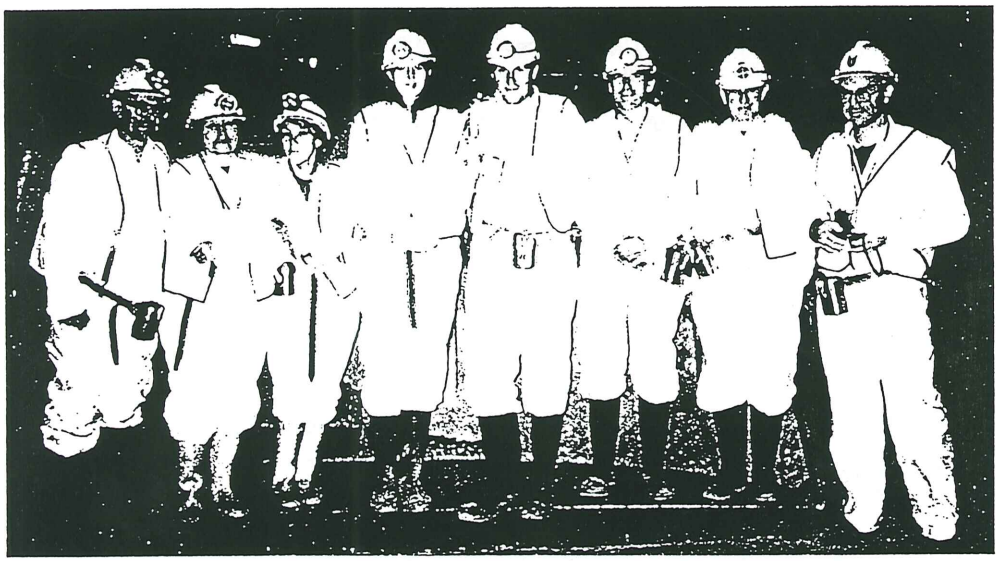
CHARNIA

LEICESTER

LITERARY AND PHILOSOPHICAL

SOCIETY



THE NEWSLETTER OF

SECTION C (GEOLOGY)

AUTUMN 1995 EDITION

Leicester Literary and Philosophical Society
Geology Section

Winter Programme 1995/6

All meetings are held on Wednesdays at 7.30 p.m. in Lecture Room 10 in the Dept. of Geology at Leicester University, unless otherwise stated. Coffee available from 7 p.m. Use car entrance no. 2, and enter Bennett Building via doors facing Mayor's Walk

1995

4th October The Magic Flute Cast - geological correlation with Mozart
Dr Alf Whittaker (B G S)

18th October Gold: where, why and how *Dr Jeremy Richards (Leicester University)*

1st November What really happened at Krakatoa
Dr Alan Woolley (The Natural History Museum)

11th November **(Saturday)** Open Day at Leicester Museum & Art Gallery
10.00a.m. - 12.30p.m. *(then adjourn for a pub lunch)*

29th November Revolution in publishing geology *Dr Marge Wilson (Leeds University)*

13th December Members Evening - Bring Your Own - *Specimens etc., Food, Drink*

1996

8th January **(Monday)** 7.30p.m. 'Meteor Impacts and the History of Life' *Dr Simon Conway-Morris (Cambridge)* Joint Parent Body Meeting

10th January Geochemistry and the environment of developing countries
Dr Jane Plant (B G S)

24th January What's new in teaching Earth Science *Dr Evelyn Brown (Open Univ)*

7th February 'Surely they don't need protecting - they're only rocks?'
Dr Keith Duff (English Nature)

21st February Members Evening - short presentations of slides

9th March **(Saturday)** "Origins & Innovations: the first 200 million years of vertebrate evolution" ***Vaughan College Saturday School.***
Organised by Dr R J Aldridge & Dr M A Purnell (Leicester Univ)

13th March ANNUAL GENERAL MEETING, Chairman's address
Mount Bardon Volcano *Dr Mike Le Bas*

Here are some details of forthcoming talks and speakers:-

Dr. Alf Whittaker - (The Magic Flute Cast, October 4th.)

