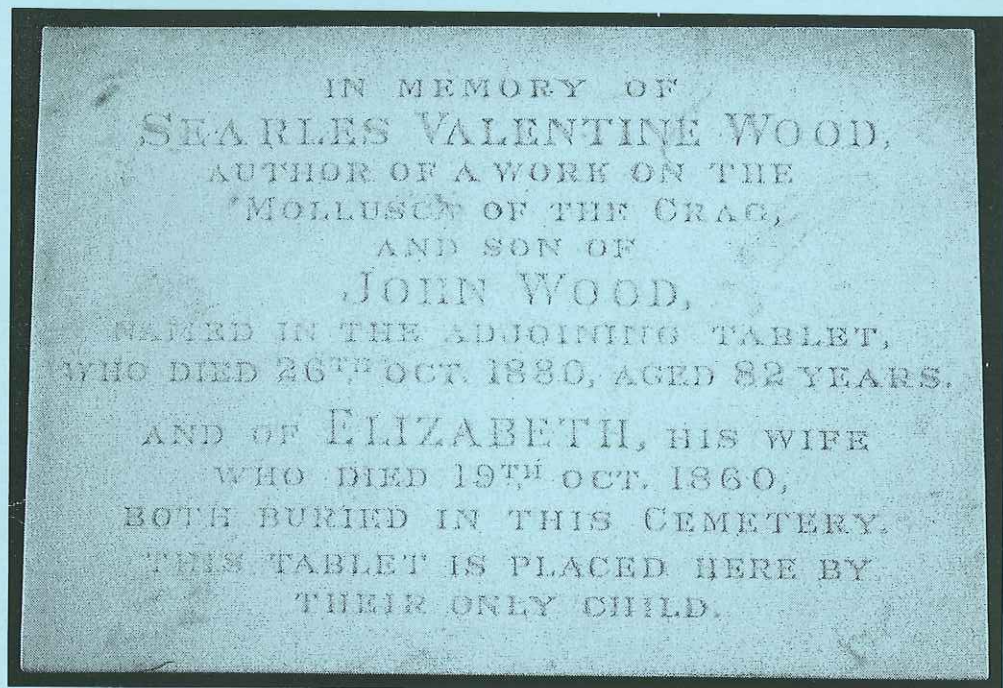


# CHARNIA



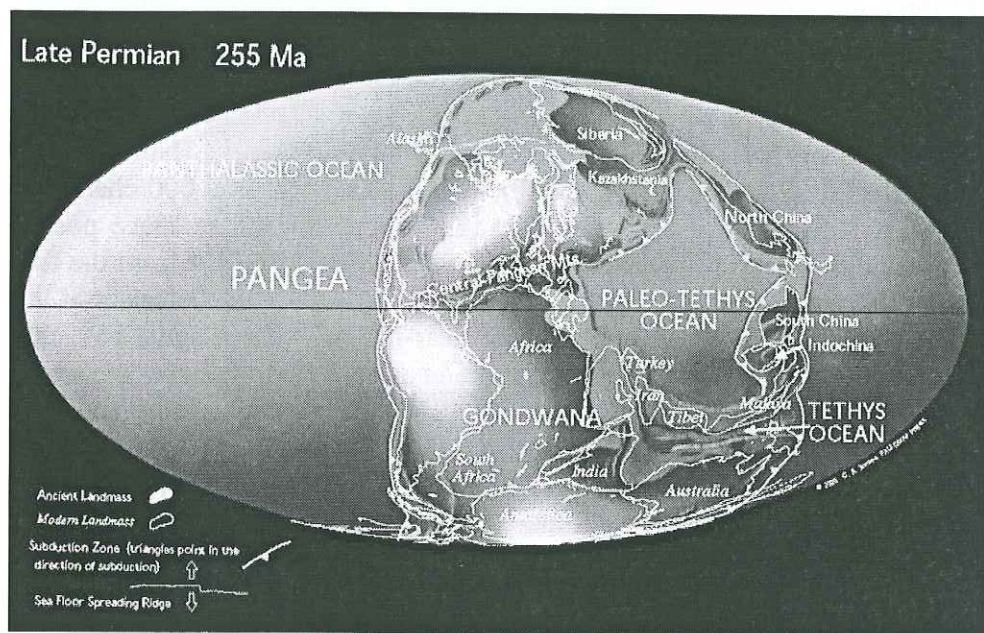
**The memorial tablet to Searles Valentine Wood snr, pioneer of East Anglian geology, in Melton old church, Suffolk**

**LEICESTER LITERARY & PHILOSOPHICAL  
SOCIETY : THE NEWSLETTER OF SECTION C  
(GEOLOGY)**

**AUTUMN 2003 EDITION**

## Editorial

Having finished reading 'Architects of eternity' (see 'Charnia', Summer 2003) I made the very pleasant discovery of Michael Benton's book, 'When life nearly died: The Greatest Mass Extinction of all time' (Thames & Hudson, ISBN 0-500-05116-X.). Both books have historical geology as a common thread, the latter being a superbly readable account of the slow dawning of the magnitude of the end-Permian mass extinction. I wanted to relate extensively on the content of this book, though I shall resist the temptation. Take it from me, once you start reading you won't be able to put this book down; it will appeal to both the professional geologist and lay amateurs alike. What Benton's book perhaps shows more than anything is the rapid evolution of the subject of geology itself; as such this book provides an entertaining means by which to update your geological knowledge.



### The Earth's palaeogeography at the end of the Permian

One topic mentioned by Benton concerned fossilized spores and plant life. In mid-September Charles Wellman and colleagues of Sheffield University announced in 'Nature' that they had found evidence for terrestrial plants dating back to 443-496 million years ago. Previously, spores of the type studied by Wellman's group had been interpreted as algal and therefore of



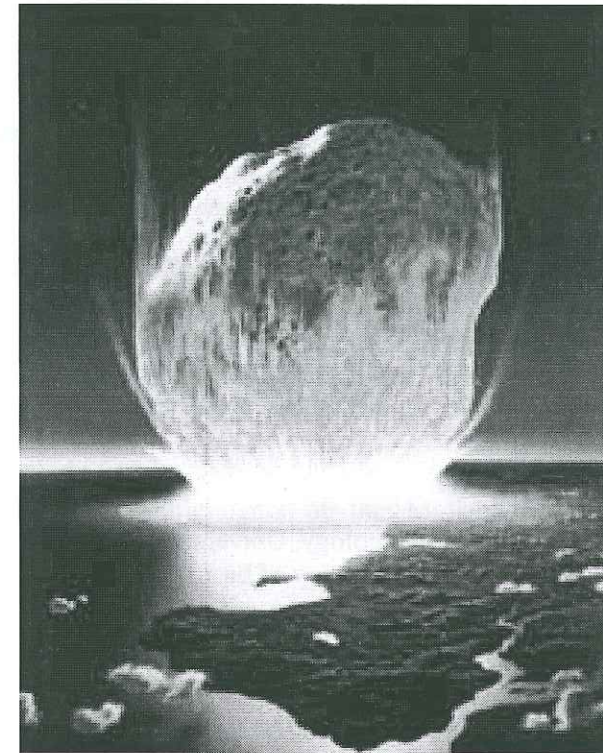
aquatic origin. Wellman's interpretation suggests that the fossils are more akin to present-day liverworts.

