



The
Black
Country
Geological
Society

NEWSLETTER No. 155

OCTOBER 2002

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 at Dudley Museum, St James's Road, Dudley.
Phone (01384 815575)
7.30 for 8 o' clock start.**

SATURDAY OCTOBER 12TH 2002. Field Visit to Bridgnorth and Much Wenlock. Led by Andrew Rochelle

Meet at 11 00 am. Take the A 454 Wolverhampton to Bridgnorth road. At the round-a-bout just before Bridgnorth carry on for 100metres to the lay by, on the north side of the road to park. Grid reference SO 729 936. This will be a fairly gentle trip of easy walking

Beginning at pebble bed exposures and The Hermitage to study the sandstone exposures and the old dwellings, a view of the Severn Gorge and pattern ground will be seen. This will be followed by a quick journey by car to Much Wenlock for lunch. Park in the public car park (30p) off St. Mary's Road where toilets and a variety of pubs and eating places are available. Following lunch travel by car to a small quarry, on the B4378, where fossil specimens can be collected. Following this stop we will travel by car to the Lime Kiln Walk nature trail on Wenlock Edge. The visit should end around 4.30pm

SATURDAY OCTOBER 12TH 2002 Walsall Local History Fair

The BCGS has a stand at this event again this year. Its at Walsall Town Hall from 10am to 4pm and is free. There will be a geological walk around the town starting at 2.30pm led by BCGS member Alf Cole.

MONDAY 28th OCTOBER 2002. Lecture: Dr Ian Sutton "Yellowstone, its Evolution and Geology."

Dr Sutton graduated from Norwich University where he also obtained his Ph.D on Silurian tabulate corals in 1964. He has wide experience as a Senior Lecturer and Head of Dept. in the Adult Education Dept. of Nottingham University, and as an organiser of numerous geology courses and field work in

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many parts of the world. He has been a member of the East Midlands Geological Society for many years including 3 years as President.

Yellowstone National Park in the western USA was originally established largely because of the wonderful array of geothermal features that adorn the area. Those features are there for geological reasons as Yellowstone currently sits right over a thermal plume or hot spot. Yellowstone is situated at a high elevation in the Middle Rockies and during the last two million years has been the site of 3 cataclysmic eruptions and it is in the caldera of the most recent of these eruptions that the geothermal activity has been concentrated. In this talk we will try to develop an understanding of the geological history of the area, visit the spectacular geothermal features and try to evaluate the possibilities for the future.

MONDAY 25th NOVEMBER 2002. Members Evening

Your chance to have a guided tour of our meetings venue, Dudley Museum, followed by a series of short talks etc. given by Society members. This will be open to anyone who would like to share something of interest, whether it be some rock or fossil specimens collected on holiday or a short talk accompanied by a few slides. The more people that contribute the better so please fill in and return the slip at the end of the newsletter or email us with your suggestions so we can put as interesting and varied a programme together as possible.

MONDAY JANUARY 27TH 2003. Lecture – to be confirmed

Vic Smallshire, Chairman of Dudley Canal Trust, will talk about, "Holes in the Ground," a fascinating personal account of his 28 year journey into some of the largest, weirdest and most obscure man-made excavations in the U.K.

MONDAY FEBRUARY 24th 2003. Lecture – to be confirmed

Robert Smallshire. Advances recently made using 3D modelling of strata and the use of time lapse processing to unfold and unfault strata to show how things were connected prior to earth movements will be described in this lecture.

MONDAY 31ST MARCH 2003. ANNUAL GENERAL MEETING

AGM guest speaker Professor Derek Siviter. "Silurian Soft-Bodied Fossils." These worm-like creatures from the Welsh Borders are illustrated by fantastic 3D imaging using the latest computer technology.

MONDAY 28th APRIL 2003. Lecture – to be confirmed

Adrian Collings, David Bridge of the British Geological Survey and Tom Lawson. 'The Birmingham Northern Relief Road'. Examining how it's design was affected by the geology found along the route, illustrated by ground photos of the new exposures and aerial photography.

EDITORIAL

There can be only one topic for the editorial this time around and that is the Dudley Earthquake of Monday 23rd September 2002, 00:53 BST. Did the Earth Move for You? We have had reports from People from as far apart as Kent, Leeds and Wales who were rudely awoken by deep rumbling and significant vibrations which rattled things on shelves and other flat surfaces around their homes. Older and poorly tended houses/churches recorded cracks appearing, tiles falling and chimney pots toppling. Oddly enough most of the damaged properties reported are in the Walsall area, although it has been reported that there has been a slight displacement of part of the tunnel lining of the Netherton Canal Tunnel. On the whole structural damage was relatively slight. Part of an arch collapsed at Dudley Castle but the Severn Sisters Cavern at Wren's Nest

National Nature Reserve shows no evidence visible from the surface of any damage and rock faces around the site similarly have shown no obvious signs of damage or distress.

