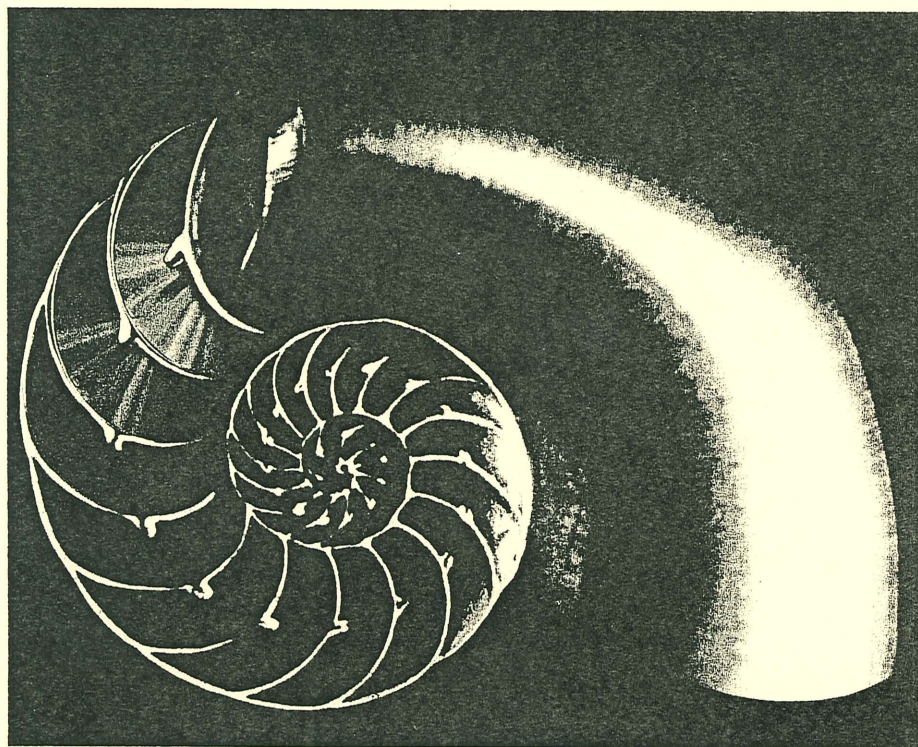


# CHARNIA

LEICESTER  
LITERARY & PHILOSOPHICAL SOCIETY



THE NEWSLETTER OF SECTION C  
(GEOLOGY)

**AUTUMN 2000 EDITION**

Leicester Literary and Philosophical Society

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EDITORIAL

Returning from yet another enjoyable and memorable annual 'Section C' fieldwork residential I thought this a good time to set about producing September's 'Charnia'. First though, an appreciation of the hard work and organisation Andrew Swift put into the Penarth weekend. I'm not really much of a collector these days - I prefer to try and visualise the conditions prevailing all those aeons ago when I study a particular bed or horizon within it. Andrew successfully paints pictures in words which transport listeners to arid deserts, ephemeral lakes, tropical seas and the life they supported two hundred million years ago. I guess we all attempt to visualise what it must have been like at the close of the Triassic, or whenever. Looking at a pale limestone band with shaly partings, virtually devoid of macrofossils and seeing another world's climate with its daily variations, its erosional and depositional conditions, what crawled over its surface and what swam in its waters, requires forensic methods.

My imagination concerning these past worlds was fired when, as a ten year old, I looked at the reproductions of the dioramas published in my copy of The Observer's Book of British Geology. A few years later, as a geology student, I studied stratigraphy, mapping, mineralogy, petrology and palaeontology in the driest of ways imaginable. Knowledge and understanding move on and today's students have the luxury of textbooks such as McKerrrow's 'The Ecology of Fossils', with its wonderful stereograms of past communities drawn by Elizabeth Winson. If you don't have a copy - obtain one and you'll appreciate what I mean!

On the subject of bringing back to life things dead in more ways than one, I have enjoyed reading more recent authors who have popularised Earth sciences and related topics. For example, Steve Jones ('Almost Like a Whale' - the origin of species updated) Richard Dawkins ('The Blind Watchmaker', 'River out of Eden', 'Climbing Mount Improbable', etc.) Stephen Jay Gould (who has promised to write three hundred essays, the last but one collection being 'The Lying Stones of Marrakech: Penultimate Reflections in Natural History'). Last but not least is Richard Fortey, whose latest book is a gem; it is called 'Trilobite! Eyewitness to Evolution'. Fortey's previous titles ('Life: An Authorised Biography', 'Fossils: A Key to the Past' and 'The Hidden Landscape') are likewise well worth reading.



Ever since, as a schoolboy, I acquired the idea of Darwinian evolution I have been conscious of the fact that self-replicating complex organic molecules respond entirely to the non-living surroundings such living systems happen to be in. The idea of Lamarckian determinism (as taught in school) never made any scientific sense to me. Reading modern authors who attempt to put a new and popular slant on Darwin's ideas has me looking for what is presumably unintentional teleology. That is, personifying 'nature' as 'mother' or as some intentional force having ends, the means of which we observe as present life forms or the fossilized traces of past organisms. In fact Darwin was guilty of the crime of teleological argument when he wrote of 'natural selection' or other terms implying some higher reasoning. This teleology is nowhere more clear than in the full title of the 'Origin', which is 'The Origin of Species by means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life.' Of course, I cannot prove it but 'nature' is surely nothing more than a blind happening, devoid of any will or consciousness and certainly lacking in any of the anthropomorphisms we bestow on ourselves and our surroundings.

