

# BRITISH MICROMOUNT SOCIETY



---

**NEWSLETTER NO. 57    NOVEMBER 2000**

---

<b>Chairman</b>	Roy Starkey	15 Warwick Avenue, Fringe Green, Bromsgrove, Worcs., B60 2AH
<b>Secretary</b>	Shirley Adrian	An Feóran North Connell Argyll PA37 1RD
<b>Membership Secretary</b>	Pearl Freeman	12A Allingham Court Haverstock Hill London NW3 2AH
<b>Treasurer</b>	Sidney Freeman	12A Allingham Court Haverstock Hill London NW3 2AH

---

## CONTENTS

Membership Changes	8
Newsletter Timing and Contributions	8

**MINUTES OF THE ANNUAL GENERAL MEETING OF  
THE BRITISH MICROMOUNT SOCIETY HELD AT  
THE UNIVERSITY OF LEICESTER ON SUNDAY 17<sup>TH</sup> SEPTEMBER 2000**

The Chairman Roy Starkey opened the Meeting at 10.05 a.m. There were 46 members present. Secretary Shirley Adrian.

**1. Apologies for absence,**

Apologies were received from Max Wirth, Jean Spence, Tony Brittain, Dorothy and Cyril Merritt, Sigrid Luff, Frank Ince, Chris Jewson, John Nowak, David Green, Mike Dannatt, Richard Braithwaite and Dick Smith.

**2. Minutes of the 1999 AGM.**

It was proposed by Doug Morgan and seconded by Rusty Waughman that the minutes be taken as read, and this was agreed by the members.

**3. Matters arising from the Minutes.**

The group photo taken last year was unsuccessful due to camera problems.

**4. Treasurer's and Membership Secretary's Reports.**

Sidney Freeman presented both reports.

On Pearl's behalf he reported that there were 204 memberships including 27 Family memberships. There had been 14 new members; losses from non-renewals and deaths were 12. Membership has only varied by 4 or 5 over the past few years.

As Treasurer Sid referred to the Receipts and Payments Account circulated in the Symposium brochure. The overall balance showed an increase of £377 during the year, a consistent pattern for the past few years. Last year it had been decided to use the Colin Horstman legacy of £250 to provide a specific item of equipment for the Leicester University Geology Department in Colin's memory. Some special display cases had been purchased, but the Department had not yet asked for the money for these. The donations received related to the proceeds from the sale of Colin's specimens, etc. A further £250 had been received unexpectedly this year as well.

Unusual expenditure items included donations to the Mike Rothwell Memorial Fund and the Geologists' Association's "Earth Alert". The Newsletter anomaly was due to an overlap of bills from the printers. Each Newsletter costs about £100.

The small Symposium deficit could easily be absorbed. This year's fuel crisis might mean that some Symposium receipts would need to be reimbursed.

Replying to a question from Ken Luff, Sidney confirmed that the BMS award to a Geology student at the University had been made each year. He thanked Mike Leppington for auditing the Society's Accounts.

Austin Lockwood proposed acceptance of the Accounts. This was seconded by Vicki Packard and carried unanimously.

**5 Chairman's Report,**

Roy Starkey said he found it hard to believe that another year had passed since he took over as “caretaker” Chairman at the 1999 AGM. He had found that the Society runs itself, its informality being a great asset.

He continued: “Perhaps the main topic of discussion this year has been that of the Caldbeck Fells, which was well aired yesterday. It is important that Members keep this subject in perspective, and strive not only to ensure a workable arrangement for the future, but also to encourage other mineralogists, collectors and organisations to comply with the arrangements put in place by the National Park authorities.

It is a long time since the publication of the 1<sup>st</sup> Edition of the British Directory of Micromounters in June 1981. This resulted from a display mounted by me as part of the West Midlands Mineral and Mining Society Stand at the First British Mineral and Gem Show at the Holiday Inn, Leicester. The 1<sup>st</sup> Edition listed the following 33 people, of whom 20 (printed in **bold** are still members today:-

Mike Bayley	<b>Neil Hubbard</b>	Mike Rothwell
<b>Graham Bell</b>	<b>Alun Jones</b>	John Sheppard
<b>Richard Belson</b>	<b>Mike Leppington</b>	John Slater
<b>Peter Braithwaite</b>	<b>David Middleton</b>	Mike Smith
Trevor Bridges	Jim Miller	Keith Snell
Michael Burt	Paul Monk	<b>Roy Starkey</b>
Mike Gough	<b>John Nowak</b>	<b>Martin Stolworthy</b>
John Hall	Eric Otty	Ron Weaver
Roger Harker	Pam Pearce	Bob Weatherall
Audrey Hatt	Peter Reynolds	Franz Werner
Colin Horstman	<b>Alan Pringle</b>	Trevor Wolloxall

The 1<sup>st</sup> British Micromount Symposium held at the Pump Room, Matlock Bath, in October 1982 set the pattern for what has become a tremendously popular annual event. On that occasion we had talks by Eric Otty, Trevor Wolloxall, David Middleton, Paul Monk, Mike Leppington, Doug Morgan, Roy Starkey, Peter Braithwaite, Michael Edwards and Jean Spence, a Members’ Slide Show, the normal Swap Session, and, believe it or not, a choice of Field Excursions on the Sunday! Maybe it is a sign that we are all getting older that nowadays we seem to prefer more chatting and swapping to ‘heavier activities’.

At the time we had 46 members, of whom about 40 made the effort to get to the 1<sup>st</sup> Symposium. The following year 52 members attended the 2<sup>nd</sup> Symposium at Leicester in October 1983.

The Society participated at the GA Earth Alert Event in Brighton, as reported in the last Newsletter, and Elsie Hansford had the opportunity to explain Micromounting to Baroness Young. A unique ‘Award of Merit’ was presented to Elsie in recognition of her unique contribution to the BMS and its public image over the years.”