It was actually an earthquake of magnitude 4.8 on the Richter Scale which occurred at a depth of 9.7km to the west of Dudley (the media quickly accredited this as below Brick Kiln Lane Lower Gornal). The earthquake as such occurred at a depth well below any of the faults and rocks about which we have any real first-hand knowledge, and so we have to speculate about its ultimate cause. It is thought to lie on a deep seated basement structure or fault which runs approximately north-south below this part of the country.

Earthquakes of this size are not uncommon and data from the BGS suggests that we can expect one of similar magnitude every eight to ten years, on average, somewhere in the UK. The Dudley earthquake was about 43 km from the 4.2 magnitude Warwick earthquake of 2000 and about 60 km from the 5.1 magnitude Bishops Castle earthquake of 1990. Our other nearest reported earthquakes of similar magnitude include Ludlow 1926- magnitude 4.8, Stafford 1916 magnitude 4.6, and Melton Mowbray 2001- magnitude 4.1

People are not used to tremors of this magnitude and it is not surprising then that first thoughts went to boilers exploding or terrorist bombs in these troubled times. Reports of people fleeing their houses in fear, animals acting strangely and police stations and telephone lines being inundated with calls and people in their nightwear are ubiquitous when such events occur.

Following more slowly in the 'wake of the quake' are the jokes and humour which find the funny side among the facts and figures. We have seen a number of jokes suggesting that there should be an appeal for the victims of the quakes to supply food and clothing packages containing black pudding, gray peas and bacon and groaty dick and flat caps and waistcoats etc and others identifying the event in the midlands as unusual as nothing normally happens here.

Perhaps it was the combined weight of intellect of all those geologists who gathered in Dudley for the Rock and Fossil Festival immediately before it (on the 21st and 22nd) that stressed the crust that little bit extra and set it off. What a pity that it didn't happen just a few hours before while they were still here.

WE should however spare a thought for those that live on very active fault lines near plate boundaries. While we 'enjoyed' the excitement of our little earthquake, a short time earlier on the 22nd June 2002 a magnitude 6.4 earthquake hit north-western Iran (about 225km west of Tehran) here reports indicated that more than 500 people had been killed, more than 2000 had been injured and 25000 people have been left homeless. Its epicentre was about the same depth as ours. This region has had many more earthquakes like this and its people live in real fear of the earth and its processes. In 1997 a similar earthquake killed 1100 people and injured 26000 people.

Links to websites containing good accounts and useful information about the Dudley earthquake and other earthquakes can be found on our new website at www.bcgs.info

NEW MEMBERS

A very warm welcome to the following new members:

**Tom Round
David James and family
Leila Battison
Kate Parker
Derek Vaughan
Margaret and Peter Twigg
Louise Kelly and family
Kayleigh Mills**

REPORTS

MONDAY 25th February 2002. lecture - Dr. Jill Norton, B.G.S. Kinsley Dunham Centre, Keyworth, Notts. " Caribbean Volcanoes."

This talk began by reminding us about some of the more spectacular volcanic eruptions within the last 100y. or so, like Mt. Pelée, Soufrière, etc.

Geologically the Lesser Antilles (LA's) seem to comprise two approximately parallel Island Arcs formed during the Miocene, viz. within the last 25Ma. They form the boundary between the western Atlantic Ocean and the Caribbean Sea where Atlantic Ocean crust is being obliquely subducted in a roughly westerly direction beneath Caribbean ocean crust at The Puerto Rican trough. One consequence of ocean crust spreading originating at the mid-Atlantic Ridge!

The outer (eastern) arc- Antigua, Grand Terre, Barbados, Trinidad etc.- comprises an older volcanic basement overlain by Tertiary limestones, tuffs and coral with generally low relief. Thus Barbados is essentially a low lying limestone plateau rimmed by terraced wave-cut platforms which probably represent several distinct periods of uplift consequential to the ongoing subduction processes. Today there is little volcanic activity at this outer "cold" arc.

Much greater recent earthquake & sporadic volcanic activity is manifest in the inner (western) arc- St.Kitts & Nevis, Monserrat, Martinique (Mt.Pelée), St.Vincent (Soufrière). There followed a brief account of known activity on each island, presented rather in the style of a Cook's Tour starting with Saba in the north to Grenada and Trinidad in the south. No particular patterns or trends seemed to emerge other than of a predominantly andesitic regime with gaps of up to ~100 years between occasional but violently explosive and widely destructive eruptions in these relatively small but densely populated areas.

