



The Black Country Geological Society

NEWSLETTER NO. 114

DECEMBER 1995

The Society does not provide personal accident cover for members or visitors on field trips. You are strongly advised to take out your own personal accident insurance to the level you feel appropriate. Schools and other bodies should arrange their own insurance as a matter of course.

Leaders provide their services on a purely voluntary basis and may not be professionally qualified in this capacity.

The Society does not provide hard hats for use of members or visitors at field meetings. It is your responsibility to provide your own hard hat and other safety equipment (such as safety boots and goggles/glasses) and to use it when you feel it is necessary or when a site owner makes it a condition of entry.

Hammering is seldom necessary. It is the responsibility of the hammerer to ensure that other people are at a safe distance before doing so.

FUTURE PROGRAMME

Lecture meetings are held in the Banquet Room (Dudley Suite) at the Ward Arms Hotel, Birmingham Road, Dudley. Phone: (01384) 458070. 7.30 p.m. for 8 o'clock start.

MONDAY 15th JANUARY 1996. Lecture: "The Great Dyke of Zimbabwe" by Dr. J.I. Langford (Birmingham University)

The Great Dyke is a major geological feature in Zimbabwe and it contains substantial mineral deposits, especially of chromite. Dr. Langford's lecture will first give an overview of the geology of Zimbabwe, followed by a more detailed account of the Dyke and its mineralisation, and then it will cover the mining of chromite with a description of mining methods.

The lecture will be illustrated by 'holiday' slides of the country as well as some taken of mines and their workings above and below ground.

DR. LANGFORD is Reader in Crystallography in the School of Physics and Space Research at Birmingham University. His involvement in the Zimbabwe project arose from his interest in crystallographic analysis of ore deposits; he is associated with the SAREC project, a Swedish-based activity to assist developing countries, in this case to develop

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F.I.E.E., M.I. Mech.E.

Zimbabwe's chromite resources which are of particular value in the manufacture of stainless steel.

MONDAY 19th FEBRUARY. 7.45 p.m. ANNUAL GENERAL MEETING (see notice in this newsletter). All posts of officials and committee members are up for annual election. Any nominations for election should be given to the Secretary or can be declared at the AGM.

Followed at 8.00 p.m. (approx) by a lecture "Tales of a travelling geologist" by Graham Hickman (Society member/British Petroleum).

We are delighted to welcome as our speaker GRAHAM HICKMAN who is one of our long standing members, joining as a junior in 1978 and keeping up his membership ever since, even when living abroad. In his work for British Petroleum he has lived, among other places, in Egypt and Houston, Texas, and has travelled to Kenya, India, Japan, Gulf of Mexico, Alaska, and now living near London he is coming up specially to speak to us.

In the lecture Graham will describe some of his experiences as a geologist and will also cover some of the techniques used in the search for oil.

MONDAY 18th MARCH. Lecture: Mass earth movements, climatic changes and civil engineering: recent catastrophic mass earth movements in North Wales. By Dr. Addison (Wolverhampton University/St. Peters College Oxford).

Ken Addison writes: " In North Wales in June 1993 heavy rainfall on the plateau surfaces, limestone cliffs and steep slopes of the Great Orme near Llandudno triggered slope failures at 30 sites. Overland water flow and eruption of new springs initiated debris flow, debris slides, rockfalls and mudslides. This led to a complex pattern of failure which severely damaged Marine Drive, closing it for 9 months with a loss of toll revenue and involving costly repair.

Erosion of the slopes revealed a complex and highly variable assemblage of angular limestone rubble, glacial sediments, tufa, buried soils and slopewash, indicating a series of mass earth movements over a long period of time during and since the Late Devensian cold stage.

In this lecture I will investigate the geotechnical aspects of the slope failures and propose an environmental reconstruction of the 1993 (and earlier) mass earth movements here and in Snowdonia. They have implications for future engineering and landscape management of the Great Orme, Marine Drive and A5 roads, and other British montane slopes."

KEN ADDISON is Senior Lecturer, School of Applied Sciences, University of Wolverhampton, and Supernumerary Fellow & Tutor in Physical Geography, St. Peter's College, Oxford. He has made a special study of North Wales geology and in particular its glacial history, and has written several guides and booklets. A selection of these will be on sale at the meeting.

