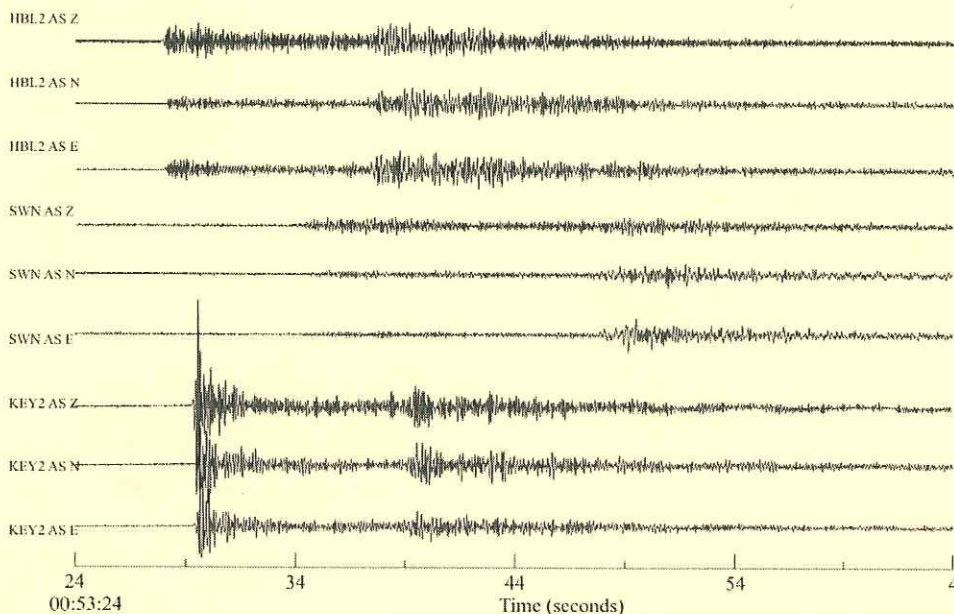


# CHARNIA

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(GEOLOGY)

**AUTUMN 2002 EDITION**

## EDITORIAL

You may recall from the Summer 2002 Edition of 'Charnia' that I mentioned a long-running saga in my local newspaper concerning Creationists vs. Evolutionists. Well, its *still* running in the letters pages and neither side is prevailing. It's all a bit daft and when the Milky Way and Andromeda galaxies finally wheel into each other at some point in the future none of it will matter one jot. Perhaps the futility of the 'arguments' presented is best summed-up in this little ditty:

The cheese mites asked how the cheese got there,  
And warmly debated the matter;  
The orthodox said it came from the air,  
And the heretics said it came from the platter.

There is, however, a deep need in many of us to know and understand how and where we came from. Perhaps it is for this reason that many of us find matters palaeontological of the greatest geological interest. Human palaeontology is certainly interesting. Earlier this summer *Sahelanthropus tchadensis* made his/her appearance. This hominid fossil is between six and seven million years old, making it our oldest known ancestor. It marks the time at which humans and apes diverged. Annoyingly, there is a four million year gap between *Sahelanthropus* and the next 'human' appearance. The fossil has chimpanzee-like skull features combined with human facial characteristics. No doubt readers of 'Charnia' will learn a lot more of this at the 2003 Saturday School.

Palaeo-molecules also featured in the previous edition of 'Charnia'. A biochemical difference between humans and chimpanzees is that the former do not have N-glycolylneuraminic acid. The question arose as to when this mutation occurred and a world-wide request for samples of ancient hominid fossils in the shape of tiny amounts of drilled material went out. This request produced no responses at all and it was only when inexpensive fossil material was purchased at the World's largest annual fossil and gem show in Tucson in 1999 that work could begin. The results were published in the first week of September this year and results indicate that the mutation in humans took place between 2.5 and 3 million years ago. This is well after humans became fully bipedal and the mutation probably marks the development of a truly human brain.

The subject of fossil and gem fairs raises ethical problems. If you discover a fossil, who really owns it, even though you may have spent months developing



and preparing the specimen? Such a dilemma arose recently in Dorset when a Mr. Sole, who makes a living buying and selling fossils, discovered a 3.5 metre-long *Scelidosaurus* on National Trust land which is also part of the World Heritage coastline. Under a local agreement, between Dorset County Council, The National Trust and English Nature, anyone finding fossil remains exposed by natural erosional processes may sell the specimen after a period of six months, during which time the remains are to be made available for research. This agreement effectively consigns valuable specimens (and I don't mean valuable in a monetary sense) to an open market. Examples of such fossils adorning plush business offices in Japan and even a case where an ichthyosaur has been used for decoration at the bottom of a swimming pool, have been cited recently. Mr. Sole's *Scelidosaurus* is one of only eight discovered world-wide - and all coming from the 'Jurassic Coast' in Dorset. I wonder where 'his' specimen will finally end up ...

How would an amateur collector know if a fossil was important or otherwise? The answer is that all fossil discoveries should be reported, though I don't think museum staff would take kindly to barrowloads of Gryphaeas turning up on their doorsteps. In turn, what do you do with the specimens you may have brought home from field trips in the past? Has it always been possible to record the exact horizon within a stratum and thus record the provenance as scientifically as possible for posterity? I haven't and scientifically speaking quite a bit of my fossil collection is worth only hardcore value when I eventually shuffle off, unless specimens are donated to a school. I could tell a story about cleaning the skull bones of a mammoth and throwing away the 'dirt' but I don't want to unduly upset readers. The 'dirt' contained adult flies, pupae and larvae several tens of thousands of years old... I have since re-examined the mammoth material and couldn't find any traces of insects. I suspect that this crime destroyed valuable ancient DNA. This is the palaeontological equivalent of the 'potsherd scrubbers' you see at archaeological digs. The scrubbers, busy with their little brushes and soapy water, remove all biochemical traces of what a pot once held. Nice pot, though not much to tell about it once cleaned and glued together and placed in its glass museum case.

It's not all bad news: last Summer coastguards at Scarborough rescued a set of dinosaur footprints from irresponsible hackers. They wrapped up the piece of rock, weighing in at around 150kg, in sleeping bags and stretchered the specimen over a distance of 3km from the beach to the road above a small bay to the north of Scarborough. Their heroic deed has preserved part of the country's natural heritage and should you wish to see the footprints they are in the Wood End Natural History Museum in Scarborough. In this instance the

museum did not have to find funds to purchase the specimen. More recently, another set of dinosaur footprints, possibly *Megalosaurus*, have been discovered on Skye. The prints are to remain in situ and casts have been taken by the Hunterian Museum in Glasgow, the National Museum of Scotland in Edinburgh and the Staffin Museum on Skye. The 15-metre stretch of foot prints will be left to the mercy of tides and Winter storms - unless someone comes along with some impressive power tools in the middle of the night ...

