



# The Black Country Geological Society

NEWLETTER No. 57 - June, 1986

## Editorial

Items which are not strictly news are sometimes published in newsletters in response to requests. In this issue we conclude Kate's summary of the Triassic new nomenclature, and begin a two part feature on soil.

Members will recall that Margaret Oliver recently was awarded a Ph.D. for her study on soil in the Wyre Forest. In response to the many people who wish to understand more about soils, she has compressed her considerable knowledge into a summary suitable for the newsletter.

May I apologise to members for the delay of some weeks in the arrival of the last newsletter. This was due to a breakdown in the photocopier.

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## Forthcoming Meetings:

Sunday: June 15th. Field trip to the Potteries, North Staffs.

Wednesday: June 25th. Briefing meeting for:-

Sat. - Sun: June 28th/29th. Weekend field trip to Llangollen.

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Indoor Meetings are held at the Saracen's Head, Stone Street, Dudley: 7.30 p.m. for 8.00 p.m. start. Field Meetings commence from outside the Saracen's Head unless otherwise stated. Those who would like lifts for field meetings, please contact Graham Whorton (Dudly 213207).

### *Chairman*

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### *Field Secretary*

*N.G. Bradley*

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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 insurance to the level which you feel appropriate. Schools and other bodies should arrange their own insurance as a matter of course.

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Programme 1986:

June 15th, Sunday: Field trip to the Potteries, North Staffs. led by Dr. L. Boardman of the National Coal Board. Meet at 10.30 a.m. at Mow Cop Folly, grid ref. SJ 857572.

June 25th, Wednesday: Briefing meeting at the Department of Extramural Studies, Winterbourne, Edgbaston Park Road, Birmingham, for:-

June 28th/29th, Sat./Sun: Weekend field trip to Llangollen, departing from the Geology Dept., Birmingham University at 8.30 a.m. Leader Dr. D. Gobbett. To visit Lower Palaeozoic fossils, slates, volcanics of the Berwyn anticline, Carboniferous rocks of Eglwseg, and the drift geology of the Dee Valley.

7th September, Sunday: Field trip to Charnwood Forest, led by Dr. T. Pharaoh of the British Geological Survey. He is currently working on the concealed Precambrian geology of the Midlands.

5th October, Sunday: Field trip to Staple Edge, Forest of Dean. Joint trip with the Shropshire Geological Society.

17th November, Monday: "Magmatic Processes at Mid-Ocean Ridges". Talk by Dr. R. Bradshaw of Bristol University.

8th December, Monday: "New Zealand Geology and Scenery". Illustrated talk by Sheila Pitts, based on a five week tour of North and South Islands.

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GOODBYE TO THE BUNTER - PART TWO

The Triassic of the West Midlands

There is no palaeontological evidence of the Permo-Triassic

boundary. Areas from Stafford and Worcestershire illustrate the upward transition from continental fluviatile to deltaic littoral marine deposits.

1. Sherwood Sandstone Group

- a) At the base are the conglomeratic Kidderminster and Polesworth formation (formerly the Bunter Pebble Beds).
- b) The ultimate disappearance of rounded extraclasts marks the ill-defined base of the Wildmoor Sandstone Formation (formerly the Upper Mottled Sandstone). These deposits provide no objective evidence of their age.
- c) The Bromsgrove Sandstone formation locally rests unconformably on the Wildmoor Sandstone Formation. It shows clear sedimentary cycles with fining upwards. The lower cycles show formation in braided or low sinuosity channels, the higher cycles in more meandering river channel and flood plain complexes. The macro-fossils are usually facies related but attempts have been made to correlate with the Standard succession.

2. Mercian Mudstone

The junction is often gradational. The only widespread distinctive unit is the Arden Sandstone, which broadly separates a thick mudstone sequence with some sulphates and halite from an overlying thinner mudstone which lacks halite. Miospores

indicate a late Triassic age.

### 3. The Penarth Group

Generally the dark Westbury Formation, mudstones with a marine fauna, pass up via increasingly calcareous mudstones into limestones and shales. The rich fauna is comparable with late Triassic faunas but does not permit direct correlation with the Standard sequence.

