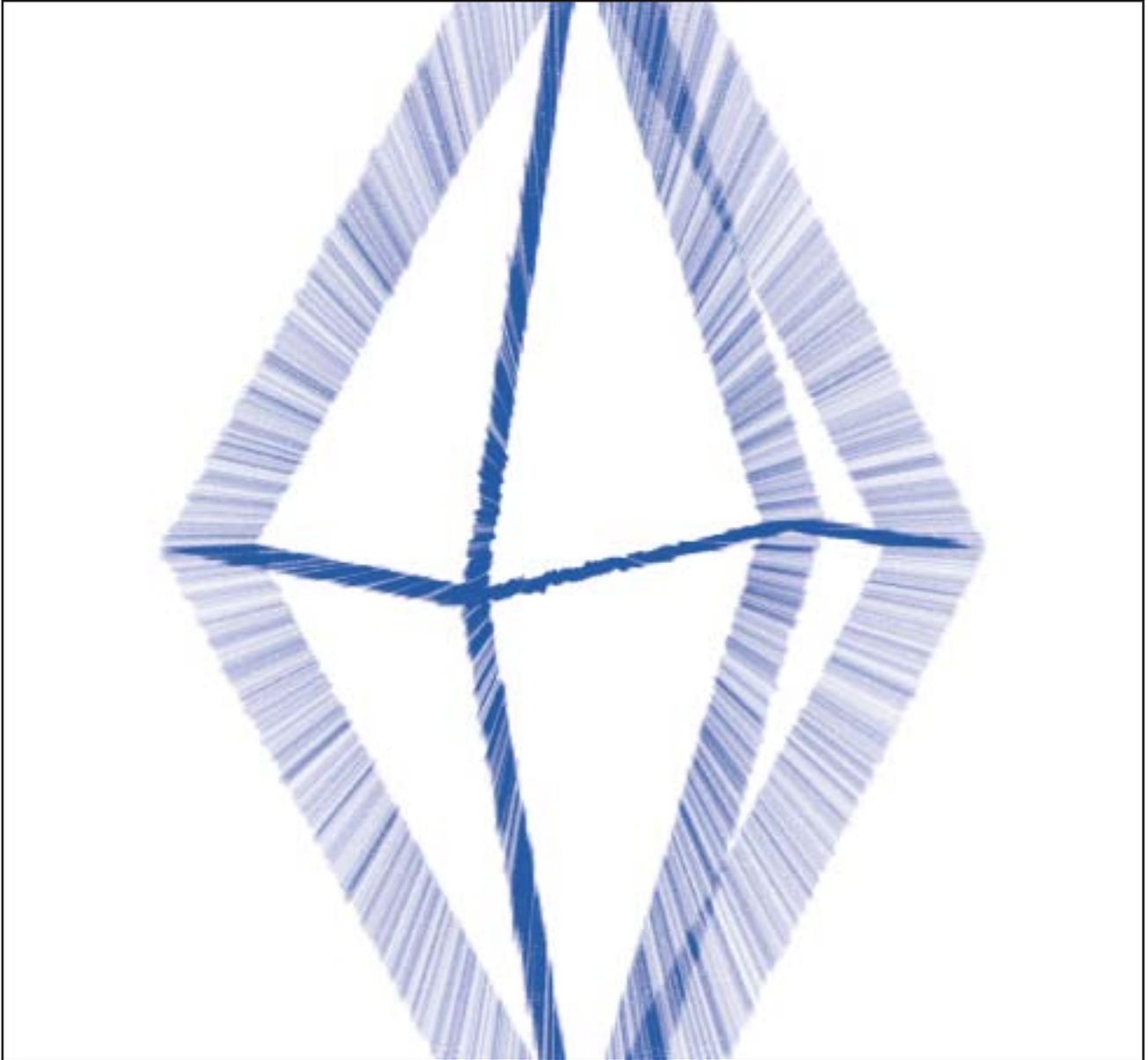


The Russell Society Newsletter



*Number 69
September 2016*

The Russell Society is a society of amateur and professional mineralogists which encourages the study, recording and conservation of mineralogical sites and material.

Registered Charity No. 803308

Russell Society Newsletter

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The Russell Society Health and Safety Policy:

Adopted by Council 2016.

- It is the policy of the Russell Society, so far as is reasonably practicable, to ensure that health and safety issues as applicable to the Society have been and will be properly addressed.
- All members of the Society are to take reasonable steps for the H&S of themselves and others who may be affected by their acts or omissions.
- All members of the Society are to co-operate with the Society, so far as is reasonably practicable, to enable the Society to comply with any duty or requirement imposed on it.
- In the event of an accident or injury members of the Society should seek the appropriate medical attention and notify Society officials who will properly document all details.
- Any member of the Society can bring to the attention of Society officials any suggestions or ideas which could improve safety and prevent accidents.

One of the aims of the Russell Society is to encourage the study, recording and conservation of mineralogical sites and material. Among the various activities undertaken in pursuit of this aim, members make many field visits to sites around the country and attend many lectures and other indoor meetings. The Russell Society promotes a high degree of responsibility amongst its members in the achievement of its aims, especially with regard to Health and Safety (H&S) matters.

It has
A Health and Safety Policy
A Risk Assessment Form
A Guide to Good Practice

A Field Leaders Indemnity Form
An Incident Report Form
A Field Visit Check List

These documents are to encourage enjoyable and interesting visits and meetings that are educational, involve conservation and recording, and are incident free. They also show the responsible attitude that the Russell Society and its members have to health and safety issues.

The Society holds Public Liability Insurance with a limit of Indemnity of £5,000,000 (extended to include Member to Member) and Personal Accident Insurance with Aviva via Bluefin Insurance Services LTD under Policy No: 19133855.

H&S Review 2016.

The views and opinions expressed in this Newsletter are those of its correspondents, and are not necessarily agreed with or shared by the Editors, the Council, the Russell Society or its Members. The accuracy of submissions is the responsibility of the authors or Society branches and will not necessarily be checked by the Editor for validity.

“Editorial”

Well, time rolls on and, once again, we find ourselves looking down the barrel of another autumn. It must be time for another Newsletter. I hope that you have all had a good summer – amid the “up and down” weather – and that you have managed to pursue your mineralogical interests in some shape or form. There has certainly been a lot of activity, judging by the number of Branch meetings and field trips reported in this issue. There are quite a lot of field trip reports. In fact I’ve had so many sent in that I have had to hold some of the later ones over for the Spring 2017 issue - otherwise this issue would have become unfeasibly large. I hope you will forgive me (especially those who laboured to write the reports) and rest assured that they will all appear in these pages in due course.

Another regular – but much less welcome – element is also present in the form of obituaries for two well known and long standing members of the Society. Norman Thompson and Bob Symes have been around pretty much as long as I can remember and their loss will be greatly felt. A full obituary and appreciation of Bob Symes, a former Russell Society President, will appear in the next issue of the RS Journal.

In the pages that follow you will find details of future events, such as the 2016 “Maisemore Event” (held jointly with the Cheltenham Mineral & Geological Society) in October. This popular annual event always provides a great day out and I hope that as many of you as possible will try to attend. If you do plan to go please let the organisers know in advance so that they can ensure an appropriate level of catering.

There is also information on the Russell Society’s 2017 ASM Weekend to be held in north Wales. It promises to be a really good event and I would encourage as many members as possible to attend it. Anyone uncertain about the value and enjoyment to be obtained from attending an ASM weekend should read Roy Starkey’s account later in this issue, of the 2016 meeting, held in County Durham. You can also find a condensed version of the AGM minutes and reports of the associated collecting activities in the “Meeting & Field Trip Reports” section. Arising from the 2016 AGM we welcome Rob Bowell and Steve Warren to the ranks of the Society’s Council, Rob taking over as Treasurer and Steve as General Secretary. We wish them well in their new roles.

It’s been an interesting year in many respects and one or two very positive “happenings” are possibly worth noting. In June the Lapworth Museum of Geology at the University of Birmingham reopened after a period of renovation and redesign. I’ve been to see it (a report appears in the following pages) and it is well worth a visit – something of a “beacon” in the field of recent museum revamps. There has also been the first manifestation of a major new mineral show. This was held for the first time in August at Leyburn in North Yorkshire and seems to have been well received. Unfortunately this was too late for an account to make it into these pages but it is intended to be an annual event and the date for the next one is 27th–28th May 2017. Put these dates in your diary!

On the same general theme, the “Autumn Show Season” is nearly upon us and I hope that as many of you as possible will make an appearance at one or more of the events in Hampshire (Lyndhurst, 3rd September), Derbyshire (Bakewell, 8th–9th October), Sussex (Haywards Heath, 12th November), Kent (Sidcup, 19th November) and Oxfordshire (Oxford, 27th November). Details of these and other shows are in the “Events” insert in the centre of this issue.

There is something of a flavour of health & safety issues in this edition. Attention is drawn both to recent incidents at the Boulby potash mine in Yorkshire and to a recent trend in requirements for safety equipment when visiting working quarries. This last point is important to all members who are active collectors and particularly to those who organise the Society’s field trips. It is always worth stressing that the Society places great emphasis on safety in all its activities and that members are expected to be familiar with the requirements in that respect. You should, for example, make sure that you have read the health and safety information on the Society website at <http://russellsoc.org/safety/>. The Health & Safety Policy (See opposite) and the Field Trip Leaders Indemnity Form have both recently changed.

I hope you find the mixture of articles, news “snippets” and meeting reports interesting – and perhaps even useful. I am always open to ideas for future editions so please keep on sending in material for publication or ideas for things you would like to see covered. An electronic version of this issue will shortly be winging its way to you – at least it will if we have your current e-mail address – please make sure that you keep the Membership Secretary up to date on any changes to your details.

Enjoy your Newsletter.

Michael Doel

From the President:

As I write this, during July, I am about to depart to warmer, but perhaps not sunnier, climes. Hopefully you have been able to make the most of what has been an unusually dry summer. Attendance on field trips last summer showed an unusual dip and one must hope that this is just a statistical anomaly because field trips are one of our most popular offerings.

Worryingly, however, the two trips I have led this year – to opencast coal sites in South Wales – have only attracted enough members to fill a small car. I view this as very disappointing. Opencast coal mines are, by their very nature, ephemeral. Consequently unless environmental policies, or world economics, change they will all soon be gone. I strongly believe that we should be making the most of the opportunity to conserve what is to be found within all active mines, quarries, or collieries. The Carboniferous Coal Measures of South Wales are no exception and provide interest for mineralogists and palaeontologists alike.

We have all seen the gradual shift from many small quarries to a small number of much larger extractive operations and the consequent negative effect that this has had on access to geological groups. However when one organizes an official society visit and only a handful of people turn up the management must wonder why we go to so much effort. Please, please, please make the most of the opportunities provided by our dedicated branch committee members.

I would personally like to express my thanks to the Northern Branch committee for organizing and hosting a wonderful ASM in Durham. The attendance was very good and it was very positive to see a number of new faces. Our AGM at Durham saw a couple of changes to your society's council including Steve Warren taking over from Michael Dunmore as General Secretary and Rob Bowell assuming the role of Treasurer which had been very ably covered by Dr Margaret Ince for an additional year. I hope that you will join with me in welcoming these new members of our council to their positions and in thanking those outgoing council members for their service. Following discussions at the ASM we now have a society twitter account run by Mike Rumsey. For those of you interested in 'following' us on social media please look out for us at [@RS_UK_Minerals](#) (RussellSoc.Minerals).

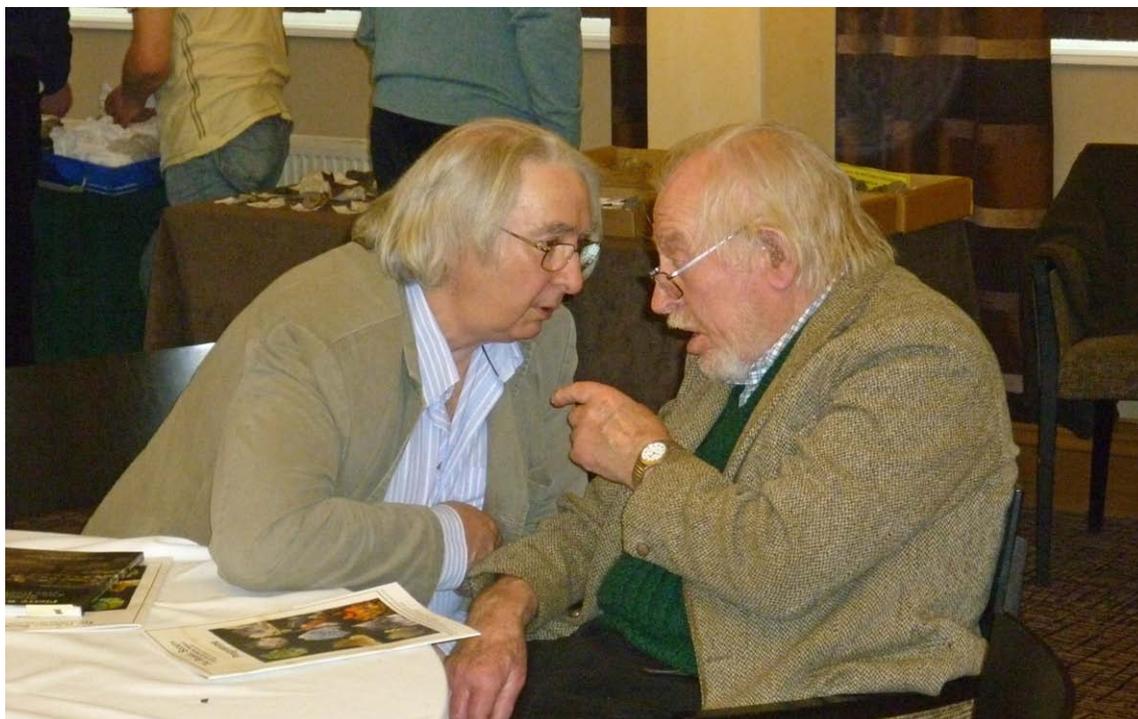
Finally, it is with great sadness that we once again report the loss of two of our best-known members. Former President, and for many years chief auctioneer - Dr Bob Symes OBE - will have been well known to many of you. I along with many other members attended Bob's funeral in Devon and was amazed by the incredible attendance. This show of support highlighted how popular he was and how many people his life touched. Roy Starkey provided a moving tribute to Bob at the service and you will note is helping to organize an event in London to celebrate the life and work of this great man. I do hope that the Russell Society can support this event and make it a success. Norman Thomson was a much quieter character, but was well-known to those in the north of England having joined the society in the early 1980s as the 'authority' on the Caldbeck Fells. His foresight in planning the dispersal of his excellent collection during his final years should be an example to us all and will ensure that his memory lives on in museum collections across Britain.

Tom Cotterell
Hon. President

SOCIETY NOTICES

OBITUARIES

Norman Thomson: 1924-2016



Norman Thomson (right) deep in conversation with Ralph Sutcliffe at the April 2013 Society AGM weekend in Kendal. Photograph: Roy Starkey.

Norman was born in 1924 in Carlisle, Cumbria and passed away at the Cumberland Infirmary, Carlisle in March 2016. A member of the Russell Society for many years, he had a lifelong interest in mineralogy, making his first collecting trip to Roughton Gill in 1939. At that time, the dumps were covered in green and blue minerals!