APRIL - DATE TO BE ADVISED. Weekday visit to Winsford Salt Mine, Cheshire.

THURSDAY (note THURSDAY) 25th APRIL. Lecture: "Monitoring active volcanoes: procedures and prospects". By Dr. W. McGuire (centre for Volcanic Research Cheltenham & Dept of Geological Sciences UCL).

SUNDAY 19th MAY. Field meeting to Wirksworth, Derbyshire. Leader: Kate Ashcroft (Society member).

MONDAY 17th JUNE. Evening field meeting to Saltwells Nature Reserve. Leader: Alan Cutler (Society Chairman).

MONDAY 1st JULY. Evening field meeting to Kinver. Leader: Alan Cutler (Society Chairman).

SUNDAY 14th JULY. Field meeting to The Roaches, north Staffordshire. Leader: Don Steward (Stoke-on-Trent Museum).

SATURDAY 7th - FRIDAY 13th SEPTEMBER. British Association Annual Festival held for 1996 in Birmingham. Details available from BAAS Office:

Fortress House
23 Saville Row
London W1X 1AB
phone: 0171 494 3326

SUNDAY 29th SEPTEMBER. Field meeting to Alderley Edge, Cheshire, for Triassic strata and an underground visit to one of the copper mines. Leader: Tony Browne (Manchester Geological Association).

MONDAY 7th OCTOBER. Lecture: Underground limestone mining in Shropshire by Dr. Ivor Brown (Consultant).

Editorial

There's a hidden geological agenda behind so many news stories. A member sent me an item on the war in Chechnya. Why do the Russians fight so ruthlessly, (it is claimed that 30,000 lives have been lost) over the small and seemingly insignificant republic of Chechnya? Answer: Oil. Chechnya lies astride a pipeline taking oil from the Caspian to the Black Sea and with the discovery of vast reserves in Kazakhstan the route will be of immense strategic importance. Alternative routes for this oil are through Georgia and Azerbaijan. The geological background to the news came centre stage at the Commonwealth Prime Ministers' conference in New Zealand when the executions in Nigeria dominated the conference. Members of the Ogoni tribe had been protesting at the problems created by oil drilling in the Niger delta. Geology isn't just a past time for eccentric fossil hunters. Many people lose their lives for it.

The December editorial gets written in Mid November and tinsel and turkey seems a long way off. I do wish you a Happy Christmas and a peaceful New Year.

Reports

Field Meeting to Lathkill Dale, Derbyshire. 24th September 1995.

This was a joint meeting of the Manchester, Shropshire and Black Country Geological Societies. Leader Dr. Cynthia Burek of the Open University provided a very thorough account of the local glaciation and provoked a great number of questions and much debate.

Derbyshire was not high enough to generate its own ice sheet but obtained its ice from outside the area. Glacial deposits are rare in the area. At high levels they are represented largely by erratics. Only in the valleys are glacial deposits found, notably in Shining Bank Quarry (232648) which has a very fine lodgment till (deposited by moving ice) up to 14 metres thick overlying the Monsal Dale Limestone which is being actively quarried. Unfortunately, for safety reasons, we were not allowed in the quarry. We saw very clear striations on the erratics lying just within the quarry boundary and striation directions indicate a north-south ice movement. The till is completely unsorted and contains clay minerals and sand. It is low in calcium despite originating within the area of limestone. Erratics are normally of local origin, limestone, dolerite or basalt. The ice travelled from the north, from the Cheshire basin, and its path was blocked by the more stationary eastern ice.

The Anglian ice has left little evidence in this area and the Devensian did not reach so far south so it must be of 'Wolstonian' age. Dating the till is very difficult as there is no organic matter in it, thus it cannot be carbon dated. Much of an earlier till appears to have been washed underground down fissures into caves and a new technique is being applied using stalactite and stalagmite material buried in this till for uranium-thorium radiometric dating. It's too old for carbon dating but the Edale shale content is rich in uranium.

