



The Black Country Geological Society

Editorial:

This issue of the newsletter heralds the tenth anniversary *Conversazione* to be held in Dudley Museum on Friday 28th June. Without doubt it promises to be the most exciting meeting ever staged by the Society.

Wine and other refreshments will be served throughout the evening (at no charge!!) providing a splendid opportunity to meet old friends, fellow members and some special guests. And, if that was not enough, the event is being supported by special exhibits and displays provided by nearly a dozen institutions and organisations (including the Geological Survey) illustrating their geologically related activities.

Particularly intriguing is the Aston university display which "involves a microcomputer and monitor showing how artificial intelligence techniques may be of use to geologists."

It is particularly fitting too that we should return to the Museum for this meeting, where of course the Society was inaugurated on the 3rd July, 1975, as it also presents an opportunity for members to see specimens from the Dudley collection not normally on view.

There is also an exciting display from - but don't let me spoil it, come and see for yourselves! It is definitely a meeting not to be missed.

Members will receive their tickets with this mailing. For further information see the advertisement within.

Chairman

*A. Cutler B.Sc., M.CAM.,
Dip.M., M.Inst.M.*

Vice Chairman

*P. G. Oliver B.Sc., Ph.D.,
F.G.S.*

Hon. Treasurer

*Anne Harrison B.Sc., M.B.,
Ch.B., F.F.A.R.C.S.*

Hon. Secretary

*P. D. Shilston M.A., C.Eng.,
F.I.E.E., M.I. Mech.E.*

Field Secretary

N.G. Bradley

Programme 1985:

Monday June 17th: Evening field trip to Wrens Nest, leader Paul Shilston. Meet at 7 p.m. outside King Arthur pub, junction of New Birmingham Road and Priory Road, Dudley.

Friday June 28th: Conversazione to mark the tenth anniversary of BCGS. At Dudley Museum.

Tuesday July 2nd: Briefing for the weekend field trip to the Lake District. 7.30 p.m. at the Dome Laboratory, University of Birmingham.

Friday-Sunday July 5-7th: Weekend field trip to the Lake District, leader Dr. Frank Moseley. Accommodation for those who have booked will be at Hawkeshead Youth Hostel, Esthwaite Lodge, Hawkeshead (Grid ref. SD 355967). This is about one mile south of H'head village. Please arrive by 7 p.m. if you have reserved a meal on Friday evening.

Monday 15th July: Evening field trip to Ketley Quarry, Kingswinford. Leader Alan Cutler. Meet at 7 p.m. outside Ketley Farm, Ketley Road, off Dudley Road, Kingswinford.

Monday September 16th: Talk by Professor Donald Hawkes at the Saracen's Head "Geology of the Midlands."

Thur.-Sat. September 19-21st: Sixth meeting of the Geological Societies of the British Isles, at Birmingham University. Details to be announced.

Sunday October 6th: Joint field trip with Shropshire Geological Society to Cotwall End. Leader Alan Cutler.

Monday November 11th: Talk by Dr Margaret Oliver at the Saracen's Head "Geology and Soils."

November (date to be announced)
Field trip to the Lickey Hills.
Leader Dr. R. Hamblin.

Friday December 6th: AGM of the Geological Curators' Group. The hosts are BCGS.

Monday December 9th: Talk by Dr. R. Bradshaw of Bristol University at the Saracen's Head "The Eye of Faith in Geology."

From the Papers: The Times 16.4.85

Science report

Giant clams sustained by continental drift

By a Special Correspondent

Usually animals and plants find a niche in the environment and stick to it. But that seems not to apply to giant clams and tube worms that live around natural, ocean-bottom hot-water geysers near the Galapagos islands, where new hot ocean crust is forming.

According to Dr Erwin Suess, of Oregon State University, who has seen them from the deep-sea diving vessel Alvin, they also live around cold water jets in the ocean off Oregon, although the chemical and thermal conditions there are totally different.

Yet there is a similarity between the two locations: a geological one. While at the Galapagos, ocean crust is coming up from the Earth's interior, off the Oregon coast it is going down, descending under North America, thus travelling slowly across the ocean floor like a conveyor belt.

The two situations would seem to be biologically worlds apart. Where the hot, molten crust is rising, as at the Galapagos, cold water is drawn in from the surrounding ocean, heated and ejected at temperatures of hundreds of degrees centigrade.

