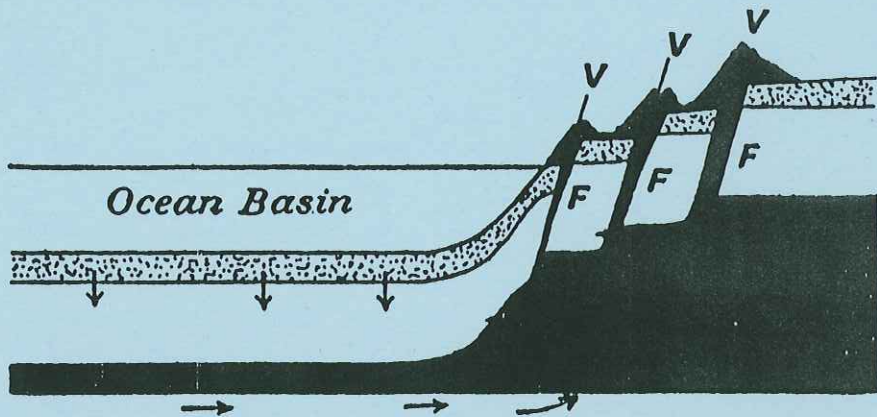


CHARNIA

AUTUMN 2004 EDITION



22.—VOLCANIC ERUPTIONS DUE TO THE PLASTIC MATERIAL (BLACK) DISPLACED BY THE SINKING OF THE FLOOR OF THE OCEAN BASIN RISING UP THE STEP FAULTS (F) AND ESCAPING THROUGH THE VOLCANOES (V).

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

Website: www.charnia.org.uk

Programme of indoor meetings 2004/2005

All held at 7.30pm on the Leicester University campus, in Lecture Theatre 3, Ken Edwards Building, except where stated. Meet from 7.00 in seminar room 322

Details: Chairman Andrew Swift, 0116 2523646, as48@le.ac.uk or Secretary Joanne Norris 0116 2833127, joanne.norris@ntu.ac.uk

Wednesday October 6th

Prof Andy Saunders (Dept of Geology, University of Leicester) - 'Mantle plumes and volcanoes'

Wednesday October 20th

Sue Beardmore (ex-Utah Museum of Natural History, USA) - 'Letters from America: fossil excavations in Utah, USA'

Wednesday November 3rd

Professor Ian Fairchild (School of Geography, Earth and Environmental Sciences, University of Birmingham) - 'Underground secrets'

Wednesday November 17th

Dr Ian Sutton (School of Continuing Education, University of Nottingham) - 'Aspects of New Zealand geology'

Wednesday December 1st

Dr Jason Hilton (School of Geography, Earth and Environmental Sciences, University of Birmingham) - 'Carboniferous coal swamp extinction: an alternative hypothesis from China'

Wednesday December 15th

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

2005

Wednesday January 12th

Barry Hunt (IBIS Ltd., London) - Title TBA. Theme: Building Stones

Wednesday January 26th

Professor Dick Merriman (BGS, Keyworth) - 'The role of clay minerals in recycling crustal rocks'

Wednesday February 9th

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

Monday February 21st

Parent Body Lecture, to be held at New Walk Museum, Leicester. Professor Chris Stringer (Natural History Museum, London) - 'The Ancient Human Occupation of Britain (AHOB) Project'

Wednesday February 23rd

Dr Rosalind White (Leicester) - 'Volcanism, impact and mass extinctions: incredible or credible coincidences?'

Saturday March 5th (whole day)

Saturday School, Ken Edwards Building, University of Leicester. 9.30 am - 5.00 pm. Theme: Earth and Life Interactions.

Wednesday March 9th

Dr Simon Lewis (Queen Mary College, London) - 'Middle Pleistocene glaciations in the English Midlands'

Wednesday March 24th

AGM and Chairman's address - Andrew Swift (Department of Geology, Leicester University) - 'Geological highlights of the Midlands. 3. Ketton Quarry, Stamford'

Abstracts of Winter Programme talks 2004

Abstract of talk scheduled for Wednesday October 6th: 'Mantle Plumes and Volcanoes' by Professor Andy Saunders, Dept of Geology, University of Leicester.

Mantle plumes were proposed in the 1960's and 1970's by Jason Morgan and J. Tuzo Wilson to account for so-called hotspot volcanism, such as that found in Hawaii and Iceland. Initially thought to be near-stationary, plumes provided a useful reference frame for plate motions, and helped to develop plate tectonic theory. However, they have generated both support and antipathy in the Earth science community. The proponents invoke plumes to account for uplift of the lithosphere in places remote from orogenic belts; the formation of flood basalts and their associated environmental impacts (including mass extinctions?) the movement of mass and energy from the deep Earth interior, the shaping - perhaps even the formation - of continents and last, but not least, the creation of numerous exotic holiday destinations within the world's oceans. The opponents, on the other hand, argue that plumes are neither necessary nor exist; there is no evidence that proves their existence, and that their apparent effects, as listed above, are best explained by other processes. Recently, the discussion has become especially vigorous¹, although some may argue that this has resulted in more heat than light.

