensive folding, resulting in vertical beds in parts and possibly some overturning. Many conglomeratic levels were noted. Keith began by giving an introductory talk about the quarry and what we would see during the evening. Cloud Hill is part of a series of Carboniferous Limestone inliers situated between Shepshed and Melbourne and has been extensively quarried, currently by Ennstone. The lowest excavations are now below sea level. Our first stop exposed the oldest strata in the quarry, comprising thinly-bedded dolostones of the Milldale Limestone Formation, with clay or shaly mudstone partings. The beds are moderately fossiliferous and Cloud Hill is the type area for the brachiopod, *Levitisia (Productus) humerosus*, specimens of which were visible. Stylolites were also discernable in some beds.

Moving along the face to the second locality we saw a sequence of dark, only partly dolomitised beds containing crinoid debris, and in the corner of the quarry a massive bed of limestone has been interpreted as a reef or mud-mound (we had interesting discussions during the evening about the origins of these anomalous features). We examined some large blocks piled up near to the edge of the quarry face. Some of these contained curious concentric features, (HJ - a bit like when you first add cocoa powder to a cake mix), of banded calcite, called stromotactis, which are complex crystalline

developments within cavities in the rock. We also saw many dolomitised fossils, chiefly crinoids, some of which were unusually complete.



Clockwise from top left: Access road dropping into the quarry past vertical beds; stromatactis; haematite mineralisation in overlying Triassic beds; the Cloud Hill party

At the third locality we had hoped to observe a significant intra-Carboniferous unconformity (the Main Breedon Unconformity) representing a time gap of some 10 million years, but it was hidden behind quarry rubble! However we were able to see tight folding and discontinuities which have been interpreted as soft sediment slumping. We then moved along the east face of the quarry where irregular white masses of chert could be seen. There was some evidence of karstification, and fissures were observed in the upper levels of the quarry into which much younger mudstones and siltstones had been emplaced. These areas were also sites of important mineralisation. The mineralisation, however, was most impressive at the final stop, where we viewed beds of the Ticknall Limestone Formation. At this location we were able to collect kidney haematite, galena, malachite, bournite and chalcopyrite. The large brachiopod *Gigantoproductus* was also

present and indicated an age of ?Late Asbian to Brigantian. Many members collected fine examples of crystals, some of which showed secondary mineralisation, crystals on crystals! It is thought there were two main phases of mineralisation, the first during the Late Carboniferous/Early Permian and the second phase during the Triassic. The copper mineralisation is generally attributed to the Triassic period.

The meeting closed at 9:00 pm after a fine evening of both weather and geology. We were particularly grateful to the owners of the quarry for allowing access, and also of course to Keith for his time and expertise. Both he and the quarry manager (who also made himself available for running us about the quarry and gave much useful information) were presented with bottles of wine as a token of our appreciation. A small group went into Breedon after the excursion to discuss the events of the evening over a convivial drink.

Helen Jones & Andrew Swift

Cauldon, Staffordshire and the Dove Valley, Derbyshire, August 3rd 2007

Leaders: Andrew Swift (Cauldon Low) and Mike Allen of the National Trust (Dove Valley)

Unusually, this excursion took place on a Friday to fit in with the policy of the owners of Cauldon Low Quarry, Aggregate Industries, who don't permit weekend visits. That led to fears that attendance might be affected, but that wasn't the case and there was a good turnout of 14 Section members on a day of uncharacteristic good weather, a distinct rarity in the monsoonal summer of 2007. We began by assembling at 10.30 in the car park of the very large working quarry at Cauldon Low, close to Waterhouses in Staffordshire, where we were met by the manager Keith Rowland, who was helpful and co-operative throughout. But what he couldn't do was break another of his company's rulings, which was to restrict access in the quarry. That meant that we were taken to a designated safe area and not allowed to stray from that or approach the faces, while all the time being supervised by Keith and his deputy. That sadly, is the state of things in 2007 in the era of the Health & Safety Executive, but we made the best of things. My role as leader was made easier here through help received before the meeting from ex-BGS field geologist Ian Chisholm, who graciously made his expertise available and provided much useful information. Ian has agreed to lead a trip for us next year to Derbyshire, and that should form an excellent

corollary to what was seen today, as it will deal with later Carboniferous beds.



Clockwise from top left: structure in Caudon Low Quarry; party outside the Yew Tree Inn; lovely Dovedale; Caudon railway cutting

The highlight of Caudon Low Quarry is undoubtedly the structure, and fortunately it wasn't necessary to study the faces or move from where we were to appreciate it. The dip of beds ranged from horizontal to vertical with evidence of overturning too, and with the widespread folding and faulting, it made for spectacular viewing. The history of this tectonic activity is complex but basically can be related to colliding plates to the south of our area during the Hercynian Orogeny. We were fortunately deposited in the quarry near a line of huge blocks which we could study and which provided a precis of the surrounding geology. Thus were we able to engage in lively debate over possible emergent surfaces and some unusually complete crinoid remains, amongst other features.

From the busy quarry we next moved on to a much quieter locality, the railway cutting near Caudon village, long abandoned by trains and these days given over to nature. It was a very sylvan spot where the birds and

flowers drew almost as much attention as the geology. Exposed here are the beds that overlie the limestones we saw in the quarry, and these consisted of dark shales of the basal Namurian. Several types of fossil are recorded from these strata, chiefly thin shelled bivalves and goniatites, but we had little luck. Probably the best preserved elements of the fauna are the microscopic remains of conodonts, but the party had to take the leader's word for that.