A bleak prospect really... A planetary body, consisting of certain chemical elements in its crust, at a certain critical distance from a certain type of star and bingo!.. living systems evolve from the wet muck. This evolution results in increasingly complex life-forms, only to be snuffed-out ultimately either by their own stupid destruction, or by the flare-up which marks a certain stage of the planetary system's star after some thousands of millions of orbits. It's all a question of scale really; life must have evolved over and over again on isolated planets throughout the Universe, perhaps to more or less the same basic pattern, rather like the ephemeral weeds which spring up and quickly disappear in our gardens. Perhaps ephemeral weeds are not a good analogy, since they flourish to leave behind caches of seeds (which is what Hoyle and Wickramasinghe theorise - but that's another story). The idea that the Earth and its inhabitants are trapped here just for a short duration in the run of cosmic time is difficult to come to terms with. Just think, all life, all of mankind's history and culture - and its desires - return unrecorded to the interstellar dust it all started from. Not a jot left behind for any other conscious being to consider at any future time...

What set off this particular train of thought was the news that the entire human genome has now been mapped. Cloning has

been possible for at least two decades and genetic recombination now theoretically knows no bounds. Everything a palaeontologist studies has happened as a result of no deterministic intent whatsoever. The surroundings that a living organism happens to be in causes the deletion of genes whose expression confer either no advantage or a disadvantage to the owner. So, up until the arrival of mankind, life bumbled along as a succession of serendipitous events, following no particular path and having no goal, 'driven' if you like by purely physical conditions. Is this some new expression of atheism or a post-modern heresy? It's not new - read on...

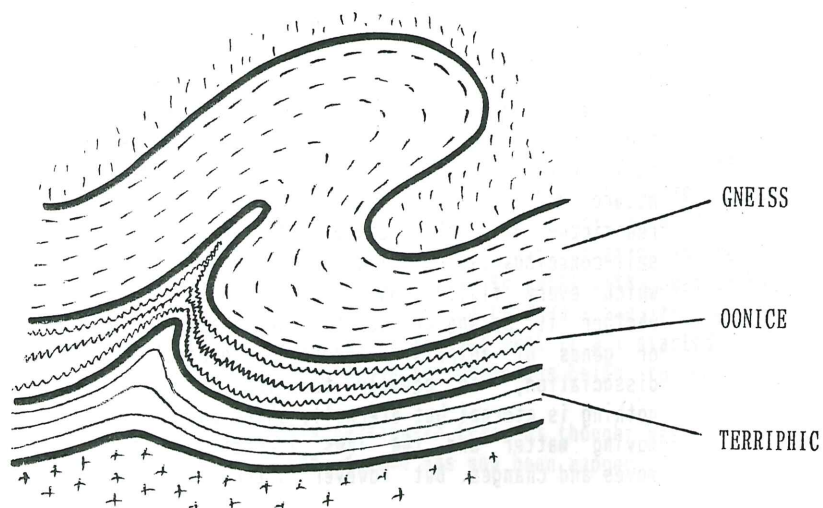
Mankind bends the rules (sorry, there are no rules - that was teleology). The question now is, 'can we shape our evolutionary destiny?' The answer is 'yes'; we consciously and intentionally select certain perceived qualities in our mates, domesticate and enhance other life-forms and manifestly change our environment in many other ways, rather than it changing us, on a very accelerated time scale. In a sense we can now truly say that 'nature is improving itself', without perhaps being guilty of teleology in the strict sense.

Darwinian evolutionary theory is really the biological equivalent of Schopenhauer's existentialist philosophy. This 'new' philosophy was in print at the time Darwin was putting together the 'Origins' and there is nothing in Darwin's recorded correspondence to indicate any awareness. I do wonder though whether C.D. was familiar at a slightly later date with the works of Friedrich Engels. In his 'Dialectics of Nature' Engels wrote:

'It is an eternal cycle in which matter moves, a cycle that certainly only completes its orbit in periods of time for which our terrestrial year is no adequate measure, a cycle in which the time of highest development, the time of organic life and still more that of the life of beings conscious of nature and of themselves, is just as narrowly restricted as the space in which life and self-consciousness came into operation; a cycle in which every finite mode of existence of matter, whether it be sun or nebulous vapour, single animal or genus of animals, chemical combination or dissociation, is equally transient, and wherein nothing is eternal but eternally changing, eternally moving matter and the laws according to which it moves and changes. But however often, and however

relentlessly, this cycle is completed in time and space; however many millions of suns and earths may arise and pass away; however long it may last before, in one solar system and only on one planet, the conditions for organic life develop; however innumerable the organic beings, too, that have to arise and pass away before animals with a brain capable of thought are developed from their midst, and for a short span of time find conditions suitable for life, only to be exterminated later without mercy - we have the certainty that matter remains eternally the same in all its transformations, that none of its attributes can ever be lost, and therefore, also, that with the same iron necessity that it will exterminate on the earth its highest creation, the thinking mind, it must somewhere else and at another time again produce it.'

