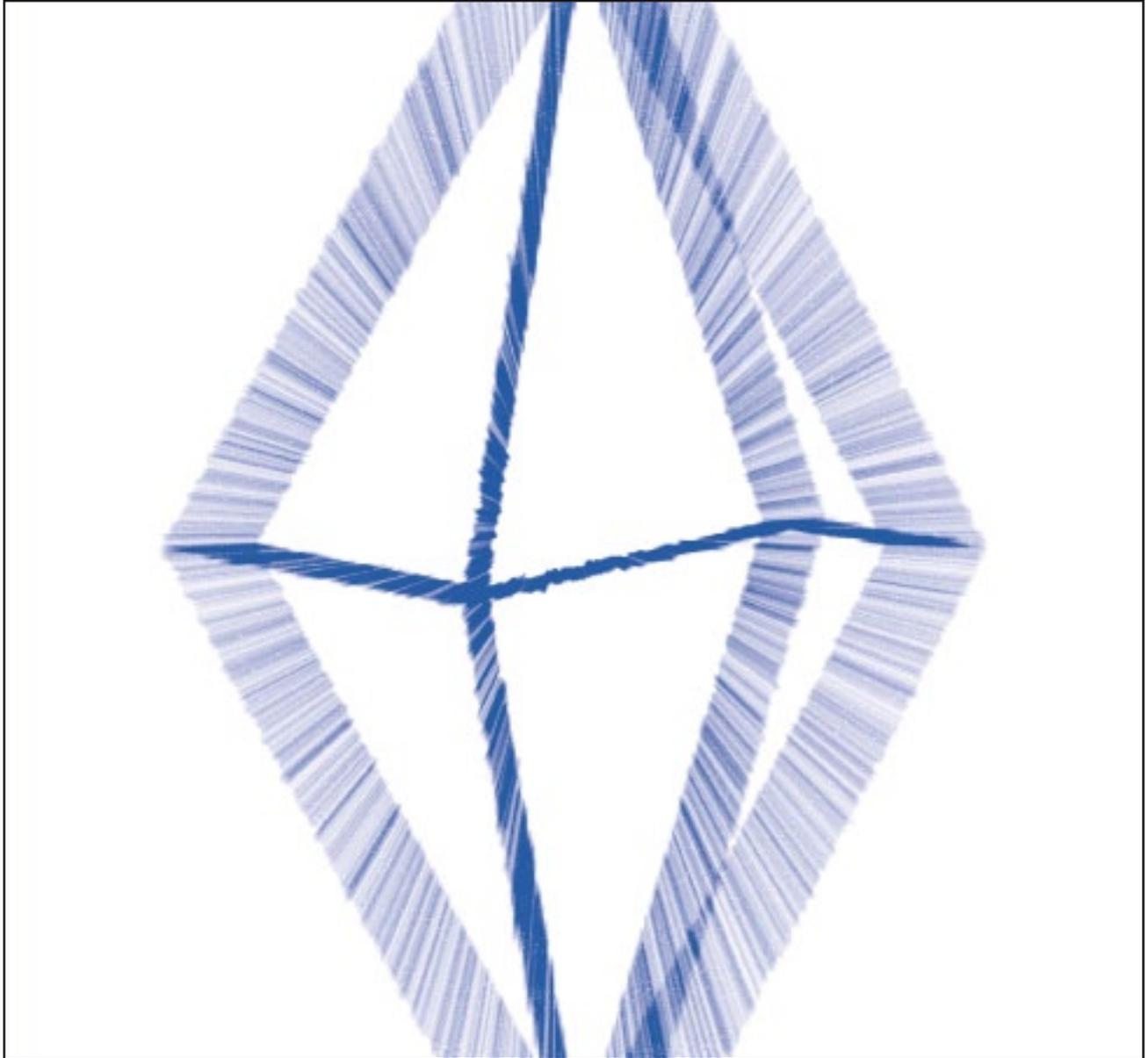


The Russell Society Newsletter



*Number 74
March 2019*

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

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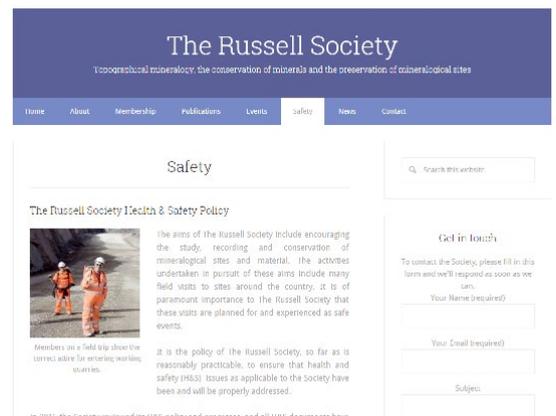
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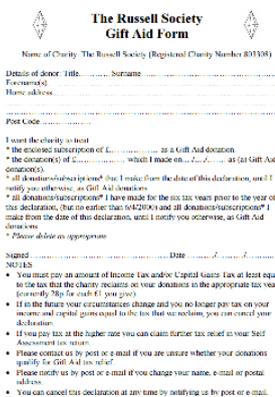
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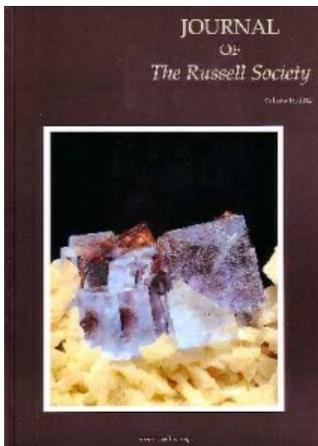
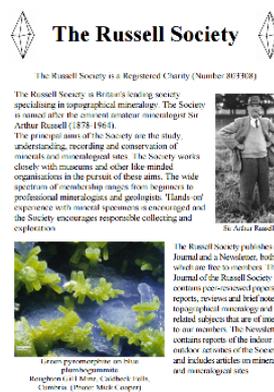
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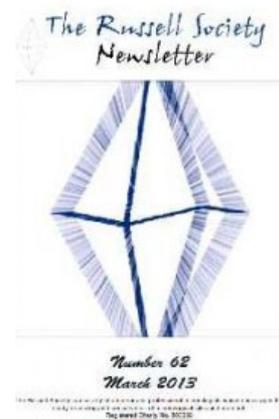
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Few



Clicks!



The Russell Society website has been changed & updated. Be sure to check it out!

Russell Society Newsletter

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The Russell Society Health and Safety Policy:

Adopted by Council 2015.

- 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 Field Leaders Indemnity Form
	A Risk Assessment Form	An Incident Report Form
	A Guide to Good Practice	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 2015

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.

“Thoughts from the Editor”:

Welcome to the first Newsletter of 2019, in which you will find the usual range of (I hope) interesting and informative items. This includes one important matter which is central to the future of your Society and its activities. Members will be aware that there has been much discussion in recent months over the structure and mode of action of the Russell Society and the need for change. There are now proposals from Council to amend the Society's Constitution to allow a “lighter touch” mode of operation in the regions and these will be discussed at the Society's AGM in April – which I hope many of you will be attending. In the envelope which brought you this Newsletter you should have found a separate insert detailing these proposals. Please take the time to read it and see how it might work for you in your area. If you have any comments or strong opinions on the proposed changes please make them known to a Council member in good time before the AGM.

In order for any form of organisation - “light touch” or otherwise - to work effectively it is necessary for members of the group to be prepared to step up and take on a degree of responsibility at some point. The Society has not found this to be easily achieved in recent times. This point is addressed both by our President in his comments on the following page and in the *cri-de-coeur* from our General Secretary which immediately follows that. Please read both of these carefully and ask yourself (to paraphrase JFK) “what you can do for your Society”.

In other pages you will also find, I'm afraid, three obituary notices for members who were well known and respected within the Society. It is always sad when long-standing members pass on but they will be remembered and it is reassuring that the Society is still able to attract new members, so that the natural order is maintained.

With the weather we have been experiencing recently (January – February) you may not have felt much like going out collecting. Nevertheless, a new season is opening before us and, in the following pages, you will find the usual programme of activities put together by our tireless field trip organisers. They include visits to a number of localities not commonly open to collectors and only accessible to our groups because of the diplomatic skills and persistence of these heroes. I hope you will support these activities and take advantage of the unrivalled opportunities which they offer to acquire new and interesting material. There is also a list of minerals shows taking place in the UK this year – along with some (but by no means all) of the events scheduled to take place in Europe. Even after Brexit (assuming it actually happens) you will still be able to go there, you know!

There are also numerous reports of past field trips, many of them detailing really interesting mineral finds. These have always (at least in my experience) been the most popular section of the Newsletter among members and they are important, not for this reason alone, but because they address one of the Society's central aims, the study and reporting of UK topographic mineralogy. The fact that reports of individual visits are regularly fed back to mine and quarry company managers and to the various other organisations which grant permission for our visits (Natural England, English Nature, various private estates etc.) – as well as being visible to a wider audience on-line *via* the Society's website - emphasises the need for them to maintain a reasonable standard in terms of quality and content. The Society provides guidance for those writing visit reports and this has recently been updated. It can be found on the website in the section on “Publications”. I would encourage members generally, and particularly anyone who feels they may find themselves writing visit reports in the future, to take a look at these.

Remaining for a moment on the subject of guidance to authors, David Green who has taken over as Editor of the Russell Society Journal, has updated the notes relating to that publication and placed the new version on the website. You will find a summary of the latest guidelines in the following pages and anyone with aspirations to contribute to the Journal in future should certainly run their eye over these.

I hope that, among these varied contents, you can find something to inform you, intrigue you and – perhaps – make you think.

Enjoy your Newsletter.

Michael Doel.

From the President:

Another collecting year should be starting by the time you are reading this. For those of you who have booked onto field trips please try to take a camera (or phone) with you to record the *in-situ* context of any minerals before they are removed. This will provide an invaluable record for the future, providing you print or store the digital images, in a manner that relates them back to specimens of course. With this approach you may also then have enough information to put in an entry for the annual Trevor Bridges Award, which encourages collectors to record as much information about their specimens as possible. For those of you who have not booked onto any field trips please try to make 2019 the year that you join in, you will enjoy it!

In a similar 'recording' vein, I gave up on the idea of having New Years resolutions years ago but in an idle moment on January 1st an unforgiving part of my brain reminded me that I must get around to cataloguing and labelling a rather large backlog of specimens, as per Tom Cotterell's reminder in the last Newsletter. Thanks Tom.... The value of having location information affixed to specimens was brought home again recently by the unintended separation of some of the late Keith Snell's specimens from their paper labels. Fortunately, Keith had affixed location information directly to his specimens, in addition to the usual separate labels, so all was not lost in this instance.

The 2019 ASM weekend and AGM are fast approaching and, apart from looking forward to what is always an enjoyable weekend, we have the rather important business of proposed changes to the structure of our Branches to consider this year. Your Council has been working hard on this matter and, whilst change is usually something to be avoided, Council has concluded that the current Branch structure cannot be sustained. Whilst some Branches are thriving, and may wonder why we need to make these changes, other Branches are already struggling. I am fairly certain that within a five-year time scale, due to our ageing membership and on ongoing reluctance of many members to help run the Society, we would see problems for all of our Branches. Roy Starkey, our General Secretary, will present the schedule of proposed changes to our Constitution at the AGM. We all need to approach the proposed changes in a positive manner and to help make this work.

The point I make about members running the Society is a fundamental one. The Society is its members and *vice versa*, there is nothing else, no third party, no other life raft, no magic. A relatively small group of people has run the Society at Council and Branch level for many years. The Society only exists because some of its members are prepared to put effort in and make it work. If we all took the view that 'someone else will do it' there simply would not be a Russell Society any more. Whilst we have a strong core of committed members it is now time for new faces to step forward and help out at Council and Branch levels. At Council level, succession planning means that we are now looking for a new Vice President and Membership Secretary. We only continue to receive our Journal due to the outstanding commitment of Frank Ince, our Journal Manager. Frank cannot, and should not be expected to do this forever. Council is most grateful to David Green for stepping forward as Journal Editor and to Susan Tyzack for agreeing to take over as Newsletter Editor next year. Now is the time for members to come forward, to fill these positions and help at Branch level. We all lead busy lives, so that is not an excuse for not helping, please make the time and help your Society.

My parting shot follows my earlier request for high quality photographs of your specimens, to use on our website and in our publications. Only one person, John Davidson, made the effort to send me some images. Thank you John. I know there are many good photographers amongst our membership, please just send me some of your favourite images. For those who don't feel able to produce good photographs, give it a go – see the image opposite, believe me, if I can do it, anyone can.



Fluorite and hemimorphite, Adelaide Level, East Arn Gill, Near Muker, Wensleydale. Collected by J & R Lawson. The largest fluorite crystal is 5 cm on edge. Photo: Steve Warren.

**Steve Warren
President.**

SOCIETY NOTICES

A Personal View from the General Secretary's Chair.

My involvement with the Russell Society began in February 1982 (yes, that is 37 years ago!). I remember being quite in awe of people such as Trevor Bridges, Mike Smith, Bob King, Howard Miles, John Jones and Nigel Moreton, to name but a few. They all seemed to know so much more than I did, and to have 'been everywhere' – I was a real newbie.

Over the years my involvement increased and I got to know many of the membership, gradually becoming more and more involved in the Society and later organising events, joining the Council and serving in a variety of roles, proof-reading the Newsletter, refereeing Journal contributions and so on. The Society has been a major part of my life and I have greatly enjoyed my association with it, but looking back it is clear that the success of the organisation owes a lot to a relatively small number of people.

Over the 18-year period from 2000 through to now, the six elected officer posts (who are also the trustees of the Registered Charity) have been filled by only 24 different members. Several of these people have served enormously long terms, for example Neil Hubbard (11 years as Membership Secretary); Frank Ince (9 years as General Secretary followed by 11 years as Journal Manager); Margaret Ince (9 years as Treasurer) and Christine Critchley (10 years as Vice-President). We should all be very grateful to them for their commitment and dedication to the Society, but it is not reasonable to expect individuals, however willing, to serve for such long terms.

A similar situation is to be found at Branch level where a few stalwarts have really kept the show on the road, but there is a problem, these people are growing weary of carrying the torch.

Christine will be standing down as Vice-President at the AGM in April and Neil has signalled his intention to stand down as Membership Secretary in 2020. Frank indicated his wish to step down from Journal Manager, but in the absence of anyone coming forward to fill the post, very graciously agreed to continue for the time-being – he will not go on for ever. Our branch structure is in a state of collapse, with very poor numbers of members supporting evening meetings, and several branches closing because they could not get people to stand for committee positions.

The currently proposed changes to simplify Branch administration and structure are aimed at trying to keep the Society alive and functioning. We desperately need new blood and we need it now.

If you have been a passive member, enjoying the field trips, evening meetings and publications, now is the time for you to consider stepping forward to play a part in the Society's future. The fact that I felt the need to return as General Secretary as a means of getting Steve Warren to fill the vacant position of Hon. President speaks volumes of the general apathy amongst the membership. At the same time, we needed a new Hon. Treasurer and I 'twisted Mary's arm' to take on that job, and so we shall continue, for a couple of years, but not for longer than that. I see my role as one of trying to help Steve to re-invent the Russell Society, of getting it onto a new and more sustainable footing, but we cannot do this without your help.

Right now, we need someone to step forward as Vice-President, and ideally, that person should be 'in training' as the next Honorary President – we do not want to run with a vacancy again. Next April we shall need a new Membership Secretary – could that be you? Shortly we shall probably be looking for a Journal Manager too.

Put simply, if some of you do not come forward to take on the leadership positions, the Society will fold – and quite possibly sooner rather than later. This would be a tragedy for the membership, and for all those interested in British topographical mineralogy. There are plenty of capable people amongst the membership, with excellent skill sets and contacts that could bring much to the party but for whatever reason they want a 'free ride'. The bus is coming to a stop. It won't be going anywhere soon, unless you get on board and help.

Please give this some serious thought. We need to be planning ahead and managing our succession – hoping someone else will do it is simply not going to work. I am very happy to have a confidential chat with anyone who might like to explore possibilities.

Roy Starkey.
Hon. General Secretary

OBITUARY: Keith H. Snell (1937 – 2018).



Keith Snell (right) with John Davidson on the occasion of the latter's wedding.

Keith passed away peacefully on Sunday 12th August, after a battle with cancer. He was born in Singapore, where his dad worked for the Royal Navy as an Engineer, the youngest of three children. Just before the Second World War started the whole family was moved back to the UK, eventually settling in Gunnislake near Callington in Cornwall.

It was in Cornwall, while he was young, that his passion for collecting things started. Keith would travel with his friends to the old mines in the area collecting from the old mine dumps - at that time good specimens of minerals such as torbernite could be easily found. In the 1950's the family moved again, when Keith's dad got a job at Cammell Laird ship yard in Liverpool.

It was while he was living in Liverpool that he met Anne who would become his wife and lifelong companion. Harry and Chris Critchley remember the many times, over a cream tea after a field trip, they would regale us with tales of experiments carried out in the labs at work and the many explosions, and evacuations needed, when things 'did not quite go to plan'. Keith and Anne set up home in Maghull on the outskirts of Liverpool and Keith's mineral collection followed him from his parents' home, together with a large fossil collection and his collection of cacti.