Saturated with sulphurous minerals, the emerging jets form a black smoke in the water which provides food for bacteria that live on a sulphur cycle (rather than the oxygen cycle that all other earthly life depends on). In turn, other organisms feed off the bacteria and so on until at the top of the chain come the black smoker giant clams and tube worms which, until Dr Suess's discovery, appeared to be unique to that environment.

By contrast, where the cold crust is descending, as off Oregon,

there are no hot sulphurous springs: only cold fetid water being squeezed out of the ocean sediments, the detritus of ocean life, like water from a sponge as the crust descends into the Earth.

As it oozes out from the sediment, the rich organic fluid forms carbonate chimneys standing 1 to 2 metres off the ocean floor, according to Dr Suess and his colleague, Gary J. Massoth, of the National Oceanographic and Atmospheric Agency, Seattle.

Around these chimneys, Dr Suess said, were giant clams and tube worms "of the same general order" as those found off the Galapagos.

Instead of feeding on sulphur-dependent bacteria, the Oregon clams and worms eat methane-oxidizing species, which are in turn sustained by the rotting organic matter in the rich sediment fluid, Dr Suess believes.

He has chemical evidence for that claim. Samples of the carbonate chimneys showed that the carbon was severely depleted in a rare carbon isotope called carbon-13 (most carbon is carbon-12), which is characteristic of carbon metabolized by methane-digesting bacteria. The same is true of the carbon in samples of the giant clams and tube worms. "This is a very important indication of methane origin," Dr Suess said.

The giant clams and tube worms of the Galapagos, and those off Oregon, have found two quite different niches connected only by one of the most fundamental phenomena of geology: continental drift, a phenomenon thus discovered by evolution long before the geologists.

November 12th, 1984: Talk on Borehole Drilling by Maitland Woods.

A range of drilling applications was outlined. These related to the search for oil, the proving of mineral reserves and sand and gravel deposits, looking at underground water resources, searching for suitable sites for the disposal of toxic wastes, and even experimenting with the utilisation of geothermal energy. The field trip borehole concerned a further category, site investigation, and typified the type of work undertaken to confirm the geology of sites and to examine the stability of rock strata below, for example industrial and residential sites.

Two fundamental types of drilling can be distinguished.

1. Cable percussion; used for the boring and investigation of soils and superficial deposits, generally leading to soil mechanic reports and recommendations for the design of foundations.

2. Rotary drilling; used for the investigation of rock formations.

The following rotary drilling techniques were described.

- (a) open hole drilling,
- (b) core drilling,
- (c) percussive drilling,
- (d) auger drilling,

and the methods of flushing and sampling were discussed at some length.

Nov.17th, B'hole drilling/Social:

On Saturday, air-flush rotary open-hole and core drilling techniques were demonstrated in a section of the Middle Coal Measures at Lower Gornal. A tractor-mounted hydraulic top-drive drill rig was used in conjunction with an air compressor developing 440 c.f.m. at

110 p.s.i. to provide the flushing medium.

The rock chippings blown to the surface were sampled and described, and a log of the geological succession was obtained. Zones of broken ground related to old underground mine workings temporarily halted the "returns", and indicated that the strata were potentially unstable from the point of view of development. A rock core was taken to demonstrate core-drilling procedures, and to confirm the nature of the strata at the rock head.

The borehole log is as follows - where a foot is a foot and not 0.304 of a metre!

<u>Depth:</u>	<u>Strata:</u>
G.L.-10'	Opencast backfill.
10' -17'	Black mudstone.
17' -17½'	Coal.
17½'-18½'	Black mudstone.
18½'-24½'	Broken ground and coal (Heathen coal?).
24½'-28'	Grey sandy mudstone.
28' -37'	Grey sandstone.
37' -37½'	Brown sandstone.
37½'-43'	Grey sandstone.
43' -45½'	Grey mudstone.
45½'-52½'	Brokenground 80% air loss (Stinking Coal).
52½'-69½'	Grey mudstone with sandstone bands.
69½'-74½'	Coal.)
74½'-76'	Mudstone.)New Mine Coal?
76' -79'	Coal.)
79' -81'	Grey sandstone.

The seams can only be named in the light of the geological sheets and information from nearby boreholes, and the history of the adjacent open-cast sites. Even then there is always room for other interpretations.

Interesting though the morning's activities were, the ensuing buffet and close examination of the ales at the Park Inn were the undisputed climax of the day's activities.

Maitland Woods:

December 3rd, 1984: Talk by Professor A. Hallam of Birmingham University "Mass Extinctions and the Fossil Record."