We can, however, be reasonably certain that Engels was familiar with Darwin's work. The amazing thing about the above passage is that it was written one hundred and twenty six years ago. I think that, as geologists, we need to consider the big picture and, as a philosophical society, where better than in 'Charnia'? I wonder, though, if this will stimulate any discussion in future editions?



## INDOOR MEETINGS 2000/2001 - PROGRAMME

All held at 7.30 pm in room LT10 in the Geology Department,  
Leicester University, except where indicated

### 2000

Wednesday October 11th

Speaker TBA.

Wednesday October 25th

Dr David T. Wright (Department of Geology, Leicester University) - 'Dolomite - a major geological enigma'

Wednesday November 8th

Professor Michael J. Benton (Department of Geology, University of Bristol) - 'Bringing dinosaurs to life: fact and fantasy'

Wednesday November 22nd

Dr Kip Jeffrey (Department of Geology, University of Leicester) - Title TBA.  
Theme - Mineralisation in Derbyshire

Monday December 4th

Joint Meeting with the Parent Body (held at New Walk Museum). Dr Sandy Knapp (Natural History Museum, London) - 'Alfred Russell Wallace'

Wednesday December 6th

Dr Samantha R. Barr (Department of Geology, University of Leicester) - 'From a west Pacific subduction factory to east Antarctic glacial history. The perspective of an ODP logging scientist'

Wednesday December 20th

Christmas meeting, to be held at the New Walk Museum

### 2001

Wednesday January 17th

Dr Michael A. Taylor (National Museums of Scotland, Edinburgh) - 'Mary Anning, Thomas Hawkins and Hugh Miller, and the problems of being a 19th century fossil collector in the provinces'



Wednesday January 31st

Dr John Faithfull (National Museums of Scotland, Edinburgh) - 'A lassie's best friend - Scottish and other British diamonds'

Wednesday February 14th

Members evening, to be held at the New Walk Museum

Wednesday February 28th

Dr Richard W. England (Department of Geology, University of Leicester) - 'Deep Seismic Profiling and the deep structure of the UK'

Saturday March 3rd (whole day)

Provisional. Saturday School, Vaughan College. 9.30 am - 5.00 pm. Title TBA. Theme - Large scale geohazards

Wednesday March 14th

Dr David Waltham (Royal Holloway College, London) - 'Models of tectonics and sedimentation' (live computer demonstrations)

Wednesday March 28th

AGM and Chairman's address - John G. Martin (New Walk Museum, Leicester) - 'Great Sea Dragons'

October 11th 2000 meeting

As of going to press, we have not been able to confirm a speaker for this date. This is because we have been trying to get someone to talk on hominids, a popular theme in our last two programmes. If we are unsuccessful we will arrange a speaker on another topic. Rest assured there WILL be a lecture on that evening!

More 'From The Archives'...

May 28th., 1841.

Mr. Smith of Birstall House on behalf of the Rev. Mr. Kebbel of Kilby presented two specimens of fossils of animals, long since extinct in this climate. They were found in a sea cave on the coast of Sussex. A vote of thanks was moved by the Rev. Mr. Drake.

The archive contains many interesting items of the Society's history and I hope to be able to present some in future editions of *Charnia*.

Abstract of talk scheduled for December 6th 2000

From a West Pacific Subduction Factory to East Antarctic glacial history.

The perspective of an ODP logging scientist

Dr Samantha R. Barr

Department of Geology, University of Leicester

Why not come along and find out about life aboard the JOIDES Resolution, the operational centrepiece of Ocean Drilling Program (ODP) research? Leicester logging scientists like myself take part in the acquisition, processing and post-cruise interpretation of logging measurements, which complement the information gathered by shipboard scientists from recovered core material. ODP research spans a broad range of exciting themes and this talk will focus on two of these: (1) Why we drilled the inputs to the Mariana-Izu-Bonin Subduction Factory and why it's essential to integrate log data with core data, and (2) How data gathered aboard the drill ship is being used to pinpoint the onset of glacial activity in the Antarctic.

Abstract of talk scheduled for February 28th 2001

Deep Seismic Profiling and the deep structure of the UK

Dr Richard W. England

Department of Geology, University of Leicester

The UK, Ireland and surrounding continental shelves is the area of the earth's crust most densely sampled by deep seismic profiling methods. Over 30,000 line km of deep reflection data and 12,000 km of wide-angle/refraction data has been acquired on land and primarily at sea by UK research groups in the last 20 years. These data provide the best images of the deep structure of the crust and constraints on its physical properties. The data enable us to delineate terrain boundaries, image major rift systems and identify regions affected by magmatic underplating. The most recent studies are focusing on the relationship between the properties of the crust and topography and the nature of isostatic compensation.

## Dolomite - a major geological enigma

Dr David W. Wright

Department of Geology, University of Leicester

The genesis of dolomite in the natural environment has been one of the outstanding enigmas of geology, despite some two centuries of intensive research and debate. The mineral occurs in a range of scales, from micromillimetric laminae in limestones or some clastic rocks, to thick monomineralic sequences. Surprisingly, dolomite has not been synthesised in physico-chemical laboratory experiments at normal temperatures and pressures, so that the chemical controls on dolomite precipitation remain undefined. Conventional hydrologically-driven models of dolomite formation, though popular, often lack empirical support, and encounter fundamental chemical problems related to kinetic impediments in saline solutions: these include the high hydration energy of the magnesium ion, the extremely low activity of the carbonate ion, and the presence of even very low concentrations of sulphate.