The newly named groups are thus lithological divisions, and research is going on to correlate units with the Standard sequence.

The tables in the report illustrate the degree of accuracy with which formations in different areas of the British Isles can be correlated with the stages of the Standard sequence, and I urge members to consult the report. I would also make a plea for further field trips to the Triassic so that we may have more first hand knowledge of this fascinating system.

Kate Ashcroft

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8th December, 1985

"The Eye of Faith in Geology".  
Talk by Dr. Reg Bradshaw of  
Bristol University.

Those of us who know Reg Bradshaw had been looking forward to his lecture since it was first announced early last year. We were not disappointed. Dr. Bradshaw is known mainly for his interest in the "hard rocks". A lesser known interest of his is Historical Geology, and this formed the basis of his talk on "The Eye of Faith in Geology".

Dr. Bradshaw started his lecture by stating how preconceived ideas are obtained and how these ideas condition thinking and hence influence findings in the field. Preconceptions arise from three major sources. The first source which influenced early geologists was religion. Noah's flood was used to explain numerous geological phenomena. Secondly, a powerful teacher can profoundly influence his students so that their research confirms his theories. Finally, the persuasiveness of a theory is important. If a theory explains many findings, it is accepted more readily. Plate tectonics is a good example of this.

Dr. Bradshaw went on to illustrate examples of preconceived ideas which led to false interpretations of geology. An early example occurred in 1663 when Otto von Guericke managed to assemble fossilised mammoth bones so that they resembled a unicorn. Kirkpatrick believed the whole world was composed of plankton and even managed to "demonstrate" their presence in granite.

Fossils have caused much confusion. Heroditus found fossils in the Upper Nile Valley and concluded correctly that they had been deposited when the sea was at a much higher level. Aristotle, however, believed that fossils had actually grown within the rocks. Other theories for the origin of fossils included formation by celestial radiation, that the Devil put them in the rock, that they were inorganic materials, that they were organic and swept into certain rocks by Noah's flood and that God had created them to decorate the inside of

the Earth as flowers do the outside.

The theory of granitisation which said that granite can be formed in situ by high temperature and pressure with constituents brought in if necessary from outside was an example of how a powerful teacher can influence his students. Professor Read, a proponent of the theory, influenced one of his students to the extent that he claimed that the granite which unconformably underlies the tillite of the Flinders Range in Australia, and the boulders of granite which are found in it, were an example of granitisation. The Professor also thought that granitisation was exemplified by the Lewisian Inliers to the east of the Moine Thrust in Scotland. He even went as far as to appoint an "Impartial" Commission, consisting of two of his own students, to prove the point.

The geology of the Southern Uplands has also been misinterpreted. Based on zoning using graptolites, Professor Lapworth suggested that north-south compression had caused tight, almost isoclinal folding. It is now believed, as a result of evidence obtained during the laying of a pipeline, that the Southern Uplands represent an accretionary prism formed during subduction of a continental plate.

Noah's flood has been used to explain the boulder clay in Edinburgh. Drainage channels from Noah's flood were described in Devon and Sussex. In Switzerland at the same time, similar geological features were ascribed to glaciation. Eventually the Swiss convinced Buckland that the drainage channels he had described in Devon and Sussex were in fact typical U-shaped valleys. Buckland was ridiculed for 20 years in this country because of his change in interpretation.

More recently, the discovery of Piltdown Man in the River Ouse at Lewes in 1908 fooled some geologists for many years as they wished to believe in the discovery of the "missing link". The discovery was announced to the Geological Society in 1912. Some people were doubtful, pointing out that with a full set of teeth the jaw and skull could not be fitted together unless the canines were a certain shape. In 1913 just such a canine was found. Later, an elephant bone club was found suggesting that Piltdown was capable of using tools. It was not until the bones were fluorine dated that the hoax was finally confirmed and reported to the Geological Society in 1953. According to the press, using their "eye of faith", the announcement caused an uproar at the meeting. Dr. Bradshaw was at the meeting and it was entirely peaceful.

This is by no means a comprehensive account of the lecture, which stimulated a lively discussion. Sadly, I think, Dr. Bradshaw admitted that in the current scientific climate, the eye of faith will have less and less impact on geological theory.