Roy also reported the death of Mr. J. C. Nicholls, a member since 1994, and of the wife of member Eddie Foy, and offered the Society’s condolences to the respective families.

He thanked the various local groups and asked them to let the Newsletter Editor know of their activities. He also thanked the Symposium Organising Team, the Staff and support personnel of the University and Geology department, and the members for attending in spite of transport problems.

## **6. Other Reports.**

### **Micromount Competition.**

Peter Braithwaite said he had hoped to find a large number of entries waiting for him to judge when he finally arrived at the Symposium. Disappointingly there were only 2, not enough for a competition. Richard Bell had at last abandoned Mineral Tack and entered a prize-winning specimen last year. In recognition of this feat Peter presented Richard with a commemorative plaque, resplendent with a large dollop of “Blu-Tack” affixed to the rear!

Roy and Peter will look into ways of promoting the competition, but it was agreed that only self-collected British specimens were eligible.

### **Newsletter Editor**

Mike Dannatt was unable to attend the AGM, but informed the meeting through Roy that the next Newsletter would appear in November.

### **Curator.**

Max Wirth was unable to attend the Symposium. His report had been given to the Chairman - in a micromount box! Since last year he had received 7 postal requests and 76 specimens, numbers 2175 -2251 inclusive. Future postal loans will be accompanied by a direct printout from Max's database, rather than the original index slips. Max was seeking to hand over the task of curating the Collection. Roy asked anyone who was interested in taking over from Max to let him know. In the absence of a volunteer Max was going to approach Tim Neal.

(Note added after the AGM-Doug Morgan has agreed to take on the duties of Curator and arrangements will shortly be made to transfer the Reference Collection from Cumbria to Birmingham.)

### **Archivist.**

Alan Edwards reported that the Rashleigh was out on loan. Two volumes of Goldschmidt were also on loan but the remaining volumes were available here. He also had a copy of Oneta Wilson's thesis on the Zeolites of Great Britain available for delegates to study.

### **Branch Reports**

Dick Smith had sent a message that the next meeting of the Midlands Branch would be on the 19<sup>th</sup> or 26<sup>th</sup> November. Since the last Symposium there had been 2 meetings; on 28<sup>th</sup> November 1999 at St. Ninian's Church Hall attended by 7 members, and on 1<sup>st</sup> April 2000, kindly hosted by Doug Morgan at his home.

Austin Lockwood reported that there were about 50 members in the South-East Branch, with 20 – 30 attending the quarterly meetings at Grove Park. He thanked Peter Wallace who reports on interesting specimens brought to the meetings, and looks after the finances, and June Lockwood for organising the refreshments.

Mick Wolfe said that the Northern Branch would be moving from Bircotes Library.

The Norfolk Branch continues to meet monthly---and members also frequently attend the meetings of other branches.

Harry Critchley reported that the Warrington group met on the 1st and 3rd Tuesdays of the month in conjunction with the Warrington Lapidary Society. There were usually 6 or so members at the meetings. As the Warrington Lapidary Society was having to move, the group would have to move with them and there would also be a change of nights.

The South-West Branch had met in March, with about 20 members attending.

## **Symposium Organisers**

Kevin Johns thanked delegates for overcoming the fuel problems and attending the Symposium. He said that the Society had built up a very good relationship with the Geology Department over the years, as evidenced by the fact that our deposit would have been refunded if the Symposium had had to be cancelled.

The Raffle had made a profit of £67, and the Auction had raised £207, greatly helped by the sale of Mike Rothwell's cabinets. Provisional dates for 2001 were given as September 22<sup>nd</sup> and 23<sup>rd</sup>.

Rusty Waughman thanked those who had phoned delegates with the information that the Symposium would go ahead.

## **Projects.**

### ***Occasional Papers.***

John Pearce reported that "A Guide to Micromounting, Part Three: Cataloguing and Labelling" by Peter Braithwaite was now available.

He informed members that Tony Brittain not only prints the Occasional Papers, but also sells them and advertises them on his web site.

David Green had been granted a two-year sabbatical from his editorial duties. John had planned to hand over to him again---perhaps that was why he had not come to the Symposium!

Asked about further Papers, John said possible subjects included Zeolites, cleaning minerals, mineral associations and secondary mineralisation, radioactivity and maybe fluorescent minerals. The aim was to publish one Paper a year. Those present felt this was satisfactory.

Ken Luff said he was impressed with the number of Papers published so far.

Doug Morgan said that Peter's "Guide" was magnificent.

### ***Directory.***

Members were asked to contact Mick Wolfe concerning their entries.

## **7. Founder's Cup,**

Roy Starkey told the meeting that this year's winner of the Founder's Cup was a prominent member who had thrown himself wholeheartedly into various Society projects. He had been very active in a number of other amateur mineralogical organisations, and instrumental in collating species and locality data from members.

A keen practical engineer, model maker, optical instrument builder and computer enthusiast, he had recently taken a step back from mineralogy to pursue other interests. Unable to be with us today due to another commitment at Maidstone Museum, Harry Day, developer of the BMS Database, is the recipient of the Founder's Cup for the Year 2000.

As Harry was unable to come to the Symposium it was hoped that the Cup would be presented at either the Bakewell or Sussex Show.

## **8. Election of Officers.**

The Officers agreed to serve for another year. No other nominations had been received. They were unanimously re-elected.

## 9. Any Other Business

Mineral Identification.

Alan Edwards asked whether members knew of a commercial enterprise that would be willing to carry out XRD or electron microscopy for Society members. Mike Rothwell's help was greatly missed and various Museums and Universities could only help to a limited degree.

Peter Wallace said that for members who were able to get to the Natural History Museum, the new Earth lab on the mezzanine floor had a Duty Mineralogist on call in the mornings. If the specimen could not be identified visually it would be sent for tests. This avoided being told that one had exceeded one's allocation for the year!