The lack of a convincing hydrological model suggests that the search for a solution should be redirected. An appropriate approach is to consider under what conditions the kinetic constraints on dolomite formation might be overcome in natural aqueous saline environments, and whether these conditions could plausibly have resulted in the thick platformal dolostones abundant in the Precambrian. Most modern dolomite is found in intertidal to supratidal environments (including alkaline lakes), whereas most Precambrian dolomite was deposited in shallow subtidal marine settings. However, a common factor linking both modern and ancient dolomites is their frequently observed association with benthic microbial communities, typically as stromatolites and cyanobacterial mats. There is increasing evidence that microbial degradation of organic matter, particularly the activities of sulphate-reducing bacteria in anoxic layers beneath cyanobacterial growth surfaces, can play a critical role in the biochemical modification of ambient waters creating the conditions necessary for widespread dolomite formation. It is argued here that benthic microbial communities have played a major role in dolomite formation throughout the geological record.

## EVOLVING IDEAS

The Summer edition of 'Charnia' introduced some observations on what occurred when ideas on evolution through natural selection first went into print. I hope readers will indulge a more in-depth look at what was going on a hundred and fifty or so years ago in this field of biology. I would hazard a guess by thinking that the majority of Section 'C' members are palaeontologists first and foremost, with mineralogists, etc., being a minority. Therefore, the way in which one species transmutes into another is of vital interest to most, if not all, of us.

In mid-July Glasgow University published the results of a survey carried out among its student population. It turned out that a significant minority hold the same views as American biblical fundamentalists, who are anti-evolution, believing that God created life from a void in the manner described in 'Genesis'. Just over 10% of Glasgow's medical students and 11% of first-year biology students reject Darwinian evolutionary theory.

In fact, is belief in an all-powerful God incompatible with evolutionary theory? If you subscribe to Engels' world-view (see Editorial) are you necessarily an atheist? Surely educated minds today accept the Old Testament need for allegorical story-telling, tailored for the largely untutored Eastern Mediterranean populace more than two thousand years ago? We seem to have slipped into a new mediaevalism during the past couple of decades, with a general 'dumbing-down' in the media and elsewhere, and with leaders of state of supposedly highly developed nations consulting astrologers for guidance, for example. Closed minds, a blind faith in dogma and turning a blind eye to demonstrably factual truth, is all very worrying...

So where did scientific evolutionary reasoning really begin? I've often wondered what went on in the minds of people who selectively bred plants and animals ever since hunter-gatherers stopped wandering about and took root. Near to my home is the site of Dishley Grange, which was the home of Robert Bakewell. Bakewell transformed animal husbandry but was he aware of the science behind his experimentation? Unfortunately, we'll probably never know: Bakewell did not appear to keep detailed records and precious little of what he did write down survives today. The



same argument could equally apply to racehorse breeders, though their records, dating back some three hundred years, are comprehensive in terms of lineage. Did the original breeders of Arab racehorses understand what might have been taking place?

At around the time that fairly detailed studbooks and herdbooks were being compiled by breeders and improvers, certain individuals were seeing beyond the practicalities of increasing the economic yield of farms and stables. One of these individuals was Sir John Saunders Sebright, who mixed with breeders and improvers such as Bakewell, the Harpur-Crewes of Calke Hall and Coke of Holkham Hall. Sebright wrote to Sir Joseph Banks (who also moved in these circles) in 1809, stating 'Were I to define what is called the art of breeding, I should say, that it is consisted in the selection of males and females, intended to breed together, in reference to each other's merits and defects.' Sebright is referring to the practice of constant and careful *selection*, which had been practised since at least the latter half of the C18th. and had been referred to as such. So, there is evidence that Darwin and Wallace were by no means the first to appreciate what lies behind selection, whether it be natural or artificial. In fact, one of the true founders of evolutionary theory was Caspar Friedrich Wolff, who was perhaps the first to challenge (in print) the fixity of species and to proclaim the theory of descent in his 'Theoria Generationis', published in 1759.

In this issue of 'Charnia' you will find more on pre-Darwinian evolutionary thinking which, who knows, may well stimulate further discussion through these pages...

GS

Some geological terms redefined...

Abyssal: The feeling of dread experienced when one realises that everyone except you understands what the talk is about.

Benioff Zone: The hidden stretch of bog lying between what you thought was the top of the hill and what actually is.

Centipoise: The stance assumed in the field by a group on a muddy slope when listening intently to the leader's spiel.

Drumlin: Sl. or contraction of 'drumling' - the low burbling noise emitted by the snoozing one at the back of L.10.

