

Bulletin

Number 82

July 2007



Field Programme:

Please note: a field fee of £2.00 per head is made on all trips attended

Saturday 21 July - Sedburgh and the Sedgwick Trail

Leader: Alan Diggles

Starting at 10.30am at the Main Street Car Park in Sedburgh to visit two locations before lunch and the Sedgwick Trail after (a packed lunch will be required). Distance about 3 miles overall. Depending upon location we will see sedimentary rocks of Ordovician, Silurian, Devonian and Carboniferous age plus a little seen igneous variety. The Sedgwick Trail will give us an insight into the structural effects of the Dent fault and also the environment at the time of deposition of some of the local rocks of the area.

Transport will be by car, please liaise with the Field Secretary.

Saturday 18 August - Lapworth Museum of Geology, University of Birmingham, Edgbaston

Due to the low level of interest expressed (perhaps due to the holiday season) this meeting has now been postponed; we will rearrange it for 2008.

Sunday 23 September - Monsal Head

Leader: Dr Fred Broadhurst

Meet at 10.00am at the Car Park (charge made) at Monsal Head (**SK184715**). A morning walk of approx 4km on a good path, but with a short scramble up to Hob's House Landslip. Lots of Carboniferous corals, plus lead mineralisation in the Putwell Hill Vein.

Lunch back at Monsal Head (pub/café available).

After lunch we transfer vehicles to Great Longstone (**SK200717**), then walk a circular route, including Longstone Edge, to see the workings in the complex system of lead veins there, together with a limestone palaeokarst and other limestone features. Distance about 6km, good paths, steep in places.

For further information contact:

NSGGA Field Secretary **Gerald Ford**, Tel. 01630-673409 or e-mail: g.ford@ukonline.co.uk



NSGGA organised events celebrating 150 years of the Geologists' Association and 200 years of the Geological Society of London

The NSGGA, in conjunction with the University of Keele, the Potteries Museum & Art Gallery in Hanley, the Apedale Mining Museum, Apedale Country Park and the West Midlands Regional Group of the Geological Society is organising a number of events this autumn under the banner of:

Local Heroes - Oil, The Potteries and the Works of Sir John Cadman

Rock around Staffordshire weekend event for children and adults

October 20th, 2007

Childrens' Event: Potteries Museum & Art Gallery, Hanley

Activities will include a mock mining tunnel and a spoil heap mineral search

Members help needed - if you want to volunteer to help for an hour or two, please contact Elizabeth Hallam (Chairman contact details on the final page of this issue)

October 21st, 2007

"Field trip" to the Apedale Heritage and Mining Museum,

with underground tours and exhibitions of the region's geological heritage.

Guided geo-tours of Apedale Country Park entitled "Rock, Fire, Ice and Water" given by Drs Ian Stimpson & Peter Knight.

November 22nd, 2007

A lecture on "Oil, The Potteries and the Works of Sir John Cadman",

to be given by Professor Hugh Torrens at Keele University.

more details are available by following the links at www.esci.keele.ac.uk/nsgga

John Myers' Awards 2007

This year's assessment took place on Saturday 9th June and the panel comprised:

John Reynolds, Lloyd Boardman, David Osborn, Vicky Tunstall (JM winner Keele 2001) and Mike Fereday. Following the closure of the geology department at Staffordshire University Ann Myatt (John Myers' daughter) kindly offered to make two awards to Keele University to the two entirely different and separate geology courses. The following awards were made:

3-year Single/Dual Honours

Winner: To be awarded a cheque for £100 and the John Myers Medal.

- Jeremy Johnson for his mapping project in Spain.

Runners up: Each to be awarded a cheque for £20.

- Vanessa Pilley
- Chloë Scott

4-year MGeoscience

Winner: To be awarded a cheque for £100 and the John Myers Medal.

- Jennifer Upwood for her work on "Development of a forward modelling program to aid parameter selection"

Runners up: Each to be awarded a cheque for £20.