He served with distinction in World War II, spending some time in the intelligence services and finding himself in the famous university town of Gottingen at the end of the conflict. Although he matriculated in general science, Norman always considered himself to be a chemist. He taught chemistry and geology, and assisted with the science syllabus at Carlisle Technical College for most of his career. He was a member of Royal Society of Chemistry until very recently, when failing eyesight made it impossible to read the journals.

Norman met Mary, a pharmacy student at Carlisle Technical College, while he was working as a lab assistant. They married in June 1950. Many happy holidays were spent in the Alps, where the couple spent time walking and searching for alpine plants, together at first, and then with children Anne and Richard.

Collectors were thinly spread in the North of England in the years after the war, but Norman was fortunate to meet up with Bill Davidson, who owned a Victorian-style Natural History dealership. The two collaborated on a detailed account of local minerals, producing: *Some notes on the Minerals of Cumberland and Westmorland*, which was accepted for publication in *The North Western Naturalist* in 1948 (Davidson and Thomson, 1951). When Bill abandoned collecting in the 1960s, Norman teamed up with George Farr, a dentist from Hexham, and the two regularly explored the mines on Alston Moor. George and Norman were among the first collectors to find their way into Heights Mine, where the walls were "covered in green fluorite". (After his death, George's collection, which included many superb north-of-England fluorite specimens was acquired by Crystal Classics).

Norman joined the Russell Society soon after it was founded; he met up with Kemp Meikle and the two collected extensively in southern Scotland. Norman's Volvo car, with a boot full of mining gear, was a regular feature of Society field trips, especially in the 1990s following his retirement. An active mine historian, he also spent a great deal of time with members of the Mines of Lake District Exploration Society, exploring abandoned mines in Cumbria. He was a

regular member of the team that excavated Silver Gill, and provided mineralogical information to more historically focussed colleagues.

My own abiding memory is of a trip to Myer's Head Mine in 1992. Jean Spence, Norman and myself met up in weather that could only be described as dreich. By lunchtime, even with Gore-Tex jackets, we were cold and soaked to the skin. Norman hardly seemed to notice it. When we made our excuses, Norman (with a dryness that belied the conditions) asked where we were going? Hadn't we got any more sandwiches? After all, there was plenty of daylight... We left him happily fossicking on the dump.

Never really happy indoors, Norman had a passion for gardening. Interested visitors were always treated to a tour of his plot, in which a wonderfully eclectic mix of plants competed for attention. He had a particular fondness for alpine plants and was an active member of the local alpine society.

Norman's collection contained in excess of 20,000 specimens. Many were unsorted in field boxes in the garden shed or the garage; some wrapped in newspaper that was forty years old. Cabinets in the house contained specimens had been purchased, donations from many of Norman's collecting colleagues, including George Farr, Kemp Meikle, Mike Rothwell, Trevor Bridges, David Green and Brian Young, and some exceptional self-collected material. The most important suites were from the Caldbeck Fells, the northern Pennines and Leadhills–Wanlockhead; with interesting subsidiary material from the Lake District, southern Scotland and the Yorkshire Pennines.

In 2003, when the time came to think about passing the collection on, Norman contacted David Green and Trevor Bridges to ask for help. Most of the best specimens, about 1700 in total, were donated to the Oxford University Museum of Natural History. A selection of specimens with a particular focus on northern England was donated to the Hancock Museum in Newcastle-upon-Tyne. Remaining material was auctioned at society meetings, and the proceeds donated to the Eden Valley Hospice, where Norman's wife, Mary, had passed away in January 2004. An account of the collection, including photos of some of the better specimens, is provided by Green *et al.* (2012).

In the course of a long career, Norman published occasional mineralogical papers, which are listed below. Access to a reliable means of identification would surely have produced more. The most important specimens in his collection have found permanent homes in Oxford and Newcastle where they are available to future researchers. That is what he wanted.

Norman is survived by his daughter, Anne Buchan, a retired teacher; his son, Richard Thomson, a retired medical physics technician; and three grandchildren, Alister, Stewart and Robyn. If any society member would like to make a donation in his memory, the Eden Valley Hospice, Durdar Road, Carlisle, CA2 4SD, would be an appropriate recipient.

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David Green

Robert Frederick Symes 1939–2016



Bob Symes chatting with the late Don Alderson in the Rashleigh Gallery, Royal Cornwall Museum, Truro. Russell Society AGM weekend, April 2005. Photograph: Roy Starkey.

It is with great sadness that we announce the death of Dr Robert Frederick Symes, known universally as Bob. A past-President of the Society, Bob has been a prominent figure in British mineralogy and geology for around 50 years. He was born on 10th February 1939 in Harrow, London, and grew up in Eastcote, Pinner. After finishing his school studies Bob joined the staff of the British Museum (Natural History) in South Kensington on 1st October 1957, as Assistant Scientific Officer. He attended evening classes and worked his way up, *via* part-time studies at Birkbeck College, gaining his BSc in geology, and eventually retiring as Keeper of Mineralogy. He was awarded a PhD in 1981 for his research on the orbicular rocks of the Channel Islands, supervised by Clive Bishop of the NHM under the auspices of Queen Mary College.

Bob developed a global network of contacts in the mineral world and became a popular and well-respected scientist and curator. His work in the Mendips and at Merehead Quarry in particular, was honoured by the naming of a pink oxychloride from the Torr Works (formerly Merehead Quarry) as *symesite* in 2000. He had a genuine love of minerals and would extol, at length, the virtues of "*our wonderful calcites and fluorites*" to anyone who would listen. It was announced in the New Year Honours list, on 30th December 1995, that Bob was to be awarded the OBE for services to the Museum and the science of mineralogy.

After retiring from the Natural History Museum, Bob and his wife Carol moved to the pleasant seaside town of Sidmouth in Devon in 1999. Here, Bob found a new career at the Sidmouth Museum, serving as Honorary Curator from 2001-2015.

Outside of his professional life Bob was an energetic and popular participant in the world of the amateur geologist and mineralogist. His passion for his subject was infectious and he was in constant demand as a speaker at local clubs and societies. Perhaps closest to his heart was the Harrow and Hillingdon Geological Society which he helped to establish in 1973.

He served as President of the Russell Society from 1989–1993, and was constantly encouraging and keen to drive up membership numbers, something which he did to dramatic effect during his presidency. He became firm friends with many members and also acted as auctioneer at the Society's annual benefit auction at the AGM.

Bob was a prolific author, and I suspect that the work of which he was most proud is *Minerals of Cornwall and Devon*, authored jointly with Peter Embrey, which set the standard for an occasional series of topographical mineralogy works in the same style, progressively covering different regions of Great Britain.

A great family man, Bob was immensely proud of his two daughters Catherine and Victoria, his devoted wife Carol, grandchildren Maisie, Olivia, Martha and Gabriel and sons-in-law Stas and Matthew. Our condolences go to all of them.

A full obituary will appear in the next volume of the Journal of the Russell Society.

Roy Starkey

The Russell Society 2017 ASM Weekend. Provisional Programme.

We know that most people are already aware of the provisional details (these are not yet set in stone) of the Society's 2017 ASM weekend and quite a few members have already booked accommodation but, just in case, the position is as follows:

The Northwest Branch look forward to seeing you in North Wales from Friday 21st April to Sunday 23rd April 2017. The venue for the event is The Lodge Hotel, Tal-y-Bont, Conwy LL32 8YX, Tel: 01492 660766. Accommodation at The Lodge is now fully booked but there are several B&Bs near Tal-y-bont, as well as a Premier Inn down the road, a local camp-caravan site, and several hotels in nearby Conwy, Llandudno and Betws-y-Coed.

For members staying at The Lodge, the 'Dinner, Bed & Breakfast' package includes the meals on Friday and Saturday evenings. For those not staying at the Lodge the meal on Friday evening and the Russell Society Dinner on Saturday night will each cost just £25 for a three course meal (drinks extra). The Conference Fee of around £30, payable by all attendees, will include tea/coffee breaks and a finger buffet lunch on Saturday.



The Lodge Hotel, Tal-y-bont. Venue for the 2017 ASM Weekend events.

The programme of activities is still not fully confirmed, but there will be the usual variety of interesting visits on Friday, including a visit to the Great Orme Copper Mine (group rate for 10 people prepaid is £5.75 or £6.75 for individuals), a Sygun Copper Mine Underground Adventure (20% discount off the Adult fee of £9 and Seniors fee of £8) and a visit to Bangor University to view the mineral gallery. Field collecting trips for Friday and Sunday will be announced later.

The ASM Weekend programme at the Hotel will look something like this:

Friday Evening (times approximate)

17:45-18:15 '3D Photographs' by John Chapman

18:15-19:00 'Solving a mystery regarding the early history of witherite' by Tom Cotterell

19:15 Three course meal and, after dinner, a showing of the 'Great Orme Copper Mine' DVD and mineral exchanges.

Saturday Activities

08:30-09:15 Registration.

09:15-09:30 Welcome and Introduction.

09:30-10:15 'Durham ASM to Wales ASM' link looking at Pyromorphite by Charles Lamb.

10:15-10:45 Morning Coffee.

10:45-11:30 'Synthetic and Natural Occurrences of Linarite and Pyromorphite in Wales' by Stephen Plant.

11:30-12:15 'Britannia Mine' by Tim Coleman.

12:15-13:15 Finger Buffet Lunch.

13:15-14:00 'Mining Memorabilia' by Philip Taylor.

14:00-16:30 'Mineral Photography Workshop' lead by Roy Starkey and Frank Ince.

15:00-15:30 Afternoon tea served during the workshop.

16:30-18:00 Russell Society AGM.

18:00-19:00 Mineral exchanges.

19:00 Society Dinner followed by the presentation of the Trevor Bridges Award and the Society Auction.

(During the day there will be various mineral display and exhibits - these will be announced later)

Activities available for partners include castles, tramways, mountain and lake railways, Zip World, Bounce World, Betws-y-Coed Bounce Below - Treetops Zipwire - Underground Zipwire (10% discount for 16 min in the group), woollen mills, gardens, garden centres, Electric Mountain hydro-electric power station experience, craft centres, waterfalls, slate works and hiking trails to all levels. Full information can be found on the Society's website at <http://russellsoc.org> and this will be updated as and when we get confirmations about trips.

Christine Critchley.

The Trevor Bridges Award.

Those of you who attended our national Annual Society Meeting (ASM) weekend at Bowburn Hall Hotel, near Durham, will know that the Saturday evening saw the presentation of the inaugural Trevor Bridges Award.

The award is presented to the winner of a competition to present your favourite specimen collected during the previous 12 months on a Russell Society field trip. The specimen should be labelled and the reason why this is your favourite specimen should be explained. The specimen and label should fit in an area no greater than A4 in size.

It was pleasing to see so many good entries for this competition, but the then very difficult decision of choosing a winner had to be made. Competition was stiff with three very fine specimens from Cloud Hill Quarry, Leicestershire, each with their own specific merits; an excellent example of crystallized witherite with minor alstonite from Dolyhir Quarry, Wales; a nicely crystallized aragonite in dolomite from Silvertop Quarry, Cumbria; and an 'older' specimen of pyromorphite submitted to demonstrate the type of labelling required.

Although the witherite with alstonite was an extremely good example from that particular quarry, and very well described by the accompanying label, I felt that the winner had to come from the suite of Cloud Hill Quarry specimens owing to the exceptional quality of the material discovered during that particular visit.

One of the specimens was extremely aesthetic comprising small, but highly lustrous, metallic, euhedral chalcopyrite crystals richly studded upon the surface of a small, palm of your hand-sized, plate of white scalenohedral calcite crystals. However the other two specimens additionally contained crystals of the much rarer (at this quarry) sulphide, sphalerite.

On one of these specimens the sphalerite was an unusual gemmy orange colour, but the matrix was slightly irregular with a less balanced distribution of chalcopyrite crystals across the surface. The presentation of this specimen upon an acrylic plinth was a nice touch.

The winning specimen, however, was somewhat better balanced overall. Despite the sphalerite being of a darker colour, the calcite matrix displayed well an excellent scalenohedral crystal form and was liberally studded with bright euhedral tetrahedral chalcopyrite crystals. This combined with a wonderful story of how the specimen had been wrapped in the field with no knowledge of the presence of sphalerite, only for it to be fortuitously discovered during the cleaning process evoked pleasant memories. Particularly those of the many hours of rock splitting required to discover the ultimate micromount specimen! Additionally this was the only entry to have a label affixed to the underside of the specimen recording all of the importance information – a fine example of curation.

This specimen was entered by Dr Frank Ince who was presented with his award after the Society Dinner. Many thanks to all those who provided entries. Start thinking about your entries for 2017.



The winning specimen in the first Trevor Bridges Specimen Competition. Calcite with chalcopyrite and sphalerite.

Tom Cotterell – Judge.

I thought it might be useful to include with the above item the actual text which Frank used in support of his Trevor Bridges competition entry. This gives a good idea of the standard of material which is expected in future.

Editor.

My Favourite Specimen Collected In 2015

Bench G (west face), Cloud Hill Quarry, Breedon on the Hill, Leicestershire.

NGR: SK 4133 2162

Collected on 22 August 2015

This little specimen (FI-2447) is one of three small specimens that came from a vugh in a carbonate-rich breccia zone exposed on the west face of Bench G (the lowest bench). The largest specimen (lustrous brass-yellow chalcopyrite crystals on colourless scalenohedral calcite) emerged in an almost pristine state and was obviously one to keep. Two smaller specimens were also collected and, as they were associated with a good-looking specimen, they were wrapped

up anyway (despite being covered with dust and fine rock debris, and looking much less attractive).

Having returned home, the two smaller specimens were given a quick rinse that removed all of the debris and revealed, as well as the expected chalcopyrite and calcite, quite large, euhedral crystals of mid-brown sphalerite; well, large for Cloud Hill Quarry and Leicestershire. As it has the largest sphalerite crystal (7 mm across), this little specimen is my favourite of those that I collected in 2015 (see photo; field of view 35 mm wide).

It is mildly embarrassing to admit that I had not noticed the sphalerite during our visit to the quarry. Still, it goes to show that one should always wrap up a selection of promising material and have a good look at it later.

Safety Equipment: New Quarry Rules Regarding Boots.

The Society has always placed great emphasis on ensuring the safety of members on field expeditions and insists that appropriate personal protective equipment (PPE) must be worn at all times (see, for example, the introduction to the Field Trips insert elsewhere in this issue). All members are expected to be aware of the Society's safety policy and the various health and safety documents on the Society's website. (See <http://russellsoc.org/safety/>)

Working quarries have long insisted on effective safety footwear (i.e. strong boots with appropriate toe and ankle protection) but on some recent trips the Society has become aware of a hardening of attitudes to this issue in some quarries. The position of some quarry companies on footwear now seems to be that:

- "Rigger" type boots and steel toed Wellington boots are not acceptable in quarries.
- Lace-up leather boots with high ankle support (with the laces set above ankle height) and toe protection are a requirement.
- Boots with steel toe caps are no longer acceptable, owing to a perceived risk of permanent crushing on impact. Toe caps should be of a plastic composite material like "Kevlar" which rebounds to some extent after deformation on impact.

The Society was not previously aware of this last stipulation. To be technical - and as far as quarries go - the pertinent rules for us on PPE are contained within:

- (a) the Health and Safety (Consultation with Employees) Regulations 1996;31 and
- (b) the Safety Representatives and Safety Committees Regulations 1977;32 as amended by the Management of Health and Safety at Work Regulations 1999.