## Field Excursion, June 18th 2000 Carboniferous geology of the Monsal Dale area, Derbyshire

After the saga of a car, its fuel, resultant breakdown and substituted emergency transport, eventually nine members and two guests assembled in the Monsal Head car park where our leader for the day, Dr David Wright of the University of Leicester, awaited us. In fact the unfortunate driver of the aforementioned car (we won't mention your name, John, honest), in a remarkable feat of dedication, actually managed to join the party, car restored, by lunchtime. Dr Wright provided the party with an excellent handout detailing the geology of the area we would be seeing and talked the group through the immediate geological landscape as we looked out over Monsal Dale from our high viewpoint. As the day was very hot, the initially proposed walk through to Miller's Dale station was shortened, although by the time we arrived back sometime after 5, most of us were still pretty weary after a walk of around 6-8 miles. But it was well worth it, as it was a splendid summer's day in the midst of impressive geology and natural history.

We began by scrambling down the steep path onto the old railway track bed to the mouth of the old Monsal Head tunnel, where Dr Wright set the tone for the day with a question and answer session which characterised his approach to field geology. While this was new to some of the party, it made for a nice change of style from the more usual approach. At the tunnel we wrestled with the question of whether the Carboniferous limestones of Asbian and Brigantian age were light or dark, and, more to the point, why? This really was the theme for the day, the rapid and sometimes bewildering facies changes and field relationships within and between the units of the Monsal Dale and Miller's Dale beds. Following recent reinterpretation of the nature of the limestones, Dr Wright demonstrated the turbiditic nature of many of them and the abundant evidence of redeposition, a feature often signalled by the disposition of the fossils within the beds. We also studied the evidence for cyclic sea level changes which resulted in karst development. Stylolites were seen cutting their irregular paths through many of the beds, and ash falls and lava flows added to the geological interest. After a long stretch on the old railway track we descended to the valley of the



Wye, and in the process passed the D<sub>1</sub>/D<sub>2</sub> boundary. Lunch was taken in a lovely spot by the river, which had the added benefit of a nearby source of ice creams.

Our geological ramble then took us along the banks of the river under glowering cliffs of limestone, and we stopped at regular intervals to inspect points of interest and admire some excellent fossils. At last we reached an outcrop of the Millers Dale lavas in a natural cave and a discussion took place on their origin and lithology, but by now the heat was seeping into our brains too, and the decision to head back was greeted with relief. Indeed it had been a day when the heat had been applied externally by the sun and internally from the combustion of brain cells stimulated by our leader's probing enquiries. None of us will look at the limestones of Derbyshire again without thinking much harder about them. At the conclusion of the walk after grateful thanks had been expressed to Dr Wright, much needed refreshment was taken by some of the party at the Monsal Head Inn.

Andrew Swift and Dennis Gamble

Ejectamenta: Biscuit crumbs and coffee slurry to be found on the table in the Sylvester-Bradley Museum, prior to Winter talks. Differs from a lahar in that the mass is static and frequently gums up Doug's attempts to part members from their payments.

Froude Number: The difference between the number of individuals who say they will attend a field meeting and the number actually turning up. This can be either a positive or negative value.

Geode: A point of particular interest (often the only such point) in an otherwise deeply uninteresting lecture.

Horst: The feeling experienced early in the morning on the first day of a residential field trip. (c.f. porphyroblastic)

Isostasy: The uplifting emotion experienced when the consensus is to visit a pub.

Joint: Could be a number of things.

Krakatoa: Ignoring advice to comply with HSE footwear requirements when visiting quarries.

## Weekend Field Excursion June 30th - July 2nd 2000

### Aspects of the Mesozoic geology of the Penarth - Sully coastline, South Wales

For our third trip following the revival of the weekend field excursion in 1998, this year we visited the South Wales coastline between Penarth and Sully. This is a classic area, unfairly neglected by geologists these days, which shows fascinating Late Triassic and Jurassic sequences developed in several unusual facies. Our leader for the weekend was Andrew Swift and we were based at the Walton House Hotel in Penarth, which turned out to be a good choice, as the management were friendly, the accommodation comfortable and the bar open. The sixteen strong party assembled on the Friday night at the hotel, but was unfortunately depleted by the late withdrawal due to illness of John and Ann Dickinson. Tables had been booked for an evening meal at the Sully Inn (in Sully, strangely enough), and the weekend got off to an excellent start with a most convivial gathering. Saturday began badly as we lost two more of the party when Jackie Green succumbed to a nasty abscess which necessitated emergency treatment, so we had to say an early farewell to her and Colin. The rest of us then drove to the shoreline at Swanbridge, from where we crossed the 'causeway' to Sully Island, looking in vain for dinosaur footprints in the red Triassic siltstones as we went. Sully Island shows a marvellous sequence of Late Triassic shallow water lake deposits ranging from breccias through to red mudstones, via evaporites, limestones and cryptalgal horizons, but perhaps the highlight is the splendid angular unconformity between planed-off Carboniferous Limestone and marginal breccias of the Late Triassic. Members also appreciated the fine display of wild flowers and the local bird population. Sully Island in fact is a perfect nature reserve in miniature.