- Sarah Chisen
- Richard Haslam

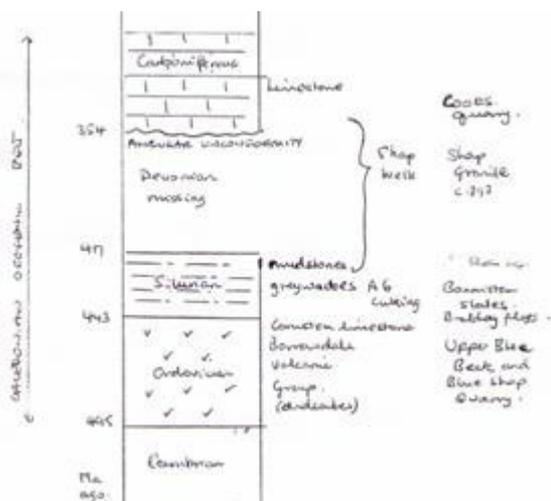
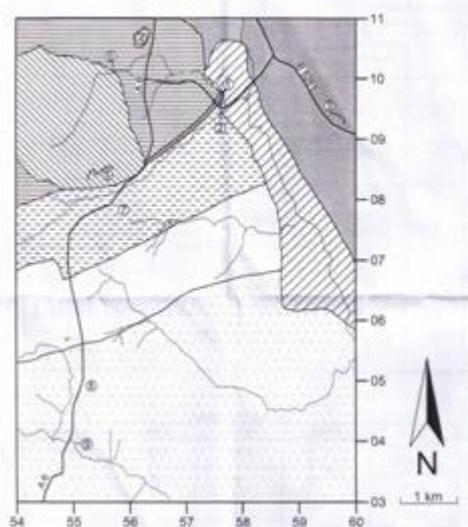
David Thompson decided regretfully that he was unable to continue to act as an assessment panellist. We thank him for his invaluable support since the inception of the award following John Myers' death in 1994.

Report: Lake District field excursion, 28 - 29 April 2007**Day 1 – Leader Professor Chris King - The Shap Story**

Red squirrels watched as over 20 of us stood by the Shap Wells spa while Chris gave a brief talk about the general principles of geology – superposition, cross cutting relationships etc. together with a nifty demonstration using a well-known plastic chocolate box, different coloured sands and some Epsom salts. He also promised us 9 locations to visit during the day and informed us that we would be doing much of the detective work in working out the geological relationships. At this first locality we looked at a mystery exposure that cut across the stream (dip 40⁰ strike SE-NW), but which although it did not fizz with acid was reported to be Coniston limestone.

We then moved to the stream in the field opposite the Shap Wells hotel to the rocks above the waterfall (Locality 2). These were Silurian age Brathay flags (60⁰ dip, strike SE-NW) comprising mudstones and greywackes typically deposited by turbidity currents. It was concluded that due to the direction of dip these must have overlain the Coniston limestones seen at the previous location confirming that the outcrop in the stream may have been of Ordovician age.

GEOLOGICAL MAP OF THE SHAP WELLS AREA



Further downstream there were red rocks (dip 5°, strike S-N) of a poorly consolidated breccio-conglomerate indicating that these may have been deposits formed from periodic fairly shallow flooding events over a wide area, possibly as flash floods. The important finds were fragments of a pink mineral that was orthoclase and matched the feldspar in the Shap granite. This indicated that its age was younger than both the Silurian Brathay flags and the pink granite of the Shap intrusion we were to see later; so maybe Carboniferous in age. The dip and direction of strike pointed towards an angular unconformity. This also placed the Shap intrusion between the two so maybe in the Devonian.

Examination of these locations involved thinking about what it would have been like to have been there at the time. Visual experiments were undertaken on the spot with sand and flour to show folding and another with gravel and sand being swirled around to calculate the rate of flow required to move large clasts. Great fun! After driving to the Moor above the hotel, near Rooks Quarry, we looked at later Carboniferous mountain limestone deposits (Locality 3) with corals and shelly fossils.



We then moved on to the Pink Shap Quarry – a mecca for geology students (Locality 5). Lots to see and discuss here from dark enclaves incorporated into the granite, the granite itself with large crystals of twinned pink orthoclase feldspar, grey plagioclase, black biotite mica and quartz and the hydrothermal mineralization of the granite to produce pyrite, chalcopyrite, molybdenite, and china clay.

After a slight (non-geological) hiatus over the locked quarry gate which entailed a certain amount of athleticism to negotiate, we moved down the road to the Blue Shap Quarry (Locality 4). Quite different from the Pink Shap as the exposures looked andesitic in composition. As we could not see the top or bottom of the units we could only surmise that these may have been lava flows associated with the Ordovician Borrowdale Volcanic Group. After lunch we walked up to a bridge over Blea Beck (Locality 6) where we could see the irregular contact where the Shap granite and associated veins had intruded the andesite.

The piece de resistance was Chris producing a cone shaped jelly and intruding it with cream from a syringe to represent the intrusion of flows along joints associated with a dyke in a granite intrusion.

We moved south along the A6, briefly stopping at Location 7, Collyrag Quarry to note another outcrop of Silurian Brathay Flags which had been baked and slightly metamorphosed by the intrusion of the granite and therefore further proof that they must have been older than the granite. Then on to a cutting on the A6 to explore the Banniston Slates of earlier Silurian age showing massive folding and faulting associated with the Caledonian Orogeny. (Location 8). There were some sigmoidal tension gashes but it was not possible to see from these any sense of shear, although there were good cleavage planes to indicate that this was a compressional event with a N-S shortening. There were also good examples of flute casts and ripple marks.