Mozart's last and perhaps best known opera 'The Magic Flute' was written and first performed in Vienna in the year of his death, 1791. The opera was inspired and the text partly written by famous geologists who were close friends of Mozart and who were scientifically active at this important period of transition when geology was fast becoming an established science.

The meaning of the opera has puzzled experts since the first performance. Detailed analysis shows that the story and music describe the alchemical process, sometimes known as the 'chymical wedding'. Like geology, chemistry too was leaving its magical, medieval past. Understanding of the early history of these sciences and the related practical techniques and materials makes clear the intent of the authors and the inspiration to this Magnum Opus.

Dr. Whittaker graduated from the Universities of Durham and Newcastle and has spent the whole of his career with the British Geological Survey. In the early part of his career he carried out field mapping in various parts of the United Kingdom but transferred to the newly-formed Keyworth-based Deep Geology Unit in 1977. He is presently Head of Petroleum Geology and Basin Analysis, operating out of Keyworth and Edinburgh, carrying out consultancy and advisory work on behalf of the BGS in the fields of deep geology, tectonics, petroleum geology and seismic hazard.

Dr. Jeremy Richards (Gold: Where, Why and How, October 18th.)

Dr Jeremy Richards, one of our Committee members, is one of the younger lecturers in the Geology Department. His speciality is mineral genesis, especially of gold and the base metals. He has mapped and prospected for gold in SE Asia, and has just spent most of the summer studying copper deposits in Chile, which he describes as a "moving experience" (seismically). Travelling is said to be the making of the good geologist. He qualifies. After graduating at Cambridge, he did a master's degree at Toronto, Canada, a doctorate at Canberra, Australia, then returned to Canada, Saskatchewan, and finally came here in 1992. He is a keen supporter of doing everything on a Apple Mac computer which he additionally puts to producing the Departmental Newsletter.

Dr.Alan Woolley (What really Happened at Krakatoa, November 1st.)

The large eruption of the Krakatoa volcano in August 1883 is legendary, having been immortalised in a Hollywood film but, more importantly, it is the first eruption to have been studied thoroughly in a scientific manner. There is a wealth of contemporary records, eyewitness accounts and numerous illustrations, including photographs that only came to light at the time of the centenary of the eruption, from which an accurate picture of what really happened can be constructed. The talk will be fully illustrated and both early ideas on the mechanisms of the eruption and more recent interpretations will be discussed.

Dr. Woolley is Head of the Petrology and Meteoritics Division at the Natural History Museum, London, where he has worked since 1966. Dr.Woolley has worked on alkaline igneous rocks, fenites and carbonatites after developing a taste for alkaline rocks from Basil King, PhD. tutor at Bedford College, University of London, which entailed work on the Borralan Complex, Scotland.

Dr.M. Wilson (Revolution in publishing geology, November 29th.)

Dr Marge Wilson is a Reader in the University of Leeds. She graduated at Oxford, followed by a year at University of California, Berkeley. Next was a doctorate at Leeds on the igneous rocks of S Greenland. In 1989 she published the highly successful student text book "Igneous Petrology - a global tectonic approach", which became a best-seller. Now she is the Chief Editor of the Journal of Petrology, the leading international journal on igneous and metamorphic rocks. Publishing used to be a matter of putting words on paper, adding diagrams and getting that printed. That is becoming too costly. She will present some challenging thoughts on other ways of communicating information.

November 11th (Saturday)

We return to the Museum for this meeting - transposed to Saturday, as we were unable to obtain this venue for the regular wednesday evening slot. We shall be based in the Council Room, as usual, where tea, coffee, etc. will be available throughout the morning. I understand John Martin is going to 'bring up' a special exhibit for us.

During the morning "behind-the-scenes" tours will be available at regular intervals - anyone wanting to book certain time slots, let me know. The new exhibition area will be available to browse around - sorry, we can't oblige with a wedding amongst the dinosaurs, but you'll likely come across other surprises around there! - come and find out! There will also be some on hand to explain/answer your questions. A pleasant, informal gathering for all the family - come and go as and when you wish, and for those who so desire - adjournment for a pub lunch after!!