Giving ourselves plenty of time to get back over the causeway before the tide returned, we then walked east along the mainland shoreline towards St Mary's Well Bay, stopping off to eat our lunch among the confusion of fallen blocks, and to bask in the sun of what turned out to be a lovely day. As we proceeded we admired the marginal Triassic rocks which are so well exposed in the cliffs, and examined ancient soil profiles, which are not developed on Sully Island. Further round into the bay we noted the rapid and profound change in facies as we entered the outcrop of the latest Triassic Penarth



Group, here in its type area. The Penarth Group is a well-bedded mostly marine unit and is faulted against the older marginal deposits. For the next hour or two we combed the sequence for fossils while the leader attempted to explain the rapidly changing environments which characterise the Penarth Group, and tried to convert members to his belief that St Mary's Well Bay contains some of the best geology in the country. We finished the day examining the overlying Lias Group beds, and attempting to establish the lowest occurrence of the basal Hettangian zonal ammonite, *Psiloceras*. After freshening up back at the Walton House, most participants headed for the fleshpots of Penarth, only to find that Penarth scores very poorly on the fleshpot scale. Nevertheless, we found excellent eating places, and a particularly Bacchanalian feast took place in the Chinese restaurant on the sea front, where we took it in turns to be embarrassed (or embarrassing).

Sunday dawned overcast and a short, sharp shower caught out the early birds who ventured out for provisions in Penarth. However, it soon cleared up to give another warm, fine day, which began with a visit to the cliffs and shore at Lavernock Point. The older rocks exposed are contemporary with those around Sully, but here, only three kilometres or so away, they are developed in quite different facies, and consisted of red mudstones, siltstones and dolomites, much like those exposed in and around Leicester. We also studied the transition from these largely continental rocks to the marine deposits of the Penarth Group, and also walked west into the bay beyond Lavernock Point to see the lower Lias Group beds. By now a happy camaraderie had built up in the party and it was with some reluctance that the party dispersed after lunch in the nearby pub. However, a few hardy souls followed the leader along the west bank of the Severn into England for an afternoon visit to Garden Cliff near Westbury-on-Severn, where once again we studied the 'theme with variations' that is the transition from Late Triassic continental rocks to those of the marine Penarth Group. Here the most notable features in what is perhaps, historically, the earliest Penarth Group exposure to be recognised and studied, are the splendid trace fossils and ample small vertebrate material in the Westbury Formation beds. And so at last after an excellent weekend for geology, weather and good company, we made our way back to Leicester.

Andrew Swift

## GEOLOGY OF THE SCUNTHORPE AREA

At 10.30am on 20th of May seventeen members of the section and two guests met at the North Lincolnshire Museum, Scunthorpe for our first field trip of the year and of the new millennium.

After a quick look round the geology gallery we assembled in a meeting room where our leader for the day Mr. Steve Thompson of the museum service gave a very good talk on the geology of the North Lincolnshire area. His talk was illustrated with some nice slides of many of the pits and quarries in the district, some of which looked promising for future excursions.

Afterwards the group took another look at the museum, including an excellent section on early history with Stone, Bronze, and Iron age exhibits.

Lunch was taken at a local public house where the group tried the various meals on offer, most of which had interesting names.

With lunch over we were led off in a long convoy to our first pit of the day. Crosby Warren is a large disused pit that has some good exposures of the Lias clays, Frodingham Ironstone and marlstone beds similar to those at Tilton on the Hill. Also well exposed at about halfway down the face are the Pecten beds, distinctive units with large numbers of this bivalve in thin laminae. They were not easy to extract in good condition but some reasonable specimens were collected. As we left the pit it was very nice to see at a face in the glacial sand deposit at the top of the pit some Sand Martins making their nests.

To reach the next pit we again formed a convoy to drive across the vast steelworks site to the pit at Yarborough. The sequence was explained to the group but we were not allowed to enter the pit. We were, however, given free range over a very large heap of ironstone at the entrance to the pit. This produced many fine specimens of bivalves including *Gryphaea arcuata*, *G. mccullochii*, *Cardinia* ssp. and *Pholadomya* sp. I'm afraid the wonderful ammonites sometimes seen in the Frodingham Ironstone were conspicuous by their absence, but it was a very enjoyable day with every one pleased with the geology seen and with the collecting.

We thanked Steve Thompson, our leader, who had put in such a lot of hard work to make the day interesting and enjoyable and left for home.

Dennis Gamble



## KETTON MAIN QUARRY, 30th JULY 2000

Professor John Hudson of Leicester University, our leader for the day, met the nineteen members and four guests at the quarry gates on a clear sunny morning. It was very nice to see such a good turnout. Professor Hudson said a few words on the basic geology of the Ketton area and handed out a set of photocopies detailing the stratigraphy and also the fossil fauna that may be found.

The party were then led into the quarry in their cars, this being necessary because of the large area of the quarry. At the southern end of the quarry Professor Hudson pointed out the Rutland Formation with its rhythmic cycles of deposits.

Above the Rutland Formation is the Blisworth Limestone. This is a fine-grained limestone with plenty of fossils, mainly the oyster *Praexogyra* but also other bivalves and brachiopods.

The Blisworth Clay which overlies the Blisworth Limestone is made up of shaly clays at the base, with siltstones above, then thicker beds of blocky clays above that. Fossils can be found in a thin bed of limestone above the shaly clays. The group spent a while collecting some very nice specimens from the fallen material at the base of the quarry face.

Professor Hudson then led the party to an area in the centre of the quarry where a sump hole had been dug through the Lower Lincolnshire Limestone and the Grantham Formation into the Northampton Sands. The bottom of the hole just reaches the top of the Upper Lias. Again the party collected from the heap of spoil from the hole which contained fossiliferous ironstone and some rock from the Upper Lias.