Beginning with a modern working definition of mantle plumes, I will review briefly some of the evidence that I believe provides strong support for their existence. Although plumes can be imaged by various seismic techniques, it is not possible to 'see' them directly. We can, however, observe their effects on the Earth's surface: primarily, uplift and volcanism. Are there really any alternative models that can explain Hawaii, flood basalts, swells and aseismic ridges as convincingly as mantle plumes?

The plume model has been with the Earth science community as long as plate tectonic theory. Like lithospheric plates, plumes and their interactions are complex and poorly understood. However, news of their demise is premature. The real challenge for Earth Scientists is to fully integrate plume and plate tectonic models into a single, coherent model.

¹<http://www.geolsoc.org.uk/template.cfm?name=NakedEmperor>

Abstract of talk scheduled for Wednesday October 20th: 'Letters from America: fossil excavations in Utah, USA.' By Sue Beardmore, ex-Utah Museum of Natural History, USA.

The Grand Staircase- Escalante National Monument in southern Utah, USA, is situated on the western side of the Colorado Plateau where an almost complete stratigraphic succession of Mesozoic rocks is exposed. The area surrounding the Henry Mountain intrusions also show a similar succession though the beds near the top have been removed by erosion. Both areas are of interest to the Utah Museum of Natural History as the Kaiparowits Formation of the Upper Cretaceous has produced many vertebrate localities. Using the help of volunteers and students from the University of Utah, excavations have revealed a high number of Hadrosaurid dinosaurs, other rarer dinosaur groups, and turtles. Bivalves, gastropods and plant debris occur in dense horizons throughout the formation, though the latter often occurs close to the skeletons excavated, revealing something of the transportation processes at the time of deposition. The high density of river channels are consistently filled by sand, fining upward into silts of the massive floodplain environment envisaged for the Kaiparowits.

Abstract of talk scheduled for Wednesday November 3rd: 'Underground secrets' by Professor Ian Fairchild, School of Geography, Earth and Environmental Sciences, University of Birmingham.

Nestling within karstic limestone terrains are caves, many decorated with calcareous deposits (stalagmites, stalactites, flowstones) known collectively as speleothems. The geomorphological context of caves is important to speleothem formation - in terms of (1) climate, vegetation and topography, (2) host limestone aquifer properties (it stores and transmits the water that drips into the cave) and (3) in controlling the air circulation which affects speleothem chemistry and growth. There is currently much interest in unravelling the details of their formation so that we can understand climate history in particular regions. For example, the annual growth phenomena of speleothems have only recently started to be studied and these are producing varied insights into climate and cave processes. Speleothem results in turn help those who are testing the climate models that are used to predict future climate

change. Examples of caves and speleothems are shown from a variety of sites in western Europe.

Abstract of talk scheduled for Wednesday November 17th: 'Aspects of New Zealand Geology' by Dr Ian Sutton, School of Continuing Education, University of Nottingham.

Originally New Zealand was part of the great Gondwana continental mass. About 100 million years ago it finally separated from Australia and Antarctica and has since developed an identity of its own. Making it even more exciting it sits astride a plate margin which separates the Indian/Australian Plate from the Great Pacific Plate. It is right on the Pacific "Ring of Fire" ! The plate margin varies from different types of subduction and strike slip and it does mean that the area is extremely active tectonically. In this lecture we will trace the geological history of the country but spend more time investigating the current setting and activity.

Abstract of talk scheduled for Wednesday December 1st: 'Carboniferous coal swamp extinction: an alternative hypothesis from China' by Dr Jason Hilton, School of Geography, Earth and Environmental Sciences, University of Birmingham.

In Europe and North America coal swamp ecosystems and their diverse coal forming floras dominated lowland depositional settings during the Upper Carboniferous. Numerous lines of evidence show these floras died out in the earliest Permian, typically associated with large scale changes in environment and climate marked by the onset of red bed deposition. These changes in biota have been interpreted as a major terrestrial extinction episode during which more than 60% of known terrestrial species and genera died. This talk will show this evidence and detail the demise of the coal swamps in Europe and North America, using this to elaborate new information discovered from other parts of the world, most notably China. Recent findings from the Palaeozoic floras of China show a remarkably different pattern of plant extinction, distribution and ecological stasis from that known in Europe and North America, and lead us to conclude that many of the previous concepts of plant biogeography and palaeofloristics have to be fundamentally reconsidered. So, what were the Permian floras of China? This talk will answer that question.

THE BUILDING STONES OF NORTHAMPTONSHIRE.