I look forward to seeing as many of you as possible on November 11th

Eliz Bellamy

December 13th (Members Xmas Meeting)

Bring the products of your summer field trips (or come and see others) - where evertone's been, what they've brought back - specimens, bits and bobs, pictures (no slides and talks please, we seem to run out of time for these - save them for the New Year meeting!)

Food and drink to share makes for a good informal gathering - dinosaur cake and dinosaur turd were on offer last year!! I look forward to sharing an enjoyable evening with you on Dec. 13th

Eliz Bellamy

Here are two other meetings of interest, organised by the East Midlands Geology Society. Further details may be obtained from Mr. A.J.Filmer on 0115-9663854:-

Geology of the Moon and Planets in relation to the Earth, 6.30pm, Saturday, October 21st.,1995. The speaker is Dr. David Baker.

Middle Pleistocene Hominids and their environment in Sussex, 6.30pm, November 18th.,1995. The speaker is Dr. Mark Roberts - and yes! This is the Researcher and the Site which has received a lot of publicity (the thigh bone in June and the tooth this September; the place - Boxgrove).

Any correspondence - queries or articles, will be most gratefully received.

GS

***Reader's Beware!!* - Riddle of the Mystery Letters**

Are you a lucky winner this time? - has your envelope been chosen to contain a mystery stamped-addressed envelope, origin unknown?

If it has, don't panic, just pop it in the post and send it on its way!

Several times now I have received phone calls wondering as to the origin, and what to do with the afforesaid post enclosed with your Charnia - a very puzzling phenomena to find a reasonable explanation for. It is certainly unlikely to have occurred at source - I would have noticed the additional "erratic" envelope when packing Charnia. I also doubt of Doug would have had such mailings around when addressing the envelopes.

A possible explanation (others welcome!) is that it happened during the mailing process:- with the envelope flaps tucked in (not sealed), a stray letter slips inside during the collection, sorting and delivery process! - chance and all that!!

Perhaps someone mathematically inclined may like to calculate the odds on that - sorry no prizes for being a lucky winner!

Eliz Bellamy

BANTYCOCK QUARRY, NEWARK, APRIL 30th.,1995.

This visit was attended by just over a dozen Lit. & Phil members, under the leadership of Andrew Swift. Bantycock is an intermittently-used gypsum quarry, exploiting two main seams in the higher beds of the Triassic Mercia Mudstone Group. For the geologist, the main interest in the quarry lies in a full sequence of Penarth Group (Rhaetian = latest Triassic) beds.

The passage from the arid playa lake environments, represented by the Mercia Mudstones via the Blue Anchor Formation and the three units of the Penarth group, to the fully marine Lias Group deposits at the top of the quarry is beautifully exposed and is easily accessible.

Especially interesting are the beds of the early Rhaetian Westbury Formation, which are the first expression of the late Triassic transgression in the Midlands. These contain bone beds, isolated vertebrate fossils and many other unusual forms (mostly molluscs) including starfish. Towards the top of the quarry is a single bed representative of the Langport Member - better known in southern counties as the 'White Lias'.

In spite of being steered by a completely unbiased leader toward the splendid exposure of Penarth Group deposits, Lit. & Phil. members homed-in on the more spectacular Lias Group beds at the top of the quarry in a (successful) search for the vertebrate fossils for which the Group is renowned.

An intended short visit to Staple Quarry nearby, where a comparable sequence is exposed, turned into a much longer stay as members delighted in collecting a spectacular wealth of Lias Group fossils from the freshly exposed faces of the quarry.

Andrew Swift

GEOPHYSICS AT MANOR ROAD, MAY 20th.,1995

On a rather chilly afternoon, a dozen budding geophysicists met Ian Hill at the University's Manor Road playing fields, the home of the Environmental Geophysics Test Site. This facility has been constructed to act as a proving ground for new methods for the detection of shallow underground structures. This type of work is increasingly in demand for investigating environmental safety near land-fill sites, redeveloping urban sites and assessing geological hazards, such as landslips and caverns.