To the best of our knowledge these regulations do not specifically prohibit the use of steel toe caps and it seems that the position outlined above is an example of a quarry company deciding to go slightly beyond the legislative requirement in the context of their own operations. It is the companies who have the final say in things like this and on who is (or is not) allowed onto their premises. Thus members will need to be aware of such changing attitudes. Certainly anyone contemplating buying a new pair of safety boots in the near future might be well advised to seek something that does not have steel toe caps. In fact all members who are active in field collecting and expect to visit active mine and quarry sites may wish to consider upgrading their footwear. There will be many sources of such equipment - just put "safety boots" into your favourite search engine and look for boots with composite toecaps.

It is also now clearly important for field trip leaders to confirm specific PPE requirements for each site with quarry management prior to the visit and to confirm these with all participants. The Society Council will shortly consider its position on PPE for members going into mines and quarries and the Society's Health and Safety documentation may be revised to take account of current attitudes and practice

Editor.

Disposal of the RS Library.

At its meetings last year, the Council decided, reluctantly, to dispose of the Library; subsequently, a small group was set up to organise the disposal: Jo Brown, Bracken Gibson, Roy Starkey and Frank Ince. A notification of the disposal was circulated with JRS 18 and those of you who contacted me were sent copies of the 'For Sale' and 'Give Away' spreadsheets. A number of you replied with your requests and the available items were set aside by Jo and Bracken; some were posted (almost immediately) and the remainder awaited collection (either personally or at the ASM in Durham).

Spreadsheets of the remaining items were circulated by e-mail in late-January this year and, again, those of you who

replied received a copy of the (now smaller) spreadsheet. This circulation resulted in further requests and the items were set aside for postage or collection. Roy and I called in on our way to Durham and collected those lots that were to be distributed at the ASM. By now the vast majority of the lots had been purchased or given away and the residue was put on a 'grab table' at the ASM. The disposal of the RS Library raised just over £1100 for Society funds: £894 from various lots, plus some very generous donations.

As a token of our gratitude for their efforts as RS Librarians and their help in organising the disposal of the Library, the Council felt that it was appropriate that we should give Jo and Bracken a copy of Andy Tindle's "*Minerals of Britain and Ireland*".

Frank Ince

The 2016 Maisemore Event.

The "Maisemore Event" is always a great day out and should be firmly reserved in your diary. Jointly organised by the Russell Society Wales & West Branch and the Cheltenham Mineral and Geological Society, this day-long event offers a mixture of talks and displays well worthy of your time and interest. The action takes place at the Maisemore Village Hall, Gloucester, GL2 8JE on Sunday 16 October, 2016 . Doors open at 10.00 am.

Come and discover more about the new Welsh dinosaur, learn about the historic salt industry in Droitwich and find out more about the rocks, minerals and fossils of Leicestershire and Rutland. You are invited to bring your own rocks and fossils along for identification and there are usually plenty of opportunities to swap your specimens or pick up "freebies". Contact Tom Cotterell at tom.cotterell@museumwales.ac.uk or 07964143773 for more details on the programme. Refreshments will be available for a small charge. Please let Marashean Parker (01452 618015, or marashean@talktalk.net) know if you plan to attend so that an appropriate level of catering can be provided.

Editor.

Commemorative Meeting to Celebrate the Life and Work of Bob Symes.

A one-day meeting is being convened under the auspices of the Geological Society and HOGG in association with the Geologists' Association, The Ussher Society, The Russell Society and the Harrow and Hillingdon Geological Society. The meeting will celebrate the life and achievements of the late Dr Robert (Bob) F. Symes, formerly Keeper of Mineralogy at the Natural History Museum, London who died earlier this year. It will be held on Thursday 8th December, 2016 at Burlington House, Piccadilly, London.

Papers on any aspect of Bob's mineralogical research, museum activities, or contributions to the wider field of earth science education and public outreach will be considered for presentation and/or publication. Suitable subjects include the mineralogy of the Mendip Hills, the minerals of Cornwall and Devon and the North of England; supergene mineral geochemistry, the formation of orbicular rocks, museums and the history of local groups. Speakers currently scheduled include Richard Scrivenor, Roy Starkey and Dick Moody.

A programme for the meeting, with details for online registration, will be published by mid-October. Those interested in contributing a talk or poster, and/or an article for publication, are asked to make contact before 31st August with one of the convenors: Dick Moody (e-mail: rtj.moody@virgin.net; mobile telephone: +44 (0) 7973273623); Roy Starkey (e-mail: roy.starkey@gmail.com; home telephone: +44 (0) 1527 874101); Andrew Fleet (e-mail: ajfleet@btinternet.com).

N.B. Although the deadline for submitting papers will have passed by the time you read this, it may still be possible for late entries to be accepted. You should in any event seriously consider attending the meeting which will commemorate a remarkable mineralogist and good friend to many members of the Russell Society.

Editor.

NEWS ITEMS:**The Society's AGM Weekend – Durham 22nd - 24th April 2016.**

The weekend got off to a great start with a “behind the scenes” visit to the Discovery Museum in Newcastle upon Tyne. The visit was attended by Harry and Christine Critchley, David and Jill Briggs, Tom Cotterell, Susan Thompson, Mike Sweeney, and Roy and Mary Starkey, with organiser Frank Bouweraerts. Our host for the afternoon was Sylvia Humphrey, Assistant Keeper of Geology at Tyne and Wear Archives and Museums.

Sylvia began by giving us a brief introduction to the collections at Tyne and Wear Museums. The mineral collection of the Great North Museum: Hancock is in two parts. The main mineral collection, owned by the Natural History Society of Northumbria, which numbers around 8000 specimens; and the University mineral collection, which is on long-term loan from Newcastle University. Much of the main collection was acquired during the 19th century, the nucleus of which was collected by William Hutton (1797-1860). Hutton was also instrumental in acquiring for the museum a collection of about 1,000 Russian minerals donated by Tsar Nicholas I in 1838.



A lot of heads in a small space! Viewing the collection at the Discovery Museum.

Within the collection are the type specimen and almost all the known examples of the mineral “jarrowite”. You can learn more about the collection at: <http://www.ncl.ac.uk/sage/research/gnm/palaeontology/mineralogy.htm> and search the collections database at <http://collectionssearchtwmuseums.org.uk/>. Entering the search term “minerals” brings up more than 19,000 “hits”!

Frank and Sylvia had pre-selected a number of specimens and laid these out for us to inspect. The specimens included some very fine examples of witherite and alstonite, a large baryte crystal from Dufton; a remarkable “Sunday Stone”; smithsonite from Farnberry Mine; pectolite and apophyllite from Whin Quarry at Wearhead; crocoite with vanadinite from Beresovsk, Ekaterinburg, Urals Region, Russia, and fine gold in quartz, also from Russia. We then progressed to several different store locations to look through the drawers and storage racks to gain an appreciation of the depth and breadth of the collections, which are truly impressive. After an enjoyable couple of hours the party dispersed to explore the city, wander around the rest of the Museum, or travel onwards to Bowburn Hall Hotel for the main part of the weekend.

By late afternoon some 25 or so delegates had arrived and the usual activities of socialising, looking at swaps, and carrying-in of all manner of giveaways and exhibits was well underway. This year there was a super-abundance of books and journals for delegates to pick through and take away – these were the residual items from the disposal of the Society's library, and a generous donation of books by Maggie Frankum. A pleasant hour or so was passed in the bar prior to sitting down for an excellent evening meal, followed by more conversation and socialising until delegates dispersed to bed.



The Bowburn Hall Hotel. Scene of the 2016 ASM Events.

Our numbers were swelled to around fifty on Saturday morning as the remainder of the delegates arrived and registered. Proceedings got underway promptly at 09.30 with a welcome and various announcements by Frank Bouweraerts, followed by the first talk – “Buxton Diamonds” by Roy Starkey. Roy provided a brief overview of his project with John Faithfull which had been written-up in the Journal last year, but spent most of the time explaining some of the trickier aspects of the project, details of fieldwork, and some of the unresolved “loose-ends”. He rounded off the talk with a short presentation on “Harrogate Diamonds”, and the prospects or otherwise of these too providing an interesting topic for further research and fieldwork.

After a break for tea and coffee, Charles Lamb, a newcomer to the AGM weekend, gave a fascinating talk on his researches over the past eight years or so looking at “The occurrence of pyromorphite in the Askrigg Block Ore Field”.

The distribution of pyromorphite can be correlated with strata containing phosphate nodules and organic remains, and specimens of remarkable quality have been collected from a range of localities in the area.

Next up was Mike Sweeney who gave us an insight to the workings of “The Copper Coast Geopark in southern Ireland”. The area was declared a European Geopark in 2001 and a UNESCO Global Geopark in 2004. This geologically diverse area contains records of Palaeozoic volcanism and the last ice age, and from 1825-1875 was one of the most significant mining areas in Ireland. You can learn much more about the Copper Coast at <http://www.coppercoastgeopark.com/>

Delegates enjoyed an excellent hot lunch (with a choice of three main courses and four desserts!) before the afternoon session kicked-off with Mike Rumsey from the Natural History Museum, London. Mike’s talk, “Enigmatic Minerals from Northern England and Scotland”, took us on a tour of several fascinating “problem minerals” – chlorophaeite, conistonite, eosite, plumbonacrite, and the peculiar range of minerals at Milltown Quarry, Ashover, Derbyshire. Mike explained his researches into each of these and outlined the current status and remaining problems to be resolved.

Finally, Society President Tom Cotterell brought the conference session to a close with a review of historical “Mineral Collecting in Northern England”, starting with a number of examples from John Woodward’s 1729 catalogue, and using illustrations from Sowerby’s British Mineralogy and the collections at Amgueddfa Cymru/National Museum Wales.

During the day, at lunchtime and prior to the AGM itself, delegates were treated to a veritable feast of mineral displays in the boardroom put on by Steve Warren and Charles Lamb, as well as the mountain of printed material available to take away, and the usual delectable range of swaps and freebies brought along by delegates.

New for this year were the entries for the Trevor Bridges trophy, which attracted half a dozen entries – hopefully this will grow in future years. The specimens were all of a high standard and the entering members had all provided thorough curatorial data with their specimens.

The Society Annual General Meeting at 16.30 ran to schedule and provided a good opportunity for delegates to catch-up with Society business and to hear the plans for the future from Council Officers. A condensed version of the minutes of the meeting is provided on page 29 this Newsletter.



Hmmm! That’s not a bad one! Members assessing the lots before the auction.



Frank Ince (R) receiving the trophy for the Trevor Bridges specimen competition from Tom Cotterell, RS President.

After the AGM, and whilst the dining room was being laid out for dinner, the auction donations were set out and numbered ready for the Annual Auction after the dinner. This year, auctioneer Roy Starkey again clustered some lots to constrain the overall number to fifty so that the auction could be completed in a reasonable length of time.

The evening meal proved to be very good, and an enjoyable time was had by all. Hon. President Tom Cotterell presented the Trevor Bridges trophy to Frank Ince for his specimen of sphalerite, chalcopryrite and calcite from Bench G, Cloud Hill Quarry, Leicestershire – well done Frank! See also the separate note on the Trevor Bridges competition elsewhere in this issue.

The auction commenced at 21.45 with the auctioneer declaring that he hoped to move swiftly through the lots and be finished by 22.30. We had a varied mix of contributions this year and all of the donated lots found new homes by the end of the auction. Thanks to all the delegates who generously provided specimens and books for the auction, and thanks too to everyone who bid and to the lucky winners for each lot. The auction raised £949 for Society funds.

The business of the evening complete, those staying elsewhere made their way to their accommodation and a few

stalwarts stayed chatting and “putting the world to rights” until a late hour.

Sunday morning saw everyone up bright and early, cars packed and delegates eager to have breakfast and be on their way to field trip destinations. Field trip locations this year were Shap Pink Granite Quarry, Closehouse Mine, Coldstones Quarry and Smallcleugh Mine. It was a fairly chilly morning in Durham and as we drove across the Pennines towards Shap it began to snow, with the high fells turning white in places. Fortunately by the time we got to Shap the snow had more or less stopped and we were able to enjoy most of the visit in dry and sometimes sunny conditions. Separate reports of the Shap and other visits appear in the “Field Trip Reports” section of this Newsletter.

Once again, this was an excellent weekend and it was really good to see some new faces. We look forward to seeing even more of you in Conway next April!

Roy Starkey

The Lapworth Museum of Geology Reopens – Back in Action & Better Than Ever.

You will have seen articles in past Newsletters (and possibly on Mindat) from Roy Starkey describing the project, which has been going on since 2014, to revamp and rejuvenate the Lapworth Museum of Geology on the campus of the University of Birmingham. This is now complete and “The Lapworth” is now open for business once more. The museum is named after Charles Lapworth, the first Professor of Geology at Mason College, which was the forerunner of the University of Birmingham. He was regarded as one of the most influential geologists in the late 19th and early 20th Centuries. I was a student at Birmingham in the 1960s and, in my student days, the Earth Sciences Building (as it then was) which housed the Lapworth Museum was a rather grubby looking brick building through whose dirty windows dusty window sills full of lumps of rock and dark Victorian display cases could dimly be seen. I did visit it a couple of times in those days but it was not really an inviting or an inspiring place. In more recent years I have visited the museum occasionally and, although it had been cleaned and brightened up somewhat and clearly had some good specimens, it was still not at all “state of the art”.

The revamped museum opened on 10th June and, later in that month, I was able to pay it another visit. What a transformation! The £2.7 million funding from the Heritage Lottery Fund, the Birmingham University Alumni Association and other bodies has enabled the entire area to be stripped out and recreated as a modern museum with a series of themed galleries.

As you enter you go past a helpful and smiling receptionist into a large gallery which now feels modern, spacious and well lit. It is dominated by a mounted cast of an Allosaur skeleton and beside it on the day I visited was a competition to provide a name for the beast. I noticed that suggested names included “Roary”, “Jolly Roger” and “Dino McDinosaurface”?! The room contains the main part of the “Evolution of life” exhibit which traces the origins of life on Earth from the Precambrian and includes sub-sections on topics like evolution and biodiversity. Also in this room is a small display about Lapworth himself. This includes a portrait of the great man and various artefacts like his desk and microscope, some of his books, thin section slides etc.



The main display room in the new museum showing the Allosaur skeleton and the Rock Wall display in the background.

Another attraction in this main gallery is the “rock wall” which is a double sided, floor to ceiling lattice-work structure with every aperture containing a specimen of a rock type (sandstone, gneiss, etc.). This is impressive – the specimens are large and good examples of their type - although some of the specimens in the upper “windows” are so far above the head of the average viewer that it is difficult to see much detail. It would have been nice to have the specimens individually labelled, although this would have meant that the higher labels were hard to read. Instead each side of the wall has an explanatory board with a diagram showing which rock types are in which hole. While there I noticed was that these boards were on the wrong sides of the wall. When I spoke to a member of staff they were aware of this and explained that the boards had initially been in the right positions but had been a bit loose and so a contractor was called in to tighten up the fixings. They did this by taking both boards off the wall at the same time (why?) and then mixing them up and putting them back on the wrong sides of the wall. They will be swapped back again but the problem is they are now very firmly fixed!

In an adjoining room you will find the “Active Earth” display which seeks to explain major earth processes. The main feature is a large and very high-tech video globe that can show colour representations of many aspects of the planet’s geography and geology. These include earthquakes and plate tectonics, ocean currents, global weather patterns etc. Unfortunately it has music associated with it which plays every time anyone presses a button – this seems like a good idea at first, but after you hear it for the 20th time it begins to pall. The room also has several hands-on displays to illustrate the folding and faulting of rock strata.