Dr. Hallam is one of the leading authorities on palaeontology and palaeoenvironments, and his Jurassic papers especially have been very innovative. He attempted to enlighten members on the very complex subject of mass extinctions.

Charles Darwin expounded the theory of extinction due to biological competition. He gave less weight, however, to changes in the physical environment, or to whether the fossil record bears out his theory of competition.

In the best known mystery of mass extinction, that of the dinosaurs, Dr. Hallam favoured the extinction of the gymnosperm plants, the main diet of the herbivorous dinosaurs, as a key factor in their mass extinction. The mammals, too, increased their competition with the dinosaurs as the reptiles steadily declined. With the extinction of the dinosaurs at the end of the Cretaceous, the mammals opportunistically advanced.

At Wrens Nest, as at most Lower Palaeozoic sites of similar palaeoenvironment, brachiopods predominate. Towards the end of the Palaeozoic, bivalves took over as the brachiopods declined, moving in to fill vacant niches.

Reef Corals, Rudists, Dinosaurs, Ammonites, and some protozoa all declined at the end of the Jurassic, and the number of families in the Cretaceous was much reduced. Was this due to sea level changes, or to climatic changes? Work at Berkeley, California has involved the

measuring of iridium in deep sea clays, left from meteorite falls. Heavy concentrations are found at the Jurassic-Cretaceous boundary, but very heavy concentrations are found at the Cretaceous-Tertiary boundary. Dr. Hallam gave the example of a 10 km. asteroid crashing into the Earth. A nuclear winter would ensue, many plants would die, affecting food chains.

But as one might expect, the situation is more complicated than that. The Cretaceous extinctions were not sudden but occurred over hundreds of thousands of years. So was another cause responsible? The "volcanic theory" expounds that the iridium concentrates could have come from volcanoes. Large scale volcanism would also have thrown huge quantities of ash into the atmosphere, affecting the climate.

University of Chicago geologists have studied marine extinctions back to the Palaeozoic, and claim to have found several mass extinctions of families, suggesting a 26 million year cycle. They think this has an astronomical cause, such as comet impacts or even an unknown companion of the Sun! Dr. Hallam treated this with scepticism.

A number of ecologists have been working on the theory that low sea level can have a global effect, and indeed sea levels were relatively low at the end of the Cretaceous and into the early Jurassic. The sea level is affected by polar ice melting, but also by the amount of sea floor spreading.

Al Fisher (USA) suggests that the Earth alternates between icehouse and greenhouse conditions, with increased carbon dioxide producing the greenhouse effect. Times of low sea level coincide with ice ages, and such conditions can be traced back to the Palaeozoic. At times of maximum sea floor spreading, juvenile carbon dioxide would be produced from volcanoes, and with an increase in land surface, would affect global

climate.

The subject is obviously very controversial, and Dr. Hallam made it very interesting and very enjoyable.

Peter Knight:

March 18th, 1985

Annual General Meeting:

This began with the Treasurer's Report, which showed a healthy financial state. This was partly because of the increase in subscriptions and the collection of arrears, but also to Peter Knight's sales. These have doubled the income. It had been decided to buy a projector and save hiring costs. The profits are likely to offset the costs of the Tenth Anniversary.

The Chairman's report followed. The seven field meetings and ten indoor ones had had variable attendances but were rising. Seven had been led by Society members. An unusual one was the talk and demonstration of borehole techniques, and the Social associated with them.

Conditions at the Allied Centre had deteriorated and costs had risen, so indoor meetings were moved to the Saracen's Head.

With regard to conservation, the schemes at Dudley Museum and Wolverhampton Art Gallery are proceeding.

For Cotwall End, a short geological trail guide is being organised.

The attendance at organised walks has been disappointing, so none have been organised for this year.

The costs of producing the news-

letter have been modest, and production is assured.

We look forward to the Tenth Anniversary of the Society this year.

Officers were re-elected, but the post of Conservation Secretary will lapse.

Sheila Pitts:

Dudley Limestone Works:
Progress Report Six:

The trial infilling scheme at the Dudley Sports Centre is progressing well, with the preparatory work underground now at an advanced stage. Initial trials of the rock paste pumping are to commence soon, to be followed by full scale operations.

The reports on the drill hole and other investigations into the abandoned workings at the Black Country Museum, Guest Hospital, Castle Mill and Broadway areas have now been published and are available for reading at the offices of the Borough Engineer at Stourbridge and of the Borough Planner at Dudley. In general the reports confirm and reinforce previous assessments and knowledge of the workings but the findings have led to minor changes to the "consideration zone" boundaries in the light of the ascertained depth and location of the workings, and to certain reappraisals of the nature and priority to be accorded to further investigations and other follow-up activities.