A valuable spin-off is that this area of well documented buried objects makes an excellent teaching and demonstration area. Members of the Lit. & Phil. were shown how to use magnetic and electrical surveying methods to detect buried drums, pipes, walls and cavities.

While some of these 'black boxes' provide instant automatic success, the discovery that a clothing zip can have a greater magnetic effect than a buried wall and the consequent care needed in collecting and checking measurements (no - there were no volunteers for the nude control experiment!) put the achievements of the 'Geophysics Bods' on the 'Time Team' programmes into context.

Some must have enjoyed the experience, judging from the volunteers to do it again!

Dr. Ian Hill, Leicester University Geology Department.

British Gypsum Works, Barrow-on-Soar, June 24th.,1995.

We're tempted to say, "So do senna pods..." - but that's how the mine is signposted! What is Terracotta, Buttermilk and Dove Grey? Anyone living in the Soar Valley will instantly recognise the livery of British Gypsum.

A long wheelbased Land Roverful of Lit. & Phil. members took the opportunity of being British Gypsum's guests for a tour of the mine and surface works. We all took the plunge, via a 1 in 5 adit roadway, to the working depth at 175 metres below ground level.

The Barrow-on-Soar mine processes pink plaster for the construction industry. The product is 80% anhydrous calcium sulphate, with 20% mudstone impurity. (The white Plaster of Paris is open-cast mined at Gotham.) Only one bed of gypsum is mined - the Tutbury Horizon.

The underground galleries form a reticulate pattern, extending up to a mile eastward from the adit. The roadways and galleries within the Tutbury seam are excavated by £3M monsters or, more properly, Dosco TB2000 Continuous Mining Machines. These would not be out of place on a science-fiction film set - they eat their way forward at an average of three metres per hour. Each machine has three motors driven by a 3.3kV supply from an 11kV underground sub-station. Two of the motors, rated at 250hp, drive the twin cutting heads while the third motor, rated at 200hp, operates a mid-line conveyor which dumps the mined material behind the machine.

Each conical cutting wheel has hundreds of tungsten steel teeth, costing £8 each. Occasionally, patches of anhydrite are encountered, which can rapidly cause excessive and expensive wear. When this occurs, the anhydrite actually fetches sparks - remarkable for a mineral with a maximum hardness of 3.5!

A different species of underground monster, a ten-cylinder diesel Wagner 'Scooptrain', transports the mined material from the galleries. These large machines (see picture on front cover - the Lit.& Phil. party are standing in the scoop: photo courtesy of Richard Flude) are relatively inexpensive, costing only £170 000.

The floor to ceiling height of the roadways and galleries is around two metres - which is a little disconcerting when the overhead clearance varies with each bounce as the Land Rover bowled along.

The 'Scooptrains' dump gypsum onto conveyors, providing a feed to the surface of 250 tonnes per hour. All of the large underground machinery has to be dismantled at the surface into bite-sized chunks, to be reassembled once underground. Diesel fuel is piped underground, via one of the many prospecting boreholes.

Borehole analysis indicates that the Tutbury Bed thickens towards the south-east and - with planning permissions - the works has many years capacity ahead, provided that flue gas desulphurisation continues to be inefficient! The mine began operation in October, 1984.

British Gypsum's operation at Barrow-on-Soar is very labour unintensive, there being only seven people underground at any one time. On the surface, a 50 000 tonne stockpile of gypsum is stored in a huge conical building. Homogenisation, milling and dehydration prepare the gypsum for bagging in a fully automated plant - there are no lights and no windows in this huge building because no people are required to operate the plant...

Susannah Haynes & Graham Stocks

BLOCKLEY PIT - AUGUST 20th.,1995

Like so many days this Summer, the weather for this visit proved to be memorably excellent. A party of fourteen, comprised of not only members of the Lit. & Phil. but guests from the Essex and Warwickshire groups too, toured the brick works and kept their feet dry!