Some time ago I wrote about 'extremophile' organisms and the origin of life. Until recently, the record holder for high temperature survival was held by *Pyrolobus fumarii*, whose normal environment is water at 100 Celsius. *P. fumarii* can survive temperatures up to 113 degrees Celsius. Now the new record holder is a micro-organism dubbed 'Strain 121'. Researchers Derek Lovley and Kazem Kashefi of the University of Massachusetts found that this 'new' bug lives quite happily at 121 degrees Celsius and is killed when the temperature rises to 130 degrees Celsius. As you may have guessed, Strain 121 was collected at great depth adjacent to a submarine 'smoker'. In this case it was 2.4km below the waves on the Juan de Fuca ridge in the Pacific. It is thus reasonable to suppose that primitive life forms evolved with a higher temperature tolerance than previously thought and therefore that life could have evolved earlier than currently thought?

At the other end of the scale - and returning to the opening theme of this Editorial - there are sizeable fragments of rock in the Solar System which could obliterate life on Earth in very short order. The latest of a number of these scares is Asteroid 2003 QQ47 - a 2.6 billion tonne rock originally calculated to intersect the Earth's orbit on March 21<sup>st</sup>, 2014. Not to panic though, the latest calculations show that QQ47 has a 1 in 909 000 chance of hitting us. However, there are another 523 similar objects in space posing comparable threats to our planet. Perhaps we can draw comfort from the fact that the UK Near-Earth Object Information Centre is here in Leicester at the National Space Centre. The most recent near-miss was on August 16<sup>th</sup>. this year, though that object whizzed past us at an astronomical whisker's breadth - 2.4 million miles. Having said this, do any of you know anything about an event occurring in Siberia, where a fireball and earth-tremors were experienced? No, I don't mean the Tunguska event of June 30<sup>th</sup>., 1908 - this happened on September 25<sup>th</sup>., 2002. It seems very strange that the event wasn't widely reported in the UK, if indeed reported at all. Whatever impacted destroyed 100 square kilometres of forest in the drainage basin of the River Vitim. It seems that one or two large meteorite fragments exploded 30km above the surface, releasing energy equivalent to 200 tons of TNT. This certainly aroused my curiosity and entering 'Vitim meteorite' into my computer's search-engine, it soon came up with a report at the 'Far Shores' website (<http://www.100megsfree4.com/farshores/n03met7.htm>). You can imagine the energy that would be derived from Asteroid 2003 QQ47 if it slammed into us at thirteen miles a second... Perhaps the end-Holocene mass

extinction? If you're feeling inclined you could calculate how many joules of energy might be derived from this impact. All you need to do is convert the mass of QQ47 to kilograms and its velocity into metres per second. The formula 'half times the mass in kg times (the velocity in metres per second) squared' should give you a very big number. If you wish to convert this figure to 'tons (imperial) TNT equivalent', you'll need to know that one ton of TNT = 4.184 megajoules.

GS



We won't see it but this is what it might look like!

### New Acting Treasurer

Please note that the Secretary, Joanne Norris, has taken over from Doug Lazenbury as Acting Treasurer until such time as a new full time treasurer is appointed. Please send all treasurer's business to her, the contacts are on the back cover. A number of subscriptions are still outstanding for the current



2003-4 year, so would all members who wish to stay members, please send Joanne their subs ASAP.

## **Programme of indoor meetings 2003/2004**

**All held at 7.30pm in Lecture Theatre 10 (LT10) in the Geology Department, Leicester University, except where stated**

### **Wednesday October 8th**

Dr Neville Hollingworth (NERC, Swindon) - 'Hunting mammoths in a Co-op creamery'

### **Wednesday October 22nd**

Dr Mark Maslin (Department of Geography, University College, London) - 'Tectonics, ice ages and human evolution'

### **Wednesday November 5th**

Professor Michael Collie (Barkstone, Nottingham) - 'Geology by canoe: Roderick Murchison's mapping of the Ural Mountains'

### **Wednesday November 19th**

Dr Jenni Barclay (School of Environmental Science, University of East Anglia) - Title TBA, theme - Volcanoes

### **Wednesday December 3rd**

Dr Jan Zalasiewicz (Department of Geology, University of Leicester) - 'Sliding into the deep freeze: the Plio-Pleistocene geology of East Anglia'

### **Wednesday December 17th**

Christmas meeting, to be held at the New Walk Museum, Leicester

## **2004**

### **Monday January 12th**

Parent Body Lecture, to be held at New Walk Museum, Leicester. Dr Jane A Evans (NERC Isotope Geosciences Lab., British Geological Survey, Keyworth) - 'You are what you eat: isotope studies and migration'

### **Wednesday January 14th**

Dr Graham Weedon (Department of Environment, Geography and Geology, University of Luton) - 'From climate change to time scales: examples from the Jurassic in England'

### **Wednesday January 28th**

Dr Diana Sutherland (Mears Ashby, Northampton) - 'Geology above ground in Northamptonshire'

### **Wednesday February 11<sup>th</sup>**

Members evening, to be held at the New Walk Museum, Leicester

### **Saturday February 21st (whole day)**

Saturday School, **Vaughan College, Leicester**. 9.30 am - 5.00 pm. Theme - The marine and flying reptiles of the Mesozoic

### **Wednesday February 25<sup>th</sup>**

Dr Jane Francis (Department of Earth Sciences, University of Leeds) - 'From greenhouse to icehouse, from forests to frost. Using fossil plants to track climate change in Antarctica'

### **Wednesday March 10th**

Professor Simon Conway-Morris (Department of Earth Sciences, University of Cambridge) - 'Meeting the extra-terrestrials: clues from evolution on Planet Earth'

### **Wednesday March 24th**

AGM and Chairman's address - Andrew Swift (Department of Geology, Leicester University) - 'Geological highlights of the Midlands, II - Southam (Long Itchington) Quarry, Warwickshire'

