The Black Country Geological Society

NEWSLETTER NO. 28 - AUGUST 1981

Editorial

It is with some pride that I draw the attention of members to the first edition of the journal, especially since I had no part in its production.

The idea for the occasional publication of original material belonged to Peter Oliver, who began the project in 1976, the year after the society was formed. Peter commissioned and advised the contributors, and edited the material. Production has been the concern of Alan Cutler, and the main problems have been financial. By negotiating grants, advertising, and taking a very personal interest in the artwork, Alan has been able to halve the expected cost, which is now £1-50.

Already some very appreciative remarks have been received from professional geologists, including those in universities. These have related both to the standard of the journal and to its presentation. There have been many good wishes for future editions, and we in the society certainly hope the same.

Forthcoming Meetings.

September 14th. Mr. K. Moseley of Birmingham University. "The Ice Age and Modern Beetles: their climatic and environmental implications." (See May 1979 newsletter notes)

October 5th. Meeting before field trip.

October 11th. Joint field trip with the Shropshire Geological Society, to classic Black Country sites. Peter Oliver and Maitland Woods will assist in leadership. Commences 10 am.

Meetings are held at the Allied Centre, Green Man Entry, Tower Street, Dudley, behind the Malt Shovel pub. Indoor meetings will commence promptly at 8 pm. with coffee and biscuits from 7.15 pm. Field meetings will commence from outside the Allied Centre.

Non-members welcome.

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

Programme.

November 7th Saturday.

A coach has been booked from the Allied Centre (correction) at 9.30 am. to the Geological Museum in London. Anyone wishing to visit the various museums or use the transport for Christmas shopping is asked to contact Anne Harrison, with the cost or £1 deposit. See booking form and Paul Shilston's description.
Adults £3 return.
Children 12-18 £2 return.
Small children free.
Return from the museum only at 6 pm. arriving Dudley 9.30 pm. The museum is near South Kensington tube station, and there is a subway to the museums from within the tube station.

November 20th Friday.
Social Evening. Canal trip through Dudley tunnel by night, with buffet supper. See details on separate sheet, and booking form. Cost £2.50. Tickets from Paul Shilston.

December 7th.
Lecture by Professor Hawkes, on the Geology of Antactica.

Geological Guided Walks. See the two previous newsletters.
Cotwall End - Sept.13th.
Doulton's Claypit Sept.6th.
Wrens Nest - Aug.16th, Sept.20th.
Helpers to act as crowd stewards on Aug. 16th at Wrens Nest would be very welcome

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Welcome to new members.

Mrs. J. Meakin - Sutton Coldfield.
Mrs. J. Williams - Sutton Coldfield.

Geological Museum of London.
Exhibition Road, South Kensington, London, SW7.

For the visit it is planned to stop in Oxford St. Marble Arch, and elsewhere in the East End as members wish, but to pick up only from in front of the geological museum at 6 pm.
Other adjacent museums are:-
The Science Museum,
The Victoria and Albert Museum,
The Natural History Museum(it is their centenary year).
Entrance to all museums is free, and the bookshop at the geological museum is excellent.

The geological museum has displays on three floors, and provides a wide range of displays of earth science topics.
Ground Floor. This has several permanent exhibitions,"Story of the Earth" outlines the 5000 million years history of our planet, from its cosmic origins to the present day. It has four main sections - the Earth in space, the Earth's interior and crust, geological processes and geological time. "Britain before Man" provides a general stratigraphical history of Britain. There are large rock specimens, dioramas, models, paintings, photographs, and detailed text panels. "British Fossils" provides a comprehensive display of fossils grouped under types and also under geological periods. There is a display of gems and ornamental stones on the ground floor.
First Floor. Geological displays of each region of Britain, with rock specimens, maps, photographs, relief models and dioramas.
Second Floor. Here is the world's largest display of ores and minerals, and exhibits of building stones, oil and coal, mining minerals and a model of Stonehenge. There is usually a free film show at 2.30.

P.S.

Field Trip to Anglesey.
May 15th - 17th.

Leader Dr. D.E.Bates of the University of Wales, Aberystwyth.

Saturday morning was spent studying the rocks in the north of the island. Here the rocks of the Precambrian Mona Complex are steeply faulted against the overlying Ordovician. On the way we were shown how to distinguish glacial striations from marks made by farm vehicles! Along one fault line at Porth Ogo'r Geifr we examined the Gaddr gneiss which has reverted to a lower metamorphic grade and become chloritic. The gneiss may not be basement but a more metamorphosed component of the bedded series. On a minor thrust fault further north (295930) we had an exceptionally good view of en echelon sigmoidal tension cracks.