I first met Keith and Anne in Coldstones Quarry fifteen years ago. He was an eager collector finding his own material but readily accepting specimens from others. I recall he had a habit of wrapping up his mineral specimens and very carefully putting them into Anne's rucksack without her knowing! Although we all suspect she really did know and was just 'taking care' of Keith.

As I got to know Keith, I found him an amusing chap who was very kind and extremely knowledgeable about anything mineral and mining related. He was also a fine engineer who could make you anything you wanted. Rock splitters were his speciality and he went on to make 300 of them! Keith was always helpful and cheerful and was more than willing to share his knowledge with all.

His passion, however, was for microscopes and when you went around to the house they were usually in bits as Keith made modifications to make them more useful for looking at minerals. He was always inventing new ways of carrying out micro-photography and made some very useful attachments that would move the microscope stage in the X, Y and Z directions.

Keith was always willing to help and served on the Russell Society North West Branch Committee for many years, attending with Anne all the field trips they could. He also was active as a tutor in geology for the University of the 3rd Age, both lecturing and running field trips.

Since Anne's death, Keith's health gradually declined and eventually he became housebound. He was, however,

mentally sharp and worked hard to update his collections and document them, much to the detriment of his house which became more and more a workshop with milling machines and rock splitters in the kitchen! Every usable surface in the lounge was used to store 'work in progress'.

Keith leaves a daughter who is a GP, a son who is a professor, four grandchildren and many friends. He will be sadly missed.

John Davidson. (with useful and much need contributions from Ian Dossett, Harry and Christine Critchley).

OBITUARY: James Gordon Todd M.B., Ch.B., F.R.C.A. (1951 – 2018)



The Two Amigos. Gordon Todd (right) happily discussing minerals with Michael McMullen in his garden museum.

Gordon, as he was commonly called, had a passion for the natural world, and with scientific curiosity he took every opportunity to extend his knowledge. He was just five when his family noticed his interest in geology. Encouraged by his father, Gordon has been collecting ever since; minerals, fossils, gems, insects, marine life, flora and fauna. Today his collection is recognised as one of the finest.

He was the eldest son of Church of Scotland missionaries; his father was a doctor who ran the mission hospital and his mother was a schoolteacher. Gordon was born in Poona (Pune) near Bombay (Mumbai), India, in 1951. Gordon's early years were spent between Poona and the hill-station of Kodaikanal. His collecting really took off after the family returned to Scotland in 1957 settling in the south side of Glasgow across the road from my parents' house. That's when I met Gordon and he remained my best friend and collecting partner for all these years.

In 1965 Gordon's father was employed as a medical officer for Anglo-American Mining Corporation in the Copper Belt mines in Zambia. Whilst visiting his parents he was able to stand next to the mine conveyor belts lifting off amazing specimens of copper, lead and zinc minerals and collecting rare secondary phosphates: tarbuttite, hopeite, parahopeite and libenthenite.

He went on to study medicine at Glasgow University, graduating in 1975. He pursued a career in anaesthetics, including a year in a clinical research post in North Island, New Zealand. Returning to Scotland, he gained his Fellowship of the Royal College of Anaesthetics in 1983 and took up an appointment as a consultant anaesthetist in Glasgow University teaching hospitals, where he became a College Tutor.

It was during these early years that Gordon and I began to extend our collections. With his meticulous research and our visits to museums and meeting the professionals and academics he gained an invaluable knowledge of localities especially Scottish. Through detailed meticulous recording Gordon was awarded the certificate of Geological Collector of the Year 1991.

In 1994 Gordon opened his first "museum" of Scottish Geology in a distinct building in his garden. The display cabinets

organised along regional lines allowed the visitor to see the full variety and quality of minerals, fossils and gemstones to be found in Scotland. His second "museum" was opened in 2010 by his friend the eminent Scottish palaeontologist Stan Wood, this time for his natural history collection of invertebrate groups and key fossils demonstrating comparative anatomy and evolutionary biology. Since they opened, his museums have been visited by amateur and professional geologists, collectors, academics and dealers from all over the UK and indeed the world. He revelled in being able to discuss his specimens and localities and was at pains to encourage the younger visitors to embrace the natural world and to go out and absorb all it had to offer.

Gordon regarded his collections as working entities, with specimens being exhibited in the National Museum of Scotland, Paisley Museum's display "Mineral and Fossil Collecting" and the Hunterian Museum, University of Glasgow. His minerals have also been exhibited at numerous Members' Nights of the Glasgow Geological Society. Additionally, he has given presentations on various aspects of Scottish mineralogy, palaeontology and geology to Glasgow Geological Society, the Earth Sciences Group at Paisley University and to several local natural history societies. Gordon has had specimens figured in several publications including "Girvan Fossils" (Hope, 2004) and *Minerals of Scotland Past and Present* (Livingstone 2003) where he was featured as a contemporary collector.

Unfortunately, Alzheimer's disease took hold of Gordon, which he battled with his devoted wife Pamela, eventually succumbing to this awful illness on the 23rd December 2018.

Michael McMullen.

Publications.

Meikle, T.K. & Todd, J.G. (1995) Silica-rich edingtonite and associated minerals from Loanhead Quarry, Beith, Strathclyde - a new Scottish locality, *Journal of the Russell Society*, **6** (1), 27–30.

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McMullen, M.J. & Todd, J.G. (1991) Vein minerals of the Mannoeh Hill, Scotland. *UK Journal of Mines and Minerals*, **9**, 35–38.

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Ingram, S., Anderson, D. & Todd, J.G. (1996) Powellite and scheelite from Coire Buidhe, Argyll. *UK Journal of Mines and Minerals*, **16**, 14.

Green D.I. & Todd, J.G. (1996) Zeolites & related minerals from Moonen bay, Isle of Skye, Scotland. *UK Journal of Mines and Minerals*, **16**, 21–27.

Hope, M.A. (2004) Girvan Fossils.

Todd, J.G. (1996). Mineralogy of a Quartz Hematite Vein at Auchenlosh Quarry, Dalbeattie and Cowdens Quarry - a temporary exposure in the Birrenswark Lavas. *Transactions of the Dumfriesshire and Galloway Natural History and Antiquarian Society*. **LXXI**, 159-160.

OBITUARY: The Reverend Vincent Alfred Douglas Holyer (1928 – 2018)



Vincent Holyer, a well-known and long-time member of the Russell Society in the southwest, died peacefully on Tuesday 17th July 2018 at Poldhu Nursing Home, Mullion at the age of 89. He was born in 1928 in Tehidy, Cornwall, to parents Ted and Ruth Holyer who had moved to Cornwall from Tenterden in Kent. He was christened in Trevenson Church at Pool, near Redruth, and it is said that this event resulted in him developing a (short-lived) fear of men as a result of the vicar placing a top hat on his head.

In his early years, Vincent's parents took him briefly to stay in Alton, Hampshire, where they were employed as cook and housekeeper. Apparently, Vincent was required to remain very quiet whilst in this house – never an easy thing for a young child! It was at about this time, when Vincent was six, that he first expressed a desire to become a clergyman. He would stand in the hall at the bottom of the stairs and preach to the empty hall because he did not want his Mum and Dad to listen.

Just before the war, the family moved to Exeter and, from the age of 7, Vincent was fortunate in obtaining a scholarship to Exeter School – a thing he referred to as “one of his many mini miracles”. He was 11 when war was declared at which time his father, Ted, volunteered for the army and was deployed to India. There he ultimately, became a Sergeant engaged in drawing strategic maps for the Air Force. During the frugal war years Vincent witnessed many bombings including the Blitz of Exeter. Later he enjoyed collecting bomb fragments and displaying them on the mantelpiece. He recalled, his mother showing great resourcefulness in catering by boiling a sheep's head and producing soups and broth for a week. Because of the restricted communications in those days, Ted remained unsure as to whether Ruth and Vincent were safe and they in turn waited many hours at Exeter railway station each evening for his return. Vincent's mother was a big influence in his life and helped him to meet an interesting and diverse range of people, in particular the underprivileged and marginalised.

At the end of the war Vincent did his National Service in the army, hitch-hiking or cycling to his base on Salisbury Plain where he trained on a Bren gun carrier. Later he was stationed in Germany where he guarded trains carrying Prisoners of War. On the whole, it seems, he enjoyed his National Service.

After this, he went back to college and gained a degree in Greek, Latin and Ancient History. Following this, he entered theological college and it was during his time there that he met his future wife, Heather. Following their marriage in Essex, and whilst he was a curate in Bethnal Green, their son Stephen was born. After a move to Braintree in Essex a brother, Andrew (a.k.a. Jake), came on the scene. There then followed another move to Islington where Vincent was Vicar of All Saints Church. During this period two further children, Dawn and David, arrived to complete the family.

Heather and Vincent had always wanted to be missionaries in Africa but, unfortunately, Heather's ill health, brought on by exposure to the London smog, meant that this was not possible and they were advised to move into the country. Vincent would have described this as another mini miracle as the opportunity arose to become Rector of Grade Ruan Parish, in Cornwall. He saw this as a return to the county of his birth, which meant a lot to him, and he served in this role for twenty years until 1985. The position provided an idyllic childhood for his children in a house with a huge garden that included a trout stream. Many parishioners still have fond memories of the garden fetes held at the Rectory which included such attractions as bowling for a pig! Vincent is fondly remembered for taking part in family football matches - particularly amusing as he played barefoot and his double-jointed toes could bend up vertically. He also ran the village Youth Club and helped with the “Reel Them In” Youth Club in Coverack.

Vincent's interest in geology and mineralogy was now well to the fore and growing up at St Ruan involved many trips for the children to mine dumps, quarries and rocky beaches to fulfil his enthusiastic hobby, along with his love of photography. This was made a little easier by such privileges as having his own key to Dean Quarry. It also helped the family become very familiar with every nook and cranny of the Lizard coastline. Vincent came to be acknowledged as a significant expert in the geology and mineralogy of the area and it is not unusual to find, in the acknowledgements at the end of scientific papers concerning the geology of the Lizard, thanks given to V. Holyer “for informative discussions on aspects of the Lizard geology”. He also amassed a considerable collection.

After 20 very happy years serving Grade Ruan, Vincent was moved to Brill to become the Vicar of Constantine. He was well respected there and enjoyed cycling around the Parish and walks up Brill Hill. It should also be mentioned that he had a love of sports cars, owning a Triumph Spitfire, Triumph GT6 and an MG Midget. His final months were spent in The village of Cadgwith with his son Steve and daughter-in-law Helen and latterly in Poldhu Nursing Home.

At a personal level, I remember Vincent Holyer in middle age from a couple of trips into Dean Quarry in the late 1980s under his guidance to observe and collect from the zeolite mineralisation there. I also visited him in his home where I was shown some impressive material from his own collection and received several characteristically generous gifts of specimens which I still have. I will remember him, as I'm sure others will, as a courteous, kindly and generous man –

very knowledgeable on the geology of "his" area and always happy to pass his knowledge on to others. Vincent will be sadly missed by those many of us in the Society who knew him and our condolences and sympathy go to the surviving members of his family.

Michael Doel. (Compiled from personal recollection and information published in the Grade Ruan Gazette)

Journal of the Russell Society: A Summary of the Revised Guide for Authors.

If you have a particular mineralogical interest and have been accumulating data (and specimens), how about sharing your knowledge and enthusiasm in an article or note for Journal of the Russell Society (JRS)? We would be delighted to hear from you.

Beginning an article or note can be a bewildering process, especially for new authors, although, many members have successfully navigated the reefs and shoals to produce accounts which are accurate and accessible. Also, we will offer you any help that might be needed to produce a suitable manuscript. Some determination will be required to follow up the inevitable 'loose ends'; however, it is satisfying to see all that hard work in print and make an original contribution to the mineralogical literature!

This note summarises some of the things that authors should consider when writing an article or note. A more detailed version of the "Guide for Authors" can be obtained from the Journal Editor (David Green) or Journal Manager (Frank Ince) and an updated version will be added to the RS website in the near future.

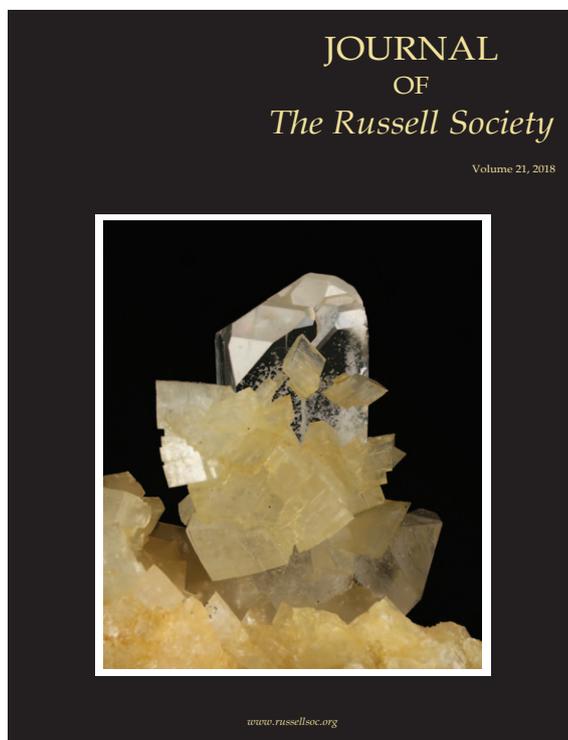
Articles and Notes.

Contributions from members and non-members are welcome; however, submission of a manuscript for publication in JRS is taken to imply that it has not been considered for publication elsewhere and that all necessary permissions have been obtained and, where appropriate, acknowledged by the authors. Articles and notes in JRS typically focus on the mineralogy of Great Britain and Ireland; manuscripts about sites outside the British Isles are not normally published. Recent editions of JRS provide a useful indication of the sort of articles and notes that are included. Authors are advised to contact the editor with a rough synopsis before beginning an article or note in earnest as there may be another proposed contribution in a similar subject area.

All articles and notes are refereed by experienced mineralogists. This is a normal part of the publication process and it helps to reduce errors, which otherwise propagate through the literature. The editor, editorial board and referees will help produce the best possible contribution. Referees may be 'critical', but their comments are intended to be constructive and positive, not pejorative.

Articles may contain up to 50,000 words, although they are usually much shorter; manuscripts should include an abstract of up to 250 words summarising the significant points of the article. Notes usually contain up to 2000 words and do not require an abstract. Manuscripts should be prepared using Microsoft Word with the pages numbered sequentially and in single column A4 format with reasonable margins. Although the content is varied, certain types of articles and notes recur. The most common are:

- **Unusual Occurrences:** Descriptions of unusual, novel or otherwise unreported minerals or mineral assemblages are an important part of the content of JRS. The principal issue in such articles can be the reliability of identifications; claims of unusual, novel or rare mineral species must be backed by supporting evidence. The manuscript would normally contain: Title, Abstract, Introduction, Locality, Analysis, Discussion, Acknowledgements (and permissions), References, Tables and Figures.
- **Locality Reviews:** Reviews of mineral localities are the core content of JRS; they are popular with readers and form valuable records of British sites. They typically draw on the collections of public institutions and private individuals and paint a complete picture of a locality. Locality reviews can be extended geographically to encompass the mineralogy of a larger area, such as an orefield, group of mines, geological unit or even a complete county. More extended reviews do not necessarily deal exhaustively with all known occurrences of every mineral. A topographic review might focus, for



example, on the occurrences of a particular mineral, or group of minerals, across a wide area. The manuscript would normally contain: Title, Abstract, Introduction, History, Geology, Minerals, Discussion, Conclusion, Acknowledgements (and permissions), References, Tables and Figures.

- **Collection Descriptions and Biographies:** A more 'human' subject area with wide scope, is commonly based on private and public collections, past and present. Some articles may be set in historical context, based perhaps on material in an archive or public museum. Others may be contemporary and provide records of current mineralogists or mineralogical practice. Collection descriptions typically include a mineralogically focussed biography and illustrations of the collector's catalogue, labels, and as many important specimens as possible. The manuscript might contain: Title, Abstract, Introduction, Main Text, Acknowledgements (and permissions), References, Tables and Figures.
- **Techniques:** In common with other science-based subjects, various techniques lie within the compass of amateur mineralogy. Collectors have led the way in digital photography which can be used to enhance resolution and depth of field in images. Advanced analytical equipment is gradually coming within the reach of some enthusiasts. Curatorial techniques, ranging from chemical treatments to prevent decay, to methods of labelling and suitable databases for collection management are of wide interest. Articles need not be ground-breaking; but will typically include of review of the scientific basis of the technique and examples of how it might be useful in a mineralogical context. There is no general template for an article. It should include: Title, Abstract, Main Text, Acknowledgements (and permissions), References, and if appropriate, Tables and Figures.

Notes are normally succinct versions of the first two bullet points; they may not contain as many sections.

Style Guide.

Writing for any journal has its quirks and idiosyncrasies. Articles should be written in a free-flowing style; but adhere to appropriate scientific and stylistic conventions. Material that is vexatious, rude or offensive will not be published. The main body of the narrative should lead the reader through the material in a logical manner. JRS uses British English (taken from a recent edition of the Oxford English Dictionary). Authors should not worry unduly about grammatical minutiae; the splitting of infinitives is not an offence. The style should be scientific, generally in the third person, and follow certain conventions. Some are adopted for sound scientific reasons, following guidance from the International Mineralogical Association or other scientific bodies. In other cases, they are arbitrary: 'for consistency, that's the way it's done'.