Unfortunately, I wasn't able to attend any of the British Association meetings at Leicester University this Summer. I particularly would have liked to have attended the Charnwood Forest visit with Roger Mason. Instead, I contented myself by reading an account of 'The Visit to Charnwood Forest - Whitsuntide 1928' by the Geologists' Association. A friend has just given me a shelf-full of GA Proceedings from the 1920s, which didn't go down too well with the distaff side, which is probably why he had to get rid of them and hence the reason for the donation! The visit by the GA took place from May 25<sup>th</sup>. to May 29<sup>th</sup>. 1928. The difficulties in interpreting Bardon are reflected by a three-line coverage in a lengthy six-page report, which reads: 'the party made a careful inspection of the quarries at Bardon Hill. The varied types made it easy to understand the difficulties which had been experienced by observers of the first rank who have investigated these rocks with such different results.' Interestingly, though the party visited what are now known to be Charnian fossil locations, nothing was recognised at the time. That privilege fell to a Leicester schoolboy in 1957.

To finish, back to the cheese-mites. How did life on Earth begin? Recent research indicates that there was probably no single Darwinian common ancestor and thus no single common point of origin. That is, the 'primordial soup' contained a multitude of self-replicating chemical pathways exhibiting negative entropy, from which three distinct life-types evolved; eukaryotes, bacteria and the archaea. Significantly, NASA has made its 'Europa Orbiter' a flagship mission. The orbiter will seek signs of life in the oceans of this moon of Jupiter, which will hopefully give clues about our own origins. For any evidence, we'll have to wait until 2010 for the first data streams.

GS

### **Affiliating to the Geologists' Association**

Some of you are already aware that we are now affiliated to the Geologists' Association, but for others this will be news. All may wonder about the background and reasons for this move, so I'll explain. The only real motive for the decision to affiliate was the need to get insurance we could afford. You may



remember from the last Charnia that our old policy was up for renewal, but in any case was unsatisfactory, as it was shared with the Natural History Section and may well not have truly reflected our needs. The key element in any insurance for a group like ours is cover for entering quarries and other dangerous areas, and we found it impossible to find a company which was willing to underwrite this requirement at a reasonable cost. However, the Geologists' Association, with the power of a large amount of potential business behind it, was able several years ago to negotiate a block Public Liability policy for its affiliated groups at a very reasonable rate. It became clear that our only chance of getting insurance we could afford was to affiliate to the Association on order to obtain access to this cover. This year's premium was a very fair £58, and is in addition to the affiliation fee of £22, which made a total of £80 – less than we were paying for our old policy. In addition, the GA are currently negotiating a personal accident policy which also includes member to member cover, and I have indicated to the GA that we would be keen to take advantage of this should it come to fruition. Thus, after all the dust has settled, we will have better cover than before, and at reasonable cost.

I must admit that some of us, including myself, were a little worried about 'surrendering our sovereignty', but in fact the GA makes no demands on its affiliates, and in practice the affiliation will have no effect on our day-to-day running. Conversely, we may gain additional benefits from the affiliation, such as access to grants and advice. There is, of course, nothing to stop us withdrawing from the affiliation at any time should we wish.

Andrew Swift

### **Programme of indoor meetings 2002/2003**

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

#### **Wednesday October 9th**

Derek Pullan (Department of Physics & Astronomy, University of Leicester) - 'In-situ analysis of the Martian surface with Beagle 2'

#### **Wednesday October 23rd**

Professor David Keen (Centre for Quaternary Science, School of Natural & Environmental Science, University of Coventry) – 'The Quaternary of the Midlands: how many glaciations and where did the rivers go? Some revisions of traditional views'

#### **Wednesday November 6th**

Dr Bill Murphy (School of Earth Sciences, University of Leeds) - 'Earthquake-triggered landslides'

#### **Wednesday November 20th**

Dr M. Paul Smith (Unit of Earth Sciences, University of Birmingham) – 'Microvertebrates and macroevolution - unravelling the origin and early evolution of vertebrates'

#### **Wednesday December 4th**

Professor Mike A. Lovell (Department of Geology, University of Leicester) - Title TBA

#### **Wednesday December 18th**

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

### **2003**

#### **Wednesday January 15th**

Dr Peter E. Long (ex-Department of Biology, University of Leicester) - 'When did the winkles come? Pre-Ice Age life in and around the southern North Sea'

#### **Wednesday January 29th**

Dr Rob A. Ixer (Unit of Earth Sciences, University of Birmingham) - 'Bronze Age mining under the (ore) microscope'

#### **Wednesday February 12th**

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

#### **Wednesday February 26th**

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

#### **Saturday March 1st (whole day)**

Saturday School, **Vaughan College**. 9.30 am - 5.00 pm. 'Climate and human evolution'. Seven leading experts in hominid studies including Professor Chris Stringer and Dr Rob Foley will talk on the role of climate in determining the success or failure of prehistoric human lineages.

#### **Wednesday March 12th**



Dr Alan Wright (Ashbourne, Derbyshire) – ‘Problems in dating the English and Welsh Late Precambrian’

**Wednesday March 26th**

AGM and Chairman's address - Andrew Swift (Department of Geology, Leicester University) - Title TBA

### Winter Programme talk abstracts

**Abstract of talk scheduled for Wednesday October 9<sup>th</sup> 2002**

*In-situ* analysis of the Martian surface with Beagle 2

**Derek Pullan\***

University of Leicester, UK, [dpu@star.le.ac.uk](mailto:dpu@star.le.ac.uk)

*\*On behalf of the Beagle 2 Consortium*

**Beagle 2 is the lander component of the Mars Express mission that will arrive at Mars in December 2003. Once safely deployed on the surface of Mars, Beagle 2 will, within it's planned lifetime of six months, conduct an intensive and exhaustive programme of surface activities.**

The principal objective of the mission is the detection of extinct and/or extant life, or at least establishing if the conditions at the landing site were ever suitable for life to have evolved in the planet's history. To achieve this goal, a systematic set of experiments using a complementary suite of instruments will perform *in-situ* geochemical, mineralogical and petrological analysis of selected rocks and soils. Studies of the martian environment will also be conducted via chemical analysis of the atmosphere, local geomorphological assessment of the landing site, measurement of the surface dust and radiation environment and meteorological measurements/monitoring including transient events such as “dust devils”. Further studies, unique to Beagle 2, include the analysis of the subsurface regime using a ground penetration tool, and a first attempt at crude *in-situ* isotopic dating of rocks on another planet.