No visit to this part of the world would be complete without calling at the Yew Tree Inn at Caudon, a truly unique establishment, and that was our next port of call for lunch. Your scribe remembers when this glory hole of antiques and mechanical instruments from a bygone age was even more dishevelled and mysterious than it is today, but even so the party were suitably impressed by the Dickensian surroundings.

2.00pm was the hour set for our meeting with the leader for the afternoon portion of our Peak District adventure, and that was the exact time we pulled into the car park at the tourist hot spot of Dovedale. If we hoped for a quiet day, seeing as it wasn't a weekend, our hopes were dashed, and the usual melange of humanity was busy doing whatever a melange of humanity does. Largely that seemed to involve ice cream and dogs, but we rose above it all (with the exception of the ice cream of course) and withdrew a suitable distance while Mike Allen of the National Trust explained the plan of action and something of the geology we would see. That plan involved a circuit of the base of Thorpe Cloud to bring us back into the higher reaches of the Dove, and thence back to the car park, observing the geology as we went. A geowalk in fact, and indeed it was a fine day for exercising outdoors in splendid surroundings. The main point of interest was the quasi-original topography of Thorpe Cloud and the neighbouring heights, representing as they do Carboniferous mud mounds, or reefs if you prefer, bounded with screes derived from the reef itself, set at original angle of repose. As is the norm with the Geology Section, we engaged in robust debate with our excellent leader about the features we saw, but there was unanimity about the most impressive geology and scenery. By the time we brought our weary limbs back to the car park we were feeling the effects of an active day, and looked forward to relaxing at home later.

Andrew Swift

Saturday Seminar 2008

Conscious of our responsibility to present another Saturday Seminar in 2008 of which the Geology Section can be proud, following the enormously

successful Charnia day earlier this year, the sub-committee responsible for organising the day have come up with a dinosaur theme and have entitled the day, 'Dynamic Dinosaurs - cutting edge approaches to ecology and behaviour'. The seminar will focus on recent innovative research concerning dinosaur locomotion, eating strategies, new fossil discoveries, skeletal modifications and other exciting aspects. We have a list of preferred speakers, and although we are awaiting responses to invitations, there is every reason to hope that we will have some hot speakers for you. Bookmark March 15th 2008 in your diaries now!

Subscriptions 2007 – 8

If you find a subscription renewal form with this Charnia, our records suggest that you have yet to pay your subscription for the current year. Please complete the form and return it to the Treasurer with the appropriate monies. Any subscriptions remaining unpaid after Christmas will be deemed to represent a wish to resign.



Sand pit at Aylestone, from the 1901 LLPS Transactions

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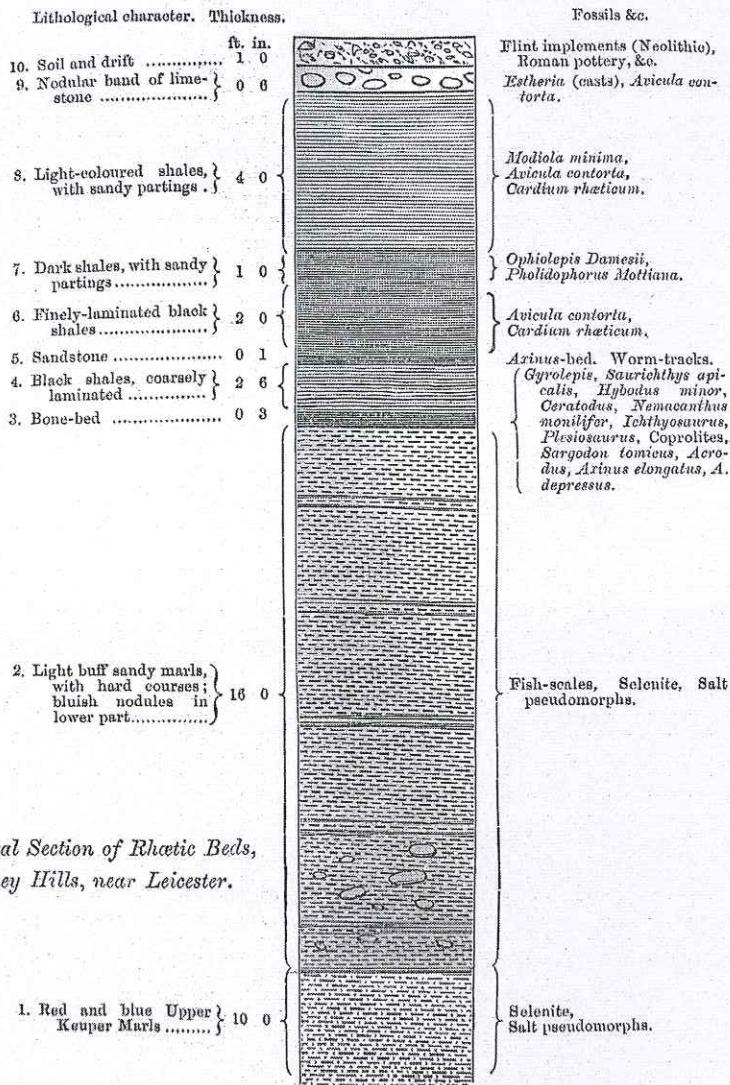


Fig. 1.—
Vertical Section of Rhaetic Beds,
Spinney Hills, near Leicester.

from: HARRISON, W. J. 1876. On the occurrence of the Rhaetic Beds in
Leicestershire. *Quarterly Journal of the Geological Society of London*, 32, 212-218.
(reproduced by courtesy of the Geological Society of London)