Lucid and simple English is encouraged. Authors write in their own particular ways and JRS does not impose a rigid style. The full version of the guidelines offers advice on a variety of topics: Abbreviations, Abstracts, Accuracy and precision, Americanisations, And/or, Apostrophes, Book titles, Brackets, Capitalisation, Chemical conventions, Chemical formulae, Chemical equations, Commas, Compound words, Compass points, Copyright, Crystallography, Dates, Deceased persons, Data, Diacritical marks, Double spaces, Emojis and other ideograms, Equations, Footnotes, Foreign languages, Fossils, Geological names for rock units, Grid references, Headings, Hyphens, Italics, Lists, Mine names, Mineral names, Minus signs, Numbers, Quote marks, References, Slashes, Single quote marks, Single Spaces, Sizes of specimens and geological features, Statistical averages, Symbols and Units.

References.

No other area of manuscript preparation gives as much trouble as references. They follow a set of seemingly arbitrary technical conventions, for which the editor humbly apologises!

References are cited in the text to support a statement, or to direct the reader to a source of information, or for both purposes. Every reference in the reference list at the end of an article must be cited at least once in the article. The reference list should not include any works that are not cited.

References can be cited in the text in two ways: 'the largest recorded crystals are 3.6 mm (Author, 2010)'; or 'crystals to 3.6 mm are recorded by (or in) Author (2010)'. If the reference has two authors this would be: 'the largest recorded crystals are 3.6 mm (Author1 and Author2, 2010)'; or 'crystals to 3.6 mm are recorded by (or in) Author1 and Author2 (2010)'. More than two authors are abbreviated using *et al.*: 'the largest recorded crystals are 3.6 mm (Author1 *et al.*, 2010)'; or "crystals to 3.6 mm are recorded by (or in) Author1 *et al.* (2010)". If there are two or more references to the same author or authors in the same year the letters, a, b, c and so on are added to distinguish them. All direct quotations must include a reference. It may be useful, especially if the quote is from a long and detailed work, to include the pagination in the form: 'Author(s), date: pagination'.

The format of references often gives cause for confusion and is best learned by example. Book titles and journal titles should be fully spelled out. In book titles and journal titles, every major word is capitalised, but in article and note titles only the first word and proper nouns are capitalised. The full version of the guidelines offers advice on a number of topics: Books, Journal Articles, Chapter in an Edited Book, Theses, Maps, Archival and Other Sources, Websites, and Order of References.

Figures.

The variety and quality of illustrations can make or break an article or note. Figures may include charts, graphs, maps and plans, mineral photographs, site photographs and SEM images. They should be numbered consecutively in the order in which they are mentioned in the text. Every figure should be mentioned at least once in the main body of the article. Authors should ensure that figures are chosen to illustrate the themes of the article or note. Authors are asked not to embed images in the manuscript; they should be supplied as separate high-resolution files (JPEG or TIFF). A list of figure captions should be provided on a separate page at the end of the manuscript. It may be possible for the editor to arrange for specimens to be photographed. The full version of the guidelines offers advice on a several topics: Image resolution, Embedding images in manuscripts, Captions, Colours and ornamentation for maps, plans, graphs and charts, and Acknowledgements and permissions.

Tables.

Tables should be numbered consecutively in the order in which they are mentioned in the text. A list of table captions should be provided on a separate page at the end of the manuscript. In captions placed below tables and in the main text the word 'Table' is used in full; if more than one table is being referred to, use 'Tables 1–3' or similar. The full version of the guidelines offers further advice on the construction and layout of tables.

Please get in touch with us and we look forward to receiving your manuscript(s).

David Green and Frank Ince.

The 2019 Annual Society Meeting: Last chance to register.

The 2019 Annual Society Meeting (ASM) of the Russell Society will be held at Buckfast Abbey in Devon from Friday 12th April to Sunday 14th April 2019 and was publicised in the last Newsletter.

This is a reminder for those who may still be thinking of attending to please book up very soon if you wish to attend. All the details of the event are in the last Newsletter on pages 6 and 7 and there is a booking form on the Russell Society web-site. The location, at Buckfast Abbey in the Dart Valley, is on the edge of Dartmoor National Park. This is only a couple of minutes from the A38 between Exeter and Plymouth, less than 30 minutes from Exeter and the M5. The location is stunning, access is straightforward and the costs are very reasonable making this a definite for all Russell Society members.

All the on-site accommodation has now been booked, but there is a range of alternative accommodation available in the local area.

We have field trips planned for the Friday followed by dinner at the restaurant in Northgate House. After dinner there will be time for drinks and further socialising. The Saturday, at the Conference Centre, will be a full day of presentations with plenty of time for members to socialise, view a range of mineral displays and make swaps. The topics for presentation cover minerals and sites in the Midlands, Devon and Cornwall, and displays are planned of minerals from Devon, the Midlands and the Mendips. This will be followed by the AGM starting at 15.45.

We will hold the ASM dinner on the Saturday evening at the restaurant in Northgate House, to be followed by the traditional auction to raise funds in support of the Society. More field trips will be on the program for the Sunday.

The Southern Branch look forward to welcoming you to an amazing weekend of collecting and fascinating presentations on a wide range of British mineralogy. If you have any questions please contact Gary Morse (details on the back of the Newsletter).

Chris Finch.
Southern Branch.

Position Vacant: Russell Society Vice-President.

Our Vice-President, Christine Critchley, has served the Society valiantly in that position for 10 years now and feels that it is time for someone else to take over. She will step down as Vice-President at the next AGM in April and there is, therefore, an opportunity for a Society member to step forward and fill this post. The Society Council is seeking a suitable volunteer to take on the role from April.

The Vice-President position is an important one for the Society; it has a specific role which is not that of President-in-Waiting, Past-President or merely Deputy President. Apart from deputising for the President when required and supporting them in promoting the aims of the Society, it involves maintaining a focus on a range of safety issues which are central to many of the Society's activities. The Vice-President will be a member of the Russell Society Council and a Trustee of the Society and will inevitably receive good support and assistance from other experienced members of the Council. Christine has indicated that she is happy to provide information and advice to a new incumbent during their settling-in period and anyone interested in taking on this valuable role is encouraged to speak to her in the first instance to gain a fuller picture of the post and its duties.

With this role, as with others within the Society's organisation, it is important that some members are prepared to step up and assume a degree of responsibility. Without this support and participation from the membership it will become impossible for the Society to function. Please think carefully about this opportunity and ask yourself if you could derive enjoyment and satisfaction in taking on this interesting and valuable function.

Your Society Needs You!

Editor.

Steve Rust wins the 2018 Marsh Award for Mineralogy.

I suspect everyone reading this will either know Steve Rust personally or know of him through his many published articles on British topographic mineralogy and his numerous important mineral discoveries. Steve currently lives in Yeovil and is a mineralogist at Crystal Classics Fine Minerals in East Coker, just south of Yeovil. Only a few days prior to Christmas last year, Steve received the exciting news that he had won the 2018 Marsh Award for Mineralogy. He received the award at a ceremony held on Friday 11th January 2019 at the Natural History Museum (NHM) in London.

The Marsh Christian Trust was established in 1981 by Mr. Brian Marsh and three Marsh Awards for Earth Sciences are made in association with the NHM. This is only the third time the prize has been awarded to a mineralogist, the previous winners being Roy Starkey (2016) and David Green (2017). The award is targeted at 'unsung heroes and heroines' who quietly get on and make a significant contribution to their particular field of interest.

Steve has been (and still is) a dedicated field collector and for the last 45 years has made many new discoveries in the UK in both species and topographic mineralogy. It must be remembered that such discoveries are not only the result of diligent fieldwork, but his long-standing friendship with curators at the Natural History Museum, London, without whose help many new British minerals would not have come to light.

Through his profound knowledge and painstaking microscopy work, Steve possess a remarkable ability to recognise the genuinely unusual. In such cases, most collectors would simply dismiss a potential new discovery as just something they are not familiar with and therefore not worth reporting.

Over the years Steve's contribution to the mineral literature has been immense. From an early age he began collecting and recording his finds in magazines such as Mineral Realm, Gems, the Journal of the Russell Society and the BMS Newsletter. I'm sure many of you will remember his articles accompanied with pen and ink illustrations of crystal habits, maps and mine cross-sections. To emphasise this, I've appended a selection of references to some of Steve's articles and published notes which appear in some of these magazines, journals and newsletters. It goes without saying that his name is scattered throughout many other professional journals and text books, with reference to his discoveries and observations.

One such article was that of his discoveries in the long disused Milltown Quarry in Derbyshire in 1981, then often referred to as K3½. This article famously described two unknown species which were destined to become the type specimens for the minerals ashoverite and sweetite, both zinc hydroxide polymorphs. The former was named for the nearby town of Ashover and the latter for Jessie May Sweet (1901 – 1979), Curator of Minerals at the Natural History Museum, London. To this day there remain at least two more unnamed species from Milltown Quarry awaiting further research.

In 2008 a mineral new to science, yet another of Steve's discoveries, was named steverustite in his honour, an extremely rare naturally occurring copper lead thiosulphate, whose type locality is Frongoch Mine, near to Devil's Bridge in Ceredigion, Wales.

Steve has donated 160 specimens to the BMS Reference Collection; in fact, the very first 22 catalogued specimens

are from Steve. Amongst his contributions are some of the rarest of British species including agardite-Y, ashoverite, bechererite, bottinoite, devilline, gadolinite-Y, kainosite-Y, namuwite, schulenbergite, serpierite, sweetite, waylandite, weddellite and wroewolfeite.

To date, he has uploaded almost 3,200 mineral photos and over 70 locality photos to Mindat. These are always accompanied with an informative caption; an important feature often neglected by other contributors.

Everyone who visits the mineralogy user groups on Facebook will be very familiar with his almost daily uploads. His photos become ever more breath-taking as he continuously develops his techniques. A typical field-of-view is now 1.25 mm; a ridiculously small size for photos with such stunning clarity and visual impact.

Steve is renowned for his visual mineral identification skills and his wonderful photography, now using focus-stacking digital techniques, of micro-crystal mineral specimens mainly drawn from his own finds. He is currently working on his new book, a beautiful photo-atlas of The Mineralogy of Frongoch Mine, which, all being well, is due for publication later this year. Steve commands an encyclopaedic knowledge of British mineralogy, especially that of mid-Wales; the Leadhills-Wanlockhead mining district; the Tertiary volcanic minerals of western Scotland; the mines of south-west England plus the Laurium-Kamariza-Plaka mining region in Greece. He is one of the many managers and a regular contributor to Mindat and an active member of the Russell Society and the British Micromount Society.

The Marsh Award ceremony was held on Friday 11th January 2019 in the Flett Theatre of the Natural History Museum, London. Earlier in the day, Steve and I met with Tom Goodland who had been the main proposer of Steve for the award. The ceremony began with an introduction by Prof. Richard Herrington, Head of Earth Sciences Department (NHM). This was followed by Dr. Martha Richter, Principal Curator in Charge (Vertebrates), Department of Earth Sciences (NHM), who explained the background and aims of the Marsh Christian Trust and of the three awards about to be made; Mineralogy, Palaeontology and Best Earth Sciences Book of the Year. There then followed an excellent talk by Prof. Chris Stringer on The Origins of our Species, concentrating on the latest fossil finds, genetic analysis and applied research. Prof. Stringer is Merit Researcher, Vertebrates and Anthropology Palaeobiology, Earth Sciences Department, NHM. Steve was then presented with the Marsh Award for Mineralogy 2018 by Brian Marsh OBE, pictured below with Steve.



Steve Rust (L) receiving the Marsh Award for Mineralogy 2018 from Mr Brian Marsh, OBE (Philip G. Taylor photo)



Austin Lockwood, Tom Goodland, Steve Rust and Robin Hansen at the Marsh Awards wine reception, NHM, London (Philip G. Taylor photo)

Next, Dr Christopher Duffin (Scientific Associate, NHM) received the Palaeontology Marsh Award and Dr Alan Graham (Senior Research Associate, Missouri Botanical Garden) for best book (Land Bridges: Ancient Environments, Plant Migrations, and New World Connections, University of Chicago Press, 2018). This splendid and most memorable day concluded with a wine reception, among which Mike Rumsey (Principal Curator, Minerals, NHM), Robin Hansen (Curator, Minerals, NHM) and Austin Lockwood (Volunteer, Minerals, NHM) were there to congratulate Steve.

Now the 2018 awards have been made, the Natural History Museum's Marsh Awards website is already open for 2019 nominations (closing date mid-December 2019). So, if you have your own unsung mineralogical hero or heroine, do put them forward for nomination to give the recognition they richly deserve. Visit: <http://www.nhm.ac.uk/events/the->

marsh-awards-for-palaeontology-mineralogy-earth-sciences-book.html. Also, well worth a read is Roy Starkey's tribute on Mindat to Steve winning this prize at: <https://www.mindat.org/article.php/2915/Congratulations+to+Steve+Rust+on+winning+the+Marsh+Award+for+Mineralogy+2018>.

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Acknowledgements

Special thanks go to Tom Goodland for championing Steve's nomination and for his very fine company and support on the day of the award. Without Brian Marsh the award scheme would not exist and all of us in the mineral community owe him a very big debt of thanks. I wish to thank Steve and Christine Rust for kindly inviting me to accompany Steve on his visit to the NHM, a day I shall always treasure. For the warm hospitality extended by Richard Herrington, Martha Richter, Mike Rumsey, Robin Hansen and Austin Lockwood whilst there. Finally, to Roy Starkey for digging out the references I needed from Mineral Kingdom and Mineral Realm while I am separated from my own books by 600 miles.

Phil Taylor
North Branch.

“Maisemore 2019”.

The Society's Wales and West Branch plan to hold their popular “Maisemore” day of events once again in 2019. This will be held on Sunday 20th of October but this year, because of problems booking the usual hall, it will be held at the Century Hall in Shurdington, Gloucs. GL51 4TB. As usual, this event will be organised in collaboration with the Cheltenham Mineral and Geological Society (CMGS).

The day will comprise a number of talks on mineralogical, geological and palaeontological themes, along with displays, giveaway specimens, sales etc. An excellent lunch will be provided for a small charge.

For more details please contact Tom Cotterell or Marashean Parker. A full programme for this event will be provided in the September Newsletter.

Tom Cotterell.
Wales and West Branch.

The Central Branch Mini-Symposium: The Minerals of Derbyshire.

A date for your diaries: Saturday 16th March 2019. On that date, between 10.30–17.00, a symposium on “The Minerals of Derbyshire” has been organised by the Society's Central Branch. It will be held at the Woodhouse Community Hall, 207 Forest Road, LE12 8TZ and talks will include:

Roy Starkey: “Hidden Treasures of Derbyshire”.

John Jones: “Derbyshire Enigmas: Brown, Black and White”.

Stephen Seymour-Smith: “The Characteristics of a Derbyshire Deposit”.

All are welcome – indeed encouraged – to attend; but, please contact Neil Hubbard if you plan to be with us. Also, please let Neil know if you plan to bring a display of Derbyshire minerals and/or any swaps or freebies.

Coffee and biscuits will be available and a modestly-priced snack lunch will be provided.

Frank Ince and Neil Hubbard.
Central Branch.

NEWS ITEMS:

UK Mining Snippets.

a) Cornish Lithium is going in deep.

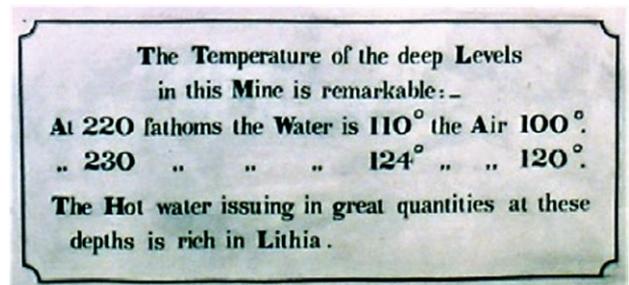
Lithium remains very much flavour of the decade with interest in this versatile metal, a key component in many aspects of today's high-tech world, continuing to grow. Cornish Lithium, the start-up that hoping to pioneer lithium production in the UK, is using 3D modelling to find - and plans to use the latest technologies to extract - lithium from geothermal fluids.

Having bolstered their team with a number of senior appointments, the company is carrying out what they claim is "the largest exploration program ever by one company in Cornwall's history". They are using data from mine plans, cross-sections, borehole logs and academic papers to create a 3D model showing faulting and how it relates to the circulating lithium-enriched fluids.

The company has also declared an interest in searching in the county for other 'technology metals' such as cobalt, indium and tin.

Water was - and still is, as Russell Society members can attest to - the curse of many mines and it has long been known that the water in a number of Cornish mines is enriched with lithia (lithium brine). Cornish Lithium plan to harness the waste heat from the brines to help power the lithium extraction and refining process.