The complete instrument package weighs in at ~9kg and requires <40watts of power which will be delivered by the lander support systems. With a probe mass limit of 68kg, imposed by mission constraints, and a landed mass of about 32kg, Beagle 2 aims to fly the highest ratio of payload to support systems in any planned mission to Mars. This is only achievable by adopting a completely

integrated approach within the design, and employing minimal or zero redundancy.

Following an overview of Martian geology, the deployable payload of Beagle 2, dubbed the PAW, will be described in detail.

**Abstract of talk scheduled for Wednesday October 23<sup>rd</sup> 2002**

**The Quaternary of the Midlands: how many glaciations and where did the rivers go? Some revisions of traditional views**

**Professor David Keen**

**Centre for Quaternary Science, School of Natural & Environmental Science,  
University of Coventry**

The English Midlands have been in the forefront of research in the Quaternary since the early days of Geology in the 19<sup>th</sup> century. For much of the 20<sup>th</sup> century a model of glacial and fluvial sedimentation first proposed by Tomlinson in the 1920's and Shotton in the 1930's has been dominant as an explanation of events. Central to this concept was the identification of the Wolstonian Glaciation held to have occurred late in the Middle Pleistocene thus providing only a short time for ice advances and retreats and subsequent fluvial landscape modification.

Work from the late 1980's using the chronology of the Oxygen Isotope sequence from the deep oceans has re-assessed the age of the glaciation of the Midlands and applied a much longer timespan to the events recognised which allows correlation with world-wide climatic changes. The new framework also provides information on such topics as the first appearance of humans into the Midlands.

**Abstract of talk scheduled for Wednesday November 6<sup>th</sup> 2002**

**Earthquake-triggered landslides**

**Dr Bill Murphy**

**School of Earth Sciences,  
University of Leeds**

Seismically induced landslides are one of the most important secondary effects of strong earthquake shaking. The 20<sup>th</sup> century contained abundant evidence of the catastrophic nature of these events ranging



from the large loess flowslides in Gansu Province, China in 1920 to the huge landslides triggered by the 1999 Chi Chi earthquake in Taiwan. Sadly, at the beginning of the 21<sup>st</sup> century we are not significantly closer to identifying such potentially hazardous sites prior to failure. The proof of this statement came when a section of the hillslope at Las Colinas, San Salvador collapsed during the 13<sup>th</sup> January 2001 El Salvador earthquake, killing approximately 400 people in a new housing development. Areas under construction in San Salvador are often found at sites of high landslide hazard.

The aim of this presentation is to review the variety of mechanisms involved in the initiation and movement of landslides during earthquakes. I will also identify why we still find it difficult to predict such slope failures. New methods being used to identify earthquake-triggered landslide hazards will be reviewed, as will some new avenues of research into the initial stages of sliding which indicates the important role of slope morphology in evaluating potential risks.

#### **Abstract of talk scheduled for November 20<sup>th</sup> 2002**

##### **Microvertebrates and macroevolution – unravelling the origin and early history of the vertebrate clade**

**Paul Smith  
Lapworth Museum of Geology,  
University of Birmingham**

The study of Early Palaeozoic microvertebrate faunas has, in the last decade, had a major impact on the understanding of vertebrate palaeobiology. A review of pre-Silurian vertebrates carried out as recently as 1991 concluded that only five species could confidently be included in the group. Since then, a number of key discoveries have been made, many of them reliant on micropalaeontological methodologies. For example, the first armoured fish are now known to be present in the Late Cambrian, and the biodiversity of Ordovician vertebrates is far higher than previously suspected, even at high taxonomic levels. One particularly important change has been the increasing recognition that conodonts are vertebrates, which has both changed the temporal perspective of vertebrate phylogeny and increased the known generic and specific diversity by two orders of magnitude.

Together, these developments demonstrate the importance of integrating micropalaeontological and traditional, vertebrate macrofossil, datasets since

neither picture is complete in itself. The new discoveries have a significant part to play in elucidating the early evolution of vertebrates, in assessing the completeness of their fossil record, and in the determining biogeographic and large-scale ecological patterns and processes.

#### **Abstract of talk scheduled for Wednesday January 15<sup>th</sup> 2003**

##### **When did the winkles come? Pre-Ice Age life in and around the southern North Sea**

**Dr Peter E. Long  
Ex-Department of Biology,  
University of Leicester**

This largely biological look at the Pliocene and Early Pleistocene history of our familiar North Sea stems from a teenage fascination with the shelly 'Crags' of East Anglia, and some frustrations with the Cromer Forest Bed. Though barely a soil layer or 'muck on top of the rocks', to many geologists these deposits, the subject of the first Palaeontographical Society Monograph, demonstrate some fascinating changes between 5 million and 500,000 years ago in life in and around the North Sea. These include the fluctuating onset of climatic cooling, the shallowing of the waters of the Southern Bight, mass extinctions of some mollusc species, the immigration of our familiar seaside winkles and mussels from the north east Pacific and more fragmentary glimpses of the mix of present day and unfamiliar mammals and plant life around our shores – including arguably the arrival of man in these parts.

#### **Weekend excursion to Dorset May 17<sup>th</sup> – 19<sup>th</sup> 2002**

There cannot be a geological society in the country which doesn't at one time or another visit the classic area of the Dorset coast, or at least aspire to get there. The reasons for this are obvious enough – wonderful uninterrupted and accessible exposure of some of the most fossiliferous Mesozoic rocks in the country set in localities of often stunning coastal scenery. And what fossils! Not just your run-of-the-mill brachiopods, corals and the like (although there are more than enough excellent examples of these in private collections, museums and geology departments up and down the country). No, these are special fossils – huge marine reptiles, ammonites of all sizes up to the truly enormous and even a few dinosaurs which somehow got themselves into the sea to be fossilised. So, naturally, Section C have been there, a few years ago



under the leadership of Dr David Martill. But one visit is never enough, and this year Field Secretary Dennis Gamble was adamant that we would go to Lyme Regis. And so we did, over the weekend of May 17<sup>th</sup> – 19<sup>th</sup>, under the leadership this time of the Chairman.