Through the gates of a Quarry, again not accessible to us, at Long Rake at 172640, we could see pockets and layers of orange, well sorted material which is described in the literature as 'silty drift'. There is no till here but loess (quite unlike the European loess in its high feldspar content) mixed with clay and angular chert which are the weathering products of the underlying limestone. Loess is wind blown dust from periglacial conditions. Its unusually high feldspar content is thought to originate from the weathering of the lowest beds of the Kinderscout grits. Cryoturbation is thought to have mixed the wind blown element with the weathered residues. These silty drift deposits are widespread and are assumed to be Devensian.

At Hassop col we were able to visualise the topography over which the ice moved from the Derwent valley into that of the Wye. Uplands like Great Longstone ridge prevented the ice moving into the area to the north and west so that areas like Long Rake are devoid of till but as the ice moved south, till is concentrated in the area around Bakewell.

An addition to the day was a guided tour of the building stones of Bakewell.

K.M. Ashcroft

Geology of the Solar System . Illustrated talk by Dr. Bob Owens of the University of Wales. October 9th 1995.

This talk concentrated on the small planets, because the large ones are gaseous and have no geology except in their satellites.

The Moon was the first planet to be studied, but mineral samples produced more knowledge than previous remote sensing. There are more craters on the far side, which has fewer maria. The craters are due to meteorite impacts, and overlap. The rims are brecciated, and have concentric fracture zones. The main maria are giant craters, dark because they have been filled with flood basalts from the mantle, similar to Earth areas such as the Deccan.

Maria impacts occurred late in the history of the Moon, so their surfaces have fewer craters. The edges of the basins are high ground, but there are also ridges formed by individual lava flows and from faulting, or lava having risen up through a fault. There are some small volcanoes in large craters, with ash, faults and rills like rivers but dry. These may well be collapsed lava tubes. There are straight rills, like rift valley fault scarps.

The favoured theory for the formation of the Moon is that of giant meteorite impact with the Earth early in its history, when some material separated to form the Moon. Its chemical composition is slightly different from that of the Earth. It is richer in calcium and titanium and poorer in volatiles, which have been boiled off. Condensation at high temperature is consistent with higher Ca/Ti. The 24 hour spin is also related to this, or the Earth would be a very different place.

Meteorites in Antarctica have been concentrated by ice movement and can be found easily. They resemble Moon rocks. Some absolute dates have been obtained from Moon rocks. These show dates back to 4.2 million years and up to 3.2 m.y., but there has been no activity since except later craters.

Mercury has craters similar to the Moon but has no maria. Sinuous ridges may be escarpments of reverse faults. They are widespread and may imply that Mercury shrank on cooling. It is also frozen in time.

Mars rotates like the Earth, with a similar axis and time. Mariner confirmed its cratered state. There is frost near the poles, and a tenuous atmosphere, and large shield volcanoes. Concentric fractures and tension faults are present around craters, with updoming, and rills like on the moon. One rift valley is as large as the width of U.S.A. Dendritic patterns suggest that water existed, but in too low a quantity to produce an atmosphere. There are ice polygons, and boulders consistent with glaciation. Half of Mars has impact craters and half has not. Volcanoes are extinct.

Some meteorites may be from Mars. Some are like our igneous rocks, but contain a different type of nitrogen from Earth rocks. They may have been thrown into Earth orbit after impact, and many have an age 3.1 m.y.

Venus has a shroud of clouds but can be studied by radar. It has continents, a rocky surface consistent with basalt, and a temperature of 700 °C. Plains form most of the surface, but the highest mountain is a volcano and there is also a rift valley. The many volcanoes have ring and radiating fractures, and concentric "arachnoid" areas not seen on other planets. The crust may not be rigid like the Earth and shows fewer craters than the Moon. It is 500 m.y. old, but some features may be younger after volcanism.

The planets are individually unique. Callisto, a satellite of Jupiter, is peppered with craters and is 4500 m.y. old. Rhea, satellite of Saturn, is similar but also has icy material. Triton, of Neptune, is the coldest planet, with a temperature of minus 235 °C. It revolves the opposite way, so may not always have been in its present state.

Many other examples were given of similarities and differences between planets. Dr. Owens gave us a fascinating talk, and took us on the ultimate geological journey.