So, what is so special about lithium? It's an energy dense metal with a high charge and power-to-weight ratio, making it ideal for use in batteries, especially rechargeable (lithium-ion) ones. With applications such as electric cars, drones, commercial buildings and even the fleet of 100 hydrogen powered trains due to be launched in the UK in the next few years, there is clearly a future market for lithium both at home and abroad.



Early reference to the lithium content of Cornish mine waters. Photo: Cornish Lithium Ltd.

Globally lithium mineral and brine deposits are not uncommon, but comparatively few are of actual or potential commercial value. In many parts of the world, lithium is obtained by solar evaporation of brines. Cornish Lithium are looking at (as yet unspecified) ways of extracting it without using solar evaporation. Given Cornwall's climate, that is probably a wise strategy.

Susan Tyzack.

b) Tungsten in the Southwest: A story of ups and downs.

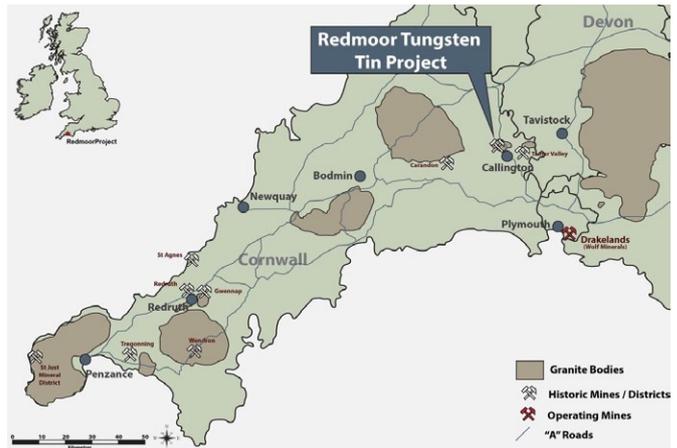
We have watched with interest the progression of the Wolf Minerals operation at Hemerdon – which came to be called the Drakelands Mine. For a time, all seemed to be progressing fairly satisfactorily, although the company's financing did occasionally cause some concerns. However, the announcement by Wolf Minerals in October 2018 that it had "been unable to satisfactorily conclude its discussions with its key financial stakeholders and therefore is not in a position to meet its short term working capital requirements in order to continue operations at its Drakelands open pit mine" and that "the Company's wholly owned subsidiary, Wolf Minerals (UK) Limited, has ceased trading effective immediately" brought everything to a grinding halt. It emerged that because the operation had failed to produce enough metal, a problem exacerbated by a significant drop in world metal prices global prices, it had accrued enormous debts. Was this the end of the road?

Possibly not. A report on the Plymouth Herald website at the end of November 2018 suggested that a "Russian Billionaire" (who else?) was ready to step in and save the day. Initial reports of a sizeable cash injection sounded promising but it appears that talks stalled over the size of the bond required to cover the remediation and restoration of the land after the mine reaches the end of its life. Although some reports suggested that other industry figures might be thinking of stepping in the situation remains unclear at the time of writing. Watch this space!

Meanwhile, only some 40 km away from Drakelands, interest in the Redmoor deposit continues. The Redmoor tin/tungsten project is located near Callington in southeast Cornwall in an area containing a number of historic mines including

Redmoor, Holmbush, Kelly Bray and Wheal Florence. These began life in the eighteenth century and, although poor tin prices eventually forced their closure, it was always known that significant metal values remained in the ground. The ore there is contained within a sheeted vein system, which is a body with numerous closely-spaced sub-parallel veins carrying high-grade tin, tungsten and copper mineralisation. This is the same type of deposit that was until recently being worked at Drakelands.

The project is being run by Cornwall Resources Ltd. (CRL) which is a partnership between two companies, Strategic Minerals plc. and New Age Exploration, and which holds exploration and mining licences covering the area. CRL is pushing ahead with a programme of exploratory drilling and resource estimation. Initial drilling on the site in 2017 was sufficiently encouraging to justify a further exploration programme in 2018. This drilling was intended to confirm the estimates of grade and tonnage ahead of a formal resource upgrade and feasibility study in 2019.



Map showing the location of the Redmoor (and Drakelands) tin/tungsten deposits. Copyright New Age Exploration.

The results of this programme have so far been very positive. A statement from CRL in August 2018 revealed that the new drilling had shown the presence of multiple layers of mineralisation and an update in November 2018 referred to intersections with a number of high-grade zones showing grades up to 29% tin equivalent, 20% tungsten oxide and 1.9% copper. These were described as “bonanza grades” and the company expressed confidence in their potential to raise the resource tonnage and grade estimates for the project once all the results are in.

Some commentators are suggesting that world prices could improve somewhat in 2019 and perhaps the future for UK tungsten is not all gloom but, as always, time will tell.

Michael Doel

c) Latest developments at Cononish Gold.

There may just be a light at the end of the tunnel for Scotland’s long-running Cononish Gold and Silver Mine project (saga?).

The area around Tyndrum in Central Scotland has long been known for its lead and gold deposits, with mining carried out on and off for several hundred years. Plans to set up a new operation at Glen Cononish started more than 10 years ago but have been beset by delays from factors ranging from fluctuations in the gold price to lack of finance and, perhaps not surprisingly, problems with obtaining permission to mine in the sensitive environment of a National Park.

Despite objections from some local groups (which were aired in a TV documentary) the project finally received planning permission in 2011 from the Loch Lomond and Trossachs National Park Authority. Signs that work could start soon have come with the recent arrival on site of some smart and expensive new equipment (pictured) and the recruitment of new team members.

Operators SGZ Cononish Ltd, a subsidiary of Australian-owned Scotgold Resources Ltd are ‘hopeful’ that the final planning and environmental obligations and commitments from the National Park Planning Authority have been met.

A further positive note comes in the shape of the offer of a Regional Selective Assistance Grant from Scottish Enterprise. The proposed grant of £430,000 would be conditional on the employment of 36 full-time staff and first phase capital expenditure of £8.6 million.



New equipment arriving at the Cononish Mine in November 2018. Photo: Scotgold Resources.

Scotgold has a further licence to look for gold in an area covering more than 4,000 sq. km of the Highlands and is confident that other deposits similar to Cononish can be found.

The company is pinning much of its hopes on buyers being willing to pay a premium for the prestige of owning their own little bit of Scottish gold, in the way that they have done for Welsh gold ... a marketing trial in 2016 proved encouraging but as we all know, the world is a very different place now!

Susan Tyzack.

d) North Yorkshire polyhalite mine gets really boring.

The Woodhouse Mine, being constructed by Sirius Minerals to extract the fertiliser mineral polyhalite from beneath the North York Moors National Park appears to be getting into its stride. An announcement from the company in November 2018 informed us that the tunnelling process had begun on the 23 mile underground mineral transportation system at Wilton International on Teesside. The tunnel is intended to convey up to 20 million tonnes a year of polyhalite ore from the company's new underground mine near Whitby to a new processing and shipping facility on the River Tees for distribution around the world.

The first 125 metres of the tunnel will be created with traditional tunnelling methods, before a tunnel boring machine (TBM) takes over for the rest of the 8-mile drive from Wilton. Two more tunnel boring machines will be lowered into the ground at the mine and an intermediate site to drive the rest of the 23 miles. The three single-shield TBMs, each 225 metres long, are being shipped from Germany and will be operated by the construction firm Strabag, who also worked on the 35 mile Gotthard Base Tunnel under the Alps. Tunnelling proper is expected to start in the second quarter of 2019.

Sirius hopes to be exporting £2.5bn worth of fertilizer every year when working at full capacity from a new processing plant and port to be built near the site of the old Redcar Steelworks - hopefully creating 1,000 direct long-term jobs. They expect to strike their first polyhalite in two years and to be producing 10 million tonnes per annum by 2024.



The first of the TBMs for use in the Woodhouse Mine under construction in Germany. Photo: Strabag AG.

Michael Doel

Denver Museum Micromount Catalogue available on-line.

The Denver Museum of Nature & Science dates back to 1868. It is very popular, with visitor numbers approaching 2 million annually, and houses a number of collections on themes such as anthropology, geology, health science, palaeontology, space science, and zoology. Its Earth Science collections date back to the museum's inception and now include an impressive mineral collection focused on Colorado and including iconic specimens such as the "Alma King" rhodochrosite (the finest large rhodochrosite specimen in the world) and the "Coors Pocket" rhodochrosite wall from the Sweet Home Mine. They also include the largest diamond collection of any museum and the second largest micromount collection in the nation, consisting of some 20,000 specimens (second only to the Los Angeles County Museum in California).

Dr. James W. Hagadorn, the Tim and Kathryn Ryan Curator of Geology at the museum recently sent out a message to



The Denver Museum of Nature and Science. Wikipedia picture.

let collectors know that a new, complete catalogue of the micromount collection is available on-line as a PDF file. This can be downloaded from: <http://www.dmns.org/science/museum-scientists/dmns-reports/>. The catalogue is aimed at making the museum's minerals more accessible to the public and includes basic information for every specimen in the collection, including its most recent collection donation - the micromount collection of Colorado minerals amassed by James H. Hurlbut who died in 2017. Dr. Hagadorn notes that this represents the first (but hopefully not the only) moment in its history when the collection has been completely inventoried and catalogued.

Editor.

News from the Oxford University Museum of Natural History.

The last year has been an interesting and busy time for both the Museum and myself having taken over as Collections Manager for Mineralogy and Petrology from Monica Price in 2018. I have some rather big shoes to fill, and while I've gotten to grips with the collections held by the Museum (at least generally speaking), I'm sure that I'm still only scratching the surface of the mineralogical knowledge held by my predecessor. I'm happy, however, to present a small update of Museum goings-on that are relevant to the Mineralogy Collections below.

We acquired a few new mineral specimens at the Sainte-Marie-aux-Mines Mineral Show in June 2018 to enhance the Museum's collection. The two stand out specimens, in my opinion anyway, are a large piece of precious opal and a large display quality labradorite. The precious opal has already had its first outing, in the Museum's 'Presenting...' case; a display case that is changed every two months and allows us to show off some of the most recent and interesting acquisitions or finds in the Museum.

As far as displays go, we are currently doing some maintenance to improve some of these. Our touchable rock and mineral specimens have been given some brand new (and easily readable) display labels, and the fluorescence tent, which was looking rather dark, has been given a brand-new lease of life with the installation of some much brighter UV bulbs.

The Museum has now migrated all of its digital records into one collections management system called KE EMu. This system has already made it much easier to respond to enquiries and will allow us to streamline collections work going forward. This links in with our new 'collections online' website, which we hope to launch later this year. This will grant greater access to our collections by allowing anyone to search the Museum's collections quickly and easily.

As is the case year on year, volunteers have been invaluable to the Museum. Volunteers in the Mineralogy Collections include Joy Irving who has been integral in managing specimens susceptible to pyrite decay, and Chris Finch, who is currently cataloguing the Norman Thomson collection which contains some spectacular British minerals and was acquired by the Museum in 2010.

An exciting development has been the introduction of a new Visiting Fellowship programme which supports object-focussed research that makes use of the Museum's extensive collections. The Museum will be advertising for 2019-20 fellowships early 2019 on the Museum website, and I would particularly welcome applications to work on the Mineralogy Collections.

We have hosted many behind-the-scenes visits to the Mineralogy Collections by researchers and undergraduate student groups as well as special interest groups and societies. I am very open to opportunities leading to the use of our collections, so if you feel that we can help with any mineralogical projects, or wish to see any specimens not on display, do feel free to get in touch (robert.knight@oum.ox.ac.uk). The Museum is open daily from 10:00–17:00 and admission is free. Please see the Museum website for an up-to-date programme of 'what's on' (www.oumnh.ox.ac.uk).

Robert Knight
Collections Manager (Mineralogy and Petrology)



New acquisition! Precious opal from Queensland, Australia; 17 x 10 cm. Photo: Dorling Kindersley Ltd.

A proposed new mineral group for the Thames Valley and South East/Southern area.

Peter Bainbridge and myself are proposing to create a new group for mineral collectors based at my house in Crowthorne in Berkshire.

We think initially that we could hold up to 4 or more meetings a year, roughly outside the main collecting season. Weekends (Saturday better, if Sunday would have to start around 12.15am) or possibly a weekday for meetings, but this is up for discussion/preferences, depending on numbers. Parking is not an issue here. Crowthorne Station is only 12 minutes' walk from my home.

This group would study (although it would not be limited to) micro-minerals and would be open to all interested mineral collectors, including other mineral society members. A spare microscope is usually available for anyone not equipped with one.

We could run themed sessions such as a particular mineral group, or element, based on the BMS Reference Collection, minerals from a noted locality, slag minerals, recent mineral finds/purchases or plain open sessions. Do bring your duplicate minerals to sell or swap.

If you are interested in coming or joining this group, or just want more information please contact either myself or Peter Bainbridge.

If you are interested please do get in touch.

John Betterton & Peter Bainbridge.

And Finally.

There seems to be something of a micro-mineral "feel" to these News Items so, just to finish off this section:



**Aurichalcite from Wet Grooves Mine, North Yorkshire.
Dave McCallum specimen. David Green photo.**



**Chalcotrichite crystals from Penberthy Croft
Mine, Cornwall. David Green photo.**

UK & EUROPEAN MINERAL SHOWS IN 2019

Date:	Event:	Location:	Organiser/Site for Information:
03 March 2019	Oxford Mineral Show	Exeter Hall, Kidlington, Oxford. UK. OX5 1AB.	http://www.mineralandfossilvents.co.uk
08-10 March 2019	Bologna Mineral Show	UNIPOL Arena, Via Gino Cervi, 2, 40033 Casalecchio di Reno, Bologna, Italy.	http://www.bolognamineralshow.com/
17 March 2019	Nautilus Ghent mineral Show.	Koninklijk Atheneum, Voskenslaan 60, B 9000 Ghent., Belgium.	http://www.nautilusgent.be/
10-12 May 2019	Verona Mineral Show	Verona Exhibition Centre, Viale del Lavoro 8, Verona, Veneto 37135, Italy.	www.veronamineralshow.com/en/home-2/
11-12 May 2019	Antwerp mineral Show, "Minerant"	Antwerp Expo, Jan Van Rijswijcklaan 191, 2020 Antwerp, Belgium.	http://www.minerant.org/minerant.html
12 May 2019	Oxford Mineral Show	Exeter Hall, Kidlington, Oxford, UK. OX5 1AB.	http://www.mineralandfossilvents.co.uk
18 May 2019	International Freiberg Mineral Show	Huebnerhalle, Dörnerzaunstrasse, D-09599 Freiberg, Saxony, Germany.	http://www.freiberger-mineralienfreunde.de/mineralienboersen.html
18 May 2019	Yorkshire Mineral & Fossil Fair	The Garden Rooms, Tennants Auctioneers, Harmby Road, Leyburn, DL8 5SG.	Don Edwards, 01433 620304. www.leyburnfair.co.uk
27-30 June 2019	Exposition Internationale Mineral & Gem	St Marie aux Mines, Alsace, France.	http://www.sainte-marie-mineral.com/an_index.php
27-28 July 2019	North Pennines Mineral Expo	St. John's Chapel, Weardale, County Durham.	NorthpenninesMineralExpo@gmail.com
28 July 2019	Oxford Mineral Show	Exeter Hall, Kidlington, Oxford, UK. OX5 1AB.	http://www.mineralandfossilvents.co.uk
07 September 2019	Hampshire Mineral Show	Lyndhurst Community Centre, Lyndhurst, Hampshire, UK. SO43 7NY.	http://www.sotonminfoss.org.uk/smfss-how.htm
04-06 October 2019	Euromineralexpo Torino	Pala Alpitour, Corso Sebastopoli, 153/d, 10134 Torino, Italy.	www.euromineralexpo.it/
12-13 October 2019	Bakewell Rock Exchange	Lady Manners School, Bakewell, Derbyshire, UK. DE45 1JA.	http://www.rockexchange.org.uk/the-rock-exchange-2014
25-27 October 2019	Munich Mineralientage	Trade Fair Centre, Munchen-Riem, Munich, Germany.	http://www.mineralientage.com
08-10 November 2019	Expominer Barcelona	Hall 1, Montjuic Exhibition Centre, Avinguda Reina Maria Cristina08004, Barcelona, Spain.	www.expominer.com
16 November 2019	Sussex Mineral Show	Clare Hall, Haywards Heath, West Sussex, UK. RH16 3DN.	http://www.sussexmineralandlapidarysociety.org.uk/Home/Show
23-25 November 2019	Verona Mineral Show	Verona Exhibition Centre, Viale del Lavoro 8, Verona, Veneto 37135, Italy.	www.veronamineralshow.com/en/home-2/
24 November 2019	Oxford Mineral Show	Exeter Hall, Kidlington, Oxford, UK. OX5 1AB.	http://www.mineralandfossilvents.co.uk
29 November - 01 December 2019	Paris International Mineral Show.	L'Espace Charenton, Rue de Charenton 327, Paris 75012, France.	Www.mineralexpoparis.com
06-08 December	Mineralien Hamburg	Messeplatz 1, 20357 Hamburg, Germany.	https://www.mineralien-hamburg.de/
Various Dates in 2019	Rock 'n Gem Shows	Various Locations.	http://www.rockngem.co.uk/

SHORT REPORTS & PAPERS.**Synthetic Wooldridgeite from Calgon Cleaning Agent- A Man-made mineral?**

The well-known cleaning agent and water-softener Calgon derives its name from its ability to remove calcium and other metal ions from hard water (Calcium-gone). Calgon belongs to a group of inorganic polyphosphates, known as condensed phosphates, which are widely used in manufacturing industry. Some of the first uses of polyphosphates were in the deflocculation of clays such as kaolin (Feldenheimer, 1922). The pioneering work of R.E. Hall and associates of Hall Laboratories, Inc. Pittsburgh, Pennsylvania, USA introduced the polyphosphates as effective water-softening and washing aids in the 1930s. It was at this time that the product was commercialised under the trade name Calgon (Hall and Jackson, 1933. Hall, 1934). Many other uses have since been found for Calgon including de-scaling boilers, as an additive in detergent formulations, in food processing, in textile and tanning processes and in drilling fluids.