**Homeward bound. Lyme Regis 18.5.02**

The party of 19 arrived gradually through the day and evening of Friday 17<sup>th</sup>, and was billeted in the Bay Hotel, which, appropriately, overlooked Lyme Bay. It was perfect for our needs, but quaintly, didn't have a car park, only a large lock-up garage about 7 minutes away. So it was necessary to park as close as we could on the prom and then unload bags, before taking our vehicles off to the garage. Once we were all gathered I gave an illustrated introduction in the large lounge to what we were to see over the weekend. The plan on Saturday 18<sup>th</sup> was to walk westwards along the foreshore to Pinhay Bay, about two miles distant, and then work our way back in a sensible up-sequence way from the Late Triassic Penarth Group rocks in the Bay through increasingly younger Jurassic rocks back to the Cobb. The sequence ended at ground level there somewhere in the Shales-with-beef, which was overlain by Black Ven Marls in the low cliffs. During our traverse we saw the full sequence of the Blue Lias. Grumbles about spending too much time looking at the splendid and complex Langport Member sequence in Pinhay Bay were, of course, quite unjustified.

Sadly, despite the best efforts of the more eagle-eyed amongst us, no marine reptiles or Jurassic dinosaurs were discovered, not even a vertebrae. But several

other lesser finds were made and some of the party joined in with the leader in trying to identify the various beds of the Blue Lias, the more prominent of which had rather strange and/or descriptive names like Specketty, Mongrel and Skulls. The reason for this is that the Blue Lias used to be actually quarried off the beach, and the old quarrymen needed to identify each bed to know where they were in the sequence. They chose names which suited the characteristics of the appearance of the bed using words which had everyday meaning.

It was originally planned that on arrival back in Lyme we should ascend to the cliffs behind the beach to study the processes of landslipping, which is so prominent in the cliffs all along the Dorset and east Devon coast, but the proximity of numerous ice cream outlets around the Cobb, coupled with understandable fatigue, meant that no enthusiasm for such a venture could be detected, and we called it a day. The evening featured the normal pursuits of geologists liberated from their everyday environment, although impromptu gate crashing of a local citizen's birthday party by certain members until the early hours was found not to be a good preparation for the Sunday to follow.

That Sunday dawned dark and gloomy, and the drab weather continued during our visit to the cliffs to either side of Eype Mouth, near West Bay. That, however, did nothing to dampen spirits and enthusiasm and after an introduction to what was to be seen, the eager group dispersed in search of further fossil booty, taking care of course, as instructed, to a) avoid falling to their doom from the cliffs and, b) try and understand the geology of the sequence as well as simply adding to their collections. At around 1 o' clock an end was called and it was with regret that we dispersed to our various destinations.

Andrew Swift

### **Excursion to Blockley, 23<sup>rd</sup> June 2002**

Our second trip of the year was to Northcot Brick Pit, near Blockley, Gloucestershire. This is a venue the Section has visited many times, but it never ceases to produce a good and interesting day out. The leaders on this occasion were Dr. Mike Howe of the British Geological Survey and Mr. Peter Blake of Rugby.

At 10.30 with all the forms signed, and everyone eager to get to the fossils, the party moved off through the works and on to a vantage point overlooking the pit. Here Mike distributed a handout. He then described the main points of the stratigraphy as we could see them from the top of the pit. The whole sequence is within the Ibex Zone of Lower Pliensbachian (Lower Jurassic) age, and although the beds appears homogeneous from top to bottom, Mike



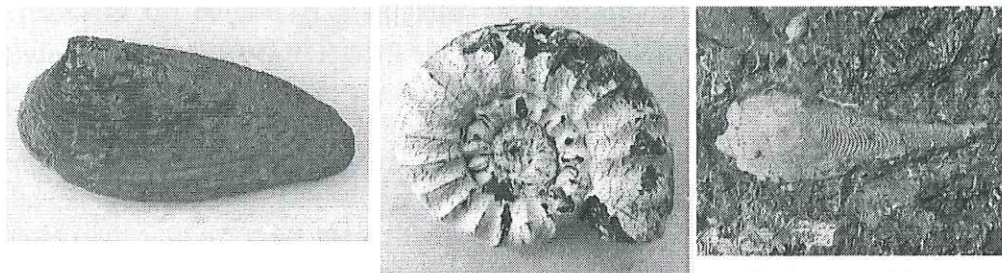
explained that following work by the BGS, the sequence could be divided into about five units. The very base of the pit is thought to rest on the Valdani Subzone.

Peter Blake gave a rundown of the main types of fossil fauna to be found and gave some pointers as to the best places to look for them. He then offered to help identify the fossils found by the members during the day. Then everyone moved off to the four corners of the pit to search out the best specimens. It was nice to see a few young people here for this meeting, hopefully they might have been inspired to become full members one day.

The weather remained pleasant all day and lots of fossils were found. Many were passed around and discussed during a break for lunch. Some very nice ammonites, mainly of the *Androgynoceras* / *Beaniceras* type, turned up in various places. The best ones came from a large heap of clay that had been tipped on the top edge of the pit, which meant their actual provenance in the sequence was unknown. Bivalves were abundant and one member at least was delighted with the variety found, including an excellent specimen of *Cercomya* sp. and many nice examples of *Cardinia attenuata*.

By the middle of the afternoon the group had filled their bags with enough items of interest, and so after thanking the two leaders for a wonderful day, and for all their help in arranging the visit, the party left for home.

#### Blockley Fossils



*Cardinia attenuata*

*Androgynoceras/Beaniceras*

*Cercomya* sp.