Still in our cars we crossed the floor of the quarry to the north east face. Here we had our packed lunches sitting on rocks overlooking the area we would be collecting from in the afternoon. I think there can be nothing nicer than sitting in the sunshine with the skylarks singing, eating sandwiches, surrounded by wonderful fossil bearing rocks.

Lunch over, Professor Hudson explained the sequence at this end of the quarry. The darker Cornbrash was easy to spot and was seen to be repeated by complex faulting. Above the

Cornbrash we could see the Kellaways Formation with Kellaways Clay passing into Kellaways Sand. There has been speculation that clay at the very top above the sand layer could be the base of the Oxford Clay Formation.

The members of the section spent an enjoyable hour looking for and finding some very nice fossils. The bivalve *Pholodomya* and brachiopod *Obovothyris* were plentiful and some people managed to find specimens of the characteristic ammonite *Macrocephalites* and the oyster *Lopha marshii*. I would imagine everyone came away with plenty of good material for their collections and a mind full of fascinating geology. It's not every day you can go into a quarry that covers the whole succession of the Middle Jurassic from the Upper Lias to the Oxford Clay.

We thanked Professor Hudson for the wonderful field trip he had organised and then we left for home.

Dennis Gamble.

*From PAUL MONK, a selection of quotes from the archives....*

Most of the Lit & Phil's archives are stored in the Leicestershire Record Office in Wigston. Early meetings of the Society were reported in the local newspapers and the reports of geological interest can be located in one of the early newspaper cuttings albums:

March 26th., 1841.

Mr. Hollings exhibited a fossil found at Staunton Harold. He reported to the meeting that a saurian of immense proportion was recently discovered at Barrow. About ten feet of the fossil was currently uncovered. He proposed that the object was well worth the attention of the Society.

April 30th., 1830.

Mr. Lawrence announced that he had received a collection of five hundred fossils from Berlin. The collection was specimens from the Tertiary Formation that had been properly arranged. The price asked for was that offered to the Society originally. He concluded by saying that the gentleman with whom he had corresponded promised to send some more specimens on approval.



## THE ORIGINAL DARWIN?

Lamarck and Cuvier wrong; Darwin right! That's the message we've all been given through our schooling, isn't it? Think about it though, these two Frenchmen and many other people can't all have been in total ignorance where the subject of speciation and evolution are concerned. Animal breeders such as Robert Bakewell must have had ideas not too far removed from those claimed by Charles Robert Darwin in his 'Origins'.

What you are about to read is a bombshell. In 1982 a book was published, entitled 'Evolutionary Concepts in the Nineteenth Century' and its author, James Dempster, wrote in its preface:

'It is a very English distortion of scientific history which claims that evolution by natural selection was a scientific innovation first promulgated by Charles Darwin. It has been a popular myth in England for so long that the name of the great man has become synonymous with evolution itself.

However, in 1831 a Scots commercial fruit grower and hybridist - Patrick Matthew - published a book entitled *Naval Timber and Arboriculture*. This book was the culmination of twenty years' field work and observation. For the first time the term appeared in print, 'natural process of selection', which Matthew regarded as the fundamental law of evolution.'

Matthew's book made no apparent impact and Perth Library went so far as to ban it! The 'Origin' appeared in print for the first time in 1859; it was reviewed widely in the national press, which is where Matthews saw what was written, which left him a bit miffed, to say the least! Matthews even predicted something along the lines of what we now know of as DNA! Dempster continues in his preface:

'Outraged, Patrick Matthew confronted Charles Darwin with his 1831 publication and staked his claim for first enunciating the principle of evolution by natural selection. Darwin, honourably enough, made a public acknowledgement of the claim. But the furore nationally was over *The Origin of Species* and not only all of the praise but all the obloquy as well was directed at Darwin. During all this furore Patrick Matthew's contribution disappeared almost without trace.

That *The Origin of Species* stimulated interest in evolution and natural selection throughout the world is historical fact. But Darwin claimed that the theory was entirely original and his own and that he owed nothing to his predecessors. This was entirely false, but it was and still is largely believed.'

A second pivotal character is portrayed in detail in Dempster's book. This was Edward Blythe, who wrote a series of 'Essays' between 1835-37 in the *Magazine of Natural History*. Dempster has shown that Darwin relied on many of the detailed observations Blythe made in his Essays. After his return to England in 1836, Darwin had access to all the published material of Matthews, Blyth and others of the previous decade. Dempster has, through carefully researching various documents of the time and through collating the work of others (notably Loren Eiseley) that 'Darwin's autobiography is unreliable and his *Historical Sketch* was economical with the truth. The priority and originality of the so-called Wallace-Darwin theory is disputed. It is also revealed that Darwin scholars down the years have been rather careless with historical accuracy.'

Jim Dempster has done what all good historians do, and that is not to rely on any documentary evidence, other than primary sources. Without going into a mass of detail here, Dempster has shown that Darwin knew of published material which fed him ideas. That said, the American science writer, Loren Eiseley, wrote extensively in the 1950s concerning his doubts over Darwin's originality, given the availability of published information.

To quote Dempster again: 'For over a hundred years English academics have taught that evolution (a word Darwin never used in any edition of the *Origin*) is Darwinism and Lamarckism is no more than the inheritance of acquired characteristics. The 'injustice' Lamarck has suffered was initiated by Charles Lyell, was continued for many years by Darwin, savagely reinforced by Thomas Huxley and perpetuated by Alfred Wallace.'