This is an exception, for the clays at Blockley can only be rivalled for stickiness and sinkability by the London Clay at Sheppey. Given such dry conditions, the day's finds were noteworthy; several interesting bivalves saw daylight, some unknown even to Roy Clements... A currently unidentifiable Gastropod was also found. Perhaps the nicest find of the day was a large bed of the echinoid ***Aspicidaris*** sp.

If anything, the unusually arid conditions made the recovery of specimens somewhat difficult, as all but the lowest clays were baked solid. The lowermost strata revealed a bed of ***Belemnites*** sp. The best fossil specimens, nicely weathered-out, were to be found on the spoil heaps to the east of the pit. Some flattened specimens of the ammonite ***Polyphyllites*** were found in new exposures.

Thirty million bricks were stockpiled at Blockley earlier in the year, though much of that has gone. With an upturn in the construction industry, it looks as though expansion (downwards) may prove interesting. If you wish to visit the site yourself, please arrange through me.

Peter Blake.

A DIFFICULT DECISION.....

In June, 1995 Scotland's longest planning inquiry came to an end, and a decision is now awaited from Ian Lang, Secretary of State for Scotland.

The inquiry was concerned with plans submitted by Redland Aggregates to dig what would be Europe's largest quarry on the Isle of Harris to extract millions of tons of rock from Roineabhal mountain for road building.

Two years ago the Western Isles Council overwhelmingly backed Redland. Jobs would be created in a very depressed local economy, and they considered that the benefits would outweigh the disadvantages.

But a referendum held recently show a majority of the islanders opposed the plan. An emergency meeting was held in Stornoway, and the Councillors reversed their earlier decision. The Council has now written to the Secretary of State asking that he ignores the Council's earlier submissions in favour of the plans.

It is difficult to guess what Ian Lang will think - he could even order fresh hearings to take place.

And just what would the correct decision be ?

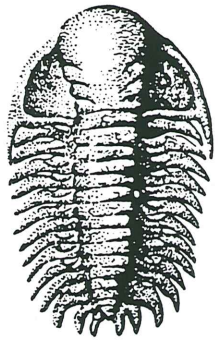
I for one do not know.

Roger Newman,
June 1995.

QUIZ ANSWERS.

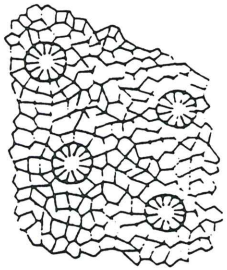
The ten questions that I set in the little quiz in the issue of CHARNIA with five colliding space shuttles on the cover did all have answers - honest !
The answers that I intended, and explanations are below:
Question 1. How many ways can a chess set be correctly set out at the start of a game? Take the white men first. The line of eight pawns can be arranged in a total of 8 x 7 x 6 x 5 x 4 x 3 x 2 x 1 ways, 40,320.
Then the rooks can be changed over, as can the knights and bishops, 40,320 x 2 x 2 x 2, a total of 322,560 for the white men. Similarly for the black men, which gives 322,560 x 322,560.But there is a final vital step. The board itself can be turned round, so I think the total is 322,560 x 322,560 x 2, a grand total of 208,089,907,200 !!!!
Question 2 Numbers again ! What will increase by 629 million during 1995 ? The thing that I had in mind was Leicester six figure telephone numbers. The change of code and the addition of the 2 meant that 0553 became 01162 in front of each number, and I think that is an increase of 629 million.
Question 3. In Leicester the odd bird out from brambling, chaffinch, kingfisher, magpie, stonechat and woodpecker, is magpie. The others are all used in street names.
Question 4. From Telesto, Rhea, Phobos, Minas and Calypso, the odd one out is Phobos. This is a satellite of Mars, the rest should be in orbit round Saturn.
Question 5. From ants, apes, asses, owls, apples and oranges, the odd one out is oranges.Adding 'gr' to each of thge others gives a new word, but not oranges. There are no groranges !
Question 6. The anagram of pictures is piecrust.
Question 7. Part of the fascination of fossils is the name. Of the names in the question five are fossils, Productus corrugatus, Passaloteuthis apicicurvata, Heliolites porosus, Conolus albogalerus and Cheirurus binucronatus.
The odd one out, Botaurus lentiginosus, is not a fossil, but a bird, the American bittern, a winter visitor to Britain.
Question 8. From static, sphere, cube, scope, plane, phobia,the odd one out is cube.Putting 'hydro' in front of the others gives a new word - There is no hydrocube.
Question 9. A similar solution to this one. Putting 'geo' in front gives a new word to all except practical. Geophysical, geometric, geomagnetic, geological, and geographic.
Question 10. The odd one here is draw. The past tense of all the others rhymes with 'ought' - taught, fought, bought, caught, and brought.
I hope that you found something of interest, and that I was fair.
Delay in publishing the solutions is regretted, but to have too much for publication is a healthy sign.
In future, should I have a future, answers will appear in the same issue as my questions, unless I go mad and start offering prizes !!!!