Dennis Gamble

#### The geology of the Welford Road Cemetery monumental masonry Evening visit, July 24<sup>th</sup> 2002

An odd choice for a Section C excursion? Well, no, not really, because there is a fine variety of rock types to be seen in the headstones and monumental masonry in this impressive example of a Victorian custom-built cemetery. A



Part of the large group which toured Welford Road Cemetery on July 24<sup>th</sup> 2002



The whole group for the Welford Road Cemetery walk on July 24<sup>th</sup> 2002





**North west Leicestershire during Coal Measures times. An impression by David Baines**





**Blue Lias Formation faces at Southam (Long Itchington) Quarry**



**And after spending some time in the quarry, what better than a refresher at the nearby Blue Lias pub! August 3<sup>rd</sup> 2002**

visit is very rewarding even without the geological interest, simply from the historical and natural history point of view. The cemetery is a veritable mini nature reserve and oasis of tranquility in the middle of Leicester. I can recommend it to anyone who works in the vicinity as the most peaceful and relaxing place to eat your lunchtime sandwiches, something I often do. Helen Boynton has made a study of the site and we were fortunate to secure her services as a guide on a dull but dry July evening. We also had the assistance of a leading member of the Friends of Welford Road Cemetery group who led us unerringly (almost) to the most interesting examples. The variety of rock types was quite amazing, and not all were the wisest choice for longevity. For example, there were a handful of headstones made of local Dane Hills Sandstone, a red Triassic 'desert' sandstone of great friability and low weather resistance. Already, the details on these stones had largely disappeared. On the other hand there were a great number of granites of various types, which seemed almost untouched by the elements. The lesson is clear – after you've gone, if you want your name to be seen and remembered by posterity for the longest possible time – use granite! In between these two extremes were other rock types, many available within 50 miles of Leicester, with intermediate weather resistance, like light-coloured Jurassic oolites and ragstones. Slate appeared to be pretty durable too to judge by the fine preservation of lettering detail, and, interestingly, there were a few examples of the relatively late use of Swithland Slate in the 1880's, and it was an exciting bonus to see the by now familiar trace fossils and bioturbation clearly present on some of these.

During the perambulation through the cemetery, many queries were raised and some new features noted, such as the ornamental use of casts of ammonites and other fossils around the grave of a man from Barrow on Soar. At last as twilight was falling the large group was obliged to disperse, but I got the distinct impression that several would be back for individual visits. Definitely one of Leicester's best kept secrets.

Andrew Swift

### **Excursion to Southam (Long Itchington) Quarry, August 3<sup>rd</sup> 2002**

The Section has visited Southam Quarry on occasions in the past, but such is the attraction of this superb locality that we had no difficulty in attracting a large group of members for a return visit on August 3<sup>rd</sup>. In fact, we had to regretfully turn a few late comers away in order to stay somewhere near a manageable number and not transgress the quota allowed by our friends at Rugby Cement. The quarry is an extremely important one because it exposes one of the very few, and certainly the best, inland section of the junction



between Triassic and Jurassic rocks in this country, as well as a contiguous and interesting sequence of Early Jurassic Hettangian - Sinemurian rocks. The latest Triassic is represented by the Langport Member of the Lilstock Formation ('White Lias') which here is about 2.5 m thick and contains a fascinating suite of sedimentological features such as mass flow deposits and probable storm generated shell coquinas. Pressure solution phenomena are ubiquitous. For a such a short sequence, it shows an amazing diversity of features. The topmost surface is an iron pan and demonstrates a period of subaerial exposure of unknown duration before marine deposits returned in the form of dark, poorly fossiliferous, laminated shales of the ?liasicus Zone of Hettangian age. The basal planorbis Zone of the Jurassic is apparently missing, but whether it was never laid down or was later removed, is unknown at present. Thereafter the sequence reflects a gradual change in basin environment from poor circulation with bottom anoxia represented by the Salford Shale Member of the Blue Lias Formation to a more oxygenated and shallower setting represented by limestones and grey shales of the Rugby Limestone Member. Organisms inceased in abundance as conditions in the basin ameliorated, and the sequence is much more fossiliferous in its higher parts. Some excellent blocks containing large nautiloids and pectinate bivalves were found, as well as an impressive group of associated vertebrate remains including parts of a jaw, found by Graham Stocks.

It hadn't been the nicest of weather in the week leading up to the trip, but we began in sunshine in the quarry and all hoped for an uninterrupted day. But it was not to be, and a couple of heavy showers meant we lost the last hour or so we were hoping for. Consolation was swift, however, in the form of an enjoyable sojourn at the inspirationally named Blue Lias pub nearby.

Andrew Swift

**Events at the British Association Festival of Science  
Sunday September 8<sup>th</sup> and Monday 9<sup>th</sup> 2002**

This was a historic two days for the Section, which are unlikely to be repeated. Of course, everyone knows the story of the 16 year old Leicester schoolboy Roger Mason and his incredible discovery of the first British Precambrian fossil, later named *Charnia*, in a quarry near Woodhouse Eaves in 1957. Well, you do, don't you? No? Alright then, one more time!

Roger and two friends decided to cycle from their Leicester homes one day in May 1957 to a quarry near Woodhouse Eaves for some very primitive (and probably very unsafe) rock climbing on the steep inclined slabs, which are in

fact bedding planes. I have no recent pictures of the Woodhouse Eaves quarry, but there is a marvellous photo in the New Walk Museum collections probably taken in 1882, which is reproduced below.



**The quarry near Woodhouse Eaves in about 1882. The first *Charnia* was found slightly below the level of the man's head on the higher of the two bedding planes to his right.**

As one of the boys was climbing, he spotted a strange impression on a bedding surface, with a very leaf-like appearance. He called to Roger, who was holding the rope, to come down and have a look. Thus, and it might be news to most of you, Roger was not the very first one to see the fossil. But he was aware enough to act on the find. Anyway, on with the story. Roger, who had already conceived a strong liking for geology and fossils immediately realised that it must be a fossil. But, then again, he knew that ancient Precambrian rocks such as those in Charnwood weren't supposed to contain fossils – or were they? There was only one way to find out, and that was to contact a proper geologist to come and have a look. Roger's father knew Trevor Ford from



extra-mural teaching classes which they both taught, so he was contacted at the Geology Department and asked to take a look.

Trevor was, frankly, sceptical, and said so all the way to the quarry when they set off to see the 'fossil' a few days later. But he was in for a big shock, and he immediately realised that Roger was right – it was a fossil, and an extremely important one. For it was known that these particular Charnian rocks were probably at least 580 million years old, and almost nothing was known in 1957 about fossils in rocks of this age. Yes, similar fossils had been known from Australia for a few years, but no-one thought they were Precambrian in age. This find in Leicestershire in rocks of known Precambrian age established without doubt that life was in existence at that time, and that is why the fossil was so important, as well as being the oldest fossil in Britain known at that time.