Having ploughed through Dempster's book - it is by no means light reading - I am left wondering how it is that the truth can be ignored by the scientific community. Is it because we are entrenched in some kind of 'establishment' myth-making? Matthews and Blythe weren't exactly nobodies, though they weren't as big a somebody as C.R. Darwin and his powerful connections. Part of the establishment maintaining and reinforcing the myth of Darwin's presumed originality was the Huxley connection.

Now, was it the Bunsen Burner that wasn't invented by Robert Bunsen, or was it the Davy lamp that wasn't invented by Humphrey Davy? I can't remember, though what I do know is that whichever key development it was happened to be made by the humble assistant who was a comparative nobody. Thirty years ago I saw brilliant scientific work being carried out by technicians who very often came up with new leads and innovations when research got stuck. Not once did the technicians get a mention when a research paper was published. Nowadays I'm happy to say that the majority of research team leaders publish the names of the entire team - and in alphabetical order.

In an age where figures who make history are constantly undergoing debunking we may not feel comfortable to find that our heroes had feet of clay. Had Darwin uttered something like Newton about only seeing further because he had stood on the shoulders of giants, I imagine we wouldn't think of Darwin as being quite so arrogant in the light of the work of Eisely and Dempster. I personally hope that Jim Dempster can make it to Leicester to tell either Section C or the Parent Body about his research into Darwin's unacknowledged sources. This would make a particularly interesting talk if it was to follow the one planned on Wallace's work. In a recent phone conversation though, Jim said that he is no spring chicken and that Leicester is a long way from his home in the New Forest...

GS

Rhaetian: Any indistinct era of non-deposition.

Septarian nodule: A dense mass which you are certain contains a superb fossil and which, after time-consuming and strenuous breaking down of said nodule, contains absolutely nothing.

Turbidite: The person who always takes copious notes during the Winter Talk season.

Umbo: Naff clothing masquerading as suitable attire for fieldwork.

Vulcanism: Experienced on the morning after the final night of a fieldwork residential.

Weathering: Sitting in damp, steamy cars and mini-buses while only the very hardy trudge off in the rain to examine some non-starter of an exposure.

## AUTUMN FUN by Joanne Norris

See if you can find the 36 words listed at the bottom of the page. They are all items associated with our recent summer field programme. Words can be found either horizontally, vertically, diagonally or backwards. Happy Searching!

C	O	R	L	A	R	T	S	E	N	E	F	J	E	O	S
R	I	P	P	L	E	S	L	A	V	E	R	N	O	C	K
I	L	S	T	E	W	A	R	T	B	Y	O	A	O	O	C
B	E	D	S	A	B	A	S	A	L	T	D	U	L	R	A
N	J	U	R	A	S	S	I	C	S	N	I	T	I	A	R
A	M	M	O	N	I	T	E	D	I	Z	N	I	T	L	C
E	T	I	D	I	B	R	U	T	L	T	G	L	E	A	N
N	E	N	O	T	S	M	T	G	T	R	H	O	G	V	O
O	E	M	Q	U	A	R	R	Y	Y	A	A	I	E	A	I
Z	M	A	N	I	E	O	R	P	R	U	M	D	N	R	T
O	I	S	C	T	E	O	H	S	L	Q	O	S	O	O	A
I	G	R	S	M	U	E	S	U	M	Y	U	N	T	O	C
B	E	Y	N	C	A	C	I	M	O	R	S	M	S	T	C
M	O	N	S	A	L	D	A	L	E	T	I	T	E	L	I
Y	S	N	H	A	R	D	G	R	O	U	N	D	M	E	S
W	A	L	E	S	E	P	E	N	A	R	T	H	I	T	E
A	Y	R	U	B	T	S	E	W	J	S	O	I	L	S	D

AMMONITE  
BASALT  
BEDS  
BIOZONE  
BONE  
CORAL  
DESICCATION CRACKS  
FENESTRAL  
FRODINGHAM

GRYPHEA  
GYPSUM  
HARDGROUND  
IRONSTONE  
JURASSIC  
LAVA  
LAVERNOCK  
LIMESTONE  
MERCIA  
MUDSTONE

MICA  
MONSAL DALE  
MUSEUM  
NAUTILOIDS  
OOLITE  
OYSTER  
PENARTH  
QUARRY  
QUARTZ

RIB  
RIPPLES  
ROOTLETS  
SILT  
SOIL  
STEWARTBY  
TRIASSIC  
TURBIDITE  
WESTBURY





Xenolith: Items in your collection of no known provenance, apart from originating from the bottom of your ruck-sack, having been there for yonks.

Yardang: A loud shout from a distant corner of a quarry, announcing the Fossil Find Of The Day.

Zweikanter: The bdbdbdbdbdbrrdrbrrr sound when you twang a ruler over the edge of a table.

...and there you have it - a complete A to Z with no mention of cleavages, exposures, thrusts, cross-bedding (or indeed any kind of bedding) arsenolites or any other arsenic-bearing mineral, tool-marks, vents, upthrusts, dykes, bottom-feeders/dwellers, smectite or rudites!