## **Abstracts for Winter Programme talks**

### **Abstract of talk scheduled for Wednesday October 8th 2003**

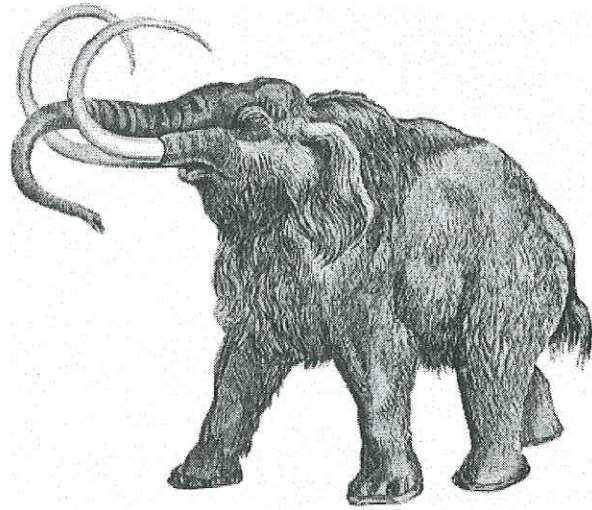
#### **Hunting mammoths in a Co-op creamery**

**Dr Neville Hollingworth  
NERC, Swindon**

Extraction of sand and gravel in the Cotswold Water Park has provided geologists with a unique opportunity to study in some detail, the geology of an area previously not mapped due to the extensive spread of late Pleistocene river gravels that obscure much of the solid geology in the Upper Thames



Valley. The gravel deposits were laid down by a major river system between 350,000 and 45,000 years ago. The underlying beds mainly comprise the Kellaways Beds and Oxford Clay which were deposited during the Jurassic period of geologic time between 175 and 155 million years ago. This talk will introduce you to some of the finer aspects of the Middle Jurassic stratigraphy of the south Cotswolds, Callovian Calamari as well as a description of some of the main discoveries in the area. For Quaternary aficionados the talk will conclude with a description of recent finds of well preserved mammoth remains and lower Palaeolithic hand axes.



**Abstract of talk scheduled for Wednesday October 22nd 2003**

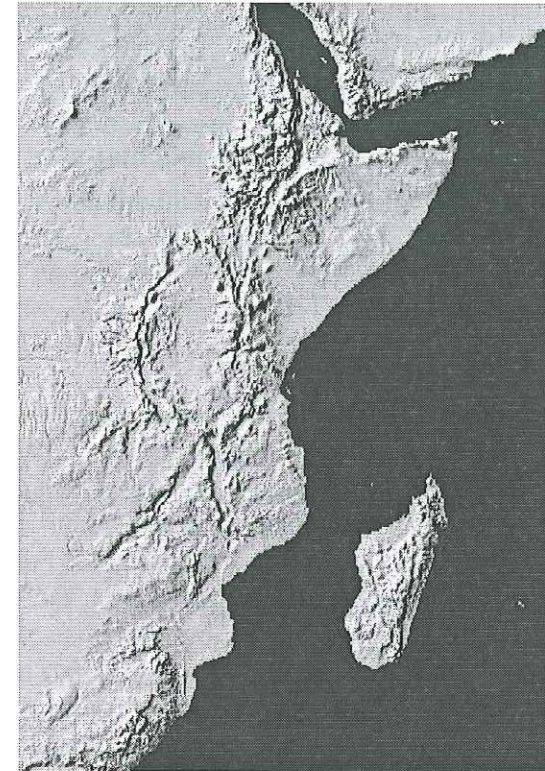
**Tectonics, Ice Ages and Human Evolution**

**Dr Mark Maslin  
Environmental Change Research Centre  
Department of Geography  
University College  
London**

The excellent BBC four part series "Walking with Cavemen" marked a resurgence in interest in the causes of human evolution. Though visually stunning, the BBC series was unable to go into much depth about what shaped the changes seen in the fossil record. In this talk I hope provide more

of that missing detail by summarising the environmental changes our ancestors had to face and provide new modelling evidence of the influence both mountain building and the ice ages had on our evolution.

Most scientists believe that environmental change in East Africa stimulated the evolution of early humans. The two driving forces of environmental change in this area over the last 10 million years are mountain building (Tibet and East African Rift) and the onset of ice ages. In this talk I want to examine first the control that regional or large-scale tectonics or mountain building has on global climate. Much of the present climate system can be explained by past tectonics. Indeed many of the climatic transitions which have occurred since the Miocene have been tectonic in origin, though modulated by changes in the Earth's orbit around the sun.



**An enhanced view of the East African Rift from space**

In the second part of the talk I will examine how the local tectonic changes in Eastern Africa caused major uplift and rifting. This altered the landscape of East Africa from a flat rainforest dominated area to a highly variable



landscape with many different types of vegetation. Indeed it is this changing mosaic of vegetation that may have caused our ancestor to become bipedal.

The tectonic changes also made East Africa much more sensitive to climate change and hence when the great ice ages started 2.5 million years ago the environment may have varied considerably throughout single human lifetimes, leading to brain expansion. Recent modelling work with the UK Met Office and Toronto University has also shown that glacial-interglacial vegetation changes are very different to what has been previously imagined. This has allowed us to turn some key palaeo-anthropological theories on their head, by showing that interglacials were periods of isolation for human ancestors, while it was glacial periods that allowed them to migrate throughout Africa. Hopefully along the way I can point out the important role geologists and geographers have in linking changes in tectonics, landscape, global and local climate changes with the key steps in our evolution history.

**Abstract of talk scheduled for Wednesday November 5th 2003**

### **Geology by canoe: Roderick Murchison's mapping of the Ural Mountains**

**Professor Michael Collie  
Barkstone  
Nottingham**

During the field seasons of 1840 and 1841, Roderick Murchison travelled extensively through Russia in Europe, reporting his results in a series of publications which culminated in his two-volume *The Geology of Russia* (1845). His immediate purpose was to demonstrate to skeptical and sometimes querulous British colleagues that the order of Palaeozoic deposits, or systems, would be globally uniform. In this respect, though, his fieldwork provided a good example of research for one purpose resulting in wider results than anticipated; while investigating the Devonian he discovered that he needed a new designation – the Permian. In the course of the second field trip he made an important decision. He would not report to the Czar on mineral deposits except in very general terms; he *would* make a major effort to understand and map the southern Urals. Though his problems may seem elementary now, he needed to explain the disruption, by a chain of mountains, of the otherwise horizontal strata of the plains and steppes. For this purpose he traversed the Urals six times at different points investigating

the contacts between sedimentary and metamorphic rocks by hazardous canoe trips through the deep ravines of fast-flowing rivers.