**Quarrymen extracting the slabs containing the two holotypes from the quarry near Woodhouse Eaves early in 1958**

Roger's story hit the local, and national, news and has passed into geological legend. Trevor rushed into print with a description and gave the fossil the name *Charnia masoni*, thus confirming the coup for Leicestershire. He went on to

discover similar specimens in Bradgate Park. Trevor was then, as he is now, a leading light in the Geology Section, and that's where our connection with *Charnia* and the other Charnwood fossils began, and has remained strong ever since, as well of course as the fact that the fossils are from Leicestershire. The type specimen of *Charnia*, and the holotype of *Charniadiscus* from the same locality, were removed from the quarry on January 22<sup>nd</sup> 1958 (see photo of the extraction in progress) to New Walk Museum for their own safety – and not a moment too soon as it was realised that crude attempts had been made to chisel out the *Charnia* specimen. The specimens still hold pride of place in the main geology gallery at New Walk Museum to this day.

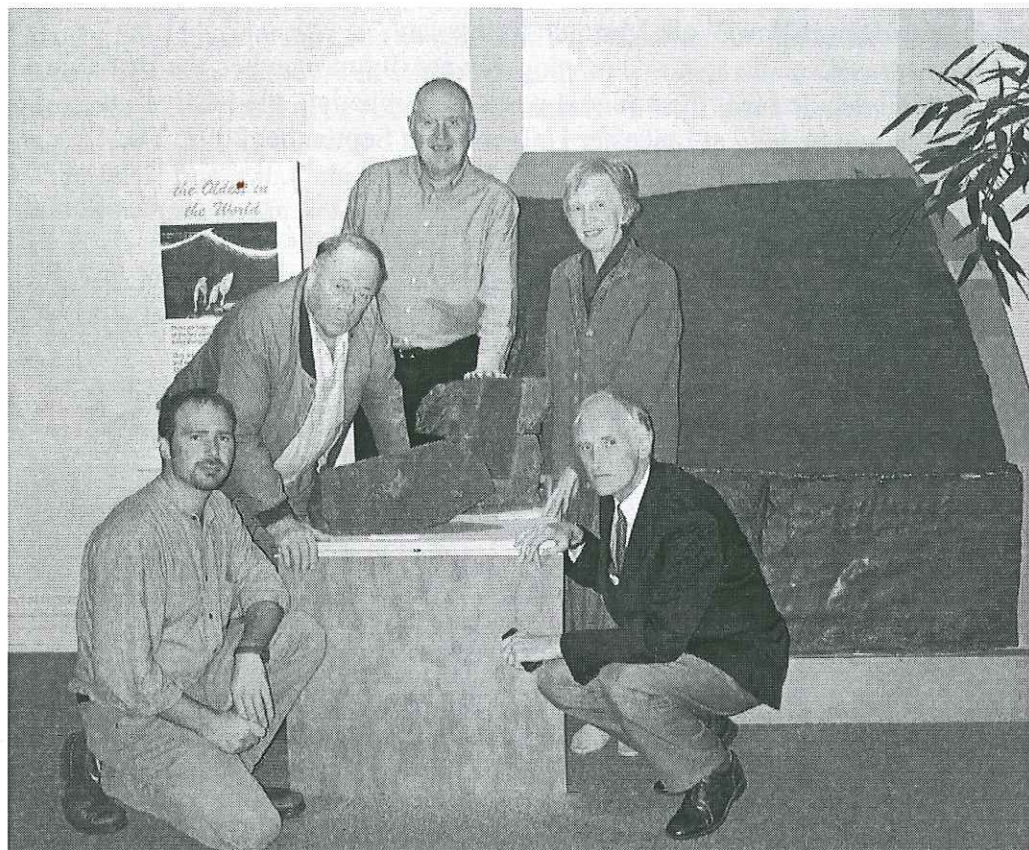
All that was 45 years ago, and memories were dimming when the British Association decided that their annual week-long meeting, the Festival of Science, would be held at Leicester University in September 2002. The Geology Department was asked for ideas for themes and talks, and Head of Department Professor Richard Aldridge thought that it would be appropriate to celebrate Leicester's part in the story of early life by making this a theme for a half day's programme of talks. And, even more exciting, what a good idea it would be to get hold of Roger Mason and ask him to lead a field trip to the scene of his discovery.



**The field trip party in Bradgate Park on September 8th. Roger Mason is the left hand of the squatting figures, and Helen Boynton is just behind him**



This might not have been so easy under normal circumstances, because Roger spends much time lecturing in China (as a metamorphic geologist these days!), but it chanced that he would be in the UK at the right time. Trevor Ford was summoned to do a talk, and Helen Boynton, who played (and is still playing) a major role in unravelling the story of the Charnwood fossils as well as having a wonderful eye for finding them, was invited to co-lead the field trip with Roger. Thus, the three main protagonists in the discovery and description of the world-famous biota of Charnwood were brought together.



**Trevor Ford, Helen Boynton and Roger Mason at the New Walk Museum on September 9<sup>th</sup> with the stars of the show. No, not Mark Evans and myself!**

I was very proud to be invited to coordinate the field trip and get the Section fully involved, and in the end eighteen of our members and a further ten from the British Association were privileged to be in attendance on that historic field trip on September 8th. The sun shone, the views were marvellous, and Roger,

still as fit as ever at 61 (note the neat transposition of the figures of his age when he first found *Charnia*), and Helen led the trip with great enthusiasm and authority. It unfortunately wasn't possible to visit the actual quarry, which is hard of access these days, but we saw the main Bradgate sites and also the impressive but extremely enigmatic forms Helen found near Shepshed. And finally we went to Ratby churchyard to see the *Teichichnus*-type trace fossils in the Swithland Slate gravestones – are they really Cambrian? Answers on a postcard!

But that wasn't all. Mark Evans, Section C Vice-chairman and geology curator at the Museum, had the bright idea to reunite Trevor, Roger and Helen with the original specimens in the Museum on Monday morning September 9<sup>th</sup>. This was duly arranged, a press release written and the Leicester Mercury turned up to record the event for posterity. I shadowed the photographer and took several shots for our archives, one of which is included here. The story, although rather truncated, appeared in the Leicester Mercury for Saturday September 14<sup>th</sup>, together with a photograph of Roger cuddling *Charnia*. On the afternoon of the 9th at the University as part of the BA meeting four talks were given with an 'Earliest multicellular animals' theme and all four, by Roger, Trevor, Dima Grazhdankin from Cambridge University and Dr Steve Temperley from Leicester's Geology Department, were of great interest and were delivered with real enthusiasm, as good talks should be. September 9th was a busy day for Roger and Trevor, as they were also interviewed in the morning on Radio Leicester's Breakfast Programme. All in all, a very memorable couple of days!