Anne Harrison

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#### Soil and Geology

Based on a talk given by Dr. Margaret Oliver to the Society on 11th November, 1985. Part One.

Soil is the most common material on the surface of continents. Together with air, water and sunlight, it is fundamental to life on this planet because it is the medium of plant growth which

sustains higher forms of life. Early human settlement reflected the importance of the quality of the soil. The Nile Basin, "the cradle of civilisation", had fertile alluvial soil which was replenished annually by floods.

Soil is a resource, but unlike coal and oil it is renewed slowly. The rate of soil regeneration is more rapid in warm than in cold climates, and also depends upon the resistance of the underlying rocks to weathering. In Britain new soil forms very slowly at about 0.1 to 0.2 mm per year. If soil is mismanaged and is depleted by exhaustion and/or erosion, the rate of renewal is unlikely to keep pace with present demands for agricultural productivity. The topsoil which contains most of the organic matter, nutrients and finer material is vulnerable to erosion, resulting in a decline in fertility. It is a world-wide problem and is increasing in Britain.

Soil forms the upper unconsolidated part of the lithosphere. Rock waste or sediments become soil after colonisation by flora and fauna which bring about a variety of changes. Plants die and are partially decomposed by soil fauna and micro-organisms to form humus, which is a complex amorphous organic material. It enriches the soil, making it darker, more porous and able to hold more water. Thus soil is an intimate mixture of mineral and organic material, gases and solutions. With the incorporation of organic matter at the surface, the topsoil becomes very different from the subsoil which contains very little organic matter and is less porous. As a result of these changes, and solutions moving through the soil, horizontal layers called horizons can be seen. They

reflect processes, past and present, acting on the soil.

Soil formation depends on the destructive forces of weathering and organic decay, and synthetic forces that create clays and horizons. Several factors are involved - climate, vegetation, fauna, topography, drainage, man, time and parent material, which is our main concern here. Climate is very important because it affects the type of weathering, vegetation, rate of biological activity and the vertical movement of solutions in the soil profile.

Physical weathering produces coarse material on which soil forms only slowly. Chemical weathering is more rapid in hot, humid climates and it produces fine material, especially clays. In humid, temperate regions organic matter decays slowly. It acidifies the solutions percolating through the soil, which results in the selective solution of some elements, causing them to be leached through the soil profile. In the humid tropics organic matter decays rapidly and there is considerable leaching because of the heavy rainfall. Tropical soil is impoverished quickly once the natural vegetation cover has been removed. In seasonally dry climates salts move down through the soil when it is wet and upwards when dry. Salty concretions often form just below the surface. In arid regions salt crusts form on the surface.

Natural vegetation also reflects climatic characteristics and this in turn affects soil. Grassland soil tends to have a thick dark layer rich in humus because the roots contribute most of the organic matter. The litter from deciduous trees is incorporated quite quickly into the topsoil, whereas that from coniferous trees is not and

# Hoots mon! There's gold in them thar hills

By A. J. McILROY

DRILLING is about to start in the search for gold on a remote Scottish estate deep in the Perthshire Hills, where the Canadian-based mineral company financing the exploration says after special radiation tests that prospects for a commercial mine are promising.

The 40,000 acre Auchnafree estate lies in the 500 million-year-old Dalradian geological belt, which is also found in eastern Canada where the B P is expected to start mining this year.

Panhandlers, including 25 undergraduates from Strathclyde University's department of applied geology, have been sifting mountain streams at Auchnafree since the winter snow-line began to recede.

The results, tested by new Canadian techniques, have shown signs of enough gold for rock hammers and diamond drills to be moved on to the site.

"This is nuclear-age prospecting, with samples being subjected to radiation techniques, the like of which the Klondike old-timers never even dreamt of," said Mr Paul Dullar, project manager.

The estate belongs to Sir James Whitaker, former High Sheriff of Nottingham and vice-chairman of the Halifax Building Society. Contemplating prospects of striking it rich on his land, he told me: "Of course, I am not totally dependent on the outcome for my bread and butter. You realise that."

"But with my feet firmly planted on the ground, I must say I am thrilled and excited. There is something about the search for gold that gets to you."