Finally we sat in the sunshine on a bend of the river near High Borrow



melting in situ.

Chris had given us a wonderful day putting together the story and sequence of the various rock units in the area and entertaining us with his ingenious experiments that will stay with us for many years to come. Thank you Chris.

A report for **Day 2** will appear in the next bulletin.

Report - Ercall Quarries Field Trip, 9 May 2007

On a blustery but dry Saturday, a small group from the NSGGA met up with some members of the Shropshire Geological Society to examine the geology around the Ercall Quarries area. The field trip was led by Chris Rayner of the Shropshire GS.

Chris started by explaining that it had been the intention to include a visit to Maddock's Hill quarry in the trip. However, the new owner of the quarry was unwilling to allow a visit until liability concerns were resolved to his own satisfaction; a process that could take some time yet. As it turned out, this certainly didn't mar the day as the Ercall Quarries themselves proved to be an Aladdin's cave of geology.

The visit started in the Forest Glenn car park, itself the site of a former quarry. Chris related how, in late Precambrian times, the area had been located on the edge the continent of Gondwana, lying some 60 degrees south of the equator. During the early stages of the Avalonian Orogeny, the development of a destructive plate margin resulted in the eruption of great thicknesses of lavas and volcanic ash in volcanic island arcs. The setting envisaged for the volcanics of the Ercall Quarries is that of a rifted basin associated with the subduction. The whole range of lava compositions from basic to very acidic are here encountered, with the acidic lavas being the most common. The high viscosity of the rhyolites meant that the eruptions were frequently extremely explosive and the resulting ash flows, tuffs and lavas compose the Uriconian Volcanics that form much of the Wrekin Hills SSSI area. They have been dated at 565 Ma. In spite of its volcano-like form and volcanic lava/ash make-up, the adjacent and imposing (407 m high) Wrekin should not be regarded as the remains of a volcanic cone. Its existence arises simply from a fortuitous combination of a hard erosion-resistant (Uriconian volcanic) rock being uplifted by faulting out of the broad low-lying ground of the Triassic North Shropshire Plain. No volcanic vents for the Uriconian have, in fact, ever been found in Shropshire.

The towering walls half enclosing the Forest Glen are composed of greenish and purple tuffs and agglomerates belonging to the 565 Ma Uriconian Volcanics. The north-western margin of the main quarry area is composed of a more recent and nearly vertical dolerite dyke. Chris commented that this was in fact a sill that had been since been upended by earth movements, and that its composition was closer to basalt. The margins of the dyke can be clearly traced and are very ragged. There was no obvious alteration of the surrounding Uriconian country rock.

From the car park, a short walk brought us to the first of the five quarries of the Ercall. Quarry 1 exposes some of the rhyolites that were erupted in vast quantities. Flow banding within the rhyolite could be readily made out and sufficiently satisfying to allow a suggestion to include a walk to the top of the Wrekin to see "even better examples" to be politely declined. Whitish clays betrayed weathering of pink orthoclase feldspar in the rhyolites. Chris pointed out spherulites a few millimetres in diameter within the rhyolites. This texture is largely confined to mixed acid-felsic volcanic rocks and they have sufficient integrity to survive weathering from the rock. Very quickly we were all experts in picking them out from amongst the debris at the foot of the face.

The first obvious feature of Quarry 2 was the spectacular Ercall Granophyre. This large pink granitic body can be viewed almost in section, intruding the Uriconian Volcanics. It has been dated at 560 Ma making this a late stage intrusion. The granophyre is unconformably overlain by Cambrian Wrekin Quartzite, the conglomeritic base of which is dated at 533 Ma (Chris pointed out that the information board on the site gives slightly different dates). This contact has played an important part in helping to date the base of Cambrian. A long period of uplift and erosion followed the emplacement of the granophyre, before a shallow sea spread over the area depositing a beach gravel derived from the underlying lavas – the present-day conglomerate. This is up to 7 m thick and the clast size is said to decrease passing upwards through the section. Abundant grains and rare pebbles of granophyre found within the conglomerate are fully in accord with the above sequence of events. Conformably overlying the conglomerate is a much greater thickness of a white and very pure quartz arenite - the Wrekin Quartzite. This was the principal material extracted from the quarry. The bedding of the quartzite is well exposed in two broad and steeply dipping faces in the quarry, both of which showed very well defined ripple marks. The quite large 17 cm wavelength of the ripple marks suggested, we were told, shallows lying to the south-east of a long fetch. The two bedding faces are clearly offset from each other and this displacement is due to an otherwise concealed dextral fault running north-west through the quarry. We found a pleasant spot beside this petrified Cambrian seabed for lunch, sheltered from the gusty wind.