In recent decades the use of water-soluble phosphates has been severely curtailed because excessive discharges into water courses, rivers and lakes cause the growth of algal blooms. This process, which is described as eutrophication, has a negative impact on ecosystems (Correll, 1998). Calgon was a valuable brand so, rather than withdrawing it from the market, it was reformulated. The polyphosphate was removed and the modern version contains Zeolite-A and organic polycarboxylates which sequester calcium and other metals. The original Calgon was a complex mixture of an alkali metal salt (usually sodium) polyphosphate with a generic formula: $\text{Na}_{n+2}\text{P}_n\text{O}_{3n+1}$ where $n=6-30$ units. It was prepared by the fusion of sodium dihydrogen orthophosphate and disodium hydrogen orthophosphate in a >1:2 ratio followed by rapid cooling to form a glassy solid. Calgon has sometimes been confused with sodium hexametaphosphate. This is a misnomer, but bottles are mislabelled to this day (Fig.1).

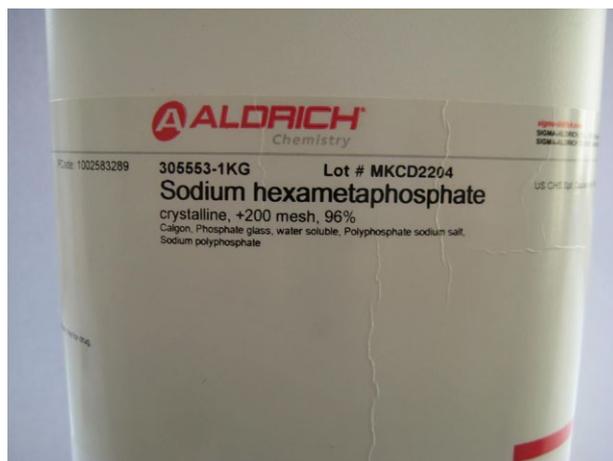


Figure 1. Commercial preparation of “sodium hexametaphosphate”.

In its original formulation, Calgon was typically composed of $n=10-14$ polyphosphate units, although the precise formula varied from manufacturer to manufacturer. It usually contained up to about 10% sodium pyrophosphate which was added to reduce the acidity of the mixture. Curatorial staff, palaeontologists and mineralogists still occasionally resort to the old version of Calgon, which is an excellent deflocculating agent for removing clay particles. Sodium tripolyphosphate is a modern substitute, which is a similarly good deflocculant. It is available in kilogram quantities on eBay.

Minerals possessing condensed polyphosphates in their structure are extremely rare in nature (Table 1) despite the relative abundance of biogenic phosphate minerals (such as apatite-group minerals in bones and teeth and vivianite occurrences near sewage works).

Table 1. Naturally occurring minerals with condensed phosphate units.

Mineral Name	Chemical Formula	Reference
Arnhemite	$(\text{K},\text{Na})_4\text{Mg}_2(\text{P}_2\text{O}_7)_2 \cdot 5\text{H}_2\text{O}$	Martini (1994)
Canaphite	$\text{CaNa}_2\text{P}_2\text{O}_7 \cdot 4\text{H}_2\text{O}$	Rouse <i>et al.</i> (1988)
Hybrownite	$\text{Na}_3\text{MgP}_3\text{O}_{10} \cdot 12\text{H}_2\text{O}$	Elliot and Brugger (2013)
Kanonerovite	$\text{Na}_3\text{MnP}_3\text{O}_{10} \cdot 12\text{H}_2\text{O}$	Popova <i>et al.</i> (2002)
Wooldridgeite	$\text{Na}_2\text{CaCu}_2(\text{P}_2\text{O}_7)_2 \cdot 10\text{H}_2\text{O}$	Hawthorne <i>et al.</i> (1999)

There is a possibility that the use of Calgon (historic formulation) for cleaning mineral specimens may have resulted in the formation of a “man-made” mineral, not meeting the criteria stipulated by the International Mineralogical Association. This prompted the author to investigate synthetic pathways to prepare one of the minerals listed in Table 1, namely wooldridgeite, using Calgon as the source of pyrophosphate.

Wooldridgeite, a sodium-calcium-copper pyrophosphate decahydrate, was first described as a new mineral from Judkins Quarry, Nuneaton, Warwickshire (Hawthorne *et al.* 1999). The geology and mineral assemblage at this locality are described by Ince *et al.* (1991). Wooldridgeite was found as transparent blue-green rhombic bipyramids associated with calcite, chalcocopyrite, bornite and baryte. A mineral of similar appearance and chemistry has also been noted from

Roughton Gill, Caldbeck Fells, Cumbria (Cooper and Stanley 1990: pp. 132–133; Bridges *et al.*, 2011). As far as the author is aware, no prior synthesis of wooldridgeite has been reported in the literature.

Soluble polyphosphates decompose hydrolytically, eventually forming monophosphates. The decomposition rate is strongly dependent on the temperature and pH of the solution. It usually increases with increasing temperature and decreasing pH. The decomposition is influenced by metal ions. Alkali metals, alkaline earth metals and Al^{3+} , Mn^{2+} , Co^{2+} , Ni^{2+} , Cu^{2+} , Zn^{2+} cations retard the hydrolysis in acid media. In alkaline solution, however, metal cations accelerate the hydrolysis. The pyrophosphate ion, which contains singly connected phosphate groups is more stable towards hydrolytic degradation (Schrodter *et al.* 2002).

An attempt was made to synthesise wooldridgeite, based on its chemical formula: $\text{Na}_2\text{CaCu}_2(\text{P}_2\text{O}_7)_2 \cdot 10(\text{H}_2\text{O})$ using Calgon (“sodium hexametaphosphate”) and stoichiometric quantities of calcium and copper cations using the following procedure:

15.2 g (0.0248 moles) of Calgon, “sodium hexametaphosphate”, molecular weight given as 612, was dissolved in 700 ml of deionised water at 50°C. Cupric acetate monohydrate, 5.0g (0.025 moles) and calcium nitrate tetrahydrate, 2.98g (0.0126 moles) were dissolved in 200 ml of deionised water. Once both solutions were homogeneous they were mixed with stirring in a 1000 ml bottle. An initial sky-blue precipitate re-dissolved with further stirring to yield a clear green-blue solution. The lid was replaced on the bottle very loosely to prevent any build up of pressure and placed in a constant temperature oven set at 50°C. Within 24 hours a light blue finely crystalline precipitate had formed. Usually within 3–4 days pale blue euohedral bipyramidal crystals started to grow on the light blue finely crystallised mass. After a few weeks at 50°C most of the initial finely crystalline precipitate had been consumed to yield, almost exclusively, pale blue rhombic bipyramids to 1–2 mm across. The final pH of the solution was 4.39. After 2 months the mixture was cooled, filtered, washed well with deionised water and the precipitate dried at 50°C for 16 hours.

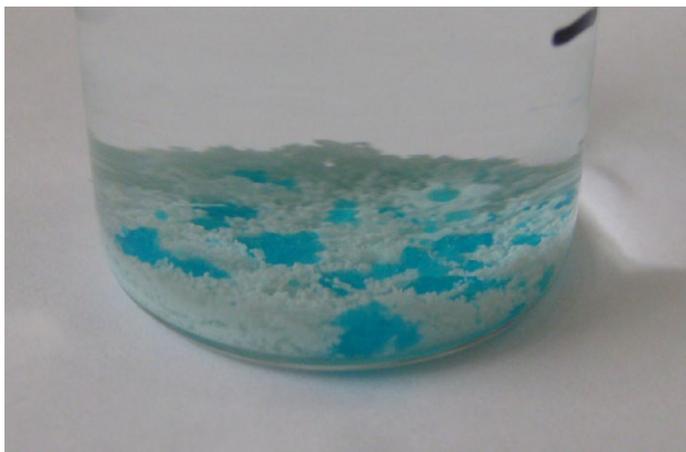


Figure 2. Formation of blue crystals of synthetic wooldridgeite amongst a light bluish-white precursor phase after a growth period of 2 weeks at 50°C. The bottle is 1 litre in volume.



Figure 3. Pure crystalline wooldridgeite isolated at the end of the reaction after filtering and drying. Crystal aggregates are 2–3 mm in dimension.

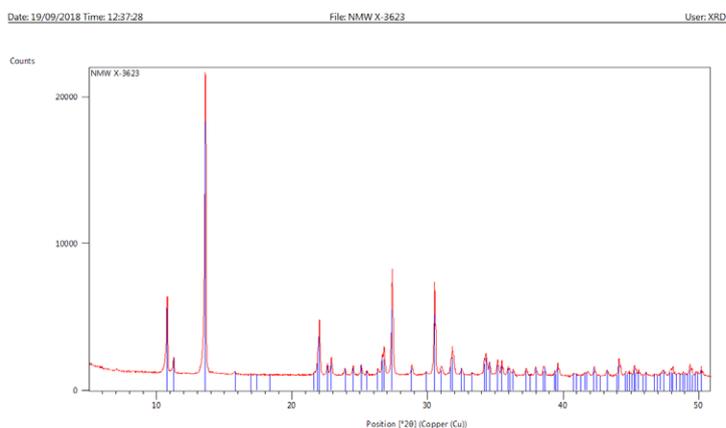


Figure 4. The XRD spectrum NMW-X3623

The material was characterised by infra-red spectroscopy and X-ray powder diffraction.

Infra-red showed major peaks at 3536-3000(broad), 1653(strong), 1195(sh), 1150(s), 1089(s), 1045(m), 893(s), 696(m), 579(m), cm^{-1} .

Discussion.

Synthetic wooldridgeite is readily made using commercial grade "sodium hexametaphosphate" by the addition of stoichiometric concentrations of calcium and copper ions. The reaction was performed at a temperature of 50°C to increase the rate of hydrolysis of the polyphosphates. One of the major decomposition products is aqueous pyrophosphate ions which reacts with the copper and calcium ions in solution. A pale blue crystalline intermediate is initially formed but this has not been analysed. With time, euhedral pale blue crystals started to form. Eventually, after 2 months at 50°C the majority of the product is in this form. The material is exclusively wooldridgeite, as confirmed by X-ray powder diffraction.

It can be seen that wooldridgeite might form if copper-bearing sulphide minerals are cleaned in Calgon solutions. The use of Calgon as a cleaning agent to remove clay and de-calcify residues on metal sulphides is likely to trap solutions rich in polyphosphate in the pores of the host rock. Here it could be hydrolysed, perhaps in acid solutions produced by the decay of chalcopyrite and sulphides such as pyrite. Such acid solutions would react with residual calcite in the host rock to produce the calcium ions to form wooldridgeite. Attempts to mimic natural conditions are fraught with difficulty due to the large number of variables. A few specimens of chalcopyrite were immersed in 10% solutions of Calgon and allowed to stand at room temperature for 3 months. The solution went dark blue but no wooldridgeite was observed. Matrix material from Judkins Quarry containing chalcocite on calcite matrix was similarly treated to 10% Calgon solutions; once again the solution turned blue but no crystals of wooldridgeite were detected. No conclusive proof is yet available that wooldridgeite from Judkins Quarry was formed via a man-made interference. However, due to the fact that wooldridgeite is readily synthesised under relatively benign conditions in the laboratory, the author would caution against the use of Calgon (i.e. "Sodium hexametaphosphate") or any other phosphate-bearing cleaning agent for the cleaning of metal sulphide minerals. The author is extending his experimental studies to other metal pyrophosphates.

Acknowledgements.

Thanks go to Roy Starkey who initiated this investigation and for useful background information, and to David Green for improving the text. Thanks also go to Tom Cotterell of National Museum Wales Cardiff, for performing the X-ray powder diffraction.

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Steve Plant.

Wales & West Branch.

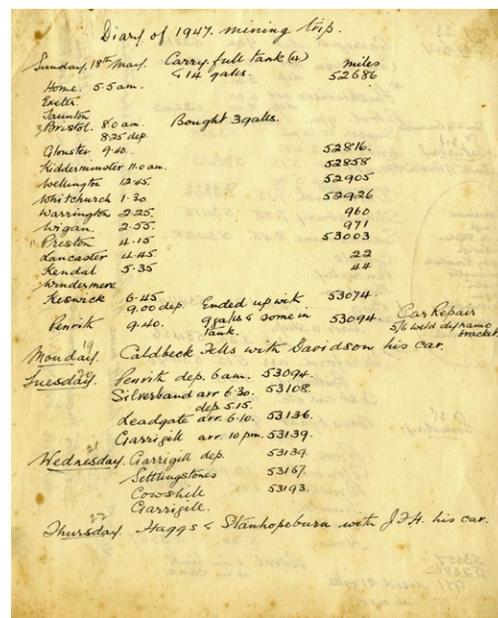
Arthur Scoble: If Carlsberg Did Mining Trips

In 1947 Arthur Scoble set off from Devon for a mining trip to the north. Within the space of a week he had visited the Caldbeck Fells with Bill Davidson and toured a number of famous mines (all of which were still working at the time) including Silverband, Rodderup Fell, Settlingstones, Sedling, Nentsberry Hags, Stanhopeburn, Cow Green and Flushiemere. On his journey home he records "I spent a comfortable night in the car sleeping in the driving seat as all the rest of the car was occupied with boxes of specimens." (!)

Dave Lloyd was kind enough to lend me a batch of Scoble's letters from the time and they make fascinating reading. He was corresponding with the likes of Amos Treloar, George Robinson and Percy Blight. He notes "Mr Robinson had prepared a lovely tea for me and after enjoying this and having a chat, George took me to his shed to see the Rodderup specimens he had selected from his collection as a gift to me ... They were a grand lot and we packed them most carefully." I bet he did!

David and I are thinking of doing an article on Scoble's letters and it would be really good to tie some of his specimens into the correspondence. Sometimes, Scoble put dates on his specimen labels in addition to locations. If you have any Scoble specimens from these mines and, particularly, any dated 1947, we would be most grateful to hear from you.

Meanwhile, continuing his journey home, Scoble also called in at Burgam Mine and Bog Mine in Shropshire. Presumably he must still have had a little room left in his car



Arthur Scoble's diary of his 1947 trip.

Steve Warren

Not Scoble specimens, I'm afraid, but here are a couple more examples of Steve's photography - featuring some of his specimens from Yorkshire:



Smithsonite. Band Hush, Langthwaite, Arkengarthdale, North Yorkshire. Specimen is 4.5 cm across and was collected by Charles Lamb. Steve Warren Photo.



Fluorite. Gill Heads Mine, Skyreholme, North Yorkshire. Specimen is 10 cm high. Steve Warren Photo.

Branch Meeting and Field Trip Reports

Wednesday 30th May 2018. Wales and West Branch visit to East Pit East Opencast Coal Site, Gwaun-Cae-Gurwen, Neath Port Talbot [SN 734 128 – centre of site].

Leader & Reporter: Tom Cotterell.

Six members attended this, possibly our last, visit to an opencast coal site in the South Wales Coalfield. Coaling operations are due to cease at East Pit Eastern Extension in February next year, with the site then being partially backfilled as part of the process of restoration.

All six of us squeezed into a Landrover and were taken into the working site. On the southern edge of the site, above the south-west corner of the open pit, a large number of cuboid blocks of sandstone had been stockpiled for use in lining watercourses around the site. These blocks immediately stood out as having many veins of siderite-quartz cutting through them and were probably from the outcrop of sandstone that we encountered above the Harnlo Seam during our visit last year. We stopped for an hour or so to investigate these veins.

Gemmy euhedral quartz crystals to several cm in size were evident, but most were either damaged from the boulders having been rolled around or were attached to such large masses of sandstone as to prevent their extraction intact. Kevin Garrod found a few good crystals in loose material near the boulders. Veins of fudge- to orange-coloured bladed siderite were of ubiquitous occurrence and were marginally easier to extract from the hard, indurated sandstone. Small, bright metallic, chalcopyrite crystals were also noted scattered upon siderite crystals in cavities and rarely, fine, hair-like millerite crystals span open cavities. Steve and Pauline Critchley collected a few of these. Later, under magnification, bright brassy, octahedral, siegenite microcrystals were observed also upon siderite.



An overview of the East Pit opencast site.

Inside the opencast we inspected the northern area surrounding the Pencraig coal seam, but nothing of mineralogical, or palaeontological, interest was seen. We progressed to an area of backfill on the south side of the opencast and here we found many large slabs containing good examples of *Lepidodendron* sp. and a few loose quartz crystals presumably derived from the sandstone.