**Map of Russia showing the position of the Ural Mountains**

One of the results was the historically important geologic map (plate VII in *The Geology of Russia*) which, in the lecture, will be illustrated and discussed in some detail. Perhaps it hardly needs to be said that these field investigations also became extraordinary adventures for Murchison and his scientific companions.

**Abstract of talk scheduled for Wednesday December 3rd 2003**

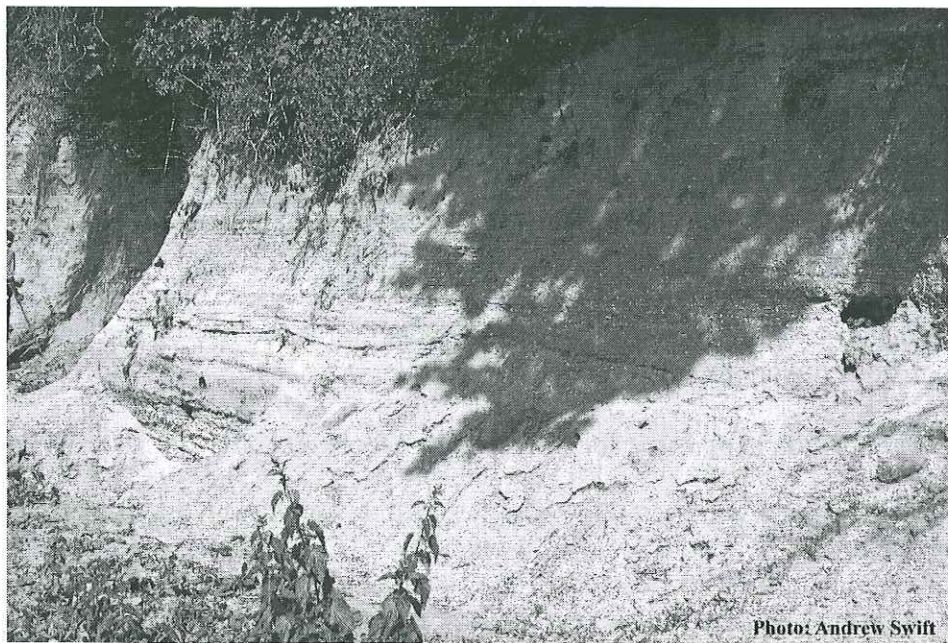
### **Sliding into the deep freeze: the Plio-Pleistocene Crag deposits of East Anglia**

**Dr Jan Zalasiewicz  
Department of Geology  
University of Leicester  
Leicester**

The spectacular and richly fossiliferous Crag deposits of East Anglia have long been researched, but much of their geology remains enigmatic. They represent a thin (<100 m), fragmentary, coarse-grained shoreline facies to a much thicker succession in the southern North Sea Basin. They show beautifully-preserved tidal and storm sedimentary structures on both small



and large scales, and contain shells and microfossils that reflect the transition from the warm carbonate seas of the early-mid Pliocene Coralline Crag to the temperate to cold pre-glacial seas of the Plio-Pleistocene Red and Norwich Crag. The Red and Norwich Crag may be separately mapped as physical units in southern East Anglia, but tracing these units northwards is problematic, as is correlating them to the global oxygen isotope record. Useful markers here are the Chillesford Clay and Easton Bavents Clay, which locally cap the succession in southern East Anglia: these are likely coeval, and mark the first severe cooling of the region, probably a little under two million years ago. The Crag succession in East Anglia has been affected by Quaternary regional tilting, while significant Quaternary fault activity has been suggested, but remains unproven.



**The Chillesford Clay at the type locality near Chillesford Church**

### **'Northamptonshire Stone'**

Section member Dr Diana Milne (better known to some of us as Dr Diana Sutherland) has been active for many years investigating the geology of the building stones of Northamptonshire, and at last she has gathered together her findings into a book entitled 'Northamptonshire Stone', which will be

published soon and may already be out by the time this Charnia is distributed. The book is priced at £12.95, and the publisher has offered to send copies post-free, but Diana says that she can obtain copies to sell at £10 to Section C members. This sounds like a good offer, and if you are interested in getting a copy at that price, please give your names to Secretary Joanne Norris either by telephone (0116 2833127, after 6.00) or e-mail ([joanne.norris@ntu.ac.uk](mailto:joanne.norris@ntu.ac.uk)), and the list will be passed on to Diana.

Also, don't forget that Diana is giving us a talk on the subject of 'Northamptonshire above ground' on January 28<sup>th</sup>, when there will be copies of the book available.

### **'The Geology of the East Midlands'**

Just a quick note to announce the publication of the long awaited field guide to the East Midlands, published by the East Midlands Geological Society and the Geologists' Association. This soft-covered 128pp book, number 63 in the series of Geologists' Association guides, can be obtained directly from the EMGS at a cost of £8 for non-members. Check their website for details or contact the Secretary John Wolff on 01623 794458, e-mail [sec@emgs.org.uk](mailto:sec@emgs.org.uk)