It wasn't at all surprising that great effort, largely on the part of the BGS, had been invested by the UK Government in studying the Monserrat-97 eruption with a view to the accurate forecasting of eruptive events in these UK Dependencies as well as to putting into place suitable emergency procedures.

Some of the outcomes mentioned were:-

- a) Installation of (inflation) measuring and volcanic gas analysis devices for continuous monitoring so that forecasting could be scientifically based. In spite of this a new hospital had recently been built in Plymouth and completely destroyed in the 97 eruption. A purely political decision!. On the other hand there was little loss of life reflecting an effective evacuation plan yet there was much local damage and destruction of fertile, cultivated land by falling hot ashes, fast red-hot pyroclastic lava flows (fortunately channelled down an old river bed), overheated groundwater and consequential mud flows.
- b) Incandescent ash erupted to heights >13 km. high into the stratosphere & jet stream. No aircraft engine damage was recorded probably because of rapid rerouting of all local flights
- c) An unexpected horizontal blast component was recorded (a mini Mt.St.Helens!) which flattened a large area of rain forest which was subsequently blanketed with hot crumbly ash, lapilli and numerous large boulders. No doubt this will become valuable fertile land within a couple of generations!

Alf Cole

SATURDAY 22nd and SUNDAY 23rd September 2002 Dudley Rock and Fossil Festival and Fair 2002 the analysis.

Take a fine sunny September weekend, lots of enthusiastic people, a road closure and more geological things to see and have a go at than ever staged before, mix them together and you have the Dudley Rock and Fossil Festival 2002. This was a great event for the lay person, family and expert alike with something for everyone.



The event returned to Dudley Museum and Town Hall after a 5 year absence (the last one was September 1997). It was more ambitious than ever featuring celebrity lectures, a family discovery/activity room and a digital surround sound film show as well as the usual fair and trips.

The BCGS stand had a major makeover for the show with all new graphic panels and an emphasis on the fun aspects as well as the important conservation and educational roles that the society plays.

The new-look BCGS stand at the R & F Festival September 2002

The BCGS members did a fantastic job of manning the show and stewarding people about. We easily covered the cost of sponsorship of the show through our sales of specimens and maps so generously donated by members of the society. We acquired a couple of new members, and the case of fossils donated to the museum collections (BCGS Collection) by members made a nice addition to the BCGS stand and received a number of very nice comments too.

In terms of analysis, I can now report that the 14 hours that the show was open over the two days saw 1300 visitors. Most of whom filled in questionnaires citing their thoughts about the show and its best and worst bits. The common themes of the worst bits reported were the parking in Dudley and the sign posting in the town centre itself, and also the amount of other events occurring around this time which competed for the time of particularly the family visitors.



The BCGS Collection Case



The favourite bits ranged across the whole spectrum with the fair stands and the various activities in the family discovery/activity area receiving the most votes. Most people came from within about a thirty miles radius and had heard about the festival through local papers, local radio and picking up literature in libraries and tourist information centres.

Although I was personally very busy at the show, one of my favourite bits was seeing society members having chance to spend time together and working as a team which strengthens the society and exchanges ideas and experience in a way that we don't have in meetings alone.

One of the dealers displays

The Earthquake that followed the show some six or seven hours after the last expert and exhibitor had gone was a quite unexpected finale to the best weekend of geological celebrations for 5 years in the heart of the country!

Graham Worton

MONDAY 30th September 2002 'Shoreline Management and Shoreline Management in the Wash Eastern England.' David Brew. Posford Haskoning Ltd.

David introduced his lecture with his employment history. He is ex BGS, now employed by Posford Haskoning Ltd consulting engineers. To begin his presentation he described The Fenland and the Wash in its geographical and historical setting.

The Holocene coastal plain was described by excellent overhead slides of the region. The underlying geology is Jurassic and Cretaceous, buried beneath coastal and glacial sediments. There is about 600km² of coast of a sensitive nature, often in conflict with agricultural interests. The coastline is about 110km long and fronted by 42km² of salt marsh, which is 9% of the UK total. Storm beaches front the eastern side of the Wash. There are four main rivers, The Witham, Welland, Nene and Great Ouse. The depth of the Wash varies from 10m to 50m. Spring tidal range is up to 6m and neaps 3m. Sediment transport is mainly from the sea and is entrapped by salt marsh. Input values of deposited sediment are between 6.8x10⁶ and 5.3x10⁷ tonnes per year. Heights, AOD, of coastal features are; storm beaches, mainly in the northeast, 4m, pioneer salt marsh 2.5m and inter-tidal flats 1.7m. There are sandbanks within the littoral zone.