Sunday July 11th 2004

I can never understand how in a year of so many wet, rainy days we manage to get such good weather for our field meetings. Sunday the 11th turned out to be a fabulous hot sunny summer's day for the twelve members who met at Churchfield Quarry near Oundle in Northamptonshire. Dr. Diana Sutherland, our leader for the day, gave the group an introduction to the local geology and to the geology of the quarry, providing everyone with a handout explaining the relationship with the rest of the area.

The quarry is disused and partly overgrown but there is still plenty to see of the Blisworth Limestone, quarried for here for many years and used in the villages locally. The boundary with the Blisworth Clay can be seen approximately two metres up from the bottom of the exposure. Quiet a number of fossils were found during the time we spent here, the brachiopod *Kallirhynchia* (possibly *sharpi*) were found in considerable numbers. Other genera found were *Modiolus*, *Pleuromya*, *Trigonia* and a few of the brachiopod *Epithyris*. A reasonable specimen of the echinoid *Clypeus* was found plus one or two smaller echinoids as yet unidentified.

Our next port of call was Lyveden New Bield, some two miles from the Quarry. This is a National Trust property and is unusual in that it may look like a ruin but in fact it was never completed. The building was started in 1595 by Thomas Tresham, his death in 1605 and then the death of his son, who was executed for his part in the gunpowder Plot some months later, meant that it was never finished. It is set in gently rolling hills with fine view of the open countryside that surrounds it. Built of local Blisworth Limestone with Weldon Stone dressings it would surely have been robbed of stone for other buildings in the area were it not for the estate cottage nearby.

Lunch was taken at the Chequered Skipper at Ashton, a delightful country pub. Most of the group sat on the green in front of the pub to eat their sandwiches and admire the village setting. Although the village looked pretty something did not look quite right: it appeared too well set out. We were informed by Diana that

it was built in the early 1900's by one of the Rothschilds. That explained it, it hadn't grown - it was designed.

The afternoon was spent in the town of Oundle looking at the way in which local stone was used for most of the smaller houses but it was seen that some of the larger properties used Weldon stone especially for the windows and quoins.

The church is very handsome and has some interesting grave stones. From the church we rambled through past the older buildings of Oundle School and along the main road looking at the Talbot Inn (Weldon Stone) and Paine's Cottage built of local Blisworth Limestone. This has Weldon Stone for its quoins, it also has a gate which reputedly comes from Kirby Hall. We returned to the Talbot Inn via Oundle School memorial chapel, built in 1922-23 of Weldon Stone, where we thanked Diana for a day of wonderful and informative geology in this lovely part of Northamptonshire.

Dennis Gamble.

Diana's book 'Northamptonshire Stone' is published by The Dovecote Press Limited, ISBN: 1-90434917X.

IMPORTANT NOTICE: The Autumn trip to Derbyshire has been cancelled.

BLOCKLEY BRICK PIT, 22 August 2004

A visit to Blockley Brick Pit is always a good day out, but as it can get very muddy underfoot in bad weather, it was with a feeling of apprehension that everyone turned up on the Sunday morning. During the previous week there had been quite a lot of rain but down in the pit our original fears were unfounded as most of the area was reasonably free from mud.

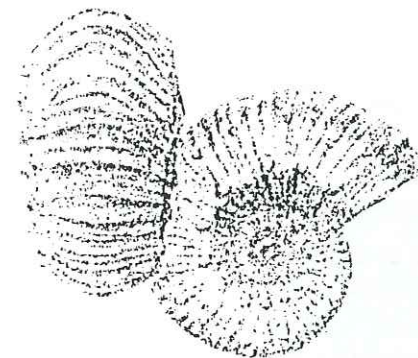
Our leader, Dr. Mike Howe of the British Geological Survey, based at Keyworth, Nottinghamshire, gave an introductory explanation of the geology found in the pit and provided everyone with a detailed handout.

Those members who came to the field meeting at Holwell and Tilton will know that the old names for the formations there have changed and that we now have the Dyrham Formation and Marlstone Rock Formation for the old Middle Lias, and that the Upper Lias is now the Whitby Mudstone Formation. This was as a result of the whole of the Lias being reviewed by the Jurassic Stratigraphical Framework Committee (Chairman M.G.Sumbler.) at the B.G.S. and so the Lias Clays of the Lower Jurassic at Blockley, also examined, are now called the Charmouth Mudstone Formation. (For those people with an internet connection the report can be downloaded from the B.G.S. website, look for Research Report Number RR/99/01 by Cox, Sumbler and Ivimey-Cook.)