Andrew Swift

### **An inspirational British Association meeting ...**

**A 'Section C' member has written to 'Charnia' telling of the trigger which led to her son's choice of career. She writes ...**

'Reading the circular about the British Association for the Advancement of Science meeting in Leicester this September brought back vivid memories of September 1972 and ensuing events. In August 1972 our son entered the Upper Sixth at Beauchamp College with no career ideas, other than whatever was chosen should not interfere with his social life!

When details of the B.A.A.S. Meeting at Leicester University were posted on the school notice board, with encouragement for students to attend talks which interested them, my son speculated that geology could be fun. He cycled to the University, attended some talks, went on a field trip and acquired a large tome



'Leicester & its Region', all for a £1 registration fee. Towards the end of that week my son stated that he intended to pursue a career in geology. His 'A'-level subjects were not all suitable and his results relatively modest.

He was lucky to be accepted on the course of his choice - Earth Sciences at Leeds University - from whence he emerged with a First Class Honours Degree. He embarked immediately on a Ph.D, followed by Post-Doctoral work in Kenya and then a spell in South Africa before moving to the University of Western Australia in Perth. He has studied and worked in the U.K. from Northern Scotland to The Lizard; the French, Italian and Swiss Alps; Kenya; South Africa; U.S.A., South America and of course, Australia.

His future wife and he met in Perth, married in New Zealand and live (occasionally) in Fremantle with their baby son. They eventually set up their own consultancy and much of the time are able to work together. They have just completed a four-month spell of work in Botswana. My son has never regretted his chance attendance at the 1972 B.A. meeting in Leicester. Colleagues, friends and neighbours of all nationalities and a healthy cultural environment in Perth and Fremantle provide that still valued social life.'

[I paid a lot more than £1 for my copy of 'Leicester & its Region'! - Editor]

### Bobkingite – a new mineral

**Bob King, Life President of the Geology Section, has been honoured by having a new mineral\* named after him. This is a rare, prestigious and thoroughly deserved accolade from the mineral world.**

The mineral Bobkingite is a copper chloride with the formula  $Cu_5^{2+}Cl_2(OH)_8(H_2O)_2$  and is described from New Cliffe Hill Quarry, Stanton under Bardon, Leicestershire. It was found in a thick deposit of cuprite that formed between the Charnian rocks and their Triassic cover. This copper mineralisation occurs in many places in the Charnwood area, but was spectacularly displayed in the early days of quarrying at New Cliffe hill. Unfortunately the deposit no longer exists. Bobkingite is described as being soft blue transparent plates up to 0.2mm across. The crystals have a vitreous lustre, pale blue streak and have no observable fluorescence under long and short wave U/V light. The crystals are perched on a compact fibrous crust of malachite and crystalline azurite attached to massive cuprite.

Bob has an international reputation in mineralogy and has always maintained an interest in Leicestershire mineralogy. Indeed his PhD thesis was on this very subject. It is therefore very appropriate that the new mineral found in

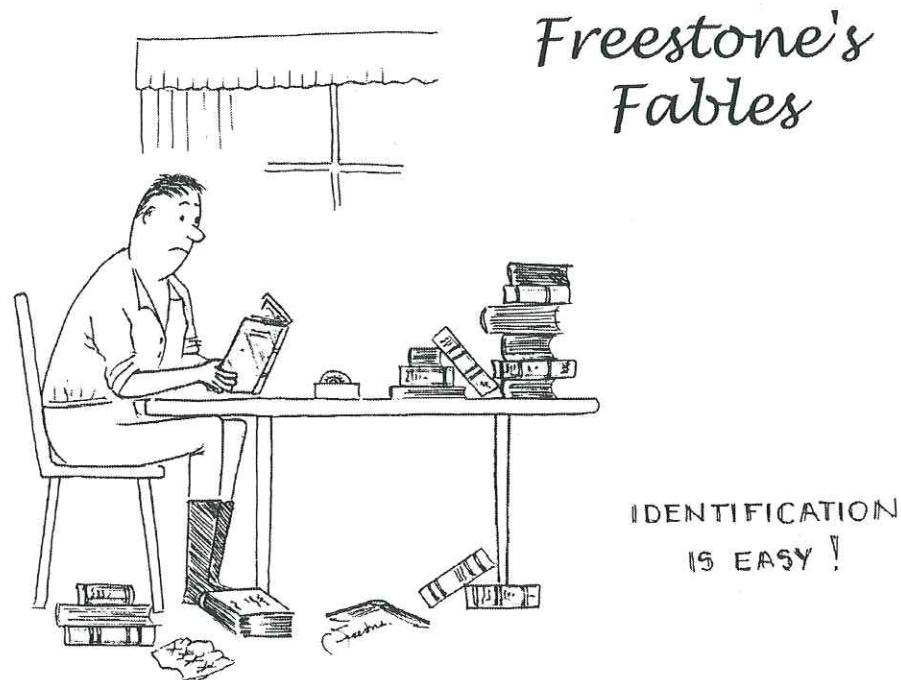
Leicestershire is named after him. To add to the story from the Section's point of view, one of the authors of the paper is Neil Hubbard, one of our long standing members.

The full reference is:

HAWTHORNE, COOPER, GRICE, ROBERTS and HUBBARD. 2002. Description and crystal structure of Bobkingite,  $Cu_5^{2+}Cl_2(OH)_8(H_2O)_2$ , a new mineral from New Cliffe Hill Quarry, Stanton Under Bardon, Leicestershire, UK. *Mineralogical Magazine*, **66**, 301-311.