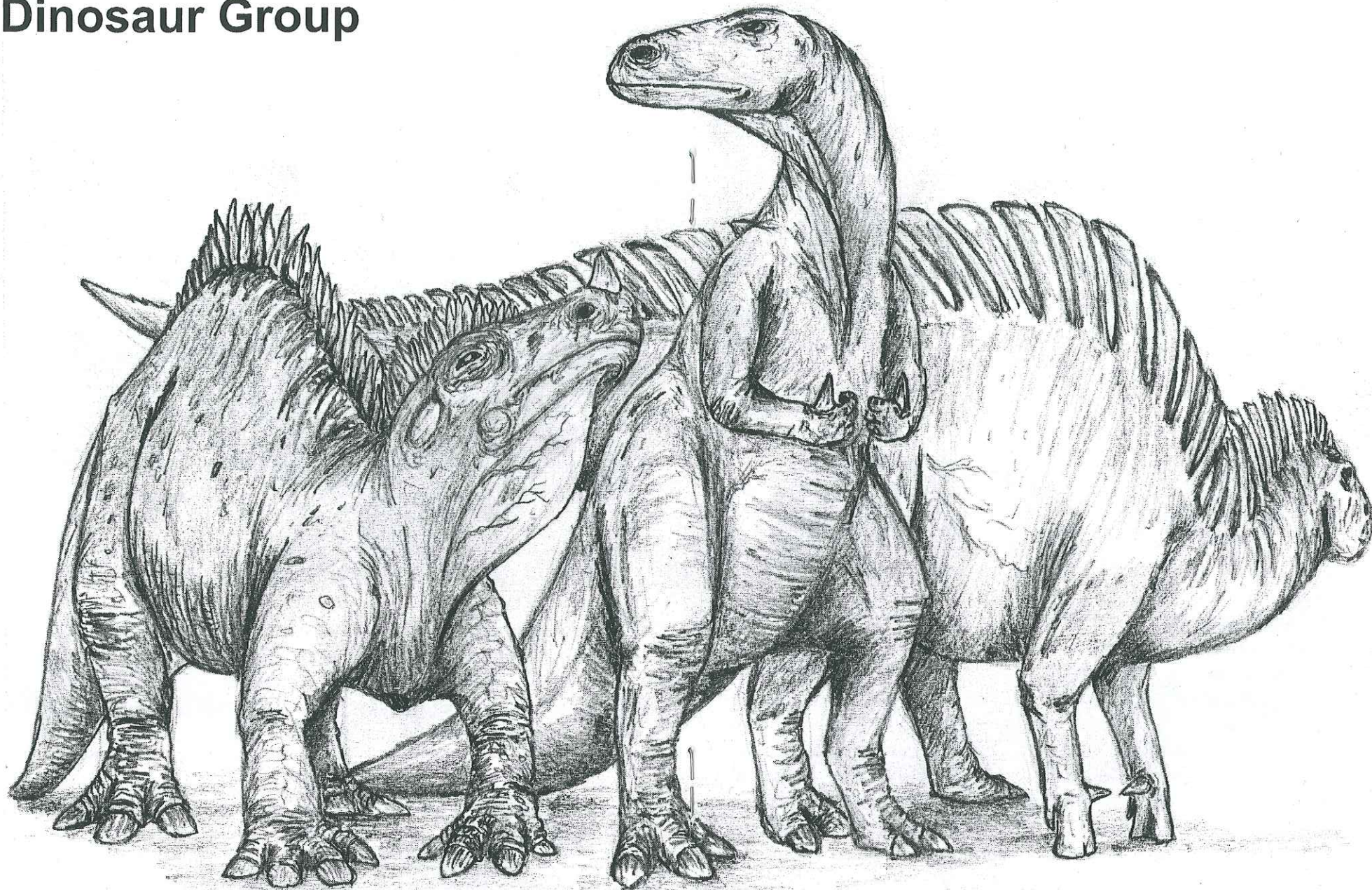
It is intended to review the book in the next issue of Charnia, but it looks an excellent buy and a most useful addition to the geological literature on our area.

### **New Evening Class in Geology – aimed at you!**

You may be interested to hear that a new evening course is to be offered in the Geology Department at Leicester University, aimed particularly at members of the general public with an interest in Geology. Provisionally entitled 'The Essentials of Geology', it will run on Monday nights from 7.30 - 9.30 from mid-January 2004 for 10 weeks, and will cover the basics of our science in a 'user-friendly' way. Each evening will consist of a themed lecture followed by a practical, using the facilities and collections used for our normal undergraduate teaching programme. Lecturers will be drawn from the Department's academic staff. In other words, it will be an excellent opportunity to enjoy the same materials and high standard of teaching offered to students, in the same environment. However, there will not be the same pressure of exams/deadlines, this is definitely a course to enjoy! We also hope to offer two one day field trips in March or April. The level will be



# Dinosaur Group



by David Baines



pitched towards the informed beginner, but that's not to say that it shouldn't appeal to the non-geological professional or the more advanced worker. In other words, all are welcome.

I am creating and co-ordinating the course, and will act as a central point of contact for enrolled students. The course will probably be run under the aegis of the University's Institute of Lifelong Learning. A fee has yet to be fixed, but you can get some idea of the cost of courses by reference to the Institute's brochure. We hope that in the autumn following the evening class, another more formalised course leading to the award of Certificate of Geology will be inaugurated. Students who have undertaken the evening course will be able to earn credits from that course which can be carried forward onto the Certificate course should they wish to continue their studies to obtain that qualification.

I would like to know how many Section C members are interested in this evening class, so if you are, drop me an e-mail at [as48@le.ac.uk](mailto:as48@le.ac.uk) or give me a call on 0116 2523646.

Andrew Swift

### Field trip reports, Summer 2003

#### Sedgwick Museum Saturday May 17<sup>th</sup>

The annual Section C museum visit was inaugurated in 1997 with a visit to the Sedgwick Museum in Cambridge, and here we were, six years later, back at the same place. In the intervening years we have visited all the major centres with geological collections open to the public, and the circle was now complete. But no apologies were necessary for coming back to the Sedgwick. Only recently the venerable old museum had seen the commission of one revamped gallery, and plans are afoot for converting the other, so there were new things to see. And for sheer quality and quantity of material, the museum takes some beating. Thankfully, the new gallery has maintained the Sedgwick's policy of showing large numbers of specimens in traditional cases. Flashing lights, walk-through dioramas and 'virtual experiences' have mercifully made few inroads (n.b. Chairman's personal prejudices!), although I have no doubt these type of exhibits have their place elsewhere. We got a good turn out of members, 17 in all, and it was pleasing to see some new faces. As in 1997, curator Mike Dorling hosted our party. An added bonus of visiting the Sedgwick is that after a tour of the museum, one can

explore the myriad delights of Cambridge, as did many of the party. A quartet of photographs illustrating the visit appeared in the last Charnia.

Andrew Swift

#### The Weekend Excursion – the Plio-Pleistocene 'Crag' deposits of Suffolk, June 20<sup>th</sup> – 22<sup>nd</sup>

Our annual weekend excursion was a resounding success and was supported by our best-ever turnout for a weekend trip, 30 members, partners and children, plus a number of locals who joined us with the local leader, Roger Dixon. Our other leader was Section member Peter Long, and we owed a debt to both leaders for their skilful and knowledgeable guidance. We were based in the picturesque market town of Woodbridge, a remarkable survival of the sort of town once common in England. I had the feeling it was 1953, not 2003, while we were there. This feeling was reinforced by our hotel, the old coaching inn, The Bull, squarely positioned in the main square of the town where it has stood for at least 300 years I guessed. The stairs creaked and there seemed to be mysterious nooks and crannies everywhere. But enough about the town and hotel, what about our weekend?