295931 is the type locality for the Carmel Head thrust. Here we saw the green schist thrust over the blue grey Ordovician shales. We examined the Gwna mélange formation, which consisted of fragments of limestone, quartzite and pillow lavas in a matrix of green schist or slate. Presumably these fragments have slipped down a submarine slope.

At Porth Yr Ebol we saw a window brough the thrust to the Ordovician rocks below which were signs of earth movements, possibly caused by the faulting.

Dr.Bates helped us to see how the stratigraphy and structure of the Precambrian have been re-interpreted and the bedded sequence inverted, compared with that described by Greenly in 1919.

The afternoon was spent on the north coast among the younger Precambrian, notably the Gwna mélange. From Cemaes Bay eastwards many of the included pebbles were angular and lens like and different horizons had different inclusions. Enormous blocks of limestone were involved. Was there a landslip of a mass of sedimentary limestone in muddy suspension?

Within the limestone blocks were stromatolites, structures created by blue green algae which suggest a late Precambrian date.

From Llanbadrig church we viewed much of the faulted cliff to the east. Above the Gwna mélange lie unconformable Ordovician conglomerates and graptolitic shales. Copper mineralisation was discovered at some risk to life and limb.

Sunday morning was spent on Parys mountain, an isoclinal syncline trending ENE-WSW and pitching NNW. The sequence is of Ordovician shales , volcanic clastic felsite, chloritic chert and Silurian blue grey shales. It has been worked, both in mines and opencast, since Roman times. We concluded our visit by watching men drill from the outer beds in the north, and retrieve the cores. The ore is presumably associated with volcanic activity, but the overlying Silurian is also mineralised. We examined each rock type in turn. Silurian graptolites were found and plenty of pyrite. One striking outcrop of silicious sinter may mark the site of a volcanic fumarole.

The last session was spent studying the Old Red Sandstone and Carboniferous rocks of Lligwy Bay. The O.R.S. is interpreted by Allen as the product of a meandering river in a mountain flanked valley. A cyclothem occurs comprising coarse material succeeded by siltstone, passing upwards into beds containing calcareous nodules. Such limestone nodules are found in the soils of semi-arid climates at the present time, as a result of capillary action as the soil dries out. Upwards the sequence became finer and thin sandstones were interpreted as flood inputs, with mudcracks indicating phases of dessication.

We concluded by studying the Carboniferous sandstones and limestones. The geology remained problematic to the end.

One limestone block surrounded by conglomerates was interpreted as a sea stack. The Lligwy Bay "disturbance" was attributed, after much confusion on our part, to cavern collapse as a result of an emergent episode.

Dr. Bates provided us with a most stimulating and mind-stretching weekend, and the society must be most grateful to him for giving up so much time, preparing handouts so carefully, and answering our questions with such patience. It was the most interesting weekend I have spent in a long time. K.A.

Members' Evening May 18th.

Igneous Features in Iceland and the Canary Islands.

As one of the items on members' evening, Paul Shilston showed some holiday slides of geological interest, with a commentary.

Iceland and the Canary Islands are both volcanic in origin, but differ significantly. The Canary Islands are sea floor volcanoes, but Iceland is on the Mid-Atlantic Ridge and has been formed by fissure eruptions as the ridge continually opens and provides new material.

The first group of slides were of the Canary Islands and showed the Island of Teneriffe with its central volcano Pico de Teide (3718m.). The crater can be entered, although it is still warm and contains sulphorous vents. Slides showed the crater, and also lava flows and ash layers in the vicinity.

The Island of La Palma has the recently active volcanoes of San Antonio (erupted 1677) and Teneguia (erupted 1971) Also it has La Caldera which is 7km. in diameter, with its wall 1500m. high.

A caldera is similar in shape but is on a much larger scale, and is a collapse feature representing the whole base of the original volcano. After the eruption, the ejected material may leave a void under the volcano, and the resulting subsidence forms the caldera.

The slides of Iceland showed a number of interesting features including hot spring pools, steam vents and boiling mud pools. There was also an area of rhyolite hills, a fairly rare occurence. Rhyolite is a very acid rock and is therefore viscous so it does not flow far from the parent volcano, in contrast to basalt which flows freely over long distances.

The final slide showed an area almost exactly on the Mid-Atlantic Ridge, with hills and lakes aligned on the [illegible]-[illegible] axis of the ridge. When this picture was taken in 1969 the study of plate tectonics had hardly been developed. A return visit to Iceland armed with today's knowledge would be really worthwhile. P.S.