He encouraged members to visit the Earth Lab and sign the visitors' book. The database that had been set up there was very useful.

Trevor Bridges said that specimens should first be visually identified, with help from experienced members if necessary, followed by simple chemical tests to confirm the identification. This should be followed by electron microscopy with X-Ray analysis. Only then should XRD be considered.

Alan Dyer mentioned the possibility of Craig Williams in Wolverhampton being able to undertake some ID work and said he would investigate this.

In the past Jamie Nelson had mentioned having access to apparatus that could be used for opaque minerals.

It was agreed that further consideration was needed.

### **E-mail addresses.**

These had proved very useful in the pre-Symposium "crisis", and members with internet access were asked to ensure that their correct e-mail addresses were included in the membership information.

Alan Dyer reported that Alex Livingstone's book "The Minerals of Scotland" was ready for publication but the Royal Museum of Scotland publications department had insufficient funds. It was suggested, and agreed, that the second £250 of Colin Horstman's bequest should be donated to support this publication.

The meeting was closed at 11.10 a.m.

## REFERENCE COLLECTION

Max Wirth wishes to confirm the addendum to the minutes of the AGM and writes:

**"I have chosen voluntary retirement and Doug Morgan has taken on the onerous task of curator of the BMS reference collection of micromounts. Any further specimens sent to me will be instantly incorporated into my own collection."**

## 19TH BRITISH MICROMOUNT SYMPOSIUM - 2000

Roy Starkey

This was nearly "the Symposium that never was" - only days before we were all due to travel to Leicester we were hit by the petrol shortage / tanker dispute and prospects for the weekend looked bleak indeed.

Much telephoning around at the eleventh hour (Thursday evening) confirmed that we were "green for go" and it looked as if we would get 50 or so delegates out of the planned 88.

The depleted numbers made for much easier car parking outside the Department of Geology - perhaps the only "plus" of the week's troubles ! The usual enthusiastic journeys to and fro from car to lab and back, laden with gear and specimens etc. - up and down the familiar staircase, confirmed that all would be well, and things settled down to a normal pace, albeit with many regular faces absent from the benches.

Welcome cups of coffee greeted members arriving from all over the country, before Roy Starkey (Chairman) opened the proceedings. He reported that he had recently been in touch with Max Wirth, John Faithful, George Ryback and Kemp Meikle - all of whom were well and sent greetings to members. It was reported that Occasional Paper No.10 - Micromounting Part 3 was now available - orders to John Pearce please.

Peter Braithwaite was stuck in Cornwall due to the fuel crisis, so Roy asked how many entrants we had for the Micromount Competition - sadly only two, Mike Leppington and Oneta Wilson. Accordingly it was decided to abandon the competition this year, and also the Workshop on mounting specimens which Peter had been scheduled to present in the afternoon.

Delegates were reminded that the special display in memory of Colin Horstmann was open to members in the Sylvester-Bradley Room, with Roy Clements on-hand to answer questions until noon.

The first lecture of the day was from Trevor Bridges - no stranger to Symposium Delegates, and this year it was "Back to bathing with the goldfish" a light-hearted trawl through the basics of redox geochemistry looking at zones of oxidation and supergene enrichment in mineral veins. There was clearly a good deal of interest in what Trevor had to say, and he has tentatively agreed to run a follow-on session next year, perhaps going into field stability diagrams using 3-dimensional Microsoft Excel spreadsheets. (Watch this space !)

After a short break for coffee we returned to the lecture theatre for an Open Forum on the Caldbeck Fells Mineral Policy lead by Trevor Bridges and Roy Starkey. This was a generally constructive debate, aimed at bringing members up to date with the situation and to encourage everyone to file an application for a Permit to Collect for next year. Particular points raised included the following:-

1. What sort of person / standing of person is required for referees. For example would the Chairman of a Society be acceptable as the referee for members of that body, or does it have to be someone of academic standing in earth science ? Guidance here would be appreciated.
2. The question of giving advance notice is something we would like to explore, with the objective of arriving at an agreement for "outline permission" to be granted to the individual or

group for an unspecified date or dates, and this to be firmed-up by giving suitable notice nearer to the date of any proposed visit once this is known e.g. 2-3 weeks ahead.

3. If this is acceptable, would telephone notification to the Blencathra Centre be viewed as a suitable means of confirmation ? This would enable more definite two-way communication at a shorter planning horizon.

4. We would like to review the "restricted areas" - particularly Carrock Mine area and Roughton Gill area and to understand what archaeological work needs to be done and whether any accommodation can be made to permit collecting.

5. We would like to stress the "educational" aspect of mineral collecting as well as the purely "research" content of permit applications.

6. It was felt by several members that the requirement to display the permit, giving full details, inside a parked vehicle was possibly inviting problems, and would it be possible to simply display a permit number or some other suitable means of verification.

Roy Starkey will be writing to Peter Davies asking for these points to be considered at the forthcoming Review Meeting in November, and thanking him for his efforts in connection with this issue. It is hoped that we shall be able to see the Permit arrangement continue to develop to everyone's mutual benefit.

After lunch David Roe gave a short presentation of colour slides rescued from the collection of the late Maurice Grigg by Richard Belson. Richard had spent many happy hours painstakingly de-mounting, washing, drying and re-mounting two hundred slides from a total of perhaps a couple of thousand which had been found going mouldy in Maurice's shed.

Whilst the quality of the images was variable, the audience enjoyed the nostalgia aspect of sharing some reminiscences of Maurice and Cornish localities, and even the "Cluedo"-like guessing game of what is it ?