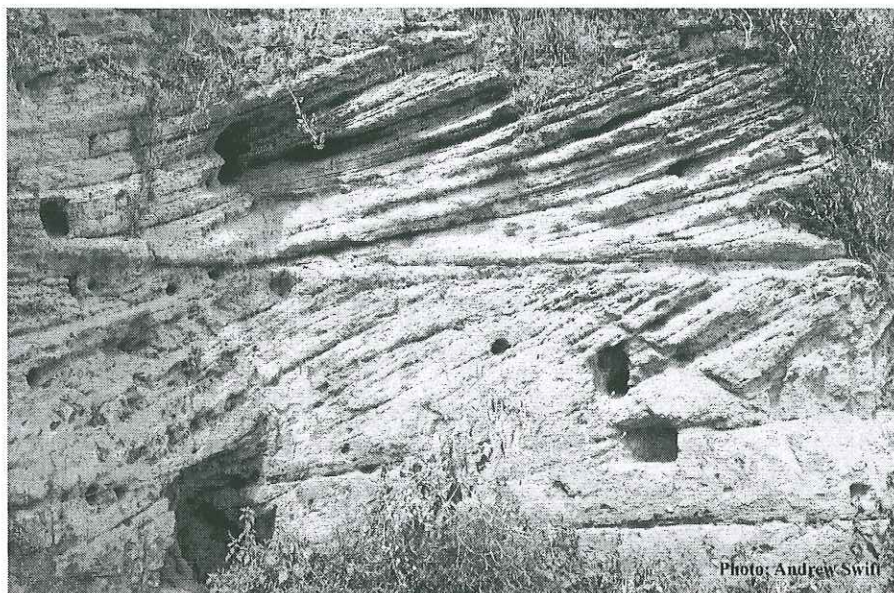
Photo: Andrew Swift

The group at Broom Pit near Orford

Almost everyone arrived on Friday 20<sup>th</sup>, and the Secretary and myself positioned ourselves in the bar to 'meet and greet' people as they arrived, and



to distribute the latest *Charnia* and the circular for the Nottingham field trip, which we'd brought with us. Later, at 8.00, we gathered in a room in the hotel where Peter and Roger introduced us to the itinerary for the weekend. After that most of us took a leisurely stroll around Woodbridge, examining the internal architecture of the licenced premises. Saturday dawned bright and warm and we enjoyed a classic English summer's day, which began with a drive to Melton old church, which was out of commission as a place of worship, but still maintained by local historians. Our visit wasn't to see actual geology, but to view the graves (or rather be near them, as they were now covered over for safety reasons and beneath a luxuriant growth of meadow grass) of the Woods', father and son, who were the first describers of much of the Crag fauna and did the foundation work on the stratigraphy of the Crag and glacial deposits. There were plaques to the two in the church, which had been specially opened for us (see front cover).



**Large-scale cross-sets at Richmond Farm Pit, Orford**

Broom Pit near Orford was our next port of call, opened in the lower levels of the Coralline Crag of Late Pliocene age, and newly re-excavated. These were about the oldest deposits we saw, and like most of the localities we visited, the beds were full of fossils, sadly mostly comminuted as was usually the case in the high-energy sand waves and bars which characterise much of the succession.

From Broom we motored down into Orford to view the spectacular cross-bedding in the Sudbourne Member of the Coralline Crag Formation at Richmond Farm pit, which took us to lunchtime. As we were near the picturesque harbour at Orford, we made our way there to eat our sandwiches and watch the maritime activities and seagulls in lovely sunshine. Next stop was Chillesford, a charming little village with an interesting church, partly built of local stone. We examined the church inside and out and then walked the short distance to Chillesford Farm pit to view deposits generally considered to be equivalent to the upper part of the Red Crag and the Norwich Crag. Once again, there were lots of fossils including some big *Mya* bivalves, but getting a whole one was not easy. The botany of the quarry was interesting too, and I had to admit that I left the site rather reluctantly. Our final stop on Saturday was at Neutral Farm pit near Butley, a classic Red Crag site with an exceptional bivalve fauna, long renowned. Again, certain folks could easily have spent more time at that splendid locality.



**Happy Section members at the dinner on Saturday night**

The evening promised to be a bit special, as we had booked a 'society meal' in the Bull, to start at 8.00. This was a new initiative for the Section, usually the Saturday night of the weekend trip saw the party dispersing in little groups. The meal proved to be a great social success, and I felt a little speech was appropriate in which I proposed that, as we have no other formal meal in the Section's programme, we should make this an annual event on the weekend excursion.



The weather on Sunday was not quite so kind initially, with some rain, but that eventually cleared. We had just 2 localities planned for the day, the first of which was Bawdsey Cliff, which used to be the finest section of Red Crag to be seen anywhere. However, the building of a protective wall had stopped erosion of fresh faces, and the whole section was deteriorating. Nevertheless, there was still much excellent geology (and 'artificial' geology – the man-made 'pulhamite' used in ornamental walling) to be seen, and there was an opportunity to see the unconformably underlying London Clay and its phosphate nodule bed. We also combed the foreshore for Miocene pebbles, the only remaining evidence of rocks from that system, the outcrop having been eroded away. Some bits of whale bone were also found.



**Fossil search at Vale Farm Quarry, Sunday 22<sup>nd</sup> June**

After Bawdsey we drove off to our last stop, Vale Farm Quarry near the village of Sutton, opened in the Red Crag. This site was approached by a long sandy track, which claimed at least one victim, sunk up to the wheels arches. But that's what a large party is for – extricating stranded vehicles! The quarry was a suitable endpiece for an excellent weekend, and featured amongst other impressive sedimentological structures, a perfect channel. If participants had not yet found any good fossils, there was no excuse here.

So at last we all dispersed, some heading for Sutton Hoo and its archaeology, others for home, after one of our best weekends ever.

Andrew Swift

### **The Triassic Rocks of Nottingham, Sunday 13<sup>th</sup> July 2003**

The day turned out to be very hot indeed and the 14 participants who took part in this trip took advantage of shade whenever it was available. Keith Ambrose of the British Geological Survey was our leader for the day. Keith had very kindly borrowed a mini-bus from the B.G.S. so that we did not have to worry about following each other in our cars around Nottingham. When all had arrived at the meeting place on the Nottingham University campus (and the car park did take some finding) the party set off down the hill to the first locality.

On the northern bank of the lake in the university grounds there is an exposure of about 7 m. of the Nottingham Castle Sandstone. This formation was previously called the "Bunter Pebble Beds" as it contains pebbles of quartzite eroded from the Variscan mountains. The sandstone represented the deposits of a major river with many low sand bars, which were constantly prograding downstream with the current. The sand migration shows up as large-scale cross bedding, which was very nicely shown at this exposure.