Field Trip to the Cotswolds. June 14th, 1981.
Leader, Mr. David Walker of Birmingham Museum.

This trip was very well attended by members who met at Coaley Peak picnic area south of Stroud, at noon. Before the official start, some members examined a tumulus dated 2500 B.C. which was in excellent condition. Our leader then explained the basic geology of the area, using the view across the Vale of Berkley and along the Cotswold scarp. The hills are of Inferior Oolite (Middle Jurassic) age, formed in warm seas by material washed down rivers from a land area which probably lay

where Wales is today. Below the Oolite limestones occur layers of Lias clay up to 300 feet thick, and these deposits occupy the lower levels and valley bottoms. Mr. Walker commented that this area saw one of the earliest colonisations by man in prehistoric times. They dwelt on the hills safe from the forests in the valleys below. Soil creep ridges on the hill opposite had been accentuated by the movement of sheep.

We then proceeded north to Selsley Common. Here in Leigh's quarry the succession showed its overlying the Upper and Lower Freestones of the Lower Inferior Oolite. It was the freestone which was sought after for building, tiling and stone wall construction. There was a noticeable difference between the dark grit beds and the cream coloured freestones, and the junction of the two types was also marked by an erosion surface with oysters and burrowing features. This represents a period of submarine erosion, one of several, which at this site cuts out completely the whole of the Middle Inferior Oolite. Most members found fossils, chiefly brachiopods and valves, and the burrows were seen on fallen blocks.

We then crossed the top of Selsley Common, looking often to the west across the beautiful valley below. Selsley Common quarry (828032) displayed similar beds to Leigh's quarry so we took the opportunity of looking across the valley to Stroud. We could see how the rivers had formed the valleys and could follow present river courses by means of the accompanying vegetation.

We made our way back to the cars noting hummocks and hollows due to previous quarrying. Most people sat in the grass in brilliant sunshine for lunch.

Across the valley to the east we visited a quarry on Rodborough Common made famous by the geologist Lycett. The Trigonia Grit and Upper Freestone were exposed. Rock faces and scree slopes were eagerly examined for fossils, many of which were found. On the way to Minchinhampton it was explained how the rain water soaks through the limestones and is thrown out by the Lias clay as springs. We examined a memorial in the freestone which showed current bedding.

It was with relief that we located an ice-cream van, and we returned slowly to the cars with the hot sun having taken its toll. Hearty thanks were given to David Walker for leading such an interesting trip on a glorious day. P.K.

Summary of Research Project - Part 1.

by Margaret Oliver.

Preliminary Problems of Soil Classification in the Wyre Forest

This project was undertaken for a Qualifying M.Sc. as a part way stage to a Ph.D. The work was started in October 1977 on a part time basis and completed in November 1980. It was examined in December 1980 by Dr. Richard Webster, a leader in the field of statistical analysis of soil information.

The subject of classification is a controversial one in many disciplines and no less so in pedology, the study of soil. Soil as a natural body has been traditionally studied by attempting to develop "natural" or general purpose classifications, as can be seen in the work of the National Soil Surveys throughout the world. Such classifications have been greatly influenced by the Aristotelian concept of natural classification

based on the successive subdivision of the population under study, using a few differentiating criteria selected to portray the population's "essential" nature. Such an approach assumes that natural groups exist and that they can be defined by a few characteristics. It was more appropriate for the classification of plants and animals because of their common ancestry, than for soil which has no common ancestry since it can form on a variety of parent materials.

Most early soil classifications used factors such as climate, vegetation and geology to subdivide the soil cover, and the groups produced were so general as to be of little use at the local level. More recent classifications such as the U.S.A.'s 7th. approximation and Avery's British system use soil characteristics themselves as a basis for differentiating groups. However the Aristotelian concepts still have a strong influence on the structure of the classification. There is a heavy dependence on a few differentiating characteristics and on soil environment relationships which have as yet not been proved to be consistent.

An alternative approach to classification, based on the ideas of the 18th century botanist Adanson, is that grouping should depend on the overall similarity between individuals, and that no preconceived assumptions should be made as to the importance of differentiating characteristics. The assessment of overall similarity requires the consideration of a large number of characteristics simultaneously. These objectives were unattainable at the time of proposal because of the difficulties of handling and comparing large numbers of characteristics simultaneously. These concepts have been adapted in the formulation of numerical methods of classification, and made possible with high speed computing facilities.