Our thanks go to Celtic Energy for permission to visit their site and in particular Mine Manager Wayne Evans, Deputy Manager Aled Lewis, and Richard Atkins for escorting us around during the visit.

Sunday 3rd June, 2018. North Branch visit to Closehouse Mine, Lunedale, Co Durham. [NY 849 227]
Leader: Steve Warren, Reporter: Mourice Czerewko.

Five members attended on a cloudy day of heavy rain elsewhere and what also promised to be a dank and wet day in this area of the North Pennines. Instead the low cloud gave way to occasional hazy sun and the rain held off encouraging the relentless onslaughts from the midges, but such occupational hazards did little to dampen our spirits.

Closehouse Mine lies on a major fault-zone through strata of Lower Carboniferous age. The large mineralised body has been formed by metasomatism of a fractured dyke-link within the Whin Sill suite of quartz-dolerite intrusions. Consequently, the host rock comprising limestone with subordinate calcareous mudstone is host to a large barytes body and includes galena-sphalerite mixed in with the baryte. Lead mining in the district dates back to the 13th Century but little is known of the mines in Lunedale until the 18th Century where records show that extraction of lead continued by hushing already present in the area and extended into underground operations with cross cut adits brought into operation, although it has been concluded that very little lead was produced from these activities. During the late 1930's exploration trenching and underground driving revealed baryte mineralisation over an area in excess of 25 m in width and a substantial opencut operation was implemented into full production by late 1945 and lasting into the 1980s. These operations have left a legacy of extensive overburden tips and broken ground.



Fig. 1 Mineralisation in baryte hosted vugs.



Fig. 2 Likely rosasite in baryte with galena.

The areas of the site known to have been productive in the past were thoroughly examined. Further exploration in the area of hushing to the east was undertaken by Ian and John but did not reveal much. Back in the main area of the large overburden tips in the east and northeast area, boulders of vein material yielded galena and baryte with anglesite, cerussite and aragonite to 8 mm (Fig 1). Several hand specimens of cerussite and pyromorphite in cobbles of baryte were found on the west side of the opencut adjacent to the fault. Frequent samples of rosasite (Fig 2) albeit a few mm in size were recovered from blocks of baryte found along the southwest of the opencut also with clear and opaque tabular baryte on galena. All in all, a good day was had by all.

We would like to thank Wemmergill Estates for permission to collect on their site, with special thanks to their gamekeeper and dogs for their friendly and helpful welcome.

Saturday 16th June 2018. North Branch Visit to Coldberry Gutter, Middleton in Teesdale, County Durham. [NY 931 290].

Leader and Reporter: John Davidson.

Coldberry Gutter is considered to be the largest and most spectacular hush in the North Pennines. It is a dominant landscape feature that is visible for many miles and is unusual in that it cuts the watershed between neighbouring valleys. Associated with the hush, the remains of the dams and leats that supplied water to the dressing floors and other equipment associated with the mines are evident. It has been estimated that nearly two million tonnes of material were extracted from the hush before the mid-18th century. In the 19th century the London Lead Company developed the extensive network of levels and dressing floors which were built on artificial terraces. The mine buildings that remain include a mine lodging shop, smithy block and a powder house (Ref 1, pages 3,4 and 5 and Ref 4, Page 4).

The gutter can be considered as a large open cast working along the line of the Lodgesike—Manorgill Vein, one of the most prominent features in the ore field. The steep northern sides of the gutter expose the beds from the Firestone up to the Low Grit Sill. The gutter also exposes sections of the Palaeogene Cleveland dike. Near its eastern edge, the north wall of the gutter exposes the base of the Low Grit Sill sandstone. This is underlain by several metres of dark grey silty shales in which occur several evenly spaced beds of rounded clay-ironstone nodules up to 300 mm in diameter (Ref 3, page 112 and Ref 4 page 35).

At the horizon where the millerite bearing nodules are found, near the top of the scree slope on the northern side of the gutter, the rock breaks into blocks in a slightly more competent shale-mudstone than is typical. The millerite bearing nodules are restricted to a single horizon in the mudstone. There are several nodule bands each having their own characteristics, some are just solid and others contain siderite and quartz. The site is mostly covered in loose fill from the weathering processes and does not show completely the rock sections (Ref 2, D. Green).

The mineral assemblage in the nodules has similarities to that found in the clay-ironstone in the overlying coal measures except for the abundance of millerite, which is unusual in northern England. The nodules that contain the millerite have a filling of kaolinite/dickite in the cavities of the nodules. Millerite forms sprays of acicular metallic crystals up to about 25 mm long (Ref 2, D. Green). See picture below of a sample collected by Steve Warren. Chalcopyrite is common in the nodules associated with the millerite and can have a purple iridescence. More rarely galena and sphalerite are present. Siderite appears to be absent from the millerite nodule bands. However, siderite nodules occur in fill near the centre of



**Broken face of a typical nodule; showing syneresis cracks.
David Green Photo.**



Spray of millerite crystals. Steve Warren Photo.

the scree and display fantastic patterns of syneresis cracks that are quite different from the millerite containing nodules.

The day of collecting by the five members of the society was very enjoyable and all collected millerite for further study and conservation, from the exposure in Coldberry Gutter, along with examples of the nodules containing siderite and quartz. Ideally, a further visit to the site should be undertaken to determine the lateral extent of the millerite-bearing nodule layer.

Our thanks go to Ian Dossett who organised the trip, John Wallis of The Raby Estate, Lee McFarlane of Historic England and Sam Almond of Natural England who all gave their permissions for our visit to this scheduled site.

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4. Dunham, K C (1990). *Geology of the Northern Pennine Orefield (2nd edition); Volume 1 Tyne to Stainmore*. Economic Memoir of the British Geological Survey, England and Wales.

**Monday 18th June 2018. Central Branch visit to Dolyhir Quarry, Old Radnor, Powys. [SO 242 584]
Leader: Neil Hubbard. Reporter: Frank Bouweraerts.**

For a change, this trip took place on a normal working day. Following an accident last year, the quarry management now require a member of their staff to accompany visitors while they are on the site. One welcome side-effect of the change in policy was that we were given transport both into and out of the quarry!

Due to the array of interesting and rare minerals that regularly seem to turn up, this trip has become an annual pilgrimage



**Panoramic view of the quarry.
Photo: Roy Starkey.**



Steve Warren receiving the inactive support of other members as he develops his copper pit. Photo: Roy Starkey.

for many members. Seven of us attended on this occasion, most hoping to find the elusive mckelveyite that Roy Starkey discovered a year ago. Although we located loose boulders of the appropriate matrix (blueish baryte/calcite/barytocalcite) I am not aware of anyone being successful on this occasion. Initial optimism on my part was misplaced as the tiny pink crystal growing from a baryte crystal was quartz when later examined under the microscope.

Your reporter last visited the quarry in 2014, since when much has changed. Steve Warren's 2017 copper pit was relocated but despite his sturdy efforts it did not yield much this time. However, there were good representative examples of the usual minerals to be had, namely harmotome, chalcopyrite, azurite and malachite for first time visitors. The quarry is due to expand considerably in a northerly direction over the next few years when more of the copper-bearing ground should hopefully be exposed. Our thanks to Tarmac for granting access and to the quarry management, particularly Mike Jones, the Assistant Manager, for his help and the lifts.

**Saturday 23rd June 2018. South West Branch Visit to South Terras Mine SSSI. St. Stephen in Brannel, Cornwall. [SW 935 524].
Leader and Reporter David Ifold.**

A party of eleven attendees assembled in the road passing the site of South Terras Mine. We had not visited for many years and it was interesting to see how much interest there is in a location which must be the most radioactive place in Britain outside of a secure nuclear installation. Even before leaving our vehicles our Geiger counters were recording levels not seen at other sites. It should be noted that at no point did we record radiation levels greater than that allowed for members of the general public. Our permission was limited to the area owned by Boconnoc Estate. The owner of Tolgarrick Bungalow does not want visitors and on this occasion, we were unable to get permission from the Ead family who farm the area around the mouth of the open adit. The Boconnoc Estate own Tolgarrick Mill, the old mine buildings and the mine dumps around North Shaft. There are tenants in Tolgarrick Mill and Estate Manager Richard Morris had already written to them saying our visit was authorised.



Zeunerite on bornite replacing chalcopyrite. South Terras Mine. Steve Rust Photo.



Torbernite crystal. South Terras Mine. Steve Rust Photo.



Sprays of goethite crystals. South Terras Mine. Steve Rust Photo.



Zippeite on unknown white mineral. South Terras Mine. Steve Rust Photo.

As we approached the area we thought of most interest, Geiger counters started detecting higher levels of activity. Members with digital counters with a fast response time found it easiest to pinpoint radioactive material. There have been several periods of development at the mine and earlier waste on the dumps has been moved to be processed or used as building material. Radioactive fines have been used as aggregate on the track that crossed the site and as sand used as render on the mine buildings. Highest levels of radiation were recorded from the render on the more modern block-built structures. Even slabs of concrete were radioactive.

Although the SSSI is becoming increasingly overgrown everyone found something of interest. Scientifically important material is still available there and falls into two main groups. Firstly, there are complex intergrown sulphides that really need studying via polished reflected light microscopy. If anyone has these facilities available then please contact me. Secondary cobalt minerals can form on these sulphides. Secondly there are very radioactive lumps of fairly soft pitchblende with occasional yellow, orange or green colouring. When these are broken down and studied with a binocular microscope uranium secondaries are found. Samples have been sent off for identification as there is considerable potential to find minerals new to the British list.

Many thanks to Boconnoc Estate and in particular Estate Manager Richard Morris. Thanks also to Miriam Harrison of Natural England.

Saturday 7th July 2018. Southwest Branch Visit to Wheal Edward and West Wheal Owles (part of the Carrick Du to Aire Point SSSI).

Leader and Reporter: David Ifold.

The South West Branch like to visit this area once each year which we do with agreement with Ash Pearson from the National Trust subject to us avoiding the Chough nesting season. Large holes left by unauthorised collectors have raised concerns by the Trust and Natural England since our last visit in 2017. Signs explaining that unauthorised collecting is banned appeared late last year and have remained in place despite comments on Facebook. When discussing our proposed visit with Ash in May, he advised me that the Trust had reported one person to Natural England for unauthorised collecting and that the Trust were trying to engage with collectors who have posted videos of collecting on YouTube. One video of collectors using a gamma scintillator to locate a pitchblende specimen with coatings of zippeite and other uranium secondaries on West Wheal Owles had caused particular concern. He also asked us to report any sales of Wheal Edward material that we spotted on eBay to him.



If you tire of collecting, the views are pretty spectacular.



Sign warning against “irresponsible and unauthorised collecting”.

Permission was granted by the National Trust and Natural England for a party to collect material from any exposed dump within the setts of Wheal Edward and West Wheal Owles which is an area bigger than that normally agreed. A combination of very hot sunshine on a very exposed site with an unfortunate clash with the football match between England and Croatia resulted in a disappointing attendance. Those who did attend were rewarded by the fact that the National Trust had recently used working parties to throw material illegally dug from the dump back into holes to try to get rid of the lunar landscape. A lot of recently disturbed material was therefore scattered across of the surface of the main Wheal Edward dump next to the Incline Shaft. Considerable amounts of highly radioactive material were left randomly scattered

across the surface some of which showed highly coloured uranium secondaries. In fact, one member discovered he had been sitting on a highly radioactive lump after finishing his lunch!

Minerals collected as crystals from Wheal Edward Incline Shaft dump included connellite, paratacamite, goethite, and quartz with goethite inclusions. Other possible mineral species detected were lavendulan, cuproslodowskite and compregnasite. Nothing was collected from the dumps of West Wheal Owles although it was noted that the surface was pock-marked where someone had been recently roving with a Geiger counter.

A very enjoyable trip which we hope to repeat again next year subject to the necessary permissions. Special thanks for the help and support from Chris Fry (the new Tin Coast Area Ranger for the National Trust), Ash Pearson (West Cornwall Countryside Manager, National Trust) and Marcus Knight (Natural England).

Saturday 14th July 2018. North Branch visit to Frongoch Mine and dumps, Pontrhydygroes, Upper Llanfihangell-y-Creuddyn, Ceredigion, Wales [SN 722 744].

Leader: Ian Dossett. Reporter: Steve Plant.

Only four members were in attendance despite the superb warm sunny weather. The site is now in a sorry state of affairs. Most of the mine buildings have collapsed or are in danger of doing so. The majority of the site has now been remediated by Natural Resources Wales such that the once extensive spoil tips have been landscaped and covered with topsoil.

On walking down the site, Ian spotted some bright red-coloured veinstone adjacent to the engine shaft, below the pump house. The bright red colour looked very similar in hue to minium. Chemical testing of the red material showed the presence of lead but this was due to the abundance of cerussite which also coated the sample, further investigation proved it to be a particularly red sample of haematite.



**The Frongoch Mine site has been extensively remediated.
Steve Plant Photo.**



**Brown pyromorphite crystals to 7 mm.
Steve Plant Photo.**

Some dispersal of tip material around Vaughan's New Shaft afforded blocks of galena and sphalerite but secondary minerals were sparse. The party moved on to the SSSI part of the site where dump material has been preserved specifically because of its mineralogical interest. It was here that the party spent the rest of the day. Much digging is now required to find anything of mineralogical interest. The following species were noted albeit in micro quantities: anglesite, caledonite, cerussite, linarite, malachite, mattheddleite (?), pyromorphite & susannite. In addition, your reporter found four matrix specimens of the brown variety of pyromorphite, the largest specimen measuring a 13 x 6 cm block covered with pyromorphite crystals to 5–7 mm in length, although most of crystals were bruised. Ian also found a matrix sample which enclosed several white balls of acicular needles with a pinkish/purplish hue, this has not yet been identified.

Many thanks go to the new landowner, Mark Skitts for access and permission to visit and also to Bob Matthews of Natural Resources Wales for granting permission to visit this SSSI.

Saturday 21st July 2018. Southern Branch Field Trip to Cavendish Mill, Stoney Middleton, Derbyshire. [SK 205 752].

Leader: Chris Finch, Reporter: John Chapman

Seven members met for a safety briefing from Chris Finch before we met the men operating the site that day, using a

large digger. The day of our visit was after two months of hot, dry weather, though it rained the day before so that lovers of muddy water were not disappointed!

Cavendish Mill is a processing plant that deals with material extracted from the nearby Milldam Mine. More material used to be brought also from an opencast operation at Tearsall until this ceased in mid-2017. At the time of our visit Milldam Mine was producing less than usual and, as a result, the amount of material awaiting processing had run low.

I remarked to Chris about a large heap of sandy-looking material that was of no use for our purposes and he told me that, as 'rich fluorite', this was of high value to the operation. There were three or four large stockpiles of material that kept us occupied. Much of this was in large pieces that only those with sledge hammers and the like could get into in the search for interesting specimens.

Cavendish Mill provides advantages and disadvantages to the mineral collector. On one hand, it's rather like walking into a room where the treasure is stored. Unfortunately, unlike the last time I came here, there was considerably more limestone than mineral. The benefit is that the material has been extracted by explosives and heavy plant from depths within a mineral vein that individuals could never access, and then it has been delivered freshly to Cavendish Mill. Therefore, unlike many mine dumps we may visit, there is no problem with atmospheric deterioration of the minerals or overgrowth of plant and animal life. They are simply presented here for our delight.

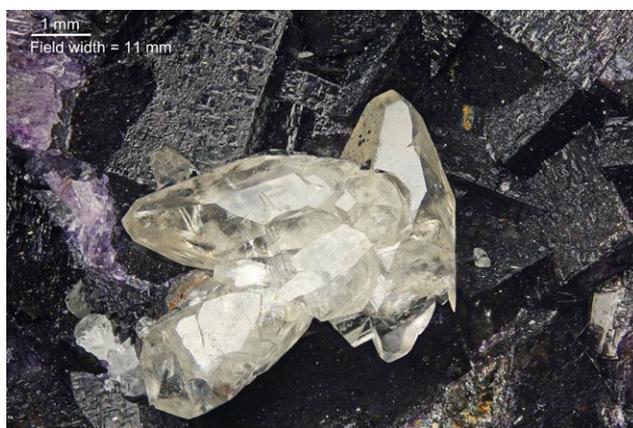
The disadvantage is that you don't know from which mine a specimen might have come and, of course, there is no way to study the mineralogy, processes of formation and so on. Several of the specimens I brought home showed that they had been subject to considerable disruption, with cracks and crushings that had been re-cemented. There are what appear to be partly dissolved fluorite crystals and epimorphs of various kinds. It could be that, in fact, there had originally been sulphide crystals on which the fluorite had grown. These sulphides, probably sphalerite, have since been altered and removed, leaving the epimorphs made of smithsonite, as well as scatterings of tiny smithsonite crystals over the fluorite and calcite. These are generally not pretty specimens, but they tell a tale, as well as raising questions. There is also some goethite and galena.



Wulfenite crystal group 0.85 mm high on corner of purple fluorite crystal, no. CMb 114. Specimen: John Chapman. Photo: John Chapman.