A short drive away across the campus near the computing centre the party examined a 6 m. section of the Lenton Sandstone Formation. The stone is a deep red colour with mottling of yellowy brown patches. The red colour is caused by iron oxide, which, with a small amount of clay, weakly holds the sand grains together. The group examined the crumbly sandstone and found it to be silky when rubbed between the fingers.

Leaving the university campus we headed for Bramcote to see the famous Hemlock Stone. Unfortunately we had picked a weekend when road works necessitated a long detour. When we did arrive we had the site to ourselves, which was helpful from the photographic point of view, because it was our intention to duplicate as closely as possible an 1883 photograph held in the New Walk Museum's collections showing the LLPS visiting the site in the heyday of Victoria. As we ascended the hill, a few significant differences were apparent between the 'then and now'. One was railings to keep out the vandals and another was the sad proliferation of graffiti (although a close study of the 1883 photo, featured on the Section's website, reveals that graffiti engravers were busy even in Victorian times). Finally, the base of the Stone had been buried beneath a quantity of soil, presumably to protect it



from collapse. Some discussion took place as to the origins of this isolated stack of barite-cemented sandstone. The consensus of the group was that it had been left during quarrying long ago. Our Victorian antecedents had a few theories too, and believed that it might have been an ancient sea stack, but that seems implausible. Weathering had revealed nicely developed cross-bedding in the sandstone. Many photographs were taken of the group in front of the Stone in a position as close to the original photograph as the railings would allow, and one is shown here, taken by Joe Sowerby. That and others should eventually find their way onto the website alongside the original 1883 shot.

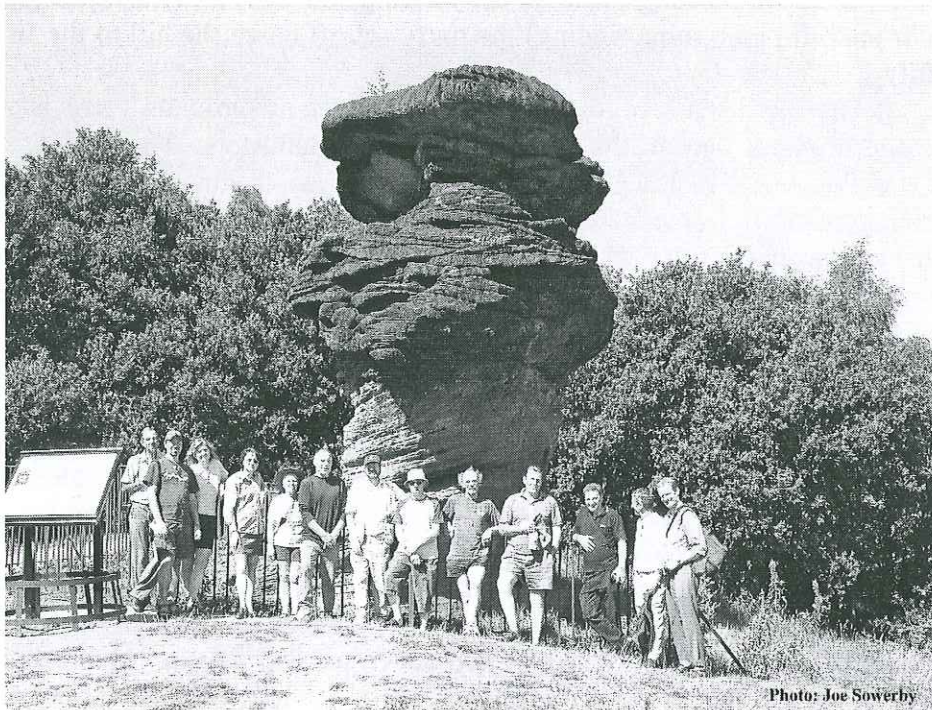


Photo: Joe Sowerby

### LLPS Geology Section, 2003 style, at the Hemlock Stone

The last of the exposures we visited was on the other side of Nottingham, at Colwick Park. After walking through pleasant parkland we came to an old quarry face overgrown with trees. The face exposes 7 m. of the upper part of the Sneinton Formation and 2 m. of the overlying Radcliffe Formation. The fine-grained sandstone beds of the Sneinton Formation are 2 - 5 cm thick and many betray their shallow-water origin with ripple marks and shrinkage cracks.

We ended the day by thanking Keith for his informative leadership and for giving the group such a good insight into the area during Triassic times.

Dennis Gamble

### Bradley Fen Quarry, Whittlesey, Sunday August 17<sup>th</sup> 2003

The extraction of Oxford Clay for brick-making in the Peterborough area has been in decline for many years, so it was a very pleasant surprise to hear a couple of years or so ago that Hanson Brick were opening a new pit in the area, at Bradley Fen near the old King's Dyke workings in Whittlesey. Of course, since that opening there has been a queue of local and more widely based geologists and geological societies waiting to get in. Our turn came on August 17<sup>th</sup>, on a fine warm day. We had hoped to be led by local expert and Section member Alan Dawn, but the hospital decided that it was to be that week that Alan had his hip operation, so Stamford and District Geological Society Chairman Cliff Nicklin kindly stepped in at the eleventh hour. I'm pleased to report that Alan is recovering well.



Photo: Andrew Swift

### The party in Bradley Fen Quarry, Whittlesey 17.8.03

Whittlesey was very much in the news anyway following the discovery of substantial remains of a giant *Leedsichthys* fish in the nearby Star Pit (see Kay Hawkins's article in the Winter 2002/3 edition of *Charnia*), a find so



important that it was made the subject of one of the programmes in the recent 'Big Monster Dig' series on Channel 4. Thus it was that the 19 or so participants all trooped in to Bradley Fen determined to find a *Leedsichthys* of their own, or at least something exciting in the vertebrate line.

One of the more attractive aspects of the new pit is that the workings have been extended down to Bed 10 of the Oxford Clay Formation, the source of large fossiliferous nodules and a multitude of other fossils. Sure enough we found more fossils than you could shake a stick at in that bed, but as always they were flattened and friable, so little use for keeping. Sadly, the ichthyosaurs, etc were mostly in hiding for our visit, although modesty doesn't forbid me mentioning that I managed to find a very presentable vertebrae of a marine reptile complete with fused ribs. Helen Jones also turned up a nicely preserved rib, and some decent invertebrate fossils were also found, so everyone went home happy.