Specimen of capped quartz from the Virtuous Lady Mine. Raising its hat to visitors.

The main mineralogical interest is found upstairs where a set of excellent dust proof cabinets display a good range of mineral species. These are both well lit and well labelled – with labels next to the specimens. Oh Joy! I think my favourite specimen was an example of “capped” quartz from the Virtuous Lady Mine in Devon which is presented as if “raising its hat” to visitors. There is also a good display – with impressively large specimens - on the old lead mines of Shropshire. Other themed cabinets include “The West Cumbrian Iron Mines” and “British Fluorite Mines”. Another of my favourites in this area was “The Bragge Cabinet” which is a many-drawer wooden cabinet containing a Victorian civil engineer’s collection of polished agates and other rocks. It makes a very attractive display with some of the shelves being illuminated from below. My only complaint was that the drawers need to be pulled out a little further to show more of the contents. Another thing I particularly liked was the educational display to demonstrate the use of a streak plate (green streak from malachite, red from haematite etc.). I’m not sure I have seen this before in a museum display. There are also good educational displays for other mineral properties such as fracture, lustre and transparency. There is even a display of UV induced fluorescence, which gladdened my heart considerably. This allows visitors to see specimens in visible light, long wave UV and short wave UV and it is quite effective, although some of the specimens do not give as good an account of themselves as they might. The top and side shields, installed to prevent anyone getting direct line of sight of the UV tubes, do tend to cut out quite a lot of UV and the bottom centre

section (especially) is a bit dull. Visitors I spoke to seemed to like it, although I had to point out to a few that you needed to press buttons to get the dark case & UV effects. Clearly some people read information/instruction cards and some don’t!

Overall, I thought the new museum was visually very attractive and offered impressive informational/educational content. It makes a great first impression but, in the longer term, the proof of the pudding will be how successful it is at attracting a consistently high number of visitors. During the time I spent there the viewing population was generally about 10 – 15, mostly middle aged people which I thought was not bad for late morning on a weekday. I gather from talking to the staff that there has been a lot of interest in the local media, including a piece on the local TV evening news. The Museum now features on Trip Advisor (as “Number 128 of 259 things to do in Birmingham”) where it has received unfailingly positive reviews. There has also been a lot of positive Facebook and Twitter traffic. Hopefully all this will translate into rising visitor numbers, especially in the school holiday periods. The auguries are good and, if you live in the West Midlands – or can get to the University reasonably easily – you really should go and take a look. It’s worth a couple of hours of anyone’s time.



The Bragge Cabinet - this contains some very fine polished stones.

Editor.

UK On-shore Oil: The “Gatwick Gusher”.

The ongoing “discussions” over the possibility of utilising “fracking” techniques to extract significant quantities of oil and (mainly) gas from on-shore sites around the UK continue to generate much heat – although possibly somewhat less

enlightenment. It seems certain that any applications to undertake such extraction will face extended and vociferous opposition from environmental groups and local residents. However, some might be surprised at the current level of on-shore oil activity, much of which seems to pass almost un-noticed.

Many people will have seen the famous “nodding donkey” pump on the cliffs above Kimmeridge Bay which has extracted crude oil from the Jurassic formations below since the 1960s. This well is part of the so-called “Wytch Farm Oilfield”, currently owned by the French company Perenco and said to be the largest on-shore oilfield in Western Europe. The field, which operates in the heart of an Area of Outstanding Natural Beauty, has three main reservoirs, the Bridport Reservoir hosted by lower Jurassic sediments, the Sherwood Reservoir hosted in Triassic sandstone and the Frome clay/limestone reservoir in the middle Jurassic. Production from this field has varied widely over the years and peaked at more than 100,000 barrels per day in 1996 and 1997. It is now declining and was in the region of 15 - 20,000 barrels per day in 2013 with much of the output coming from “extended reach wells” where horizontal or shallow angle boreholes extend miles from the actual well-head. Oil is extracted using modern “reservoir management” techniques which include drilling additional wells and forcing water down these to drive oil in pre-existing voids and fractures up the production wells. It is important to note that this is not the same as the fracking technique now proposed for many other sites which aims specifically to fracture the rock layers to promote the release of gas. The Wytch Farm complex has reserves that are estimated to be sufficient to keep the wells producing until 2037.

However, Perenco/Wytch Farm may have to look to its laurels as the UK’s largest on-shore oil producer as a company exploring the lower Kimmeridge limestone in an area of Sussex near the border with Surrey has been reporting some rather remarkable results in 2016. In recent trials the so called “Gatwick Gusher” – a test site near Horse Hill north of Gatwick Airport - is said to have produced the highest flow rates of any onshore wildcat well in the UK, matching the kind of levels normally seen in the North Sea. During the tests the Horse Hill well delivered nearly 2000 barrels of so-called “light sweet crude” to the Esso refinery at Fawley. It has been estimated that something in excess of 10 billion barrels of oil may lie beneath the site. Other exploration sites in the same general area remain to be assessed.



A sign of things to come? The “Gatwick Gusher” well-head.

The initial well was a simple vertical borehole and in the initial tests the oil apparently flowed to the surface under its own pressure. Despite this the company expects that, to improve flow rates and extract a reasonable fraction of the available oil, it will be necessary to employ the kind of now conventional drilling and reservoir management strategies mentioned above for the Wytch Farm field. Once again, the companies involved are keen to emphasise that this is not fracking as proposed for other sites.

Despite all this, it is fair to say that a degree of scepticism persists in some quarters regarding the commercial viability of the Horse Hill area. Both the size of the available reserves and the company’s ability to extract viable amounts of oil at an acceptable price has been questioned. As usual, more work, more money and more time will be necessary to resolve the outstanding questions. Time will tell – but the prospect of an oil bonanza in Surrey and Sussex is an intriguing one on many levels. I did hear that a shop was opening in Haywards Heath selling Stetsons and cowboy boots (or did I imagine that?)

Editor.

More Problems for the Boulby Potash Mine.

In the previous Newsletter we reported on problems, including job losses, at the Cleveland Potash mine (owned by Israel Chemicals) at Boulby, North Yorkshire. Since then problems of a different kind have been reported from the site, including a tragic fatality.

John Anderson, described as “an experienced driver” was killed in a gas blow-out 1,000m (3,200ft) below ground and up to 5 km out beneath the North Sea when a sudden and powerful release of gas occurred in the section where he was working. The blow-out, which consisted of a mixture of methane and nitrogen, did not explode but the high pressure

release displaced “a significant amount of mineral”. The gases arise from natural processes and blow-outs of this kind are not unknown in deep mines although they are not common.

After the incident all production at the site was suspended for a while to allow a “root and branch” review of safety systems and procedures. The company’s Safety Manager Simon Hunter said there was no suggestion that proper procedures were not being followed at the time of the incident. A full investigation is being carried out involving Her Majesty’s Inspectorate of Mines.

In April this year seven workers were taken to hospital after a fire broke out underground at Boulby. The workers, who were 1,100m (3,600 ft) under the sea bed and five miles (8km) from land at the time, were treated for smoke inhalation and later discharged. It is understood that the fire, which was quickly extinguished, began in a quantity of plastic insulation materials.

The mine management are very clear that recent job losses and restructuring at the mine have not lead to any weakening of safety procedures or the company’s commitment to safe operation.

Editor.

NASA Scientists Discover An Unexpected Mineral on Mars.

Scientists have discovered an unexpected mineral in a rock sample at the Gale Crater on Mars, a finding that may alter our understanding of how the planet evolved. NASA’s Mars rover, “Curiosity”, has been exploring sedimentary rocks within the Gale Crater since landing in August 2012. In July 2015, 1060 Martian days after it landed, the rover collected powder drilled from rock at a location named “Buckskin.” In the process of analysing data received from an X-ray diffraction instrument on the rover, scientists detected significant amounts of a silica mineral called tridymite.



Tridymite (SiO₂) is a high temperature form of quartz and this detection was a surprise to the scientists, because on Earth it is generally associated with silicic volcanism. This process is well known on Earth but was not thought to be important, or even present, on Mars. The discovery of martian tridymite might cause scientists to rethink the volcanic history of that planet, on the basis that the planet once had explosive volcanoes which led to the presence of the mineral. Scientists in the Astromaterials Research and Exploration Science (ARES) Division at NASA’s Johnson Space Center in Houston led the study. A paper on their findings was published on-line in June this year in the *Proceedings of the National Academy of Sciences*. See <http://www.pnas.org/content/early/2016/06/07/1607098113.full>

The NASA Mars Curiosity Rover. Making interesting discoveries in Martian geology. (Picture used under Wikipedia Commons licence)

On Earth, tridymite forms in an explosive process – exemplified by the Mount St. Helens volcano in Washington State and the Satsuma-Iwojima volcano in Japan – which is characterised by a combination of very high silica content in the magma and extremely high temperatures in the volcanoes. It is conjectured that the Martian tridymite was incorporated into ‘Lake Gale’ mudstone at the Buckskin site as sediment from the erosion of older silicic volcanic rocks.

The paper may also stimulate scientists to look again at the way tridymite forms. The authors have looked for terrestrial evidence that tridymite could form at low temperatures from geologically reasonable processes not implying silicic volcanism. However, they found none. “I always tell fellow planetary scientists to expect the unexpected on Mars” said Doug Ming, ARES chief scientist at Johnson and co-author of the paper. “The discovery of tridymite was completely unexpected. This discovery now begs the question of whether Mars experienced a much more violent and explosive volcanic history during the early evolution of the planet than previously thought.”

Editor.

SHORT REPORTS & PAPERS.**Caroline Birley and her Zeolites.**

Knowing that there are a number of members of the Russell Society interested in zeolites I thought that this short note might be worthwhile.

In the course of my research into historic mineral collectors and labels one particularly interesting character has come to light – Miss Caroline Birley (1851-1907). Birley was a Manchester-based collector of zeolites and fossils during the later period of Victorian Britain. A very recent trawl of the internet has revealed that Birley was also well-known as a children's author and has a Wikipedia page devoted to her: https://en.wikipedia.org/wiki/Caroline_Birley. She is also recognised on the Trowelblazers website as a pioneering female geologist: <http://trowelblazers.com/caroline-birley-this-ardent-geologist/>.

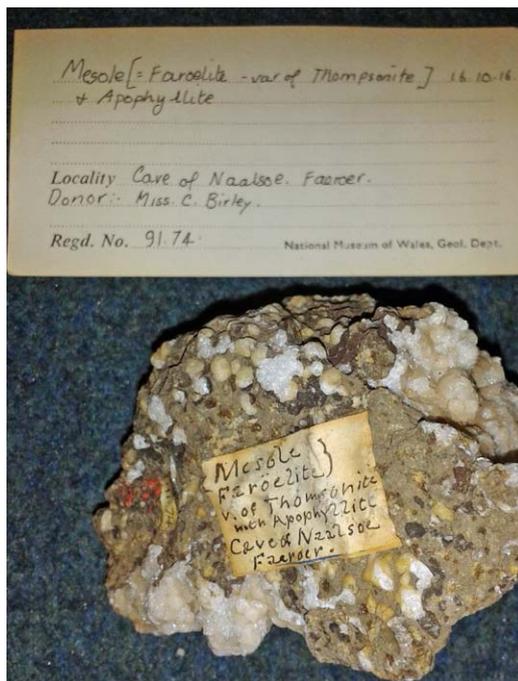


Fig. 1. A typical Caroline Birley handwritten specimen label affixed to specimen no. NMW 91.74 (ex. Cardiff Museum).

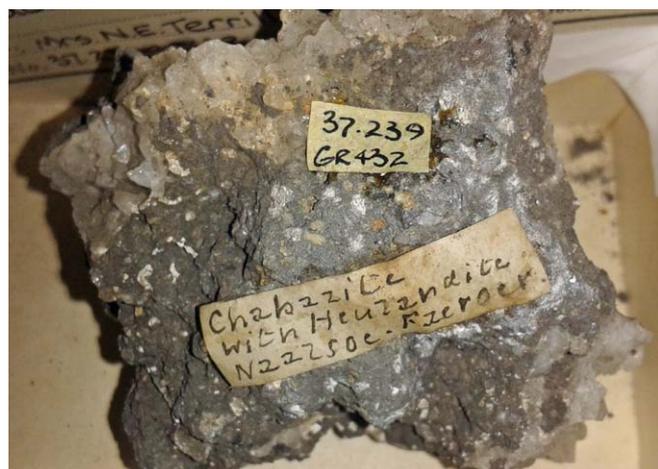


Fig. 2. A Caroline Birley handwritten label affixed to specimen no. NMW 37.239.GR.432 (William Terrill collection).

Through my studies of mineral labels at Amgueddfa Cymru – National Museum Wales (AC-NMW) I was aware of a particular style of handwritten label (Figures 1 & 2) associated with zeolite specimens. These labels are present in two separate accessions - ex Cardiff Museum specimens acquired by AC-NMW when the National Museum was founded by Royal Charter in 1907 and the William Terrill collection (NMW 37.239.GR) acquired in 1937.

The history of the Cardiff Museum specimens is well-documented in old archives and shows that the labels were written by Caroline Birley: a letter from Miss C. Birley of Seedley Terrace, Pendleton, Manchester, to Mr. Storrie, dated Oct 14th, 1891, is preserved in the AC-NMW archives. In her letter (the start of which is reproduced in Figure 3) to Mr. Storrie, who was curator at Cardiff Museum, she mentions 'her private museum of Geology & Mineralogy.' Her donation consisted of four zeolite minerals from the Faeroe Islands, including NMW 91.73 – chabazite, NMW 91.74 – thomsonite, NMW 91.78 – thomsonite, and NMW 91.75 – stilbite. Her labels vary in size, but her handwriting is instantly recognisable. Typically her labels are affixed to the specimen and record details of the mineral species and locality.

The history of the Birley zeolite specimens in William Terrill's collection is less clear. At least eight specimens are identifiable by Birley's distinctive labels affixed to them, but strangely Terrill does not record the specimens in his handwritten catalogue. There was some suspicion that these specimens could have been unregistered material from the old Cardiff Museum which could have been erroneously added to Terrill's collection after it entered AC-NMW, but all of Birley's original Cardiff Museum specimens are accounted for. It seems more likely that Terrill, who was geological curator at the Royal Institute of South Wales in Swansea, obtained the specimens from Birley shortly before his death in 1901. A full account of William Terrill and his mineral collection will be provided in the next edition of the Geological Curator..

During a recent visit to see Monica Price at Oxford University Museum of Natural History (OUMNH) I came across another suite of Birley specimen labels. In March 1898 Miss Caroline Birley donated a large suite of zeolite minerals to Oxford Museum. These specimens are extant at OUMNH and her typical handwritten labels are preserved together in a label archive (see Figure 4). The localities represented are predominantly in the Faeroe Islands which Birley visited in 1889 and again in 1890. Once again her labels vary in size, but their style and handwriting are distinctive.