Sheila Pitts

Geology in the Canaries - Sun, Sand and Volcanoes by Dr. John Stanley, Associate Director of Adult Education at Keele University. 30th October 1995.

The Canary Islands are very new; less than 3 million years old. Parts of Lanzarote have a Martian landscape. The volcanics on this island are older at either end and younger in the middle. The island shows the familiar features of oceanic volcanic eruptions, craters, scoria, ash, ropy lava, dykes and lava tubes. The eruptions of the seventeenth thirties show limited vegetation cover but after five thousand years the lava is well vegetated. The eruptions were largely of ash and pools in the ash in the south are deeply green from the activities of diatomaceous algae. Brown ochrous ash denotes eruptions which took place under the sea.

The basalt shows inclusions of olivine, perhaps peridotite from the upper mantle or possibly cumulates. Columnar jointing is common and the tops of the flows are rubbly. In places the lavas are veined with caliche, which is drawn up through the lava by capillary action. The caliche has been extracted and used for lime. Vegetation may have been destroyed as a source of fuel in the lime making process. Marine cut platforms in the lava may result from changing sea levels associated with glacial events in more northerly latitudes. Limestones, conglomerate and sandstone beds with solution hollows where shells once were, are indurated beach deposits. These also may be a result of fluctuating sea levels.

The deposits from the north east of the island are 5000 year old volcanics without free silica so they decay to clay soils. The people construct rectangular basin-like fields and take soil to them, overlaying it with volcanic ash to improve water retention.

Tenerife is higher with more rainfall and hence has more vegetation. It shows much variety of vulcanism. Towering cliffs on the western side show ignimbrites while elsewhere Surtsey-like tuff rings are seen. Situated on the edge of a large caldera with lava flow ramparts, Teidi, the highest mountain, is of pyroclastics. Within the crater are ash cones. The lavas on Tenerife are varied, some being quite acidic.

The theory that the islands lie on a hot spot is gaining favour but the variety of lava types may be a result of fractionation or contamination.

Dr. Stanley's talk was very well illustrated by a wealth of good slides.

K.M. Ashcroft

Conservation Column

Colin Reid of Dudley Museum is spearheading a bid to have the Wrens Nest and Castle Hill area given the status of a World Heritage Site on account of its outstanding geology. For this he has prepared an 'Outline Proposal for World Heritage Status' listing its special geological importance, highlighting the diversity of fossil species and the exceptional quality of their preservation. This document was to be presented to the World Heritage Secretariat in London on 10th November with the aim of having the site included in GILGES - Global Indicative List of Geological Sites.

To reinforce the application he is also organising a publication '*Castle Hill/Wrens Nest Dudley. Faunal list for the Middle Silurian System (Wenlock and Ludlow Series)*'. By consulting old records and current authorities he has identified over 600 fossil species, with their references in the scientific literature, which have been found at the site. Over one third of these are believed to have Dudley as their type locality.

If the bid is successful, World Heritage Status would possibly enable the site to attract additional funding for conservation and developments such as a visitor/interpretative centre.

News in Brief

1. Dr. Fraser's Fossils

Have you visited the small new permanent geology gallery in Wolverhampton Art Gallery? The Victorian-style display is particularly suited to children. The collection of some 10,000 fossils, rocks and minerals was bequeathed to the borough of Wolverhampton in 1911 for the education and enjoyment of the people of the borough. Items from the collection are displayed in the gallery and you are invited to discover how an 180 million year old fish becomes a fossil, guess who is likely to become a future fossil, listen to a talking geological clock and see what Wolverhampton was like millions of years ago.

2. University of Bristol

Details and booking: Dr. P.G. Hardy
Dept for Continuing Education
8 - 10 Berkeley Square
Bristol BS8 1HH
phone: (0117) 928 7155

(a) Geology in Tenerife. Study tour. 26 Jan-2 Feb 1996. based at Playa Paraiso near Playa de las Americas. Cost £485 approx £50 local travel.

(b) Geology in North West Scotland. Study tour based at Ullapool. 30 June - 5 July 1996. Cost for tuition £105 - NOT including travel and accommodation.