Species / specimens featured included the following:- native silver; gold in quartz; quartz pseudomorph after scheelite from Ramsley Mine; hemimorphite, dundasite, leadhillite, aurichalcite and wulfenite from Greystones Quarry; scorodite and an unknown blue mineral from Hingston Down; tetrahedrite and chalcopyrite from Herodsfoot; monazite from Lanterdan Quarry; stream tin from Goss Moor; fluorite from Rostowrack; coffic torbernite crystals from Blackpool Pit (colour, mineral, focus and exposure all just right !); connellite from Wheal Charlotte; Pigs Egg; cassiterite from Lee Moor; super smoky quartz from Treviscoe Pit; bismuthinite from South Crofty; monazite and anatase from Longdown Quarry; cassiterite, cyrilovite, chalcosiderite, apatite, cuprite, libethenite, unknown fibrous white mineral, leucophosphite from Gunheath Pit; ceruleite, malachite, chalcophyllite, olivenite, spangolite all from Wheal Gorland. Thanks to David and Richard for an entertaining session. Offers of help to wash and remount the remaining 1000plus slides would be welcome (please contact Richard Belson).

The usual hectic afternoon of talking, swapping, buying and selling seemed to pass all too quickly, many members only managing to work their way through five cabinets of specimens from the collection of the late Mike Rothwell by tea time ! The Annual Mineral Auction commenced at 4.30pm with Trevor Bridges and Roy Starkey acting as joint auctioneers. Just over £200 was raised for Society funds, greatly helped by the sale of the Mike Rothwell mineral cabinets. The raffle raised a further £67 - thanks to all those who purchased tickets.

Members retired to the Stonecroft Hotel and Reynards Bar for a pre-dinner chat and drink, before enjoying an excellent meal. The dinner was again voted a great success and it is planned to return next year.

Ken Luff changed tack from his usual Mineral Quiz, and stunned delegates by hitting them with a mineralogical crossword instead. This at least avoided the usual dissent about what answers were acceptable, but all the teams struggled with finding the word "druse" - everyone being more familiar with "vugh", but this did not fit. (Turns out the crossword was from a South African magazine - so presumably this term is in more common usage out there. Many thanks again to Ken for another entertaining half-hour or so. The crowds gradually drifted away as midnight approached, save for a few die-hards (including the Chairman and David Roe !) who talked on into the early hours.

Sunday morning kicked off with a free hour to follow-up on the previous day's swapping and workshop activities, before we were all herded into the lecture theatre for the AGM. The Chairman again declared his intention to see the proceedings over in a shorter period than scheduled on the agenda, and we were more or less finished in 70 minutes. (The official minutes are published elsewhere in this Newsletter).

Peter Braithwaite had struggled up from the south-west to be with us - eagerly anticipating an overwhelming number of entries for the Micromount Competition, but was sadly disappointed. After lamenting the lack of entries, Peter proceeded to remind delegates that Richard Bell had finally managed to mount a "proper" micromount - without mineral tack, the previous year, and had been awarded the Micromount Trophy. Accordingly, Peter had prepared a commemorative plaque with a large lump of blu-tack on the reverse side, and duly presented this to Richard, much to the audience's amusement.

Once again David Roe stepped forward to fill the "What's about on the tables?" slot, and some of his choices are summarised below:-

Beryl Harrison - Knipe Mine; a host of antimony minerals with many a question mark.

Steve Plant - Dolyhir Quarry - harmotome and what looked remarkably like realgar.

Alan Hinton - Wheal Sparnon, Redruth, some flashy torbernite plus pharmacosiderite and scorodite

David Roe – as one of the few from the SW gave some hints of the wonders for next year hidden amongst the chlorite of Wheal Caradon - anatase, monazite and sparable tins

Plus some gemmy clinoatacamite from Gurnards Head, Lands End.

Andy Castleton - Mill Dam Mine, "drop dead gorgeous" dark purple fluorite with calcite and barite

Colleen Thomson – proving yet again that furnace bricks yield slag minerals such as blades of elyite that can aesthetically match any supergene.

Harry Critchley – whose acid attack on White Straits calcite had yielded some handsome galena.

At this point David confessed that it had taken him until 4pm Saturday to get to the end of the front bench.

On the second bench he had been met with a certain "frisson" - excuses such as "minerals are hard to come by nowadays", "I had to come by train", "you should see my leadhillite (but I haven't brought it with me!)", "it's the petrol crisis you know". Whatever the excuse the message is "Don't leave it at home - PLEASE"

Steve Rust – revved up the excitement with zircons in miarolitic granite from Skye – suggesting miarolitic is the in thing for 2000.

Roy Starkey – continued the theme by a multitude of largely unknown but rather interesting specimens from miarolitic syenite from Islay.

Austin Lockwood - showed even Kent could provide micromounting opportunities with a pretty quartz and marcasite vugh from the Deal coalfield.

Jean Terry - Tynagh, Ireland – had a specimen marked “gorgeous” which was a suitably flamboyant azurite and malachite on dolomite with just a touch of something else.

Peter Wallace – couldn't compete with flamboyance but had some very interesting octahedral fluorite with possibly epidote sprays from a very hard rock site in Ireland.

George Fletcher – has returned to his blue school of collecting with aurichalcite and linarite

Richard Bell (we're now on Bench / Row 3 !) – showed that the two extremes of micromounting can co-exist – obscurity and commonplace – but it does help to have some good crystals. A rarity from the Isle of Skye – erionite – as an extremely attractive whisky coloured prisms in cavities. A stunning Loanhead Quarry, haematite equalled by a Wheal Cock haematite as embossed "shields" leached from calcite.

Many thanks to David for drawing delegates' attention to interesting items.

Austin Lockwood was next to take the floor with the results of the Micromineral Competition which are recorded below in more detail.

After lunch on Sunday an impromptu slide show/lecture on "The Mineralogy of the Shetland Islands" by Roy Starkey, proved very popular, and seemed to encourage a significant number of delegates to stay on longer in the afternoon than has been the case in previous years.