In 1894, another group of zeolites was donated by Caroline Birley to Manchester Museum. These consisted of

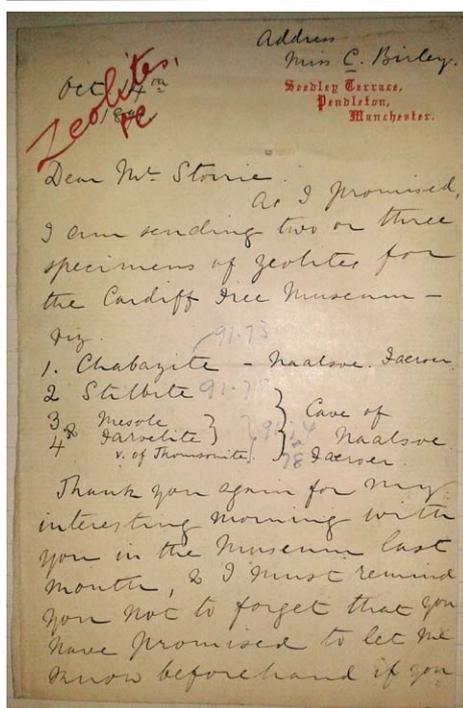


Fig. 3. A letter from Caroline Birley to Mr. Storrie, curator at Cardiff Museum, preserved at AC-NMW.

eight specimens from the Faeroe Islands and Iceland (<http://www.museum.manchester.ac.uk/collection/earthsciences/rocksandminerals/>). According to her obituary in *Geological Magazine* (1907, p. 143-144) from 1888 her collection was stored in an iron building in her garden in Manchester. In 1896 she moved to London (No. 14, Brunswick Gardens, Kensington, W.) along with her museum. She died in 1907 and, as stated in her will, her collection was offered to the British Museum. They took a selection of her finest specimens with the remainder of her collection being donated to Manchester Museum. However, some specimens were given to other museums in north-west England in what is believed to have been her wishes (<http://www.boltonmuseums.org.uk/museum/museum-collection-highlights/geology/caroline-birley>).

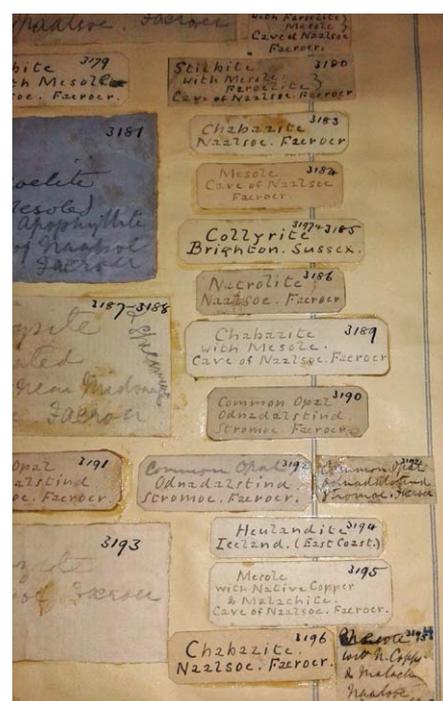


Figure 4. A suite of Caroline Birley specimen labels preserved in a label archive at Oxford University Museum of Natural History.

It seems highly likely that she donated zeolite specimens to many more British museums during her lifetime. Perhaps

armed with the knowledge of what her specimen labels look like many more of her samples will be identified in time. If anyone knows the whereabouts of other specimens from Caroline Birley I would be interested to know the details.

Tom Cotterell
Senior Curator, Mineralogy
Amgueddfa Cymru – National Museum Wales.

Prince of Wales Gold Mine. How much trust do you put in a label?

Amgueddfa Cymru – National Museum Wales (AC-NMW) has probably the most complete collection of gold specimens from Wales. The foundations of this collection date back to the 1920s when, in 1927, the museum purchased the mineral collection assembled by Griffith John Williams: former Assistant Inspector of Mines and Quarries for North Wales and Ireland under the supervision of Sir Clement le Neve Foster.

William's had visited all of the working mines in north Wales and collected examples of the minerals for his private collection. Welsh gold mines are well represented within his collection which contains gold-bearing specimens from eight different mines in the region known as the Dolgellau gold-belt.

Further specimens from gold mines in Wales were donated by William Pritchard Morgan – known to some as the Welsh 'Gold King' - in 1917 from his Gwyn (Gwynfynydd) Mine and a small number of gold-bearing specimens from the Dolgellau mines are in the R.J. King collection purchased in 1983. By far the largest suite of gold specimens from Wales in AC-NMW collections is that purchased from Geoffrey Lane during the early 1970s (NMW 70.19G) closely followed by several sets of specimens (NMW 77.35G and NMW 79.18G) acquired by exchange and purchase from Richard W. Barstow later in the same decade.

In terms of the number of gold specimens from individual mines the two most famous, and productive, mines are as one would expect the most represented: There are 55 gold-bearing specimens registered from Clogau Mine and 44 gold-bearing specimens from Gwynfynydd Mine. More surprising is the presence of 30 specimens of gold from Prince of Wales Mine.

Prince of Wales is a little known gold mine situated near Llanelltyd but was, in 1853, the site of one of the richest discoveries of gold in Wales. Very few specimens of Welsh gold dating to the 19th century are known probably because

most of it was processed rather than preserved as specimens. Indeed most specimens in museum collections are from 'modern' workings such as those at the Clogau and Gwynfynydd mines. To have such an array of fine, rich, gold specimens from such an early discovery is quite special. Or perhaps things are not what they seem?

The 30 gold-bearing specimens in AC-NMW labelled as from "Prince of Wales Mine" have come from several sources, but the vast majority show the same characteristic of being extremely rich in gold. Many of the specimens show an intimate association between gold and sphalerite – an association that is well-known at, but not restricted to, Gwynfynydd Mine. It should also be noted that some of the specimens are accompanied by labels recording, "Prince of Wales Mine (Part of Gwynfynydd Mine)". This has caused considerable confusion and therefore a thorough investigation of all of the Prince of Wales Mine specimens was instigated.



Specimen of Welsh gold, labelled as "Prince of Wales Mine (Part of Gwynfynydd Mine)". It is almost certainly from Gwynfynydd Mine, but where the Prince of Wales association comes in is unknown. The scale bar is in cm.

At this point it is worth highlighting that Prince of Wales Mine has no relation to Gwynfynydd Mine whatsoever, but that between 1910 and 1915 gold-ore from Prince Edward Mine, near Trawsfynydd, was transported to Gwynfynydd Mine for processing. Some of this gold was used to make the regalia for the investiture of the Prince of Wales in 1911 (Hall, 1988, p.78).

The outcome of this investigation, reported here, is that 53 % of these Prince of Wales Mine specimens appear to have come directly from one individual – Geoffrey Lane - who acquired the collection during the late 1960s while he was studying at Leicester University. 30 % of the specimens came through Richard W. Barstow, in the mid-1970s, who also appears to have obtained them from Geoffrey Lane. 10 % of the specimens were obtained from Allan C. Dean, in the late 1980s. Dean was good friends with Barstow and it appears that he acquired the gold specimens from Barstow during the late 1970s. 3 %

(1 specimen) were acquired from Ald. C.E. Breese in 1930 and 3 % were part of J.W. Gilbey's Ph.D. collection acquired in 2005. Therefore 93 % of the Prince of Wales Mine specimens passed through the hands of Geoffrey Lane in the late 1960s.

What then do we know of this collection? When the gold specimens were originally offered to AC-NMW by Geoffrey Lane, in 1969, it was commented by the museum that the collection is, "*of particular interest historically partly because it reflects the travels of the original collector (a gold miner from Ffairborne, Merioneth) in this country and in the gold fields of the U.S.A. and Australia; and partly because the person selling the collection has been extremely successful in piecing together the history of the collection by detailed study of the specimens, mining documents and personalia*". Based on the evidence presented below one must now question the accuracy and authenticity of this provenancing. Fortunately the vast majority of the specimens do appear to be derived from the Dolgellau gold-belt, but confidently assigning them to specific localities is a much harder task.

Despite thorough searching, no specific details relating to Lane's 'history of the collection' have been found. Indeed, the only indication of who assembled the collection is a brief mention of "*the 'Williams' Welsh Gold Collection*" in a letter written by Geoffrey Lane to the museum, in January 1999. The description of "*the 'Williams' Welsh Gold Collection*" is at odds with Richard Barstow's collection of Welsh gold from the "*Davis Collection*" which bear identical labels and which featured prominently within correspondence between Dick (Richard) Barstow and Emlyn Evans (Assistant Keeper of Geology at the National Museum of Wales) between 1975 and 1977 (Starkey, 2010, p.38).

The fact that Barstow acquired his Welsh gold specimens from Lane is beyond doubt. The evidence for this movement of specimens is clear when one compares the full suite of Welsh gold specimens acquired from Lane and Barstow. Both sets of samples bear small number labels identical in style, or show the remains of such labels which have been partially removed – many of the Lane specimens appear to have had the original numbers partially removed. More importantly, however, a small number of specimens are clearly pieces from the same block and can still be physically joined together. In one case the two parts are labelled as from entirely different mines! For example specimen NMW 70.19G.M.177 labelled as from "Llechfraith Level, Clogau Mountain" joins with NMW 70.19G.M.197 labelled as from "Gwynfynydd Mine".

Examples of specimens that came separately from Lane and Barstow, but which join together perfectly, include specimen no. NMW 77.35G.M.20 labelled by Barstow as “Gold + pyrite & traces blende. Gwynfynydd (sic) Mine. Davis Coll. no. 2..” and NMW 70.19G.M.173 acquired from Lane and labelled by the museum as “Gold, pyrite and blende in quartz. Gwynfynydd Mine, near Ganllwyd, Merionethshire”. Another, NMW 70.19G.M.184 from Gwynfynydd Mine and acquired from Lane, joins with NMW 77.35G.M.45 also from Gwynfynydd Mine, but acquired from Barstow.

I would urge anyone with specimens of gold from Prince of Wales Mine to get in contact as it is highly likely that the specimen is not from where the label states. Of the 30 Prince of Wales Mine gold-bearing specimens in AC-NMW only one – specimen number 783 in Gilbey’s Ph.D. thesis collection (NMW 2005.44G.M.154 a) - appears to be genuinely from that mine. The gold forms 100 micron scale inclusions within sphalerite with associated minor inclusions of pyrrhotite rather than the bonanza style highly visible gold observed in those specimens provided by Lane. The Breese specimen (NMW 30.84.GR.1) may well also be genuine, but its appearance is atypical of most specimens from the Dolgellau gold-belt and the museum number label is absent from the specimen.

Detailed descriptions of gold specimens recorded from Prince of Wales Mine in AC-NMW

NMW 30.84.GR.1: native gold with minor chalcopyrite and pyrrhotite in milky quartz stained orange by iron oxides. This specimen has the appearance of having been weathered at surface. Donated by Ald. C.E. Breese in 1930, but the absence of any museum number label attached to the specimen brings into question its true provenance.

NMW 70.19G.M.168-172: all originally registered under one label.

NMW 70.19G.M.168: a small specimen comprising localised rich native gold in massive milky vein quartz with dark brown to slightly reddish-brown sphalerite and minor pyrite. Purchased from G. Lane in 1970. Recorded on an early museum note as from “*Prince of Wales Mine (Part of Gwynfynydd Mine)*”. An old collection number once attached to this specimen has been removed at some point.

NMW 70.19G.M.169: a small but extremely rich specimen of native gold intergrown with very dark brown sphalerite and massive milky quartz. Minor galena. Purchased from G. Lane in 1970. Two polished blocks have been produced from this specimen subsequent to purchase. An old collection number once attached to this specimen has been removed at some point. Recorded as from “*Prince of Wales Mine (Part of Gwynfynydd Mine)*”.

NMW 70.19G.M.170: a small but exceptionally rich specimen of native gold intergrown with brown sphalerite and minor quartz. Purchased from G. Lane in 1970. Two polished blocks have been produced from this specimen subsequent to purchase. An old collection number once attached to this specimen has been removed at some point. Recorded as from “*Prince of Wales Mine (Part of Gwynfynydd Mine)*”.

NMW 70.19G.M.171: this specimen is currently on display recorded as from Gwynfynydd Mine. A small rich specimen of visible native gold in massive milky quartz and very dark brown sphalerite. Purchased from G. Lane in 1970. Recorded (along with NMW 70.19G.M.168-172) on an early museum note as from “*Prince of Wales Mine (Part of Gwynfynydd Mine)*”.

NMW 70.19G.M.172: a small but very rich specimen of native gold intergrown with dark brown sphalerite and patches within massive milky quartz. Minor chalcopyrite and pyrite. Purchased from G. Lane in 1970. An old collection number once attached to this specimen has been removed at some point. Recorded as from “*Prince of Wales Mine (Part of Gwynfynydd Mine)*”.

NMW 70.19G.M.175: a small but very rich specimen of native gold richly investing pale brown sphalerite in massive milky quartz. Recorded as from “*Prince of Wales Mine (Part of Gwynfynydd Mine)*”. Purchased from G. Lane in 1970. An old collection number once attached to this specimen has been removed at some point.

NMW 70.19G.M.176: an extremely rich specimen of native gold intergrown with brown sphalerite in massive milky quartz. A thin veinlet of corroded small bladed marcasite crystals cuts through the quartz which in the vicinity has red inclusions. Very similar in appearance to material from Gwynfynydd Mine. Recorded as from “*Prince of Wales Mine (Part of Gwynfynydd Mine)*”. Purchased from G. Lane in 1970.

NMW 70.19G.M.217: a rich specimen showing native gold within massive milky vein quartz with dark brown sphalerite and traces of galena. The gold is concentrated within the vein quartz rather than specifically the sphalerite. A handwritten label accompanying the specimen records “*Gold with fresh blende Prince of Wales Mine, Dolgellau, Merioneth 239*” (no mention of Gwynfynydd Mine). An old number label (239) is affixed to this specimen. Purchased from G. Lane in 1970. A small piece of this specimen was sent to J. Nader (University of Aston) for microprobe work in 1985.

NMW 72.33G.M.2: a very large and extremely rich specimen. Extremely rich native gold intergrown with medium to dark brown sphalerite in massive milky vein quartz. Minor chalcopyrite occurs towards the edges of the vein. The sphalerite appears to be progressively darker in colour (and less rich in gold) towards the edges of the vein. Recorded as from “*Prince of Wales Mine, part of Gwynfynydd Mine*”. A small number 202 is affixed to this specimen in a style identical to other specimens acquired from Geoffrey Lane (NMW 70.19G accession) and also from Richard Barstow (NMW 77.35G accession). Purchased from Geoffrey Lane in 1972 along with six other specimens including one other Welsh gold – the famous ‘leaf’ gold from Gwynfynydd Mine - for a total of £275.

NMW 77.35G.M.11: a small but very rich specimen displaying native gold intimately intergrown with massive milky quartz and dark brown sphalerite. Minor chalcopyrite and pyrite in neighbouring quartz. Accompanied by a small handwritten (Barstow) paper label recording "No 206 = *Prince of Wales Mine*". A small handwritten number 206 label is attached to the specimen. Exchanged with Richard W. Barstow in 1977. A small piece of this specimen was sent to J. Nader (University of Aston) for microprobe work in 1985.

NMW 77.35G.M.12: a small but extremely rich specimen displaying native gold intimately intergrown with crystallized pyrite and to some lesser extent with dark brown sphalerite and traces of galena within a massive milky quartz vein cutting through pale rock matrix imbedded with non-auriferous euhedral pyrite crystals. Accompanied by a small handwritten (Barstow) paper label recording "No 163 = *Prince of Wales Mine*". A small handwritten number 163 label is attached to the specimen. Exchanged with Richard W. Barstow in 1977. THIS SPECIMEN SHOWS REMARAKBLE SIMILARITIES TO NMW 77.35G.M.16 and NMW 70.19G.M.173 (both labelled as from Gwynfynydd Mine).