"They say I prospected in the Yukon. That is a slight exaggeration. I was there in the late 1950s and saw gold prospectors and shared their enthusiasm, even though we found nothing."

"I must say that with so much of their own country in this particular geological belt, I was surprised when the Canadians approached me."

## Earlier records

Speaking from Babworth Hall, his Nottinghamshire, estate at Retford, Sir James, who was High Sheriff from 1969 to 1970, said: "Going back to the days when Scotland was separate from England, there have been records of precious minerals in this area of Perthshire, confirmed by the 1968 Scotland Geological Survey. But the Canadian approach was right out of the blue."

"It has surprised me that what is happening on my Auchnafree Estate has attracted such little publicity, so I welcome this opportunity to give some re-assurances."

"I have seen the scars left in



Sir James Whitaker

South Africa, Canada and Australia by huge open-cast operations. I am not going to allow that here.

"There will be small hole-in-the-hill diggings as part of my insistence that the environment will not be damaged. And if the result is work that takes one hundred people off the dole into mining, I will be absolutely delighted."

## Millionaire prospector

The two Canadian companies behind the Colby Resources and the East West Resources Corporations; venture are owned by an Edinburgh man Michael McCormick, 58, a former sergeant in the Scots Guards, who left Canada 34 years ago to make his fortune and become a millionaire.

Mr Dullar, 26, a geologist working with Middleton Exploration Services, an Ontario company commissioned by Mr McCormick for the work at Auchnafree, said: "We have signed an agreement to lease mineral rights on the estate."

"Sir James will get royalties on every ounce of gold removed."

Nuclear-age technology was used to find the gold. "Rock samples and stream sediments were analysed by "neutron activation", a highly-developed Canadian technique known as "finger-printing".

The samples are "cooked" in a nuclear reactor. Different minerals give different radiation energy readings, so the gold content can be accurately assessed. Scientists say in Perthshire, samples hold out the promise of rich strikes.

The Canadian companies hold a licence from the Crown to explore for gold and silver in 185 square miles of Scotland.

Other companies are prospecting on a site of five square miles on the same geological line at Tyndrum and in the Loch Tay area.

gives rise to very acid conditions. Soil fauna help to break down the organic matter, and they are more abundant and more active in warm climates.

Margaret Oliver

(To be continued in the next issue.)

## From the Papers

Several newspapers report the imminent demise of the Cornish tin mining industry. The independent Geevor tin mine at St. Just near Penzance has requested interim financial help from the Government until a final decision is made.

The trio of tin mines, Wheal Jane, South Crofty and Wheal Pendarves, held by the Rio Tinto Zinc Corporation via their subsidiary Carnon Consolidated Mines have also

## Alaskan volcano continues to blow

THE AUGUSTINE volcano in Alaska, which began erupting on 27 March for the first time in 10 years, is still pouring ash into the air 300 kilometres southwest of the city of Anchorage.

A plume of ash 15 kilometres high has been drifting towards the city, and health officials have warned people to stay inside. Flights to Anchorage airport have been diverted.

Scientists are trying to monitor the formation of a lava dome inside the volcano, similar to that which burst Mt. St. Helens in 1980. They are hampered by the ash, however. The dome is expected either to explode or collapse in the next few months. Then seawater contacting the hot rock could form a tidal wave and devastate surrounding coasts. Residents of the nearby town of Homer have been practising evacuation drill, and a tidal-wave warning is out for the coast. □



announced a closure programme. This arises after a period in which the tin price has been halved from about £9,000 per ton to £4,500, when trading was suspended.

Wheal Jane and its twin Mount Wellington have recently undergone a several million pound development programme. These mines lie in the Carnon Valley, once said to be the richest area of mineralisation in the British Isles.

Perhaps things look more promising in the Scottish Highlands, as shown in the recent Daily Telegraph article on the previous page.

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#### SOCIETY WEDDING

On Thursday, 22nd May Hilary Logan and Gordon Giltrap were married in Solihull. We send them our very best wishes for the future. Hilary's devotion to geological duties has included help with the newsletters, and she intends to be at the next Committee Meeting!