Baryte, miniature cockscomb crystal groups on purple cubic fluorite, no. CMb 72. Field width 6.8 mm. Specimen: John Chapman. Photo: John Chapman.



Calcite dog-tooth crystals, double terminated to 5.7 mm on almost black fluorite. Field width 11 mm. Specimen: Mourice Czerewko. Photo: John Chapman.

The most striking mineral to be found here must be the deep purple fluorite. Sometimes, this is so dark that it is almost black; sometimes it colours the outer edges of colourless crystals and sometimes there can be seen definite purple spots on the crystal surfaces. There are occasionally tiny veinlets of an opaque black substance and it was tempting to think this might be a hydrocarbon, as at Treak Cliff. However, it does not ignite in a flame and so it must be something else. The fluorite is not fluorescent.

Baryte occurs in amorphous inclusions and as tiny cockscombs. The latter tend to be off-white whereas the former may be pinkish orange. Quite nice dog-tooth calcite was also easy to find, and Mike Milward found some slightly atypical nail-head calcite, spangled with tiny smithsonite crystals (see photo). Mourice Czerewko found some small but lovely doubly terminated calcite dog-tooth crystals (see photo). I think most of us found the calcite, baryte and purple fluorite but Roger Robinson broke open a cavity to find colourless fluorite. He was disappointed at first, but it is a beautiful specimen, with a very thin iridescent coating adding to the sparkle of the fluorite crystals. One showed a pale blue iridescence on a mosaiced surface with growth hillocks. Mike Milward found some baryte that was foliaceous and arranged in a criss-cross formation on top of deep purple fluorite (see photo). Chris found gypsum and chalcopryrite that was converted to malachite.



Calcite nail-head crystal group on deep purple cubic fluorite. Field width 10.1 mm. Specimen: Mike Milward. Photo: John Chapman.

There were also amber wulfenite crystals in small cavities, often only one, but up to five had been seen in a single cavity. A strange crystal group, reminiscent of a Gothic castle, was found and reproduced here. The only other wulfenite crystal in the same cavity was much more cubic in appearance and was perfectly clear.

Our thanks go to Chris Large, the plant manager at Cavendish Mill, to Kevin Mather the foreman on the day of our visit and to the plant operators Cliff and Conor with whom we co-operated for access to the muck pile.

Saturday 28th July 2018. Central Branch visit to Cloud Hill Quarry, Worthington, Leicestershire. [SK 413 215].

Leader: Neil Hubbard. Reporter: Steve Critchley.

On a bright day 12 members from various branches of the Russell Society - the writer, Chris Finch, Michael Doel, Roy Starkey, John Davidson, Bob Buckie, Richard Bateman, Nick Millet, Steve Warren, Peter Briscoe, and David Green, led by Neil Hubbard - visited this eagerly anticipated locality under the expert guidance of Stuart Shrimpton, the Quarry Manager for Breedon Aggregates. After signing in and kitting-up in the visitor's car park, we headed off following an update of the changes since the previous visit.

The primary aim of this visit was to examine the exposures of goethite mineralisation located along an unconformity in the south west portion of the quarry. In 2007, when this locality was previously accessible, it yielded some excellent specimens of goethite with dolomite, baryte, calcite and quartz with some tantalising shows of copper sulphides with malachite. The deposit was of interest to the operators, who at the time stockpiled the material in the hope of finding a buyer, but when this was not forthcoming the whole lot was added to the landscaping bunds surrounding the quarry. Since that time although a Central Branch trip was organised to the stockpile to recover specimens for future reference, the phasing of quarry operations meant that the *in-situ* exposure was inaccessible until today.



Goethite/copper mineralisation exposed at the Triassic/Carboniferous unconformity.



Bottoms up – the copper mineralised zone at the base of the goethite deposit.

The geology of the site and its accompanying mineralisation has been detailed in a number of reports from previous

visits. There is no intention to repeat the details other than to advise readers that this locality is one of a group of Carboniferous Limestone inliers unconformably overlain by Triassic Red Bed deposits in this part of Leicestershire, having been extensively quarried for many decades.

Sure enough, as the party proceeded into the quarry, extensive exposures of the goethite deposit were available for examination in a safe manner. Hammers at the ready the party were soon busily excavating pods of chalcopyrite/bornite sulphide mix at the base of the goethite, much altered to malachite both on the sulphides and within cavities in the underlying dolomite. Some excellent showy specimens were recovered by those who were first to the locality and were kept busy for most of the trip. David Green reported after the trip that he had located micro matts of native copper on some of the specimens of malachite.

Those who missed the chance to gather specimens of the coppers worked on the abundant boulders of goethite, many of which on breaking open produced good specimens of banded goethite often with cavities containing micro calcite/dolomite/quartz and baryte crystals. Specimens were abundant, though the collective weight of them was beginning to prove a problem for some participants.

A little north of the unconformity Neil discovered a pod of galena in the quarry floor which after a little digging produced chunks of semi crystalline galena liberally peppered with cerussite crystals to several millimetres. This turned out to be a good find and supplied specimens to all members of the party. David Green reported, after home examination of the galena blocks, the presence of micro wulfenites. Sadly, on this occasion the formerly extensive cavities lined with large calcite crystals dusted with chalcopyrite were nowhere to be seen, having long disappeared into the crusher.

Not giving up in the search for new material, some of the party drifted to the north part of the workings where reclamation was taking place of now disused workings. At this locality unsuitable material and other waste was being dumped and amongst it lay hundreds of tons of goethite rich material from sand size to large blocks. Hammers began to be swung and bit by bit good samples of stalactitic goethite emerged, along with some good size cavities lined with sparkling colourless to reddish to smoky quartz crystals.

Time was moving on and Stuart's sturdy truck was being quickly weighed down with bags of specimens; the sight of three people heaving a full rucksack over the tail gate was not to be forgotten. By this time most members had over collected material for later processing, simply because so much material was available which would either end up as back fill or find its way into the crusher. Thankfully Stuart was happy to drive members and their bags out of the quarry; otherwise the return trip out for some on foot would have been a difficult one.

All in all, an excellent day for all members and thanks must be extended to Neil Hubbard for organising yet another successful trip to this popular location. Particular thanks must go to Stuart Shrimpton for his help in making the trip possible ensuring that the importance of the mineralogy of Cloud Hill Quarry in its wider context is understood for future generations.

Saturday 11th August 2018. Southern Branch Field Trip to Hampstead Farm Quarry, Chipping Sodbury, Gloucs. [ST 724 840].

Leader: Chris Finch. Reporter: David Aubrey-Jones.

On the morning of the visit it was bright and sunny, but thankfully far cooler than it had been the previous week when we had been sweltering in 30-degree temperatures. The 'chipping gang' on the day consisted of Chris Finch, David Aubrey-Jones, Roger Robinson, Tony House, Nick Millett, Rob Tripp, Michael Doel, Tony Brook, Nick Hawes, and Stuart Wagstaff. As we eagerly waited outside the quarry offices to enter at 8 o'clock, a hot air balloon drifted past. This was the same weekend as the Bristol International Balloon Fiesta, which was nearby.

Chris Finch, our leader, gave us a safety briefing in the car park, and then we were chauffeur driven in two groups into the old Hampstead Farm section of the old quarry. Our driver, Chris Finch, seemed to have joined the quarry staff for the day!

The first group into the quarry went straight to the newer lower level, but soon they were seen climbing up to the 5th level where we spent the rest of the day. Most of us headed to the southern end of the quarry, and spread out across the quarry floor. Evidence of previous trips could be seen, with slightly damaged small calcite groups and the occasional nicely banded celestine. But it wasn't long before heavy hammering echoed through the quarry, and more calcite was extracted. There was an interesting celestine boulder with a scattering of pyrite casts after calcite that broke into some nice pieces.

After a while a group congregated round a celestine vein at the southern end of the quarry which had cavities containing some lovely large calcite crystals. Chris succeeded in extracting two wonderful large undamaged museum specimens of calcite, and Nick Hawes also eventually came away with a beauty. This acted like a magnet to most of the party, who proceeded to cluster around the area like bees round a honey pot (the 'bee gang'). Many dismissed the small groups of barite crystals, some with small galena crystals.

While the 'bee gang' continued to search for large calcite, a couple of us went to explore the northern end of the quarry. Did it too hold some secrets waiting for intrepid explorers to discover? Pyrite was soon in evidence, and thick veins of pyrite and marcasite with badly damaged calcite crystals lay amongst the rubble. Wandering around I discovered a small undamaged group of calcite on pyrite and celestine that was loose amongst the blocks. Tony House then found a fantastic vein cavity of celestine, covered in pyrite, part covered by calcite crystals to 3 inches. The calcite was remarkably clean, and some of the smaller crystals were more or less transparent. Unfortunately, we had to be content with photographs of the find as it was impossible to extract any specimens without causing major damage. In fact, when Chris came to have a look, he managed to break off one of the large calcite crystals without matrix just by 'testing' to see how firmly it was attached! It was a fitting end to a great morning, and all too soon we were ferried through the tunnel under the road back to our cars.



**The doubly terminated scalenohedral calcite crystal some 80mm long, broken off by hand!
Specimen and photo: Chris Finch.**

We would like to thank Hanson Aggregates, the Quarry Manager Vincent Pitt and Jon Young the Production Supervisor for being such welcoming hosts and making the visit possible.

Saturday 18th August 2018. North Branch visit to Southam Mine [NX 995 123] and Pallaflat Mine [NX 997 126] Bigrigg, Cumbria.

Leader: Ian Dossett. Reporter: Frank Bouweraerts.

There were four members for this trip and despite rain earlier in the day, we were fortunate that it held off for the duration of our visit.

The dump at Southam Mine is not particularly large but very overgrown with brambles and other annoying vegetation. We eventually located the best area for unearthing baryte, which turned out to be the same place as the previous year. Specimens consisted of massive, lustrous, bluish hematite-stained intertwined sheaves of crystals with, if you were lucky, a few small cavities with terminations. It was difficult to discern the best bits without washing, so heavy rucksacks were carried back to the cars, happily just a short distance away.



It's in there somewhere! Members searching the overgrown Southam Mine dumps.

We were then able to visit the dumps of Pallaflat Mine that were also situated nearby and similarly much overgrown. These have clearly been subjected to a great deal of collecting over the years and there was very little to find, certainly nothing like the specimens that turned up when your reporter last visited 20 years earlier. However, we did unearth some massive iron ore, calcite and Ian found a tiny fluorite crystal that turned out to be fluorescent. It must be said that the blackberries were excellent, on which 50% of the party chose to concentrate their collecting efforts.

Thanks to Mr. T. Beaty and Mr. P. Woolaghan for permission to visit Southam and Pallaflat dumps respectively. Also, as always, thanks to Ian for organising access.

Saturday 25th August 2018. South Western Branch Visit to Halamanning and Croft Gothal Mine Dumps, St Hilary, Cornwall [SW 56253 30989]

Leader and Reporter: Sheila Harper.

Eight members, including Darren Whitaker from Central Branch, turned up on a nice sunny day. We started off at Halamanning on the main dump. This is much over picked but a small amount of native copper, brochantite, sphalerite and arsenopyrite turned up.

We then proceeded along the track to the very overgrown Croft Gothal section of the dumps where we spent most of the time. The suite of minerals for both sites includes copper and lead minerals. Croft Gothal also produced cassiterite, bismuth bearing minerals and monazite rosettes. The area near the shaft at Croft Gothal is noted for monazite so most of us congregated there. David Ifold and David Roe went down the bottom of a nearby slope. David Ifold found a nice large quartz. I think he sat on it. David Moulding had what looked like balls of whitish scorodite but later, under the microscope, the little balls turned out to be sulphur and sparkly euhedral crystals of sulphur. Your reporter found bismuthinite and we also found monazites, chlorite, beautiful little pyrites, possible bismoclite, quartzes etc. Darren got a double-sided vein with quartz crystals in the middle interspersed with galena. All the finds, apart from Darren's and David Ifold's quartz, were micros.



It's in there somewhere! Members searching the "very overgrown" Croft Gothal dumps.

Many thanks to the Land Owner for permission to visit the site and collect.

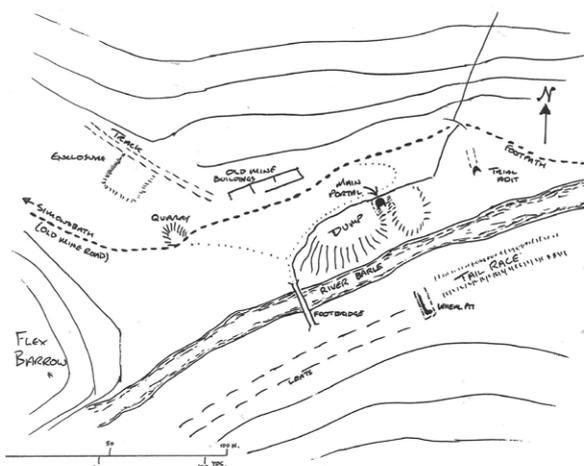
Monday 27th August 2018. South West Branch and BMS visit to Wheal Eliza, Simonsbath, West Somerset, Exmoor. [SS 784 381].

Leader and Reporter: Rupert Harrison

Four individuals convened in the car park behind the Exmoor Forest Inn, in Simonsbath, on the morning of August Bank Holiday 2018. A light mizzle descended upon us, but the weather was mild, and the mizzle quickly dissipated, to leave light cloud and sunny spells for the remains of the day. With house-keeping and administrative duties behind us, a general discussion on the historical and geological context of the site ensued. I had brought along some good specimens of pyrite and siderite, collected from the site many years before, to demonstrate the dump's potential to the assembled.

The 30-minute stroll to the site is rather picturesque, and our progress was frequently interrupted by group members, stopping to identify or photograph fungi and wild flowers growing in the side of the path. This path, cut into the northern flank of the Barle Valley, follows the old miner's track. During its active period, ore was hauled along here by horse and cart. The river below was crystal-clear, as it babbled through swathes of bright orange wild *Crocodymia*. Here and there, metallic, azure blue damselflies alighted upon them. This must be one of the prettiest approaches to any mining site.

In due course, we rounded a bend, and the site stretched out below us, on the nearside bank of the river. The position and condition of the architectural remains of the old miners' cottages and counting house (?), were noted. On the opposite side of the river, reached by a small footbridge, were the remnants of the wheel-pit, two parallel leats, and wheel race below. The mine utilised water power! The dumps lay below us, partially held back by a retaining wall, and to the left lay the portal of the mine, heavily fenced-off with barbed



Sketch map of the Wheal Eliza workings.

wire. The dumps are not vast, and the exposure is exclusively around the steeply sloping flanks. The top of the dump is covered with gorse, interspersed with heather, bramble, and various mosses and lichens. It was part of the visit conditions we agreed with ENP that these should remain undisturbed.

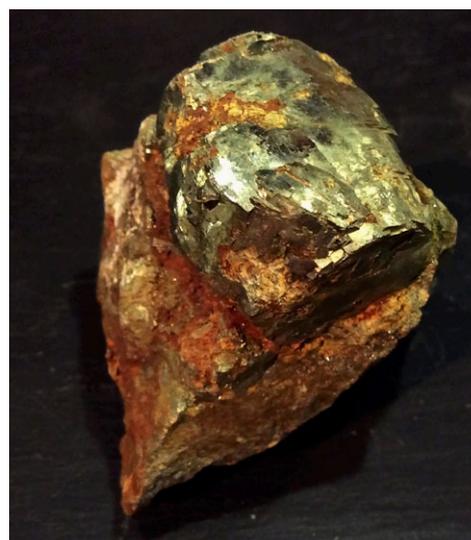
After making our way down to the dumps and dispersing to various corners, it wasn't long before signs of iron and copper were spotted on the surface, and specimen examination began. A late-comer, David Rowe made an appearance at this point. Having been delayed, en-route, by bank holiday traffic in North Devon, David valiantly hiked to the site confident of finding us, having noted Alysson Rowan's van in the car park.

The make-up of the dump corresponds directly to the mining records for the site, which describe initially, finding of copper, at shallow depth, then giving way to siderite (Spathic Iron/White Ore), as the mine ran deeper. Thus, at the easterly end of the dump, nearest the portal, there are glimpses of green copper minerals, standing-out amongst the loose, grey shillet (a local term for slate/mudstone). Further West, away from the portal, the dump takes-on an increasingly ferruginous aspect.

At the 'iron' end of the dump, the material is more consolidated, cemented by ferrous oxides. This is where I started my excavations. Steve Rust chose the 'copper' end, determined to find examples of chalcocite crystals, which have been previously recorded here. The others moved about to various locations between the two.

Close examination of the Iron end of the dump revealed an abundance of pyrite, the majority of which is found as grains and weighty, disseminated masses. This is often accompanied by hackly, iron-stained milky quartz, limonite, and occasionally, dark, burgundy masses, suggestive of manganese oxide. A lot of the pyrite showed partial decomposition. A distorted, partially decomposed pyrite cube, to 20 mm, was found, loose on the surface.

The surface abundance of pyrite, along with the fairly high precipitation rate at this location, explain the ferruginous nature of the dump, and suggest that a state of accelerated acid decomposition, prevails. This is a hostile environment for the less-durable and less-stable minerals in the dump, particularly micro-minerals. There can be no doubt that time is running out for recording the range of minerals at this location, and some may have already been lost.