NMW 77.35G.M.13: a very small chip displaying a more unusual association. Very rich native gold is intergrown with dark brown sphalerite and glassy partly crystallized quartz with galena with later rich carbonate (possibly dolomite) cementing earlier phases. Accompanied by a small handwritten (Barstow) paper label recording "No 159 = *Prince of Wales Mine*". A small handwritten number 159 label is attached to the specimen. Exchanged with Richard W. Barstow in 1977.

NMW 77.35G.M.14: a small but extremely rich specimen displaying native gold within massive milky vein quartz with minor dark brown sphalerite and traces of chalcopyrite. Accompanied by a small handwritten (Barstow) paper label recording "No 157 = *Prince of Wales Mine*". A small handwritten number 157 label is attached to the specimen. Exchanged with Richard W. Barstow in 1977.

NMW 77.35G.M.15: a small but extremely rich specimen displaying native gold within milky vein quartz with dark brown sphalerite and traces of galena. The quartz is in part crystallized but shows evidence of dissolution of ?carbonate. Accompanied by a small handwritten (Barstow) paper label recording "No 156 = *Prince of Wales Mine*". A small handwritten number 156 label is attached to the specimen. Exchanged with Richard W. Barstow in 1977.

NMW 77.35G.M.16: a small but extremely rich specimen displaying native gold intimately intergrown with crystallized pyrite and dark brown sphalerite with minor dark grey ?tetrahedrite within a somewhat crystallized massive milky quartz vein cutting through pale rock imbedded with non-auriferous euhedral pyrite crystals. A small handwritten No. 144 label is attached to the specimen. Exchanged with Richard W. Barstow in 1977. THIS SPECIMEN SHOWS REMARAKBLE SIMILARITIES TO NMW 77.35G.M.12 (*Prince of Wales Mine*), NMW 70.19G.M.173 (labelled as Gwynfynydd Mine), NMW 75.35G.M.20 (labelled as Gwynfynydd Mine) and NMW 77.35G.M.9 (labelled as Morgan Mine).

NMW 77.35G.M.46: Atypical of the Dolgellau gold-belt. Massive milky vein quartz displaying on one side particularly yellow native gold richly investing fractures in the quartz. Small patches of a hackly ?tarnished dark grey phase have the appearance of native silver. Away from the gold small spots of chalcopyrite, galena and small cubic pyrite crystals are present along with crystals of a possible silver sulphide. Labelled by the museum as "*Prince of Wales Mine*" but there are no accompanying labels from Richard W. Barstow with whom it was exchanged in 1977.

NMW 77.36G.M.27: a small specimen of patchy rich native gold associated with galena with dark brown sphalerite in somewhat glassy vein quartz. Labelled (Barstow green label) as from "*Prince of Wales Mine, near Dolgelly, Merioneth.*" Purchased from Richard W. Barstow for £9 in 1977.

NMW 79.18G.M.4: a small specimen of iron-stained milky quartz veinstone with rich native gold in pockets formed by the oxidation of ?sulphides. Purchased from Richard W. Barstow for £28 in 1979. Atypical of most Welsh gold specimens.

NMW 89.4G.M.1: a small but rich specimen of native gold in milky vein quartz. Claimed to be a 19th century specimen. Purchased from A. Dean for £68 in 1989.

NMW 89.4G.M.2: a small 'chip' of milky quartz containing gold associated with darker inclusions. Claimed to be a 19th century specimen. Purchased from A. Dean for £7 in 1989.

NMW 89.4G.M.3: a small 'chip' of milky quartz containing visible gold. With calcite. Claimed to be a 19th century specimen. Purchased from A. Dean for £6 in 1989.

Tom Cotterell.

Senior Curator: Mineralogy

Amgueddfa Cymru – National Museum Wales.

Branch Meeting and Field Trip Reports

Saturday 20th June 2015. Northwest Branch Visit to Castell Carn Dochan Mine, Llanuwchllyn, nr. Bala, Merionethshire, Wales [SH 850 307] and Llangynog Mine and Quarry, Llangynog, Montgomeryshire, Wales [SJ 054 256].

Leader: Ian Dossett. Reporter: Richard Bell.

Four people eventually arrived at the parking area a short distance from the Castell Carn Dochan Mine in misty, drizzly but not cold weather. After getting changed we made our way to the dumps adjacent to the old mill. The area was quite sheltered and therefore infested with lots of midges which as always really were a nuisance. After a couple of hours, one of the group decided to go home and two others went up to the quartz/reef outcrop. They returned half an hour or so later having not found much. Not even any ticks.

Minerals found were as follows: gold (occasional tiny flakes in gossan or with galena), pyrite, arsenopyrite, chalcopyrite, galena, sphalerite, marcasite, dolomite, calcite, hemimorphite, clinocllore, cerussite, bismuthinite and a possible anglesite.

Many thanks are due to Gwyn Roberts for kindly giving us permission to visit the mine and for sharing his background knowledge of the mine.

The weather improved in the afternoon and as we had finished at the mine early it was decided to go to the Llangynog Mine and Quarry in Llangynog, Montgomeryshire.

Having arrived at the site in what was now bright sunshine, we found that the quarry had been turned into a mountain biking centre and that a huge ramp had been constructed in the main quarry area. The guys at the centre were very amenable and gave us permission to go into the quarry. There wasn't much to find there so we made our way around to the mine dumps where again not much was found. The main reward was a really good view across the valley to the Ochr Graig Mine on the other side.



Gold Fever! The group searching the dump at Castell Carn Dochan.

Minerals that were found were as follows: aurichalcite, cerussite, galena, chalcopyrite, dolomite, linarite and a possible pyromorphite. All were very modest pieces except for the chalcopyrite which was a respectable lump.

Thanks go to the Revolution Bike Park for permission to visit the quarry and mine.

**Friday 12th February 2016. North West Branch Meeting: "Cumbrian Micro-minerals".
Reporter: Christine Critchley.**

Despite three cancellations on the day, due to a flu bug going around the area, we still had a full table of microscopes. John Chapman had brought some 'spares' for those who did not have their own (many thanks). All were soon set up with lights and those who had '*never used a microscope since being at school*' were given brief but excellent tuition by John, who also gave information about the advantages and disadvantages of ring lights, swan neck lights, and lights with tracing paper filters.

The minerals, with accompanying notes, were borrowed from the 'BMS Micro-mount Collection' (many thanks for the loan) and had been sorted into five 'areas'. Each of these was given to a pair of members to view. Each section took about 5-10 minutes; after which the boxes went around the table in a somewhat clockwise direction so that everyone had a chance to see all forty eight specimens. Everyone was encouraged to add notes on the back of the information sheets if they found other minerals on a specimen or found something really interesting and wanted to comment on it. Some also made their own notes to take home for information when looking at the minerals in their own collection. David Hardman had brought some 'oldies' from his own collection for all to look at, alongside those from the BMS Collection.



NW Members getting into the micro specimens (L-R: John Chapman, John Davidson, Susan Thompson & David Hardman)

The sets of minerals from the five areas ('Shap and Surrounds', 'All Around Alston', 'The Best of West Cumbria', 'Keswick Konundrum', 'The Secretary's Seven') each contained 7 to 12 specimens, all with notes. Comments immediately came flowing in, such as "Wow - a whole new world", "Paper please, I want to take some of this information down to look through my own collection at home", "Interesting to see the eulytine; I will now check my Buckbarrow Beck specimens for this", "The terminations on this apatite are really interesting, as are the unusual crystal forms", "They've missed a couple of extra minerals from this one", "I wouldn't have spotted that one on the corner if it hadn't been in the notes". Then all went very quiet as the process of looking was taken to a new level. On the last of the five turns of round robin, Susan Thomson and John Davidson had the 'Shap and Surrounds' tray and were looking at the notes for the leadhillite from Myers Head Mine when she read out "Susanna Mine at Leadhills is the type locality. This could be my next mission, to find a specimen from the Susanna Mine". Other members also suggested that she should find some susannite for her collection also - perhaps

during the 2017 ASM in North Wales if we get near to Devils Bridge.

Finally the usual refreshments were served, after which all departed, the last of the scopes and lamps being fitted into John Chapman's car by about 11:15!! A really good night and one which we hope we can repeat next year, if the BMS are willing.

Friday 11th March 2016. North West Branch Meeting. "The 'Rare Earth' Elements and their Minerals" by Michael Doel.

Reporter Christine Critchley.

A very full house, we had to borrow chairs from a neighbour for this one! Michael initially looked at what the rare earth elements are - 17 metallic elements with most of the usual properties of a metal: shiny, silver or grey, high melting point, electrical conductors and ductile, but these are also highly reactive and have rather splendid names. They tend to occur together in ores but unfortunately not in veins as with many other metal ores, and it is due to this broad dissemination of their ores (formerly known as "earths") that they are called 'rare earth metals'. They are not actually especially rare in the earths crust. Cerium is 25th in order of abundance in the earths crust and is more common than other metals like copper and lead which are not usually considered to be rare.

Michael then took us through a discussion of rare earth mineralogy explaining the associations of the elements in ores. They can substitute readily for each other in mineral structures and so they are never 'alone' in a structure. However, there does tend to be one dominant rare earth in any mineral and this is the basis of the monazite-Ce, monazite-La and monazite-Nd nomenclature. There are about 270 minerals containing rare earths, with more being discovered. These include halide, carbonate, oxide, phosphate and silicate minerals. There were lots of 'wows' from the group as Michael showed images of some crystal 'beauties'. He then went on to point out that in reality most of the commercially significant ores are actually quite ugly!

This lead neatly into a discussion of ore processing, the methods being very 'high tech' due to the 'mixed up nature' of the ores (monazite-Ce having a formula of $(\text{Ce},\text{La},\text{Nd})\text{PO}_4$); the relative 'likeness' of the individual rare earths; and the management of the waste from the processes. The waste streams are highly toxic and also radioactive as many rare earth ores contain radioactive elements like uranium and thorium. Another problem with processing arises from the fact that ore samples from different deposits can be very different in composition and so the process needs to be 'tailored' for each deposit - one method does not fit all! However the current large scale demand for rare earth elements drives the continuing extraction and processing industries despite the quite considerable environmental "down-sides". It is notable that although a number of countries have significant and accessible rare earth resources (for example Australia, Canada and the USA), processing tends to be carried out only in countries (China and Malaysia for example) where 'environmental considerations' are given a lower priority. Newer and large deposits are being evaluated but as these are in places like Greenland and on the deep ocean bed, perhaps production will be years away!

There are many uses of rare earths and it would seem from the list that we really did not 'live' before they were initially

isolated! High performance alloys for aircraft engines (Pr); catalytic converters (Ce); catalysts for fluid 'cracking' of petroleum (La); phosphors in fluorescent lights and television screens (Eu, Y, Ce); high strength magnets (Nd and Sm); rechargeable NiMH batteries (La); smart phones (Nd, Sm); as a storage medium for hydrogen (La); solid oxide fuel cells (La, Ce, Pr); carbon arc lighting (Sm); X-ray and MRI systems (Gd); lasers (Y, Pr, Tb, Yb, Er, Dy, Ho); optical fibre communications (Er); camera and telescopic lenses (La); and synthetic jewellery stones (Er) to name but a few.

With so many uses resulting in rising demand and such problematic ore processing what does the future hold? New deposits are being investigated and more investment into mining and processing methods is being found. More recycling of rare earths could help but this is still widely regarded as "too difficult" due to the complex separation techniques needed. New technology may enable the removal of rare earths from some products to reduce our need for rare earth elements. It's a complex equation and currently nobody knows the answer.

Michael was thanked for a very instructive and thought provoking presentation. Following questions and inspection of the specimens and ore samples which Michael had brought the usual refreshments were served.

Saturday 19th March 2016. Southern Branch Visit to Durnford Quarry, Long Ashton, Bristol. [ST 535 714]

Leader: Chris Finch, Reporter Tony House.

Since 1880, this hidden quarry on the southern bank of the Avon Gorge has produced carboniferous limestone aggregate mostly for local industry, including recently the prestigious Cabot Circus shopping development. Since 2005 the recycling of building materials has been undertaken with a maximum output of 75,000 tonnes per year, supplementing the primary stone from the quarry and helping reduce demand on primary resources.

The above was relayed to us by Quarry Supervisor, Mr Nelson Scott, our excellent host who having signed us in and instructed on safety allowed us to start examining the new blast on the top shelf where a 4 m wide hematite-stained, infilled vein was situated. At first glance this seemed uninteresting, but later revealed some good quartz on goethite. Some of the upper blast had dropped to the next level where Chris Finch retrieved one of the best vughs of amethystine quartz in hematite I had seen on the Mendips.

Another nice specimen of "stepped" or oddly shaped crystals of grey coloured calcite in a vugh surrounded by hematite was found by Clive Minker. The crystal growth was very reminiscent of those found in Taffs Well and elsewhere in South Wales when associated with iron ores and carboniferous, limestone.

A nameless member from "Up North" (Steve Warren), wielding a sledge and chisel and muttering, attacked an interesting looking hematite vein running down a large boulder. The more he belted, the less the crack budged while the chisels' "song" rose higher and higher, going from middle "C" to high octave "G" as driven deeper. In all innocence I tried to help him and advised him to hit harder at which point he advised me to "go-away"!

Small blocks of manganese in the form of pyrolusite were examined from the same area but contained little of interest but the potential is there if a large pod was to be exposed.



Nice specimen of amethystine quartz in haematite from Durnford. Field of view is 8 cm.

We all went home well pleased, especially me as it was my first time of visiting this quarry. As always it was a rewarding day with excellent company. Our thanks go to Chris Finch as organiser and Nelson Scott and Tarmac for access for this most enjoyable and educational collecting trip.

Saturday 26th March 2016. Southern Branch Visit to Whatley Quarry, Frome, Somerset. [ST 720 475]
Leader: Chris Finch, Reporter: Tony Pedley.

Five members assembled early, ahead of an 8 am start on a day promising rain. We were met by Andy Fussell, the site manager for Whatley Quarry. After introductions and signing in we travelled in convoy (one site vehicle followed tentatively by one increasingly mud covered member vehicle) to the upper bench at the far extent of the workings. We

were restricted to access only part of the bench due to several areas of unstable face. However it quickly became clear that there was little of mineralogical interest exposed with only a few displaced blocks showing calcite vein fill.

The group then drove to a lower bench, which was more promising. Investigation of a blasted rock pile revealed extensive development of calcite fracture fill with numerous areas of dog tooth calcite developed in the more open fractures. Most crystals were small and often difficult to extract from the, in places, large host limestone blocks but several specimens were recovered. Some botryoidal hematite was also encountered in this area but this was thin and poorly developed on underlying calcite fill.



Calcite crystals removed from a loose block, specimen is 7 cm across. Photo courtesy of Ross Whitaker.

As group members explored the bench some larger calcite crystals were encountered in a series of several large blocks moved aside by the quarry operators. Careful extraction from these resulted in a number of specimens.

The promised rain had now arrived and members were treated to a persistent light drizzle. Further exploration across the bench revealed a number of fallen blocks beneath a large area of vein fill. The outcrop itself was not accessible, unfortunately, for safety reasons. However a number of calcite-lined voids, some containing crystals up to several cm in size, could be observed from the bench floor. Upon splitting of the fallen blocks some nicely developed quartz crystals were revealed, some showing double termination with the quartz developed upon

calcite and manganese.