After looking at a fresh exposure that showed the nodule bed quite well everyone went off to look for fossils. Good specimens of *Mactromya cardioides*, *Pseudopecten acuticostata*, *Pleuromya costata*, *Gryphaea gigantea* and an *Astarte sp.* were found on the area the company uses as a stock pile. Gastropods proved a little more elusive with only a few *Eucyclus subimbricatus* turning up, and reasonable specimens of Ammonites were restricted to *Liparoceras cheltense*, although most of the members went home with a nice example.

At lunch time we all sat around and discussed the finds we had made during the morning before another hour or so was spent searching for yet more pieces to take home. In the middle of the afternoon, with everyone hot and tired, we thanked Mike for giving up his time to lead the day for the section and all the members headed off for home.

Dennis Gamble



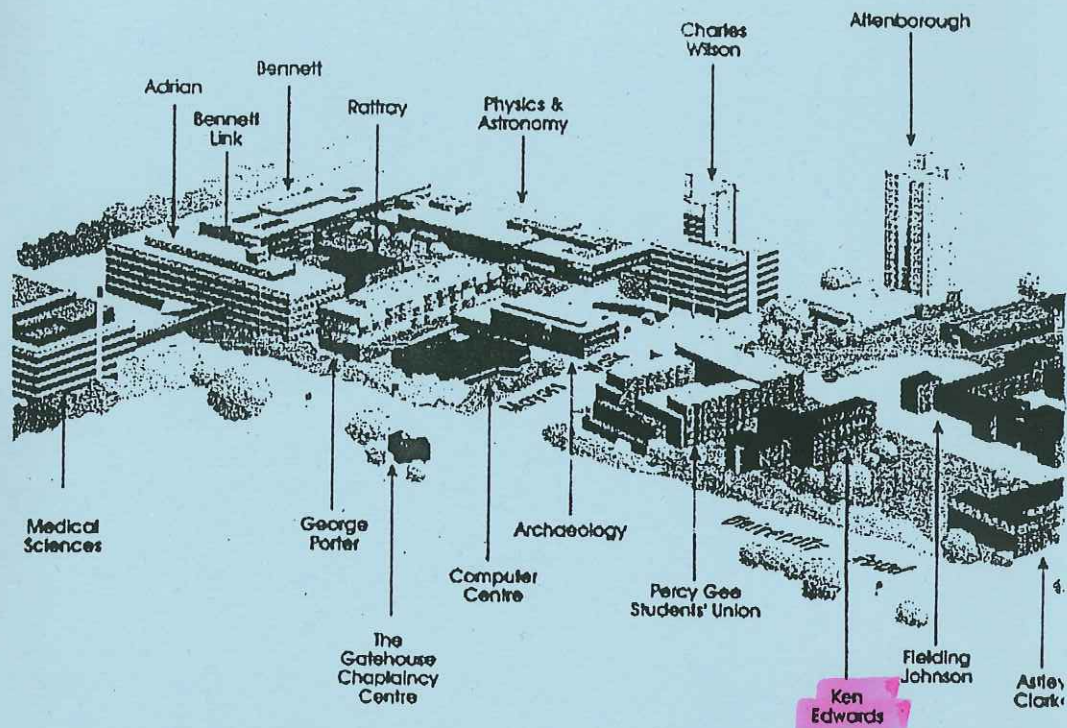
'Charnia' website - Progress report

The Section C website (www.charnia.org.uk) has progressively developed over the last twelve months and is steadily raising its profile since the change of domain name to charnia.org.uk last November. Certainly, its ranking on the UK's most widely used search engine - Google - has significantly increased, though efforts still need to be made on some of the other online services.

One of the most effective means of increasing the overall awareness of the site is through 'cross-linking' with other already well-established websites managed by other geological societies. This strategy is being pursued, and already a number of neighbouring societies have agreed to provide links to our site in exchange for links to their own. The Yorkshire Geological Society (www.yorksgeolsoc.org.uk), for example, is presently undertaking an 'overhaul' of its own site and is providing links to a selection of specific pages in charnia.org.uk to help it build an online resource of field reports and other information broadly dealing with aspects of the geology of northern England. Likewise, our own site is developing beyond merely being a 'shop window' for the Society's current activities and events and steadily becoming a valuable information resource in its own right. With time, we should accumulate an extensive body of information with a strong emphasis on local geology and reflecting the long and distinguished history of Section C. As such we must endeavour to maintain a simply structured website that will be of value to all with an interest in geology - whether amateur, professional or merely interested members of the public.

I would like to thank all who have contributed material to the site to date, and hope that we can continue to attract articles, field reports, and especially photographs, to build on what has been achieved so far.

Dennis McVey



NEW VENUE FOR MEETINGS

We are still awaiting confirmation that the indoor programme will be held in the Ken Edwards Building (Lecture Theatre 3). However, please assume that the talks will be in this new venue unless you hear otherwise. The Ken Edwards Building is next to the Student Union Building just near the main car park.

STOP PRESS - VENUE CONFIRMED!

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