There were still a lot of people in the lab at 4.30pm - a return to what we used to see maybe ten years ago. Please do write in and tell us what you think about the Symposium format and content. It is your Symposium - we can do almost anything. If you'd like an after-lunch slide show again on Sunday next year, please let us know.

Thank you to everyone who helped to make this year's event a great success, thank you to those who made big efforts to get there, and condolences to those who didn't make it - see you next year we hope.

## 2000 MICROMINERAL COMPETITION

Austin Lockwood

This popular event, now in its sixth year, was again held during the Annual Symposium at Leicester University. Judges were appointed from four branches of the Society and our thanks are due to Jill Goltz, Vicki Packard, Andy Coster and Mick Wolfe who kindly gave up their time to examine and award points for each of the 19 specimens entered for the Competition.

As a judge, you have an opportunity to examine carefully each specimen without distraction and the general view of the judges was that this year's entries were again of a high standard.

As members may recall, judging is based on a maximum of 50 points awarded by each judge for features such as perfection of crystals, overall cleanliness, rarity of species and dramatic appeal. Part of my job as Competition Administrator is to check the marking and to work out the average points awarded by the four judges. This year I remembered to take my calculator with me so I did not have to stay up half the night working out the results!

June Lockwood was judged to have submitted the best entry with a specimen of pink thomsonite on analcime from Bracadale on the Isle of Skye which was awarded an average of 43.25 points. This was from a site that June and I discovered during a reconnaissance visit in 1994 and some very attractive zeolite specimens have subsequently been found there.

Pam Parlanti took second place with her caledonite within a vugh of cuprite crystals from the Meadowfoot Smelter dump near Wanlockhead, Scotland for which the the judges awarded an average of 41.5 points. Pam took third place in the Competition last year and will obviously be looking for first place next year.

June Lockwood again appeared amongst the list of best entries having also secured third place, with 41.25 points, for her attractive specimen of calcite crystals speared on mesolite on thomsonite, again from the same site at Bracadale.

There were two other specimens that scored 40 points or over these being Alan Hanton's micro-metatorbernite from Wheal Sparnon, near Redruth, Cornwall and Paul Nicholson's smithsonite and fluorite on barite from Cavendish Mill, Milldam Mine, Derbyshire.

Following the announcement of the results on the Sunday morning, Roy Starkey kindly presented June with the Maurice Grigg Micromineral Trophy to display at home until next year, and a small trophy for June to keep to mark her success in this year's competition.

It is encouraging to see the Micromineral Competition so well supported and I would like to thank all of those who entered specimens for this. I will remind you all in good time about next year's Competition and perhaps, when you are sorting through your finds over the next nine months or so, you will put aside something special for this.

## THE MISSING PAPER

John Pearce

Over the last few years BMS members have bought the first two of Peter Braithwaite's excellent "A Guide to Micromounting" Occasional Papers and asked "When is the third paper, Paper 10, going to be available?" The good news is that it was launched at this year's BMS Symposium. Many congratulations to Peter on producing this most valuable and well presented paper.

### **A Guide to Micromounting. Part Three Cataloguing & Labelling** by Peter Braithwaite

*This, the third part of the papers on micromounting, examines the existing "standard order of accession form of cataloguing and describes a system designed specifically for micromounts in which the label rather than the catalogue becomes the key to the collection*

If you would like a copy of the "missing paper" or any of the other papers, then drop me a line with a cheque not forgetting p & p

The 13 papers which have now been produced are detailed below:

1.	An Introduction to Micromounts	Roy Starkey	£1.00	(£1.50)
2.	Determining the Optical Properties of Minerals	Max Wirth	£1.50	(£2.25)
3.	Minerals are Chemicals	John Pearce	£1.50	(£2.25)
4.	Paper Chromatography	Max Wirth	£1.00	(£1.50)
5.	Using the Mineralogical Literature	Roy Starkey	£3.00	(£4.50)
6.	Stereomicroscopes	Mike Edwards	£2.00	(£3.00)
7.	Photography of Minerals through the Microscope	Elsie Hansford	£1.00	(£1.50)
8.	A Guide to Micromounting: Part 1, Collecting	Peter Braithwaite	£1.50	(£2.25)
9.	A Guide to Micromounting: Part 2, Micromounting	Peter Braithwaite	£1.50	(£2.25)
10.	A Guide to Micromounting: Part 3, Cataloguing	Peter Braithwaite	£1.50	(£2.25)
11.	Chemical Testing of Mineral Grains	David Green	£2.00	(£3.00)
12.	A Select and Personal Bibliography from the Mineralogical Magazine	Roy Starkey	£2.00	(£3.00)
13.	Minerals are Chemicals Part 2: The Periodic Table	John Pearce & Austin Woodbridge	£3.00	(£4.50)

(prices in brackets are for non-members)

*If you are interested in purchasing any of the above papers, please write to :*

*John Pearce: 7 Condor Way Burgess Hill West Sussex RH15 9QB, cheques payable to BMS  
please, or:-*

*Tony Brittain, Endsleigh Books Unit 2B Tharston Industrial Est. Long Stratton, Norwich,  
NR15 2PD (cheques to Endsleigh Book Co) adding p & p at the rate of:*

*Up to 3 copies 75p; 4 - 10 copies £2.00; 11+ copies £3.50*

## MINERAL REACTIONS - A TALK AT THE BMS SYMPOSIUM 1999

A. Edwards

I am not a chemist, but I have become interested in the why and how of mineral reactions. As a result of this curiosity I have uncovered a few facts and some interesting stories. I have been greatly helped in this by the notes of Trevor Bridges' past lectures and also his kind help in editing some of my offerings. I will take you on a light-hearted look at some mineral reactions.