A lower bench was investigated by members in the quarry vehicle but nothing of interest was spotted so a return to the car park was then made. The usual finale of screening the adjacent rock pile was cancelled as the quarry manager informed us no new material had been added to the pile for the past year or so.

Thanks go to Chris Finch for organising the trip, to Andy Fussell for supporting the visit and to Hanson Aggregates for their permission.

Friday 8th April 2016 North West Branch Visit to Milldam Mine, Great Hucklow, Derbyshire.

[SK 177 777]

Leader: Ian Dossett. Reporter: John Davidson.

This first NW field trip of the year was attended by six members of the Russell Society from across the country. It was also the society's first underground visit to Milldam Mine.

The mine is discretely located just outside the village of Great Hucklow in Derbyshire. The mine was put into care and maintenance in 1999 by the Spanish owners, but in 2013 the mine was again put into production by British Fluorspar Limited. To recommence mining, planning permission had to be obtained, this requiring a great deal of work by geologists and the mine owners. The mine being in a national park and in a village, truck movement to Cavendish Mill, noise and ground movements when blasting are sensitive issues that were part of the planning consent.

Before going underground the mine manager Rob Ridley carried out the safety briefing and described the mine and its operational methods. He explained the mine plan and how extraction was currently taking place at the Milldam Mine end, rather than starting from the far end at the Ladywash workings. These are connected underground albeit inaccessible. They are driving a new decline off the old access tunnel which will allow the miners to drive tunnels into the vein at regular intervals to extract the fluorite. The plan (see below) at the moment is to have eight sub levels below adit and continue this over to the old Ladywash workings over the next few years.

Rob told us the vein splits near Milldam Mine but it's believed that it joins up again further into the workings where the fluorite vein will be wider and possibly richer in mineral.

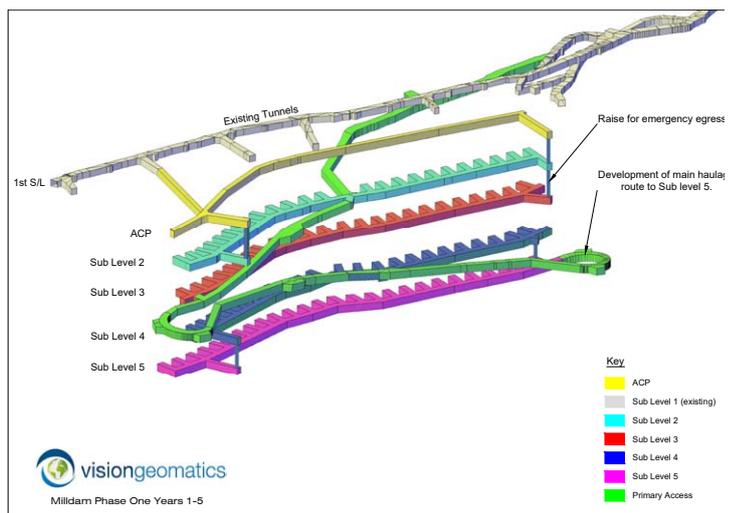
We were taken down the decline to the current working area on Sublevel 3, Northeast Drive and shown their open stope

techniques of extraction, which have been used at Milldam for many years. The fluorspar grade in the vein runs from about 20 to 80% fluorite. Rob allowed us to pick up some fluorite from the loose material in the current working area. After two hours we were all taken out by Land Rover back to the surface.

The extracted ore, once it's at the surface, is taken to Cavendish Mill near Stoney Middleton, for processing into fluorite, baryte, galena, and calcite with some limestone. The fluorite concentrate is then shipped off to Runcorn to be converted into hydrofluoric acid.

The fluorite specimens collected, once cleaned were mainly clear with large amounts of pyrite inclusions. Some large translucent golden brown calcite crystals were also found in one cavity by Ian.

Our thanks must go to Helen Breen of British Fluorspar Ltd for facilitating the visit, Rob Ridley the mine Manager at Milldam for his time and assistance, and Ian Dossett for organising an excellent trip.



Schematic diagram of the Mill Dam Mine workings, present and future.

Sunday 9th April 2016. North-West Branch Visit to Cavendish Mill, Stoney Middleton, Derbyshire [SK 205 753].

Leader: Ian Dossett, Reporter: John Chapman.

Where I hail from, a mill has some connection with wool, and I was expecting to meet at such. However Cavendish Mill, the processing plant for British Fluorspar Ltd, is more akin to a pepper mill in that it crushes and processes the rock extracted from Milldam Mine four miles away, as well as other sites.

The day before, many of our party visited Milldam Mine and saw the rock being extracted, following breaking with explosives (but not whilst we were there), and then being trucked away to Cavendish Mill at maybe four or five large trucks per hour.

On the day we met in the car park at 10 am and Ian provided the Health and Safety Briefing. The Mill was not operating therefore we were unable to see the processing method, which involves crushing and floatation with detergents. However, we had the advantage of not requiring the site safety briefing and the risk of being hassled by a large digger when we were intent on dealing with a potentially fine specimen!

Primarily, as the name would suggest, the company extracts fluorite, but also recovers the little galena that remains in the vein, and baryte, leaving limestone. The rock from the mine, therefore, should have been much like that we'd seen inside the mine, but somehow it looked different outdoors. The extraction had been piled in large heaps, much of which consisted of quite large rocks and, as you walked past these, your eyes were constantly drawn to some quite large, intensely purple and mauve rocks. In the sunlight, which we had for much of the time, this pale purple was often very striking since our peripheral vision is very sensitive to short wavelength light. This made progress slow because one was constrained to take a better look at each one!

The lure of this site was the prospect of finding the famed pockets of large (up to 1"), deep purple fluorite crystals, and so the six Russell members attacked the piles with hammers and chisels with great gusto. It sounded more like hard labour in a Siberian correctional camp! Unlike inside the mine, with its noisy and smelly diggers with dazzling headlights, the weather was very pleasant and fresh. But, to my knowledge, nobody found prize specimens like this. There was, however, much very densely purple fluorite in small crystals up to around 3 mm covering the faces of cracks in thin layers and occasional small pockets. Ian advised us to look for rocks showing "frothy" purple fluorite. Indeed, some



Processing plant at the Cavendish Mill site.

rocks consisted almost entirely of this, which looked like massively grown-together tiny fluorite crystals, sometimes having an almost sedimentary appearance.

Some of these rocks yielded (with effort) pockets lined with very deep purple crystals averaging 1.5 mm. Rarely, small, irregular spaces with crystals up to 5 or 6 mm were found. Some larger crystals were found but, strangely, these were invariably almost colourless, which may indicate a later, slower period of crystallisation. Baryte appeared in several forms: layers of white microcrystalline baryte in flat or spherical shape; small, isolated growths of lamellar crystals; and a distinct, orange-coloured form occurring as layers or as central motifs surrounded by calcite and fluorite.

Calcite occurred in pale ginger-coloured dog-tooth crystals up to 1 inch, often containing flecks of pyrite. Ian, though, again found some of the very large calcite crystals he'd found the day before. These are unusual in having slightly curved faces and a satin finish.

Secondary mineralisation wasn't obvious and, apart from the three main minerals and a little galena, there was a suggestion of cinnabar and limonite. Mindat lists for Milldam Mine also anglesite, cerussite, chamosite, marcasite, smithsonite, wulfenite and sphalerite but, to my knowledge, nobody found these.

Who got the best specimen? We all did, and most of us would have been unable to carry away our treasures any distance at all, but ferried them in stages to nearby cars.

Our thanks go to Helen Breen and Chris Large of British Fluorspar Ltd for facilitating the visit, and to Ian Dossett for organising this excellent day.

Saturday 23rd April 2016. Russell Society Annual General Meeting. Bowburn Hall Hotel, County Durham. (A shortened version of the AGM Minutes).

Forty one members attended this year's AGM. The minutes of the 2015 AGM were agreed by all present.

Tom Cotterell (President) gave an overview of the Council's role, which is to keep the Society running as smoothly and efficiently as possible, whether it be producing publications or making decisions about insurance policies or the structure of the Society. The key message was that the Council represents you, the members, and is very open to discussing anything relating to our Society at any point in the year.

Tom thanked outgoing Council members Michael Dunmore (General Secretary) and Margaret Ince (Treasurer) for all their hard work and welcomed their replacements, Steve Warren and Rob Bowell respectively. Frank Ince was due to retire from the Journal Manager's post but has decided to stay on to ensure that we all still receive the journal, this was warmly welcomed by all.

The post of Conservation Officer remains vacant and Tom encouraged members to come forward and get in touch with him about what is involved.

Finally Tom noted how refreshing it was to see a number of new faces at the AGM and urged all members to help promote the Society whenever possible. Some new advertising material is being produced that we can all use for this purpose.

Christine Critchley (Vice President) summarised field trip attendance in 2015: a total of 39 trips with a total of 279 person/visits. As in the previous year, Christine was very pleased to report there had been no incidents on the field trips. Christine also noted that a review of the Society's H & S information had been completed during the year and that the updated information has now been issued to field trip leaders and placed on the website.

She also noted that the Society will be holding two Scavenger Hunts this year, firstly at the new Leyburn Show in August then at the usual Bakewell Show in October. Please let Christine know if you have any suitable donations that can be used as prizes for these events.

Michael Dunmore (General Secretary) reported back on some questions that had been posed on insurance and on the implications of changing to an incorporated charitable association. On insurance he advised that insurers had been shown our approach to running field trips and had confirmed they were happy with this. On the matter of incorporation Michael noted that this would leave trustees with similar responsibilities as a company director, would incur extra costs and would entail a lengthy registration process. Based on the above Council considers that our current insurance

arrangements are the most appropriate for the Society and that it would not be in the interests of the Society to change from unincorporated status.

Although Michael is stepping down from the role of General Secretary he has agreed to stay on as manager of the website, this was much appreciated by all.

Margaret Ince (Treasurer) gave a presentation to explain the financial position for the year 2015 - 2016. She confirmed that the Society accounts are in a healthy condition and suggested that the Society might wish to use some of the reserves for beneficial activities, perhaps related to increasing membership, through improving PR material, or providing services that would be of benefit to members. Discussion followed on possible benefits, which could include funding access for members to analytical facilities at museums or university departments or setting up workshops to help improve member's photography skills? Both of these aspects could, in turn, help member's contributions to the Newsletter and Journal.

Margaret and Neil Hubbard reiterated the need for members to pay their subscriptions through Gift Aid wherever possible and to please make sure payments are made promptly, preferably before the end of January and certainly before the end of March, otherwise administration of Gift Aid becomes more complicated.

Neil Hubbard (Membership Secretary) provided an overview of membership numbers and trends, and expressed some concern about the continuing decrease in the membership. At 17 April 2016 there were 351 members, with only ten new members joining in 2015 and three so far in 2016. He stressed that it is up to all of us, not just Council, to try and recruit new members.

A discussion of ways to promote the Society and increase the number of members (particularly students and young people) followed and included:

- Organising social events during mineral shows;
- Creating a Facebook page and/ or Twitter feed for the Society (with the need to find members who could create and post content regularly – are you the younger person we need to help with this?);
- Providing unique content through the website, such as lectures;
- Linking to/ advertising on relevant pages of the Open University website.

Please get in touch with Neil, or any Council member, if you have any other suggestions.

Frank Ince (Journal Manager) summarised the hard work that goes in to producing the Journal and confirmed that plans for JRS 19 are already underway. He encouraged all members to consider submitting papers for the Journal and pointed out that assistance can be provided in writing papers and in preparing any photography and figures, so don't be shy! Although Frank is staying on as Journal Manager for the time being if YOU would like to become the next manager of JRS please get in touch with him.

Frank also reported on the disposal of the Society's library and noted that its dispersal raised over £1000 for the Society. He thanked Jo Brown and Bracken Gibson for their work as Society Librarians and for their help in the disposal.

Michael Doel (Newsletter Editor) reported on production of the Newsletter, noting that he had kept within 3% of his annual budget, although rising postal costs are a concern. As ever, Michael's key message was that this is YOUR Newsletter and that we all need to try and submit articles. As for the Journal, help can be provided if you need it. Michael also noted concern that not all field trips are being written up, and that all those involved in the planning and leading of field trips, across ALL branches should ensure trips are written up - the recording of our activities and observations is a central principle of the Society! Finally, he noted the popularity of the electronic Newsletter and asked everyone to make sure they give up to date email addresses to Neil Hubbard.

Finally, Christine announced that the 2017 AGM would be hosted by the North West Branch from Friday 21st April to Sunday 23rd April at the Lodge Hotel, Tal-y-Bont, Conwy, Wales, LL32 8YX. Further details about the event will be published when they are available. Please try and come along, you will not be disappointed!

A full copy of the 2016 AGM Minutes can be found on the RS website at http://russellsoc.org/wp-content/uploads/2016/07/2016-AGM-Minutes_final.pdf

Steve Warren (Secretary)

**Sunday 24th April 2016. ASM Weekend Visit to Closehouse Mine, Upper Teesdale, County Durham.
[NY 849 227]**

Leader & Reporter: Martin Walker.



Distant view of the Closehouse Mine workings.

The Closehouse Mine had its origins in a collection of ancient hushes and, in later times, the area was worked for lead ore by the London Lead Company. Still later the mine was reworked for baryte, initially underground and later by opencast methods. The site is now abandoned with all plant having been removed from the area. There is currently no access to the old mine levels. In addition to galena and baryte a number of other minerals are reported from the site including anglesite, aragonite, calcite, cerussite, covellite, cuprite, leadhillite, malachite, pyromorphite and rosasite.

During a brief snow shower, 8 members met at the gates of this SSSI site before driving down to the mine. Luckily the weather improved during the day to allow a sensible period of collecting. During the day most people found reasonable examples of galena, cerussite, baryte, rosasite and pyromorphite, as well as calcite and aragonite. All left reasonably pleased with their finds.

I would like to thank the Wemmergill Estate for granting us permission to visit the mine.

**Saturday 24th April 2016. ASM Weekend Visit to Coldstones Quarry, Greenhow, North Yorkshire.
[SE 125 641]**

Leader and reporter: Steve Warren.

Eight members of the Society and special guest Charles Lamb (after his pyromorphite heroics at the ASM the previous day) turned up on an overcast but dry day. The quarry is still working in the new area at the upper north east edge and has now replaced the old crusher with mobile plant. We did a quick scan of the upper workings but nothing of note was seen.

Heading down into the main body of the quarry we quickly excavated a few bags of unaltered galena from an exposure on Garnet Vein and left them for Killhope Museum to collect. Alas, no secondary species were evident. Good, banded exposures of the Coldstone Limestones with interbedded shales and sandstones were seen in the eastern face of the quarry as we descended.

Continuing down into the quarry no significant new working has been carried out so we re-inspected an old exposure of the Garnet Vein in the eastern face of the quarry. We found friable/ rotted fluorite with occasional small vugs, as on previous occasions, but weathering had taken its toll and nothing of note was found. An earlier dig directly onto Sun Vein had unfortunately been filled in, to make a wider roadway.



Cockscomb baryte from a flat on the bottom level of Coldstones Quarry.

Moving down to the bottom level of the quarry (100 m below the quarry top) Garnet Vein was exposed within the western and eastern quarry faces and comprised mainly dense calcite with a little unaltered galena and some fluorite.