A numerical approach fulfilled the requirements of this study because it avoided preconceived ideas as to the nature of soil to be expected, and the dependence on a few differentiating characteristics, since a large number can be handled simultaneously, and the many statistical techniques enable the soil data to be examined from different aspects. For instance, classification, whether traditional or numerical, assumes that soil profiles can be grouped, whereas another set of techniques known under the general name of ordination can handle a continuously varying medium with no need to recognise groups. Ordination enables the relationships between individuals to be expressed graphically indicating the nature of variation in the population relative to a few major axes. It is capable of revealing the presence of groups, if they exist, as clusters of points on the graphs. Classification cannot indicate the relationships between each individual, it merely provides generalisations about the individuals in each group. It was decided that classification and ordination should be used in a complementary way in order to obtain the fullest possible analysis of the data.

The study examined the soil in an area of approximately 6 sq.km. in the eastern part of the Wyre Forest, where the soil is relatively undisturbed, and where there is a variety of relief and the predominance of one geological formation giving rise to two markedly different parent materials. The area occupies part of a plateau dissected by post-glacial drainage associated with the deepening and

development of the Severn Valley. Dowles Brook, the main stream running W-E across Wyre Forest, has incised 100m. below the present surface and there are river terraces along its valley which correspond with those along the Severn Valley. The main geological formation in the study area is the Old Hill Marl of the Middle Coal Measures. Its lithology is complex resulting from its deposition under varying deltaic conditions which have given rise to current bedding, a rapid variation in grain size and impersistent beds. The Old Hill Marl has two very different components, the Etruria Marl composed of red, purple and mottled clays, and the "espley" sandstones, bands of impersistent sandstone which can vary from a coarse grit to a fine micaceous sandstone.

K.O.

(to be continued)

Survey of Nature Conservation Sites.

Since the last newsletter, the Urban Wildlife Group has been co-ordinating a survey of known sites of importance or potential importance for nature conservation in the county. The survey is being undertaken during the summer by several societies including BCCS. We have been allocated 4 sites, Dudley Castle Hill, Barrow Hill, Beacon Hill, and Bluebell Park Dudley. There is still time for members to join in on Beacon Hill on August 16th, (Meet at Allied Centre 10 am.) Bluebell Park and Castle Hill will be surveyed on August 9th, and Barrow Hill is completed. Surveys finish before lunch. No special experience is needed.

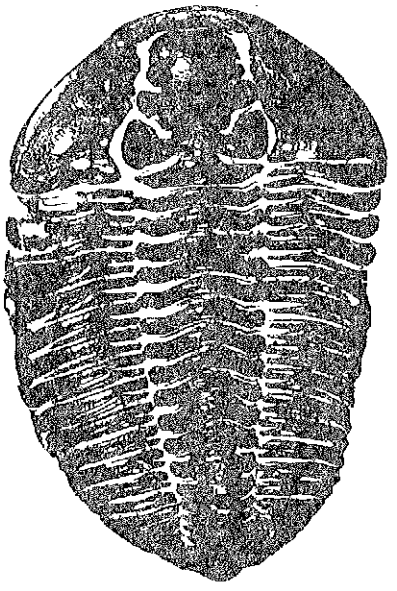
Geology Courses this Winter.

1. Origin of Mineral Deposits.
   Rob Ixer, Central Library, Dudley.
   20 meetings, fee £12.00.
   Wednesdays from Oct.7th.
   (This course will please many members who enjoyed the shorter one last year - further details from Hon.Sec.and Editor.)
2. Geology A-level.Bilston College of Further Education,Westfield Rd. Thurs.6.30 - 9 pm.Details from College.
3. Sutton College of Further Education. Lichfield Rd. Enrol Sep.7,8,9. Tues. A-level 7-9pm. Thurs.O-level 7-9pm.
4. History of Life on Earth. Geol.Dept. Birmingham University. £7. 10 meetings. Thurs.7.30pm.from Oct.1.
5. Evolution of Landforms. Birmingham, Winterbourne. £12. 20 meetings. Wed. 7.30pm.from Sept.30.
6. Peak Nat.Park Study Centre. Losehill Hall, Castleton, Derbyshire.
   a) Rocks, Minerals and Fossils. Oct.23-25. £39.50.
   b) Caves of Peak. Nov. 13-15. £40.

Committee Dates. General:-
Sept.7th, Nov. 9th.
Conservation:- Sept.28th,Nov.23rd.

Editor, Sheila Pitts, 4 Siskin Rd.Pedmore, Stourbridge,W.Midlands.

THE BLACK COUNTRY GEOLOGIST



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