The story starts in southern Africa. This is as good a starting place as any, as it is an interesting part of the world and encompasses a number of outstanding mineral discoveries.

The diamonds of Namibia, which were scattered over and in the sand along the coastal belt, are now nearly worked out. We have visited the spot where the first one was found, near to the old railway station of Grasplatz, in 1908.

The diamonds of Kimberly and the eventual enormous cavity, which was dug out and which is now their monument to posterity.

The Copper belt between the Congo and Zambia, the extent of which was beyond belief. I worked in this area of the old Belgian Congo for a number of years. I went down and into a number of mines, but I did not collect minerals then, which is a pity.

This is also where the famous Namibian mine Tsumeb is located, and where Sue and I have peered through the gate, but gone no further. More about this mine later.

Alfred County, Natal South Africa is where the ramble begins.

In the 'Mineral Deposits of Southern Africa, Volume II', there is a report, which states that "Exhalation of Carbon Dioxide CO<sub>2</sub> takes place at about 8 locations in Alfred County, Natal, S.A. This extraordinary pure Carbon Dioxide has been tapped since 1926 for use in aerated mineral waters.

"In the absence of any recent volcanic activity the gas is thought to be formed by the action of ground water containing free sulphuric acid on fragments of crystalline limestone in the underlying strata. The sulphuric acid is probably derived from the oxidation of Pyrite in a zone above the limestone strata."

Quite extraordinary in a way and rather interesting, but if you are curious, you can work out the probable chain of reactions which take place, from the clues that are given. These are water, dissolved oxygen, pyrite and limestone.

We take	pyrite	FeS <sub>2</sub>
Add	water	H <sub>2</sub> O
Containing	dissolved oxygen	O <sub>2</sub>
and get:		

(1) FeS<sub>2</sub> + H<sub>2</sub>O + 3.5O<sub>2</sub> (a natural reaction takes place and gives)

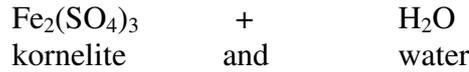
FeSO <sub>4</sub> +	H <sub>2</sub> SO <sub>4</sub>
Melanterite	sulphuric acid

The algebra of the equation shows that either side of the equation has 1 iron, 2 sulphur, 2 hydrogen and 8 oxygen and is therefore in balance

Melanterite is a monoclinic iron sulphate, which can form with either copper or cobalt or iron or manganese or zinc. It needs 7H<sub>2</sub>O to crystallize out, dissolves in water, and is unstable and ephemeral. However, this is a possible source of the sulphuric acid we are looking for.

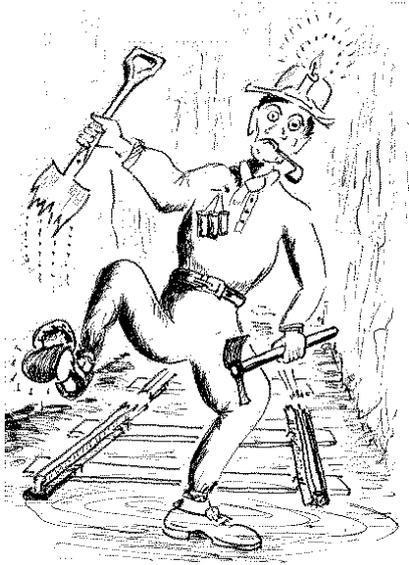
However, if the melanterite does not crystallize out, then:

(2)  $2\text{FeSO}_4 + \text{H}_2\text{SO}_4 + \frac{1}{2}\text{O}_2$  (Two melanterites + one sulphuric acid + oxygen) in water produces



Kornelite needs  $7\text{H}_2\text{O}$  to crystallise out as pale pink to violet fibrous masses. The full chemical formula being  $\text{Fe}(\text{SO}_4)_3 \cdot 7\text{H}_2\text{O}$ . If it does not crystallise out and the pH is low (at about 1.5, very acid), a further reaction then takes place with this sulphate.

(3)  $\text{Fe}_2(\text{SO}_4)_3 + 4\text{H}_2\text{O}$  (Kornelite reacts with water and produces)



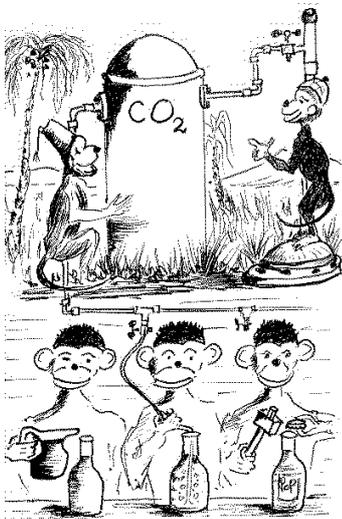
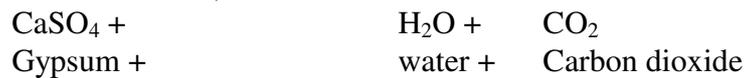
Once the process reaches this stage, the goethite is stable but the sulphuric acid is free and can continue on to a further process. This is the second possible source of the sulphuric acid.

The high levels of sulphuric acid produced by process (1) and (3) can, in the absence of calcite or calcareous rocks, cause the pH to fall to 1 or less (very, very, acid). That is why the water from many mines dissolved iron rails and miners boots so readily and caused major problems for all concerned.

We now have an indication as to where the sulphuric acid could have come from, by a number of natural mineral reactions. The next stage:

If the ore body or adjacent or underlying strata contain Calcite or pieces of calcareous rocks, these will tend to neutralize the sulphuric acid released by the oxidising pyrite, as follows;

$\text{H}_2\text{SO}_4 + \text{CaCO}_3$  (Sulphuric acid + calcium carbonate)



The carbon dioxide is heavier than air and is probably exhaled because of the sheer volume of gas produced. This is then forced through the strata and exhaled into the open air and is tapped. (Carbon dioxide was called "heavy damp" by old miners)

It is quite staggering that nature can produce sulphuric acid so easily, way underground and without the help of a single Health & Safety officer, complete with a face mask, glass bottle and pot of yellow paint.