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#### Geology in Harrods

(From the Geologists' Association Circular, May 1986)

The perfume section has recently been floored and partly walled with dark Larvikite slabs, with startling effect. Many small lights catch the schiller effect from the plagioclase. There are at least 1600 half metre slabs on the floor, and more on walls and partitions, at an estimated cost of £144 per slab. It is polished every day before opening.

#### Welcome to New Member

Barbara Richards, Wolverhampton.

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#### Geological Holidays

1. Western U.S.A. 1987.  
Flights, coach and accommodation £1,200 for 3½ weeks. Visit Craters of the Moon, Yellowstone, Grand Tetons, Grand Canyon, Bryce, Zion, Yosemite, Petrified Forest, Death Valley and a good deal more. (Anyone coming too? Sheila.)  
28th July to 19th August.  
University of Nottingham, Adult Education Dept.,  
14 Shakespeare Street,  
Nottingham, NG1 4FJ. Tel:  
(0602) 473022.
2. University of Bristol, advance notices. There will be:-
  - a) Paris mineralogy,  
6th - 9th November. £110.
  - b) Eastern Canada,  
16th Sept. - 5th October, 1987. £1,200.
  - c) Volcanoes of Southern Italy, April, 1987, 7 to 10 days. £330.
  - d) Peruvian Andes, spring or summer 1987.  
  
Dept. of Extramural Studies,  
Wills Memorial Building,  
Queens Road, Bristol, BS8 1RJ.  
New tel. no. (0272) 303030.
3. University of London, Dept. of Extramural Studies,  
26 Russell Square, London, WC1B 5DQ.
  - a) St. David's Peninsula,  
Dyfed. 2th - 5th May, 1986.  
Tuition £12.
  - b) Kent Rocks, at Wye College.  
£160 inc. accommodation.  
19th - 26th July, 1986.

c) Iceland, 23rd July -  
2nd August, 1986. £590.

d) Rocks and Fossils of  
N. Yorkshire, Whitby.  
2nd - 5th October, 1986.  
Tuition £15.

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Geology Today. Six issues per  
year. £12. Blackwell  
Scientific Publications Ltd.,  
P.O. Box 88, Oxford.

East Mendips Geology New Field  
Guide. Nature Conservancy  
Council, Northminster House,  
Peterborough, PE1 1UA.

Ice Age in Cwm Idwal. From the  
Author, K. Addison, 10 Hurst  
Close, Broseley, Shropshire,  
TF12 5SG. £2 inc. postage.

Wildlife Photographer of the  
Year Competition - Natural  
History Museum, Cromwell Road,  
London, SW7 5BD. Closes  
30th June.

Journals:-

Applied Geochemistry, £56.  
Pergamon Press,  
Headington Hill Hall,  
Oxford, OX3 0BW.

Palaeontology, £86.  
Marston Book Services,  
P.O. Box 87, Oxford,  
OX4 1JF.

Sedimentary Environments and  
Facies. Edited by  
H. G. Reading. Blackwells, as  
above. £19.50.

On the Track of Ice Age Mammals  
by Anthony Sutcliffe. £12.95.  
Natural History Museum, as  
above.

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STOP PRESS

NEW START POINT

Field Visit to the North Staffordshire Coalfield

Sunday 15th June 1986.

Itinerary:

10.30a.m. Park Hall Country Park - Sherwood Sandstone Group  
(9290 4510)

11.30a.m. Metallic Tileries Quarry, Chesterton  
(8400 4980) - Upper Coal Measures, Westphalian D

12.15p.m. Opencast Coal Site  
(Detailed to be finalised)

LUNCH Dog & Partridge, Packmoor (8670 5440)

14.00p.m. Mow Cop Folly (8570 5720)

14.45p.m. Mount Pleasant (8510 5640)

15.30p.m. Footpath leading to Grotto Wood (8525 5865)

16.00p.m. Potbank Quarry, Congleton Edge (8693 5929)

Leader: Dr. E.L. Boardman

EXTRA MEETING

LIVING COLLECTA 7. JUNE 1986 (7.30 pm) EDGEM  
RICHARD ROBERTS QUARRY HOUSE / REGIS (A.P. 1986)  
MEETING IN THE GARDEN OF THE HOUSE OF EDGEM  
INTO THE GARDEN FROM THE ROAD.