Roger Newman, 1995.

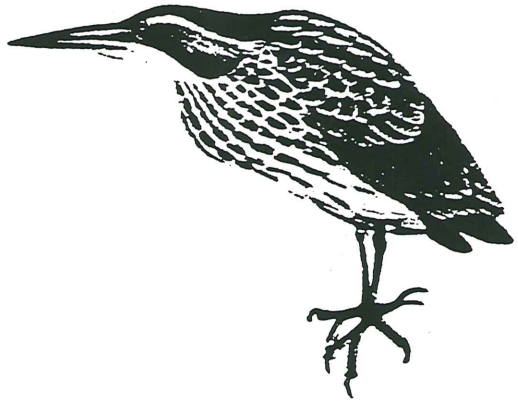


Cheirurus bimucronatus

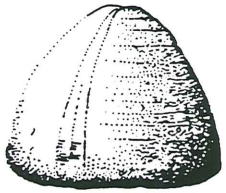
Productus corrugatus



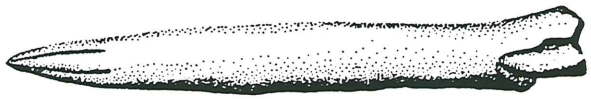
Heliolites porosus



AMERICAN BITTERN
Botaurus lentiginosus 30 in.



Conulus albogalerus



Passaloteuthis apicicurvata

LEICESTER LITERARY & PHILOSOPHICAL SOCIETY

GEOLOGY SECTION

Committee 1995/6

Life President: Dr Robert J King
Longdon, Tewkesbury, Glos.

Chairman: Dr Mike Le Bas
Geology Dept
University of Leicester
Leicester LE1 7RH
Tel: 2523647

Vice Chair: John Martin
Leicester Museum & Art Gall
New Walk
Leicester LE1 6TD
Tel: 2554100

Secretary: Eliz Bellamy
11 Bennetts Hill
Dunton Bassett
Lutterworth LE17 5JJ
Tel: Leire 209314

Asst. Sec.: Dennis Gamble
13 St. Helen's Close
Leicester
LE4 0GR
Tel: 2539786

Treasurer: Doug Lazenbury
39 Station Road
Countesthorpe
Leicester LE8 3TA
Tel: 2776407

Field Sec.: Peter Blake
35 Holbrook Road
Long Lawford
Rugby CV23 9AH
Tel: Rugby 550965

Committee: Graham Stocks *(Editor)*
63 Barrow Road
Quorn
Loughborough LE12 8DH

Roger Newman
5 Highgrove Cresc.
Leicester
Leicester LE2 8PX

Dr Jeremy Richards
Geology Dept
University of Leicester
Leicester LE1 7RH

Student Rep:
Peter Stevens
Geology Dept
University of Leicester

Co-opted: Dr Trevor Ford
21 Elizabeth Drive
Oadby
Leicester LE2 4RD

Colin Green
45 Warwick Ave
Quorn
Loughborough LE12 8HE

Dr Roy Clements
Geology Dept
University of Leicester
Leicester LE1 7RH