We now have the Carbon Dioxide, which is then used for the mineral drinks. All very neat and simple once you know how. Even the Chimps in the jungle could do it.

As we have now seen, sulphuric acid reacts with limestone to produce not only carbon dioxide, but also gypsum. According to a "Tomorrows World" programme, transmitted over a year ago, the Dutch were about to conduct a large scale experiment to create land for a new airport.

Instead of building a dyke and then pumping the enclosed water out, which is their traditional method of reclaiming land, they intend to try to lift the sea bed.

Sulphuric acid will be pumped down into a limestone strata below the sea bed to create gypsum. This gypsum will have a volume which will be greater than the original limestone, and this will raise the sea floor and help to create new land. The programme did not explain the chemistry of the reaction, nor did it mention the large amount of carbon dioxide that would be produced. The programme has not, to my knowledge, followed up on this subject.

A possible explanation of what they hoped to achieve, lies in the relative atomic mass of the two elements. Limestone, has an atomic mass of  $40 + 12 + 3 \times 16 = 100$ .

Gypsum has an atomic mass of  $40 + 32 + 4 \times 16 = 136$ , to which must be added the water in crystallization. The full chemical formula being  $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ , which adds 36, giving a relative atomic mass of 172.

Trevor's comment about this was, " I hope they know what they are doing. Gypsum's much more water soluble than Calcium Carbonate & it may dissolve out again!" Perhaps that is why we have heard no more about it.

To digress for a moment and look at copper itself. Copper is a widely distributed and abundant element. It has a specific gravity of about 8.9, which is quite heavy, melts about 1100 C and is not very soluble in water. Its name is derived from CYPRUS (CYPRIUM), where it was mined. This was corrupted to CUPRUM to give the symbol Cu, and we took the name copper. The name cuprum did however carry forward as cuprite. The main mineral family is as follows:

			(%Cu)	
OXIDES	$\text{Cu}_2\text{O}$	Cuprite	89	Red
SULPHIDE	$\text{CuFeS}_2$	Chalcopyrite	35	Brass
	$\text{Cu}_2\text{S}$	Chalcocite	80	Grey
	$\text{CuS}$	Covellite	66	Blue
	$\text{Cu}_5\text{FeS}_4$	Bornite	62	Reddish
SULPHATE	$\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$	Chalcanthite	25	Blue
CARBONATES	$\text{CuCO}_3 \cdot \text{Cu}(\text{OH})$	Malachite	57	Green
	$\text{CuCO}_3 \cdot \text{Cu}(\text{OH})$	Azurite	55	Blue
SILICATES	$\text{CuSiO}_3 \cdot 2\text{H}_2\text{O}$	Chrysocolla	36	Blue
	$\text{H}_2\text{CuSiO}_4$	Dioptase	40	Green
CHLORIDES	$\text{CuCl}_2 \cdot 3\text{Cu}(\text{OH})$	Atacamite	59	Green

In addition there are the Grey Coppers, formed by a mixture of copper, iron, antimony, lead and arsenic. Chiefly - tetrahedrite, tennantite, famatinite and enargite.

Two interesting by-products of copper are Bronze and Brass. The former gave the name to the bronze age, and is mainly a copper/tin alloy. The latter is an alloy of mainly copper/zinc. It is an interesting possibility that the bronze age might have been known as the brass age.

True bronze seems to have appeared between 3000 and 2500 BC, beginning in the Tigris-Euphrates delta. The discovery of the value of tin may have occurred by chance through the use of stannite. A mineral with a name that derives from the Latin for tin, STANNUM, and hence the Sn symbol.

Stannite is a mixed sulphide of copper 29%, iron 13% and tin 28%, with a sulphur content of some 30%. Interestingly, if the sulphur was burnt off, and the iron oxidised, the result would probably be a half-decent bronze bell-metal alloy. Some zinc appears in bronzes dating from the Bronze Age, though this is thought to be an accidental inclusion. The term Brass was the ancients name for what we now call bronze.

True brass was produced by the Romans as early as 200BC. They placed zinc oxide mixed with charcoal in a crucible and covered it with lumps of metallic copper. The zinc oxide was reduced in the lower part of the crucible. Zinc vapour was formed and that vapour dissolved directly into the copper, without the visible appearance of the zinc, to form brass.

As the vapour was produced at 907 C, before the main melt at over 1000 C, this remained as a piece of alchemist magic, which was not understood until more recent times. The ancients were not able to identify zinc as a mineral but must have worked out the ore mix needed to perform the magic of brass by trial and error.

It is interesting to note that Copper was being used in the casting of objects in the Near East in the period 5000-3000BC, during the so called stone age. This seems to have been achieved in closed kilns and arsenic and antimony were being added to improve the finished copper.

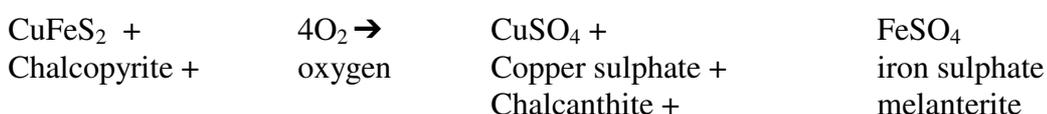
There is an article in the National Geographic in the April 1999 issue, which talks about the thousand year Copper Age - the Chalcolithic Period - and the craft of metalwork. Some orthodox archaeologists do not accept the definition "copper age" or the Period name.