The Holocene

Studies have been made for the time period 8000 to 2000 years ago using bore hole records, of which there are over 2000 in Fenland, and seismic profiles. This has enabled a study to be made of deposits and the elevation of the Holocene surface. Alternating phases of sea inundation were noted on pre-Holocene surfaces. Sea level change was determined at about 4-5m per 1000 years. A study using radio carbon dating on peat deposits has shown that 7000 years ago there was a transgression phase (fresh to salt water), whereas 4000 years ago there was both transgression and regression in different areas of the Wash, and 3000 and 2000 years ago there was regression over the whole area. It has been observed that post 2000 transgression began to take place probably because sediment supply had become exhausted.

The 13th century to the present.

There is little information from borehole records for this period and most information has come from historical records. Although the Romans drained a little of the area it was the Saxons who were the main instigators of land reclamation. They built a sea defence bank to counteract flooding due to storms. Reclamation was continued, which resulted in the diversion of water flow to the east side, thus salt marsh began to increase on the west side. Man has continued to have a major impact on reclamation within the Wash, 320km² being reclaimed since 13th century. OS mapping and aerial photographs have provided recent historical data and showed that between 1828 and 1995 Low Water Mark had generally moved seaward whereas from 1971 to 1995 LWM has moved landward, which has conservation implications for inter-tidal areas.

Three case studies were described.

The Boston Wash Banks Scheme.

There had been a RSPB inter-tidal habitat survey, which suggested that depletion of salt marsh was the cause of bank erosion. Salt marsh was to be recreated by managed retreat and breaching of sea defences. Funding was available from English Nature, the Prison Service, North Sea Camp Prison being close by, and the Environment Agency. The largest area of new salt marsh in England was thus created. Borrow Pit Lagoon was created as a special habitat and wildlife refuge with public access.

Hunstanton Sea Defence Scheme.

In the past 30 to 40 years salt marsh had become less effective as a sea defence. A secondary embankment was built. In 1953 the great storm surge resulted in 65 deaths and great destruction. In 1978 a caravan site was destroyed. The 1988 hard defences caused loss of coastal sediment and impoverished the build up of material on the storm beach. Since 1988 continuing studies and strategies have been undertaken.

The Great Ouse Outfall.

Kings Lynn is a minor port that required regular access to the sea. A training wall, made of faggots, was constructed, but accretion of sediment against the walls and formation of meanders began to block the channel. The solution was to lower the height of the training wall, resulting in an increase in flow, the sediments being flushed to sea.

Questions were taken at the lectures end and thanks proposed by Gordon Hensman.

Andrew Rochelle

CONSERVATION COLUMN

UKRIGS Conference 2002: *Providing Geodiversity*

Alf Cole attended this annual event on behalf of the BCGS and reports that it was the usual gathering of interested people and held in memorable accommodation of a convent. Alf reports that the presentations were of the usual high quality and found the Urban Geology talk by Prof Peter Doyle and the Dorset Heritage Coast Talk by Richard Edmonds to be very informative. Field excursions to the Great Orm to see the geomorphological features produced following the recent one-in-a thousand years storm event, and the Bronze age copper workings were spectacular in their scale and the Carboniferous limestones yielded fossils a plenty. A trip to Roscolyn was similarly spectacular as a real lesson in complexity of the Anglesey geology. All trips were treated to the warming sunshine of our 2002 Indian summer.

Although the numbers were a little smaller this year, Alf reports that it was good to see some new faces and new RIGS groups present at the event, and a good time was had by all.

Dudley Museum Update - *The Black Country Geological Society Collection*



A large Favosites coral head showing Growth lines and encrustation

A selection of items from The Black Country Geological Society Collection were put on display at our stand at the Rock and Fossil Festival.

Here is a closer look at a couple of the colonial corals that were on display.



A hand specimen of Heliolites

The BCGS collection continues to go from strength to strength and we look forward to what additions may come in the run up to christmas.

Until next time..... Graham W

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BCGS Website now at www.bcgs.info

Last Call for Your Contributions to the 2002 members meeting which is shaping into as varied and fun an event as last year's.

Members Meeting 25th November 2002	
Yes, I / we would like to contribute to the meeting Name (s) Address Phone	Brief outline of Contribution (eg talk on trip to Skye with 4 slides and some specimens)
Please complete and return (by 1 Oct if poss please, end Oct latest) to the meetings secretary: Gordon Hensman 10 Parkway Road Dudley DY1 2QA <u>OR</u> email Gordon: GWJHENSMAN@aol.com	Approx. time needed