Areas of the exposed Wrekin Quartzite on the opposite side of Quarry 2 were highly polished to a rather glassy finish, scored with grooved striations – a very pleasing example of a slickenside. Chris explained that the direction of the tear faulting could be discerned from the feel of the slickenside, with the surface feeling rough in the opposite direction to which the fault moved. There

Bridge (Location 9) and admired the bedded glacial till and concluded from the topography that this must have been deposited from lateral moraine

was much feeling, nodding and murmurs of agreement with the officially designated direction for this particular fault - sinistral.

The adjacent Quarry 3 allowed a large section through the thick Wrekin Quartzite to be viewed up close. Even more interestingly, the contact between these steeply dipping beds and the overlying Lower Comley Sandstone are here very well exposed. In contrast to the very hard white quartzite, the LCS is a greenish brown, poorly consolidated and easily eroded and the contact between the two beds is very clear and remarkably sharp. The greenish colouring arises from the mineral glauconite within the sandstone. Close examination showed it to be micaceous and we were left in awe as expert members of the group applied a teeth-grinding test to confirm that it was, in fact, here a siltstone.

Quarry 4 also contains features of geological interest, but was currently so heavily overgrown and even locating these would be have been regarded as something of a feat.

Elizabeth Hallam thanked Chris for leading the group and husband Mike for his valuable input into what had been a particularly rich and enjoyable field trip.

Bob Fletcher

Phil Burkinshaw

I'm sure those who knew him will be as shocked and saddened to hear of the death of Phil Burkinshaw, who collapsed on Sunday 29 April when leading a walk.

Phil was stalwart of the Staffordshire Wildlife Trust for many years, the Potteries and Newcastle Local Group and the Bat Group. He led the Sunday volunteer conservation group at Hem Heath and Newstead Woods, and was also a member of NSGGA and was treasurer of the Staffordshire RIGS group for many years.

It seems only yesterday that he and his wife Jay moved to Scotland. I've spoken to Jay on the telephone, and she says Phil appeared to be in his usual excellent health, and there was no warning of what happened. As she said, it was some comfort that he died doing what he loved. He was 52.

The Staffordshire Wildlife Trust are of course sending condolences, but if anyone wanted to write to Jay personally, her address is:

Cottage 1, Ballinbreich Farm Newburgh, Fife KY14 6HJ.

Pat Callaghan (Chair, Staffs. Wildlife Trust)

NSGGA Winter Lectures Diary Dates for 2007-08

11 Oct 2007 - Speaker Tim Harris on geomorphology.

22 Nov 2007 - Prof Cope Memorial Lecture – Bi-Centenary celebrations

Speaker Professor Hugh Torrens – Oil, The Potteries and the works of Sir John Cadman.

6 Dec 2007 - Christmas Social & buffet with a talk on Volcanoes in Ecuador

and the Galapagos Islands by Dr Peter Floyd.

10 Jan 2008 - Dr Bob Roach – follow up lecture on The Volcanic Geology and Bronze Age Minoan

Archaeology of Santorini, Cyclades, Greece.

7 Feb 2008 - Speaker Dr Derek Siveter on Cambrian soft body fossils of Chengjiang,

China and the flowering of early animal life.

6 Mar 2008 - AGM and Chairman's Lecture with Elizabeth Hallam.

Dudley Rock and Fossil Fair - *Return of the dinosaurs'*

Saturday 22 & Sunday 23 September 2007

Dudley Concert Hall and Dudley Museum & Art Gallery

Exhibitors from the world of geology

including superb fossil and crystal displays, gem cut stones, jewellery

Opening times: Saturday 10am - 5pm, Sunday 10am - 4pm

For more information contact

Tourism Development on 01384 817611

or visit www.dudley.gov.uk/leisure-and-culture/tourism-travel/events/rock--fossil-festival-2007

NSGGA - Next Committee Meeting

- **Thursday 20 September at 7.00pm**

in the School of Earth Sciences and Geography, Keele University

Staffordshire RIGS Group

For details about the Group and meetings, contact:

SRIGS Secretary: Sue Lawley

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Janet Osborn; John Reynolds; John Winchester

Executive Committee (co-opted):

Ellie Hooper (Keele Geol. Soc), Nick Hulley

Why not visit the NSGGA web pages: www.esci.keele.ac.uk/nsgga

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