Andrew Swift



Inside Bradley Fen Quarry

### Tilton and Holwell, Sunday September 14<sup>th</sup> 2003

In keeping with our record of excellent weather for almost all of our 2003 excursion programme, September 14<sup>th</sup> also proved to be blessed with superb weather. We were also fortunate that this excursion took us to the prettier

parts of our county of Leicestershire, and that we had the services of Roy Clements as leader, someone who knows the rocks of Tilton and Holwell probably as well as anyone. The party of 18 started the day in the long abandoned railway cutting near Tilton on the Hill, which is owned and managed by the Leicestershire and Rutland Trust for Nature Conservation for its excellent exposures of the middle and higher levels of the Lower Jurassic Lias Group (Dyrham, Marlstone Rock and Whitby Mudstone formations). The cutting is managed to show four separate faces showing the various parts of the sequence, starting with the oldest at the western end and progressing with the prevailing dip to the youngest at the eastern end. Although nature seemed to be taking a particular interest in reclaiming this cutting as her own, there was still much of interest to be seen, and thoughts were stimulated to make us wonder how the conditions fluctuated so markedly to produce such a variety of facies and breaks in deposition, and, indeed, to wonder how on earth ironstones were formed?



Enjoying the geology, and weather, in Brown's Hill Quarry, Holwell

Much the same thoughts stayed with us for the visit to the Holwell quarries. But first we had to drive through the best of east Leicestershire (so little appreciated it's always seemed to me, but especially attractive on such a wonderful day) and through Melton Mowbray to the area of hillocks (caused



by ironstone extraction) near the Holwell quarries. Here we took an al fresco lunch. So warm was the sun and so pleasant the surroundings that it was quite an effort to get ourselves into the first stop, Brown's Hill Quarry. But it was well worth the effort, for, despite duplicating to a certain extent what we'd seen at Tilton, there were sufficient differences and new features to engage everyone. The 'belemnite pavement' on top of the Marlstone Rock Formation excited much interest, also the 'fish bed' which lay immediately above it and the innumerable small fossils weathered out of the Whitby Mudstone on the bank at the top of the quarry. After Brown's Hill we made the short walk to North Quarry, where the Whitby Mudstone Formation was exposed in a long face. Despite becoming overgrown, enough could be seen to discern the nature of the rocks, and their extremely fossiliferous character.

And so, with the bright sun still shining, we thanked our leader for his thorough guidance, and made our way back to our various homes.

Andrew Swift

### **Remanié ....**

If you feel disposed to calculating the energy unleashed by Asteroid 2003 QQ47 (should it collide with Earth) some data to compare, or rather contrast, might be useful: the two nuclear devices detonated in Japan in 1945 each released the energy equivalent to 20 000 tons of TNT (20kt). On the other hand, the Tunguska event was in the order of 10 megatons.

I am informed at the time of writing by a very reliable source that the timing of broadcasts of 'The Big Monster Dig' is about to change. The reason for this rescheduling is that 'East Enders' is biting into the viewing figures - or is it the other way round?

In the last issue of 'Charnia' I mentioned that plans were under way in Africa to investigate climatic data held in Lake sediments. Work is now imminent at the Lake Malawi (= Lake Nyassa) site, which hopefully will give an insight into human evolution, particularly the role played by forest and savannah at critical times. Also, it is hoped that detailed information will be obtained about the role of the tropics as a driver for the Earth's 'climate engine'. Other lake sediment boring projects have gone back further in time (notably Lake Baikal) though low sedimentation rates have yielded sparse data. This will be of specific interest to the readers of 'Charnia' who attended this year's Saturday School and the original informative press release for the Lake Malawi project can be found at this website: [www.nsf.gov/od/lpa/news/02/pr0210.htm](http://www.nsf.gov/od/lpa/news/02/pr0210.htm)

GS



**Leicester Literary and Philosophical Society  
Geology Section (C)  
Officers and Committee 2003-2004**

**Life President:** Bob King,  
The Oak,  
Longdon.  
TEWKESBURY  
Glos GL20 5SE

**Life Vice-President:** Trevor Ford OBE,  
21 Elizabeth Drive,  
Oadby.  
LEICESTER LE2 4RD  
0116 2715265

**Chairman:** Andrew Swift,  
208 Milligan Road,  
Aylestone.  
LEICESTER LE2 8FD  
0116 2523646 or 0116 2833127  
e-mail: [as48@le.ac.uk](mailto:as48@le.ac.uk)

**Vice-Chairman:** Mark Evans,  
Leicester Museum & Art Gallery,  
New Walk,  
LEICESTER LE1 6TD  
0116 2254904  
e-mail: [evanm003@leicester.gov.uk](mailto:evanm003@leicester.gov.uk)

**Secretary and Acting Treasurer:** Joanne E. Norris,  
208 Milligan Road,  
Aylestone.  
LEICESTER LE2 8FD  
0116 2833127 (after 6pm)  
e-mail: [joanne.norris@ntu.ac.uk](mailto:joanne.norris@ntu.ac.uk)

**Field Secretary:** Dennis Gamble,  
43 Somerset Avenue,  
LEICESTER  
LE4 0JY  
0794 7725361

**'Charnia' Editor:** Graham Stocks,  
63 Barrow Road,  
QUORN  
Leics LE12 8DH  
01509 415186  
e-mail: [graham.stocks@lineone.net](mailto:graham.stocks@lineone.net)

**Publicity Officer:** Paul Monk,  
2 Rennes Close,  
ASHBY-DE-LA-ZOUCH  
Leics LE65 2YD  
01530 411563  
e-mail: [paul.monk@virgin.net](mailto:paul.monk@virgin.net)

**Student Representative:** Kay Hawkins,  
Department of Geology,  
University of Leicester,  
University Road,  
LEICESTER LE1 7RH  
e-mail: [kh62@le.ac.uk](mailto:kh62@le.ac.uk)

**Committee:** Mark Purnell (0116 2523645, e-mail: [map2@le.ac.uk](mailto:map2@le.ac.uk)), Andy Saunders (0116 2523923, e-mail: [ads@le.ac.uk](mailto:ads@le.ac.uk)), Roy Clements (0116 2523800, e-mail: [rgc@le.ac.uk](mailto:rgc@le.ac.uk)) (all Department of Geology, University of Leicester, University Road, LEICESTER LE1 7RH), and Doug Lazenbury (39 Station Road, Countesthorpe, Leicester LE8 5TA, 0116 2776407).

**Co-opted:** Margaret East,  
36 Brambling Way,  
Oadby  
LEICESTER LE2 5PA  
0116 2716252

Dennis McVey,  
130 Carisbrooke Road,  
Knighton  
LEICESTER  
LE2 3P