Just south of the main body of Garnet Vein, on the east side of the quarry, a large calcite vug was found by Charles Lamb, with plates of brown to clear, hexagonal, stepped calcite crystals (including double terminated) in excess of 40 mm. Associated clear fluorite to 10 mm and small vugs with hemimorphite were also found. Some of the calcite demonstrated a habit change, with scalenohedral phantoms contained within the final prismatic form.

At the southern edge of the bottom level Shirley did our job for us, drawing attention to some small flats full of calcite with later secondary calcite and elongated, fine grained baryte cockscomb

groups. A number of large and, sometimes (!) attractive specimens were found and bags were quickly filled. Further west, Tom Goodland found a nice hand size plate of lustrous fluorite in a minor vertical cross vein.

Although not a vintage trip, we found a lot more than was expected and everyone experienced the benefit of walking back up the 100 m vertical ascent to the car park with full bags.

Once again our thanks go to Shirley Everett, Quarry Manager, for her outstanding efforts in giving up her own time for the visit and making us feel so welcome.

Sunday 24th April 2016. ASM Weekend Visit to Shap Pink Quarry, Shap, Cumbria. [NY 558 084]

Leader: Ian Dossett. Reporter: Roy Starkey.

The group travelled across the Pennines from Durham under cloudy skies, accompanied by snow flurries and rain, to meet the leader at 10.30 am. Attendees were Frank Bouweraerts, David Briggs, John Davidson, Chris Finch, Neil Hubbard, David Roe, Roy and Mary Starkey, Ralph Sutcliffe, Mike Sweeney and Phil Taylor.

After a prolonged period of inactivity, the freehold interest of Shap Pink Quarry was acquired by Armstrongs Aggregates Ltd in November 2014. The quarry has a reserve of 20 Million Tonnes of stone and valid Planning Permission for mineral extraction until 2042.

We were greeted by the security guard and able to drive up to the bottom level of the quarry to park near the new Portacabin offices. After a short introduction by Ian we set off to explore the boulders in the area immediately adjacent to the office and screening plant. The freshly blasted, coarsely porphyritic, granite is a truly spectacular rock, and we were able to see patches of pyrite with sprays of bismuthinite, smears of molybdenite and occasional cavities. Dark xenoliths of country rock were fairly common, but the hoped-for pegmatites were nowhere to be seen and we worked our way progressively uphill to the higher levels.



The RS party "kitting up" on arrival at the quarry.

The quarry is working on four benches, and the material in the blast piles on the second bench proved to be the most interesting and productive, with representative examples of most of the common minerals being noted, although not in spectacular specimens. We can record albite, anatase, biotite, bismuthinite, brookite, calcite, chlorite, epidote, feldspar, fluorite, molybdenite, orthoclase, pyrite, quartz, and an unknown waxy (?) clay mineral. Neil Hubbard collected one piece of miarolitic granite with abundant titanite and apatite, and also a specimen with sphalerite crystals to 5 mm. Ian Dossett also reports finding apatite and a small amount of baryte. The uppermost level was almost devoid of mineralogical interest, but the third bench did produce several large boulders with faces showing a fairly rich covering of silvery-grey molybdenite. Specimens of this were however extremely difficult to liberate.

Some of the muddy puddles on the quarry floor were swarming with rapidly growing tadpoles, and the occasional common newt. As the morning progressed the weather improved markedly and the early rain and sleety snow gave way to dry conditions and patchy sunshine. The group began to disperse around lunchtime with members setting off for their journeys home to the Midlands, Oxfordshire, Aberdeen and Ireland, as well as more local destinations.

The amount of freshly broken stone is impressive and the prospects for future finds should be good as the quarry progresses, especially when the operation goes back towards the area noted for pegmatites. Our thanks go to Armstrongs and, in particular, Emma Armstrong for allowing us to visit the site. You can study the Shap Granite on the Virtual Microscope website at <http://www.virtualmicroscope.org/content/granite-shap>



Specimen of molybdenite from Shap Pink Quarry. Collected by Mary Starkey.

Saturday 7th May 2016. Southern Branch Field Trip to Hampstead Farm (Chipping Sodbury) Quarry, Gloucestershire. [ST 724 840].

Leader: Chris Finch. Reporter: Alistair Napier.

A full complement of 12 members met promptly in the quarry car park at 7.30 for an 8.00 am start. It was overcast but humid and warm so the weather was in our favour. Especially given all the rain of late that was a blessing!!

With the required PPE in place and after a H&S briefing and a chat with the quarry manager we made our way down to the quarry through the tunnel. The decision was made to start at the lowest level and work our way up. On arrival it initially looked as if very little had happened since our last visit a year ago other than some rock pile clearance.



Section of a cavity (100 x 70 mm) bearing calcite, pyrite and baryte from Hampstead Farm Quarry.

The boulders that were left were tidily organised into rows. So the searching began and it was not long before the ring of hammer on rock could be heard, a sure sign that there's material around! The reporter came across a very large boulder with a calcite-sulphide vein which provided plenty of physical exercise. Soon another member (Chris Finch) joined me and we shared the job of trying to get into the sulphide material, which was not easy. The calcite is soft and just absorbs the hammer blows and the sulphide is very hard so the hammer just bounces off. However our efforts were eventually rewarded with a number of specimens, possibly some of the best material to come out of the quarry in a while.

Time just flies by when you are having fun and all too soon it was time to make our way out of the quarry. We stopped to have a very quick look into the new workings just after the tunnel but there was very little of interest. After some discussions and chatting to other members it was clear that they were all very

happy with what they found and expressed the view that it had been a very good session. The finds were mainly calcite, pyrite and sphalerite.

This was a great start to the collecting year. Thanks must be given to the quarry manager for the day, Richard Blannin and to Chris for organising the trip.

Sunday 8th May 2016. Wales and West Branch Visit to Ffos-y-fran Land Reclamation Site, Dowlais, Merthyr Tydfil [SO 0690 0705].

Leader and Reporter: Tom Cotterell.

This was our first field trip of the year. Five members attended on what was a sunny spring day. Georgina Taubman, Miller Argent's Environmental Liaison Officer, chauffeured us around part of the 367 hectare site where derelict industrial land containing abandoned mine shafts, waste from fly tipping, and burnt out and stolen cars, is being restored to open moorland over a period of seventeen and a half years.



Double terminated "Merthyr Diamond" quartz crystals from Ffos-y-fran. Picture courtesy of Clive Minker.

We began by checking over the new areas of backfill on the western side of the site. Clay ironstone nodules, some of considerable size, were present but in the first area they were largely compact with none of the open cavities required for the formation of euhedral quartz crystals known locally as 'Merthyr diamonds'.

A short distance further north the nodules in the backfill started to show an iron-stained appearance and many of these were more open in texture. A high percentage of these were found to contain quartz crystals and some good examples were collected. In the same general area some good examples of fossil fern (*Mariopteris sp.*) leaves were found.

We progressed into the deeper workings and spent a little time investigating an area where large cuboid blocks of competent

sandstone had been separated from the more friable shale waste rock. The sandstone was cut by frequent thin veins containing quartz, but despite much searching no large undamaged quartz crystals were found. A small amount of dolomite, or ankerite, was also present, but not worthwhile collecting. No clay ironstone nodules were observed.

We moved higher into the workings and briefly looked at an exposed coal seam at the northern end of the site, but no mineralogically productive clay ironstone nodules were found.

Finally we stopped near to the eastern face in the higher workings and investigated the piles of broken rock destined for backfill. Abundant clay ironstone nodules were found within which fresh white ankerite/dolomite crystals lined the cavities. Occasional fine, filament-like, millerite crystals to 1 cm occurred spanning cavities. This is the highest point in the site that millerite has been found – it had previously only been observed in clay ironstone exposed in the very lowest level of the site. Small 'Merthyr diamond' quartz crystals were common and a number of sulphides were identified. Cubic galena was found in one or two cavities along with chalcopyrite and one minute crystal of siegenite was observed under a microscope.

Our thanks go to Miller Argent Limited and in particular Georgina Taubman for allowing us permission to visit the site.

**Saturday 14th May 2016. Central Branch Visit to Cloud Hill Quarry [SK 413 219]
Leader: Neil Hubbard, Reporter: Chris Finch.**

Cloud Hill Quarry has been an annual trip of the Society for many years now and invariably it proves a valuable collecting site. Stuart, the acting manager who is very supportive of our visiting the quarry outlined the recent blasted areas and reminded us of the health and safety matters to be observed while in the quarry.

We often, and this was no exception, walk in as it is downhill and Stuart realises that we would struggle to walk out and again and so invariably finds a means of transporting us back uphill. On the walk in, Stuart explained that the severe rain over winter had led to rock adjacent to the haul road and the conveyor falling onto it during the Christmas break. Thankfully no one had been injured but operations had been delayed for several months to make this area of the quarry secure with rock bolts and mesh and to repair the damage. At the same time as repair works were undertaken, an opportunity was taken to install a new crusher to feed the conveyor belt. We became very appreciative that even though production was down we had been allowed to visit the quarry as production had only recently re-started.

Previous reports have provided detail on the geological attributes of the quarry but in summary the quarry primarily extracts carboniferous limestone. Dolomitisation has occurred in the past which has resulted in cavities that have been subsequently mineralised. The minerals found in the past are wide ranging but are primarily lead, zinc and copper sulphides as well as very aesthetic calcites.

Two areas of recently blasted rock were on the ground at the time of the visit. The first at the lowest level in the quarry - Level G is working at the northern end of the quarry where last year we had found very reasonable sphalerite crystals, albeit small! Stuart explained that this level was just out of the area where the numerous cavities had caused problems with drilling and blasting. However, we all gave it our best shot to find what few cavities there were. There was some



Galena and Calcite 100mm x 70 mm from Level B, specimen and photo courtesy of Alistair Napier



Sphalerite crystal to 5mm with a small calcite crystal perched on it. Level G. specimen and picture from the report writer.

reasonable chalcopyrite on calcite found but most of it appeared to be shattered through blasting and a few cavities did produce some individual sphalerite crystals to 5 mm - slightly larger than last year but not on matrix.

After exhausting the opportunities at Level G, we moved to the next blast area at Level B at the western edge, which is being extended in this direction. In the past, bright, unaltered galena has been found in cavities in this broad area. Stuart ferried us here in the VIP vehicle, a BMW X5, which has done just over 200,000 miles! The group found evidence of galena in solid form and some cavities with reasonable calcite were found but to the best of my knowledge the best galena with calcite was found in a boulder by one of the Southern Branch contingent as shown in the adjacent picture.

Once again, Cloud Hill had proved itself to be a memorable collecting site, the weather was superb and the arrival of the BMW with Stuart to ferry us all out in comfort signalled the end of another good collecting day. Thanks must go to Stuart for hosting the Society and to guiding our collecting and to Breedon Aggregates for allowing us to visit this quarry.

Saturday 21st May 2016. Northern Branch Visit to Heights Quarry, Westgate, Weardale, Co Durham [NY 925 390]

Leader and reporter: Steve Warren.

Seven members turned up on an overcast but dry day. We were welcomed by Assistant Manager Richard Micklethwait who took us through a risk assessment and safety briefing. The quarry works limestone within the Great Limestone for aggregate. Richard explained that due to historic quarrying methods the northern face of the quarry had been left in a relatively unstable condition meaning that larger than usual standoff distances are required. The quarry works broadly east to west along the line of the outcropping Great Limestone. Overburden depth increases to the north and creates a space constraint on operations, with overburden currently being tipped along the south edge of the quarry. As extraction proceeds from east to west the north face is being stabilised and overburden backfill will follow as extraction is completed.



Pyrite nodules in a weathered shale block.

Firstly we inspected an overburden pile to the east of the quarry plant area where iridescent pyrite nodules have been found in shales. The shale beds lie just above the Great Limestone and can be seen in the north face of the quarry. Nodules up to 50 mm in length were found at several locations, either loose or within weathered shale blocks that are scattered across the north face of the overburden tipping area.

The West Cross and Heights South Veins have produced fine fluorite specimens from within the Great Limestone in the recent past. Within the quarry boundary the Great Limestone along these veins has been worked out and the resulting void backfilled with overburden. A collapse in the sandstone and shale beds, above old flat workings in the Great Limestone on West Cross Vein, is visible at the north west edge of the quarry.

Several small pieces of purple fluorite, not of specimen quality, were seen within overburden above the vein.

Within the next 2-3 years, and subject to planning permission, the quarry is hoping to extend to the west and north west, where workings at Heights Mine are expected to be encountered.



Members inspecting the collapsed sandstone and shale beds on the line of West Cross Vein in the north face of the quarry.

Our thanks go to Aggregate Industries for giving us permission to visit, to the Quarry Manager Peter Scott for arranging the trip and to Richard Micklethwait and Barry Smith for guiding us around the quarry.

Friday 3rd June 2016. Wales and West Branch Visit to East Pit East Opencast Coal Site, Gwern-Cae-Gurwen, Neath Port Talbot [SN 735 130].

Leader and Reporter: Tom Cotterell.

Five members attended on a beautiful sunny summer's day. Aled Lewis, Deputy Mine Manager, escorted us around the site.

We began by checking the lowest accessible workings at the southern end of the open pit. The lowest face on the east side of the level was capped by a thin seam of coal known as the Pennypieces Seam. This seam is one of the more sulphurous and therefore it was no surprise to find small nodules of massive pyrite embedded within the coal. We then walked northwards following the Pennypieces Seam up-dip as we went but very little of mineralogical interest was noted.

The group continued ascending the main haulage road and dropped slightly to the west onto a slightly lower coal seam exposed in the floor of a bench. Here small veinlets of massive fudge-coloured siderite (iron carbonate) and massive milky quartz were observed cutting through the coal seam and surrounding sandstone. Large quantities of fossiliferous mudstone and sandstone were evident with *Lepidodendron* sp. noted.

This coal seam was followed northwards up-dip and eventually a level area was found which was excavated into the sandstone immediately below the seam. Multiple quartz-siderite veins were observed many with cavities lined with curved fudge-coloured siderite crystals. A few cavities were found to contain sulphides including radiating sprays of delicate acicular millerite crystals and microcrystals of sphalerite and chalcopyrite. Also present in this area were a large number of cylindrical sections of the fossil horsetail, *Calamites* sp., and a number of root systems (*Stigmaria* sp.).



View over the East Pit Opencast Site.

Our thanks go to Celtic Energy and in particular Aled Lewis and Wayne Evans (Mine Manager) for allowing us permission to visit the site.

Sunday, 5th June, 2016. Central Branch Visit to Dolyhir Quarry, Old Radnor, Powys, Wales. [SO 242 584]

Leader: Neil Hubbard. Reporter: Stephen King.

A warm and overcast morning greeted ten members ready for a dusty walk into the quarry after a rare period of dry weather. After the customary safety briefing we made our way initially to the higher benches along a narrow access road with a minor amount of material to inspect. On reaching an area with numerous large boulders seemingly of some old blast we began closer inspection with most finding small crystal clusters of azurite with malachite associated with various forms of calcite. After a while the group divided with some inspecting the lower part of the quarry, reporting finds of small amounts of witherite, harmotome and barytoalcite. Even a small ewaldite crystal was noted.

In the meantime Chris Finch's persistent excavating at the first area had paid dividends with some superb associations of azurite crystals on a massive malachite and azurite matrix.

As the quarry did not appear to have had a recent blast, new material was hard to find and consequently hard going. After a while the two groups reconvened and we made our way out with at least something collectable.

Our thanks to Manager Mike Jones for allowing access and hope he can accommodate us again in the future.