Modified composite pyrite Crystal collected previously at Wheal Eliza,

Despite this, under x10 magnification, abundant, sharp, cubic, to modified cubic pyrite crystals were observed in numerous vugs. Often, these are well-formed, multiple and parallel twins, or composite crystals, some with bronze-coloured patinas. Previously, I have found sizeable, bright, lustrous pyrite crystals here to 30 mm+, but sadly, none were found, on this occasion.



**Brochantite, Wheal Eliza.
Steve Rust Photo**



**Aragonite & malachite, Wheal Eliza.
Steve Rust Photo.**



**Malachite, Wheal Eliza.
Steve Rust Photo.**

Back at the 'Copper' end of the dump, Mr. Rust's thoroughness had paid-off, with a cache of likely-looking specimens, requiring further cleaning and examination. Despite this, there were still many likely-looking signs of green copper

minerals, dotted about on the surface.

I picked, up a handful of these, for closer examination, and was quite excited to note that one piece, in particular, appeared to be a smooth crust of chalcopyrite, with glistening dark crystal sections of chalcocite at the centre, accompanied by a crust of green malachite. Turning the same piece over, a botryoidal surface was evident, implying the variety 'Blister Copper'. In fact, several other similar pieces were found to confirm this identification. A first for this site!

By 3 p.m. most of us were satisfied we had given the site its due and worthy attention, and despite our weariness, managed a relatively swift retreat back to Simonsbath, along the route we had come. Readers might hope that the anticipation of examining our finds under better conditions was the over-riding factor, for our haste. This was partially true, but it was also the prospect of refreshment at The Exmoor Forest Inn, which spurred us on. Duly, we spent a pleasant hour in the beer garden, basking in the balmy late-afternoon sunshine, regaling each other with various tales and experiences. I am pleased to report that all unanimously agreed that the trip had been most pleasant, and the site worth revisiting in the future, preferably quite soon! Thanks go to Shirley Blalock, Conservation Officer (Historic Environment), at Exmoor National Park, for granting permission to visit the site

List of minerals reported by members on the trip:

- Aragonite – fine sprays and masses of colourless acicular micro-needles, on several specimens.
- Bornite – iridescent coatings on partially altered chalcopyrite and chalcocite crystals and masses.
- Brochantite – green/blue microcrystal druses and coatings, to <1 mm.
- Chalcocite – glistening metallic, dark grey crystal sections with associated bornite/chalcopyrite. Also, well-formed, pseudo hexagonal, dark grey micro-crystals to <1 mm.
- Chalcopyrite – fairly sharp golden micro-crystal druses and >1 mm masses in quartz and in vugs.
- Chalcopyrite – (var. Blister Copper) bronze-looking, botryoidal 'nuggets' to 30 mm.
- Chlorite – micro-crystalline patches disseminated in various masses.
- Malachite – pale green acicular micro-crystal sprays and druses.
- Posnjakite – druses of sharp, sky-blue micro-crystals in vugs.
- Pyrite – abundant masses and micro-crystals. Larger, crystals showing modified cubes.
- Pyrolusite – metallic grey bladed crystals in Mn oxide-rich masses.
- Siderite – abundant masses and druses of rhombic and lenticular crystals to >1 mm. Also, abundant lenticular crystals >1 mm, in vugs, from translucent to dark metallic grey.

Saturday 1st September, 2018. Wales and West Branch visit to Mine Train Quarry, Bixslade Valley, Parkend, Forest of Dean, Gloucestershire. [SO 6065 0988].

Leader and Reporter: Tom Cotterell.

Four members attended this interesting and educational excursion to a small, privately-run, sandstone quarry. The owner, Jon Tainton, provided us with a detailed overview of the geological and industrial history of the quarry and the associated iron- and coal-mines.

The quarry extracts Carboniferous Pennant Sandstone using traditional stone-working techniques. Numerous broadly N–S trending vertical fractures infilled with iron oxides cut through the thick shallow-dipping sandstone beds. Several openings in these fractures visible high up in the main face of the quarry represent old iron workings exposed during quarrying operations – hence the name of the quarry. These iron workings extend beneath the floor of the quarry indicating the scale of operations that once existed.

In the woods above and to the NE of the quarry lie both iron and coal workings in close proximity. The coal – the Yorkley Seam – crops out a few metres above the top of the quarry and the vertical iron oxide-bearing veins cut through the coal, hence the close proximity of the workings. Jon explained to the group how one can tell the surface features apart simply by the presence, or absence, of clay in the spoil heaps. The coal is always associated with a sticky beige-coloured clay, while the spoil from the iron workings has a distinctly orange



The quarry face, showing openings of old iron mine workings exposed by quarrying. Tom Cotterell Photo.

(rusty) soil associated with it.

Within Mine Train Quarry we were able to collect good examples of stalactitic goethite from vertical fractures freshly exposed in a small upper bench. Here, large specimens of the tree-like fossil *Sigillaria* were also present, possibly due to the proximity to the Yorkley coal seam.

Our thanks go to Jon Tainton for a thoroughly entertaining visit.

Sunday 9th September 2018. Central Branch Visit to Bardon Hill Quarry Extension, Coalville, Leicestershire [SK 469 129]

Leader: Neil Hubbard. Reporter: Richard Brooks.

There was a relatively good turnout of 10 for this return visit to Aggregate Industries' new hard rock quarry at Bardon Hill; this being despite a rather wet and inauspicious start to what had been forecast as a fine, early-autumn morning. Once the party had kitted-up and assembled in the Visitors' car park, however, the skies began to clear, and the eager party were provided with a brief introduction to the Bardon Hill quarries and an update on progress with the Bardon Hill Extension Quarry ('Extension') project since the previous RS visit by our two guides, Jemma Moore and Sam Rhodes, from Aggregate Industries' technical department.

The old and near-depleted Bardon Hill Quarry has been operating since the 1850's, with the target lithologies being the Precambrian epiclastic and tuffaceous mudstones, siltstones and sandstones of the Charnwood Supergroup, and the intruding calc-alkaline intrusives and extrusive volcanic rocks (typically porphyritic andesite with dacite/rhyolite) of the Bardon Breccia of the Bardon Hill Volcanic Complex. These Precambrian rocks have been tectonised, deeply eroded and then buried below a later cover of Triassic Mercia Mudstone Group mudstones, siltstones and subordinate sandstones, with the significant topography on the top of the basement rocks giving rise to the spectacular infilled Triassic 'wadi' valleys for which the quarry is notable.

The old Bardon Hill Quarry is heavily constrained by Bardon Hill itself and the associated Site of Special Scientific Interest (SSSI) located to the southeast of the quarry void, and by the urban development and quarry plant located to the west. For this reason, the quarry is anticipated to be effectively exhausted by 2020. Aggregate Industries embarked on the Extension project, therefore, to exploit a further 142 million tonnes of Precambrian basement rocks, and so extend the life of its Bardon operations by a further 40 years. The Extension area covers some 128 hectares to the east-southeast of the old Bardon Hill Quarry, between that quarry and the M1 motorway. Site works began in early 2015, and by the time of the September 2018 visit, the Triassic overburden had been significantly removed, screening mounds constructed, and the in-pit crusher installed. Full production is anticipated to commence by early 2019, with waste from the new quarry being used to partially backfill the old Bardon Hill Quarry void.

Many RS members will be familiar with the copper mineral suite that occurs relatively widely within the shattered and jointed Precambrian rocks local to the Triassic unconformity at the old Bardon Hill Quarry, with the writer having secured some representative samples of azurite, malachite, cuprite and native copper during visits in the early 1990's. Clearly these were the species that the assembled party hoped also to find in the new Extension, although the less common minerals noted from Bardon, including vanadium and arsenic species (and native gold for that matter!), might also have been in the minds of the more optimistic!

The first location visited during the walk down into the Extension was a bench face in the eastern-part of the developing void that displayed the sub-Triassic unconformity (ref Loc. 1 on Figure 1). Here a few 'shows' of bluey-green cupriferous

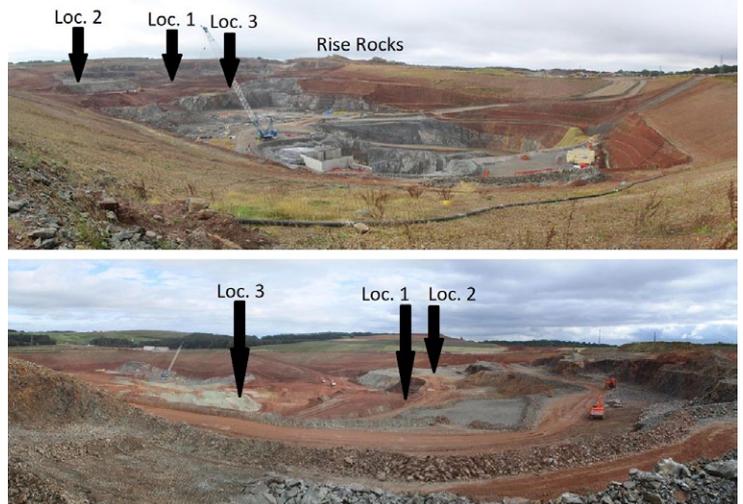


Figure 1: Panoramas across the Bardon Hill Quarry Extension void, with the upper photo taken looking southeast, and the lower one looking north-northwest. The crane with white and blue jib is located adjacent to the in-pit crusher station, and locations described in the text are arrowed. Note topography on surface of grey-blue Precambrian rocks, below the unconformably overlying red-brown Mercia Mudstone Group strata. (Photo: R Brooks).



Figure 2: 'Chrysocolla' from shatter zone at sub-Triassic surface, Location 1 (ref Loc. 1 on Figure 1). Field of view 30 mm (approx.) (Photo: R Brooks).



Figure 3: Detail of the sub-Triassic unconformity exposed locally at Location 3 (ref Loc. 3 on Figure 1). Note pale-coloured (ferrous iron-rich?), sandy Triassic basal breccia matrix surrounding rotated Precambrian clasts, and the underlying, finely laminated Charnwood Supergroup strata, with *in situ* cupriferous staining (ringed, with example of botryoidal malachite inset at top right). Scale indicates centimetres (Photo: R Brooks, & Roger Robinson [inset]).

species were noted in shatter zones, with the writer securing a specimen showing 'chrysocolla' (ref Figure 2), botryoidal malachite, spots of massive cuprite and a lone fleck of native copper on a matrix of Precambrian rhyolite exhibiting areas of adhering basal Triassic sandy breccia and possible 'desert varnish' aeolian polishing (?). The bench above this location (ref Loc. 2 on Figure 1) exposed further probable rhyolite, but negligible minerals; although Roy Starkey and Clive Minker noted a very dark green, almost black, probable amphibole mineral coating a slickensided fracture surface, this being associated with chlorite, quartz and subordinate calcite.

Following a brief excursion to the fine view point across the Extension void available from the 'Rise Rocks' rock outcrops, which are located on the present southern rim of the void, the party moved to the final location for the day (ref Loc. 3 on Figure 1). This exposure of the sub-Triassic unconformity and immediately overlying basal Triassic breccia had been the primary source of material on the preceding RS trip to this locality and was again the most productive location visited on this second visit. *In situ* cupriferous staining at this location is visible in the Precambrian rocks featured immediately below the sub-Triassic unconformity in Figure 3, with a typical example of micro-botryoidal malachite from this location being also shown inset in that Figure. In addition, Neil Hubbard reports finding a 'poor' specimen of tyrolite, a relatively rare copper arsenate mineral previously recorded from the nearby New Cliffe Hill Quarry.

N.B. Tyrolite has been previously reported from both Bardon Hill Quarry [JRS (2007). 10, p.35] and from Bardon Hill Extension [RS Newsletter (2018). 72. p.38]. **Editor.**

All-in-all the pickings on this visit were poor, but representative examples of some of the principal copper minerals were bagged by most, and it was interesting to see the Precambrian topography being slowly revealed from beneath the Triassic cover. The writer was also intrigued by the various soft-sediment deformation structures and crystal lithic tuffs visible within the strata of the Beacon Hill Formation near Location 3 and recovered a large slab for his garden! It is hoped that future visits, over several years, will allow the new areas of sub-Triassic unconformity to be further explored by RS members before production inevitably drops to deeper (and possibly less mineralogically productive) levels.

I'm sure all those in attendance would like to join me in thanking our guides (who gave up their weekend to escort us on this occasion) and to Aggregate Industries for granting access to the site. Also, to Neil Hubbard for again facilitating this (hopefully annual) visit.

**Saturday 15th September 2018. North Branch Visit to Shap Pink Quarry [NY 560 081].
Leader: Ian Dossett. Reporter: Richard Joel.**

The party assembled in the quarry car park and went through the health and safety briefing. There was plenty of quarrying activity on the lowest bench with heavy machinery clearing out a muck pile (Fig.1). Before we headed into the quarry we had an impromptu mineral swap with several members having brought spare material along.

We then headed into the quarry and made our way up to the top bench. Unfortunately, there was none of the scheelite and fluorite discovered in the previous year but Steve Warren found a pegmatite pocket which yielded smoky quartz

crystals to 2 inches.

On several of the benches we found pyrite (rough cubes) and molybdenite but no bismuthinite this time. On one of the lower benches the party found further pegmatite material exposed on several large blocks and most of the party managed to secure a specimen or two. At home Ian subsequently found 2–3 mm inky blue bipyramidal fluorites on the quartz specimen in Fig.2.



Figure 1. Machinery at work processing the muck pile.



Figure 2. Smoky quartz from one of the blocks on the lower benches. Ian Dossett specimen.

All in all a reasonable trip this year. Our thanks once again, go to Emma Armstrong of Armstrongs Aggregates Ltd. for their permission for the visit and ongoing support.

Saturday 20th October 2018. North Branch visit to Milldam Mine, Great Hucklow, Derbyshire.

[SK 177 780]

Leader: Ian Dossett. Reporter: Roy Starkey.

Six members including the leader assembled in the mine carpark for 09.30. The mine, originally established in 1951 has enjoyed a long period of production. Operations came to an end in 2010, but were restarted in 2013 following the acquisition of the mine and nearby Cavendish Mill in 2012 by British Fluorspar. Planning permission allows for the production of up to 150,000 tonnes per annum of run of mine ore, and current production is grading about 60–70% fluorite. Reserves are thought to be sufficient to keep the mine operating for around 20 years. The mine is being developed using trackless mining and a sub-level open stoping system to extract the narrow vein sub-vertical orebody which is hosted in Carboniferous Limestone.

We were greeted by our host for the day Dan Ridley, and issued with self-rescuers and belts before being driven underground in a conventional 4WD pickup truck. The mine is accessed by a decline which maintains a gradient of about 12.5% for 400 metres. We descended to the current production area on Sub Level 3 East, about 1 mile from the entrance. Here we were able to observe fluorite–baryte–calcite–galena mineralisation *in situ*, and to collect from loose material on the floor of the stope, and from several large cavities exposed in the walls.



Exploring one of the large cavities in the tunnel walls.
David Aubrey-Jones Photo



The spoils! Large calcite crystals waiting to be wrapped.
David Aubrey-Jones Photo.

Several presentable pieces of well-crystallised colourless fluorite, with crystals up to about 20 mm on edge, were collected, together with smaller dark purple crystals, typical of Milldam Mine. Two large cavities on opposite sides of the drive produced an abundance of large calcite crystals (up to about 20 cm in length), but few of these were completely free from damage (a consequence of vibration from blasting).

A little before 13.00 our host announced that it was time for us to return to surface and we (together with our specimens) were driven back up the decline and dropped-off in the car park. It had been a very instructive and productive visit, and our thanks go to Ian Dossett for organising the trip, Rob Ridley of British Fluorspar for granting permission, and Dan Ridley for hosting the visit and keeping us safe on the day.

**Sunday 21st October, 2018. The Maisemore Event.
Reporter: Tom Cotterell.**

This popular annual event, organised jointly by the Russell Society (Wales and West Branch) and the Cheltenham Mineral and Geological Society (CMGS), took place on Sunday October 21st, 2018, and attracted 48 people.

The theme was “Quartz” and talks included, “The Rock Crystal mines of Snowdonia” by Tom Cotterell; “Minerals of the English Midlands” by Roy Starkey; and “The silica springs of Yellowstone National Park” by Dr Alan Channing (Cardiff University). Displays included Welsh quartz by Tom Cotterell and Dr Stephen Plant, and separate displays of quartz crystals from classic English localities by Steve Warren, Neil Hubbard, Alan Thorogood and Brian Beveridge.



Members inspecting the displays at “Maisemore 2018”.

A large collection of geological books from the late Tom Levinson, donated by his widow, Alison, was sold to raise funds for both societies.

Our thanks go to Marashean Parker and Carole Allaway-Martin for organising refreshments and food, Denis Martin for booking the hall and Tony Parker for overseeing the setup of the hall. Plans are already in place for another event in 2019!

Errata:

In the report on page 33 of Issue No. 73 in September 2018 of a visit to Bampfylde Mine, North Molton, Devon some of the photographs were wrongly attributed. Except for the picture of the cuprite epimorphs, which is by David Roe, all the pictures are by Steve Rust. Apologies to both gentlemen for this confusion.

Editor