The Department of the Environment have indicated a minimum of £2.6 million to be allocated to Limestone Schemes in the West Midlands in 1985/6. It is considered that this order of funds will be insufficient to achieve the programme envisaged in the Dudley Strategy Document. Over £1.1 million may be

spent in Dudley in the current financial year, including the following projects:-

Dudley Sports Centre -
Completion of infilling trial.

Guest Hospital area - com-
pletion of stage one
investigations.

Black Country Museum -
Completion of stage one
investigations.

Mons Hill preliminary appraisal
desk top studies.

Wrens Nest - ditto.

Monitoring of certain mines.

It is hoped that Derelict
Land Grant will also be made
available for drill hole
investigations on the flanks of
Wrens Nest hill and for desk
top studies, and where ap-
propriate inspections by
personal entry into workings
at Dudley Zoo and on Castle
Hill.

There is now increasing emphasis
on the execution of desk top
studies similar to that at
Seven Sisters (outlined in the
last newsletter) for a number
of areas in the Borough. Never-
theless, there are a number of
important issues to be debated
by the Council relative to
future levels of funding and
programmes of work.

Alan J. R. Evans:

Welcome back to Member:

Dear Secretary,

I am a qualified mining geologist
and have just returned home to
Wolverhampton, having been
working for a mining company in
Namibia. Although I have been
a student member of the ECGS in
previous years, I have lost
contact in the last couple of

years having been overseas.

I would like to renew my member-
ship and be kept up to date with
the Society's news.

With many thanks,
Yours sincerely,
Andrew Marshall.

And a very good year to choose,
Andrew - welcome home. Editor.

Shropshire Observed:

Sunday July 14th. Shropshire
Geological Society Anniversary
Day. 10 a.m. at Allington Hall,
Shrewsbury. Illustrated talks,
guided walks, details from Les
Dolomore, 3 Woodlands Park,
Shrewsbury.

London University Extramural
Dept., 26 Russel Square, London
WC1B 5DQ.

Programme includes:-
Sutton Water Company,
Decorative Marbles,
Pitsea Waste Disposal,
London river terraces and
building stones,
Hertfordshire Pudding Stone,
Building stones,
Gault and Lower Greensand,
Sheppey-London Clay.
Contact Michael Bamlett at the
above address.

Geological Museum, London:

There is a programme of lectures
and films, for adults or for
children, on many weekdays and
Saturdays. It includes volcanoes,
fossils, earthquakes, coal, polar
regions and beaches.

Photographic Competition:
for conservationists.

Entry forms from Natural
History Museum, Cromwell Rd.,
London SW7 5BD.

Many prizes. Two categories:-
"The World in our Hands"
"Endangered Wildlife".

Closing date June 29th.

Committee Dates:

Wed., 19th June.
Mon., 2nd September.
Mon., 4th November.
All at the Park Inn,
Sedgley.

Field Secretary:

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Meetings are held at The Saracen's
Head, Stone Street, Dudley. Indoor
meetings commence at 8 p.m. Those
who would like lifts for field
meetings, please contact Nigel
Bradley.

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 ar-
range their own insurance as a
matter of course.

The Black Country Geological Society

10th Anniversary

C O N V E R S A Z I O N E

Dudley Museum & Art Gallery, St James's Road, Dudley

Friday 28th June, 1985

from 7.30 p.m.

Special displays or exhibits from:

British Geological Survey
Nature Conservancy Council
Birmingham University Geol.Sciences Dept.
Aston University Geol.Sciences Dept.
Dudley Museum Palaentology Project
Dudley M.B. Council Planning Dept.
W.M.C.C. Waste Disposal/Hydrogeology
Severn Trent Water Authority
Johnson, Poole & Bloomer
Douglas Technical Services Ltd.

Refreshments:

Wine and canapes. Some soft drinks will be available, but it would be useful in planning for prior indication

Admission:

Admission is by ticket only. To avoid embarrassment please show your ticket to the attendant

Guests:

Members may apply for tickets for their guests to the Hon. Secretary. In the event of over subscription priority will be given to husbands or wives appropriately thereafter on first come basis

R.S.V.P:

Help our planning by letting us know your intentions even if tentative or you can only manage to attend part of the proceedings. If you are unable to come please return your ticket(s).