(c) Santorini: geology and scenery. Study tour. 7-21 Sept 1996. Cost £635.

3. 'GEOLOGY TODAY' MAGAZINE

GEOLOGY TODAY is a lively magazine for amateurs and professionals with a wide range of articles, news and other items.

BCGS members have a 20% discount on the annual subscription to GEOLOGY TODAY making our subscriptions for 1996 £24.00. When making or renewing subscriptions, members should indicate that they are BCGS members.

Last month's issue had a lively article by our Vice Chairman, Graham Worton.

Enquiries and orders for GEOLOGY TODAY to:

Journal Subscriptions
Blackwell Science Ltd.
PO Box 88
Oxford OX2 ONE
phone: (01865) 206206

4. Lapidary Publications

84 High Street, Broadstairs, Kent CT10 1JJ are offering a 25% reduction on the prices of a list of books up to Christmas. The list is available from me - phone 0121 308 6783 for a copy.

5. Welcome to new members

Derrick King (Solihull).
Ann Nicholds (Dorridge).

I have run out of puzzles so am reprinting last months. Has anyone completed it? How about designing some for me to use in the New Year?

Find the geological term which is an anagram of each of the following words:-

- | | | | | |
|---------------|----------------|----------------|-----------------|-----------------|
| 1. Parcel | 2. Skater | 3. Lament | 4. Master | 5. Patho |
| 6. Remote | 7. Grouse | 8. Insert | 9. Result | 10. Cocaine |
| 11. Citadel | 12. Caterer | 13. Marline | 14. Aimless | 15. Trainer |
| 16. Tertian | 17. Artiste | 18. Picture | 19. Destiny | 20. Gardenia |
| 21. Formulae | 22. Clothier | 23. Intended | 24. Neurosis | 25. Milestone |
| 26. Triteness | 27. Antimonial | 28. Indiscreet | 29. Neotropical | 30. Typographer |
| 31. Introduce | 32. Course | 33. Endive | 34. Sliver | 35. Creative |
| 36. Platen | | | | |

By "Tamia"

Editor

Kate Ashcroft
48 Worcester Lane
Sutton Coldfield
B75 5NB

Tel: 0121 308 6783

Secretary

Paul Shilston
16 St. Nicolas Gardens
Kings Norton
Birmingham
B38 8TW

Tel: 0121 459 3603

BLACK COUNTRY GEOLOGICAL SOCIETY

NOTICE IS HEREBY GIVEN that the twentyfirst annual general meeting will be held at 7.45pm on Monday 19th February 1996 at Ward Arms Hotel, Birmingham Road, Dudley.

AGENDA

1. Apologies for absence.
2. Minutes of the AGM held on 20th February 1995.
3. Statement of accounts and Treasurer's report.
4. Chairman's annual report.
5. Election of officers and committee.
 - (a) chairman.
 - (b) vice-chairman.
 - (c) secretary.
 - (d) treasurer.
 - (e) three committee members.
 - (f) hon.auditor.
6. Any other business.

The retiring officers and committee members are :

Chairman: Alan Cutler Vice-chairman: Graham Worton.
Secretary: Paul Shilston Treasurer: Judith Shilston.

Committee members: Sue Fairclough Chris Jowitt Peter Smith
Hon.auditor: Mr.G.Hubbard ACA.

ALL POSTS OF OFFICERS AND COMMITTEE MEMBERS are up for annual election.

NOMINATIONS for any of the posts of society officers or committee members should be sent to the Secretary or can be declared at the AGM.

SUBSCRIPTIONS 1996

Membership subscriptions WILL BECOME DUE on 1st January 1996 and can be paid at any meeting or to the Treasurer :

Mrs.J.Shilston
16 St.Nicolas Gardens
Kings Norton
Birmingham B38 8TW.

SUBSCRIPTION RATES ARE AS FOLLOWS :

Individual member	£10	per annum
Family membership	£14	per annum
Full-time student	£3	per annum
Group membership	£28	per annum

BLACK COUNTRY
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NAME :

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Cheques should be made payable to BLACK COUNTRY GEOLOGICAL SOCIETY.