**\* The term new mineral needs some explanation. A new mineral is a chemical compound that has been found for the first time in a geological context. Obviously there are thousands of compounds that have been created in laboratories. These would be elevated to mineral status if they were ever to be found naturally.**

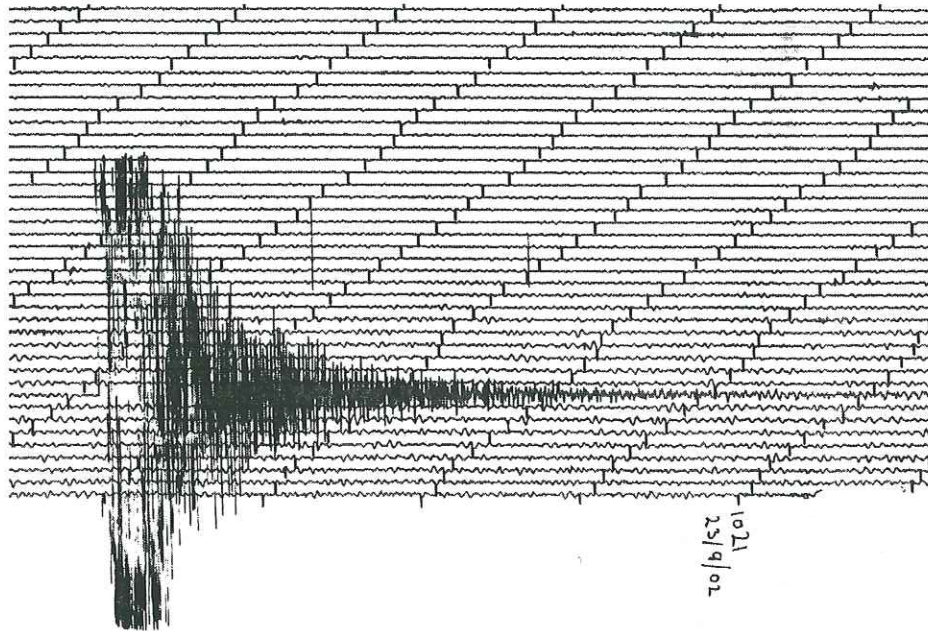
Paul Monk





## Geology on the Web

The front cover of this edition of 'Charnia' is graced with a copy of the seismograph of the Dudley Earthquake. As I write this, the event actually occurred a couple of nights ago. I was writing the Editorial - or at least about to write it - when the floor vibrated, accompanied by a very low frequency rumbling which went on for quite a few seconds. The noise was somewhere between the lowest note of a church organ and (10-15Hz?) and the rumbling made by a very heavy lorry being driven past the house. The seismograph was posted on the British Geological Survey's website by breakfast on September 23<sup>rd</sup> (see also front cover). If you have access to the web, you'll find the BGS site at [www.bgs.ac.uk](http://www.bgs.ac.uk) or if you have a search engine of the Google calibre, just type-in British Geological Survey. You'll be amazed at the variety of geological information from just this one website, which also has a portal accessing other geological websites.



Another trace of the Dudley earthquake on September 23<sup>rd</sup>, taken by the recorder in the Geology Department at Leicester University

The Editorial attempts to justify the bias towards past life, so to even things up, a look at subjects other than palaeontology within the field of Earth Science is in order. If volcanoes take your fancy try The Center for the Study of Active

Volcanoes (University of Hawai'i at Hilo) at <http://www.uhh.hawaii.edu/~csav>

Other sites are:

The Electric Volcano at <http://www.dartmouth.edu/~volcano>

The Space Science Engineering Center at

<http://www.ssec.wisc.edu/data/volcano.html>

The MTU volcanoes page at <http://www.geo.mtu.edu/volcanoes>

Volcano updates at

[http://volcano.und.nodak.edu/vwdocs/current\\_volcs/current.html](http://volcano.und.nodak.edu/vwdocs/current_volcs/current.html)

As you can see, American websites predominate. If you wish to widen your field somewhat, try Ian West's Geological Directory at

<http://www.soton.ac.uk/~imw/index.htm> Here you will find just about everything from volcanoes to regional geology of just about everywhere.

There are many sites which are crammed full of geological links - try

[http://www.isgs.uiuc.edu/earthsci/es\\_links.htm](http://www.isgs.uiuc.edu/earthsci/es_links.htm)

Perhaps minerals and crystallography are of particular interest to you. If so, Albert Hines' Virtual Crystallography is quite unique. Access this at

[http://www.novagate.com/~ahines/rocks/vir\\_cris.htm](http://www.novagate.com/~ahines/rocks/vir_cris.htm)

If you are not familiar with Miller Indices, which describe the intersection of crystal faces with the three dimensions of the solid world, go to Bob's Rock Shop for a quick tutorial at

<http://www.rockhounds.com/rockshop/xtal/part1.html>

Another excellent tutorial can be found at

<http://www.rci.rutgers.edu/~geolweb/index.html>

I didn't realise that the Russell Society held its meetings for the Central Region at Loughborough University, details of which are located at

<http://www.russellsoc.org/index.htm>

All this is just the merest dip in the ocean. If you've searched any of these websites it's highly likely that you've been drawn to other links. Why not write in to 'Charnia' describing worthwhile geological websites you've located?

Graham Stocks

## Year 2001-2002 report for the Transactions

Those of you who are not Parent Body members may be interested in the report I wrote for the 2002 Transactions, summarising the doings of the Geology Section in 2001-2002. As follows:

The Geology Section continued to thrive through the last year despite having to overcome a few problems. Chief amongst these was the outbreak of foot and



mouth disease which effectively put the countryside 'out of bounds' for much of 2001. A late re-shuffle of the summer programme was necessary but thanks to some (only slightly desperate!) phone calls and maneuvering Dennis Gamble was able to keep the programme running, which went well despite the weather doing its best on a couple of occasions to ruin things. Both in the Welsh Borderlands and at Cleeve Hill the rain teemed down, but the members, as ever, were undaunted. Attendances at all the field trips were very good, peaking at around 25 on the Welsh Borderland excursion. The weekend excursion, this year to the Yorkshire Coast, again proved popular, and the unusual theme, that of dinosaur footprints, created much interest. The trip to Ketton Quarry was originally requested by the Geologists' Association as a joint venture as part of an 'East Midlands weekend', but in the event most of that programme was cancelled due to lack of interest from GA members. However, lots of our members turned up at Ketton Quarry, as might be expected.

The Winter Programme ran very smoothly with only the minimum of disruption when the advertised speaker was forced to withdraw on March 13<sup>th</sup>. However, he 'did the right thing' by arranging an able substitute, who spoke very well. The Parent Body lecture was very successful, and we continue to persuade some excellent speakers to turn out for that one. Indeed, quality is very much the watchword of the indoor programme, and this year we had no less than five professors, all leaders in their field, on the programme. The two social evenings held at the New Walk Museum, the Member's Evening and the Christmas meeting, both went well, although we would very much like to see more people turning out for these informal occasions. The only black spot in the indoor programme was the enforced cancellation of the Saturday School one day seminar on March 2<sup>nd</sup>, it simply proved impossible to attract enough speakers for the proposed planetary geology theme, despite intensive efforts.

Membership held steady over the year, although we had the inevitable comings and goings, and stood at around 125.

Andrew Swift



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