However, excavations on the west side of the Dead Sea discovered 429 cast copper objects wrapped in a reed mat. They are dated to about 3500 BC and the work is of unexpected artistry. The casting required technical finesse and the use of copper ore rich in arsenic or antimony - elements not found in nature at the Dead Sea site. The ore was thought to have come from Dana, in what is now Jordan, and would have taken some 10/15 days to complete. These objects would seem to indicate that a long period of time would have had to pass, before they were able to cast objects to this perfection by 3500BC.

All this activity predated the Bronze Age, which it led into. The knowledge of smelting was therefore well established in the Copper Age in the Near East. It is possible to speculate that this knowledge of smelting was the source of the Bronze Age in the Tigris-Euphrates area at about 3000 BC, when they might have used stannite as a copper ore and ended up with bronze. Which is an interesting thought.

Chalcopyrite is one of the principal commercial sources of Copper. It is a sulphide of Copper and Iron and has a copper content of some 34.5%

It reacts to oxidation from dissolved oxygen in percolating rain water by forming two sulphates as follows:



Chalcanthite is soluble in water.

Copper is very insoluble but, when converted to copper sulphate, chalcanthite, it can become transportable. This shows how easy it is for nature to move metals which are dissolved and carried downwards in percolating water.

This is mentioned at this point as it comes up again later. The foundation needs to be established to understand the reactions that take place subsequently. The metal is converted to a liquid in a natural reaction and is then moveable.

*(To be continued in Issue 58.)*

## **WANLOCKHEAD LEAD MINING MUSEUM**

**Roy Starkey**

We have recently learned that the Museum of Lead Mining at Wanlockhead, after 25 years in existence, is facing the bleak prospect of closure if no new source of funding can be found to pay staff salaries, heating bills and essential maintenance.

The Museum has received very good support from Dumfries and Galloway Council, but they have great pressure placed upon their budgets. So far the Museum has received £35,000 this year, but to function adequately almost double that amount is needed.

The Museum is the only Lead Mining Museum in Scotland and one of a small number in the UK. It is unique in being one of the best documented small communities in Europe and this gives a very good picture of how the miners and their families lived. It is well known nationally and internationally for the records available on Education, Religion, Engineering, Geology and Social History. In 2002 the International Mineralogical Association is visiting Wanlockhead.

The Trust and Museum is part of the Education and Life Long learning system providing project facilities for schools, teachers, members of the public, various Societies and students researching their heritage. It would be a tragedy if the Museum had to close and the support given to the many people like this at home and from abroad had to be withdrawn.

Historically, the preservation of heritage has fallen to charitable trusts, but it would make more sense if funding and the preservation of industrial heritage were shared by a partnership of charitable trusts, regional and national government. Therefore, the Trust feels that the Scottish Executive have a responsibility for all Culture and Heritage including Museums like Wanlockhead.

The Board of Trustees would greatly appreciate your support in lobbying the Deputy Minister for financial support - either as an individual or on behalf of any organisation or Society of which you are a member.

It is suggested that interested members might wish to express their views by writing to:

*Ms. Rhona Brankin, MSP, Deputy Minister for Culture and Sport, Scottish Executive, Victoria Quay, Edinburgh. EH6 6QQ. FAX: 0131 244 7715.*



## **GEOLOGICAL DISCOVERY ON THE CALDBECK FELLS**

**Mike Leppington**

With the compliments of the Lake District National Park Authority came an invitation to attend a day of Geological Discovery on the Caldbeck Fells with Brian Young. I decided it would be a good idea to see what was on offer so sent of my £5 registration fee and when the day arrived duly presented myself at the required hour.

The venue was the Blencathra Field Centre and there were about twenty attendees of whom probably half were volunteer wardens or employees of the LDNPA. After coffee and biscuits an introduction was given first by the Educational Safety Officer and then secondly by Colin Eastham, the Ranger for the area, who, before introducing Brian Young, gave the background to the permit policies introduced by the LDNPA for collecting minerals on the Caldbeck Commons.

Brian gave a very interesting talk covering the geology, mining history and mineralisation of the area whilst showing slides both of locations on the fells and of minerals from the area.

We then transferred from the Blencathra Field Centre to Carrock Mine where, after a picnic lunch, Brian pointed out various geological features and gave a brief history of Carrock before proceeding up to the mine to look for minerals. Unfortunately, as the weather was typically Cumbrian, this was not an easy matter although, as the bulk of the party were not mineral collectors, the lack of mineral finds did not matter too much.

It was then back to the field centre for tea and cakes and an informal chat about the day and mineral matters in general before wending one's way home.

In general I found the day most interesting and sociable and would recommend BMS members to take advantage of any future events that may be organised.

## **CALDBECK FELLS - LETTERS FROM MEMBERS AND PERMIT APPLICATIONS**

The editor received two letters - both containing much in the way of personal reminiscences of days spent collecting in the Caldbeck Fells. It is not possible to reproduce them both in full. One member writes that, by collecting a few pieces during family picnics in days past, he now feels that he is being accused of damaging our national geological heritage. He sees the amateur collector who simply derives enjoyment and satisfaction from harmless collecting and micromounting as "collateral damage" in the offensive against more predatory collecting. While thanking those responsible for negotiating successfully to reach the present compromise, he feels that the research requirement is far too onerous and will deter the ordinary collector. Copies of both letters have been passed to the Chairman.

By the time you read this the deadline will be upon us for applications for 2001. The editor is aware that successful applications were indeed made for the year 2000 by ordinary members of the Society. They will surely be happy to advise and assist others to make their own applications.

**BMS Northern Group Meetings**  
**Mick Wolfe**

Meetings of this BMS local group will, in future, be at a new venue in Bawtry. It is only about 5 minutes drive from the old venue. The reasons for the change are twofold - the old venue was becoming restricted as the library introduced more and more computers. Additionally, before every meeting, there had to be a major reorganisation of tables and chairs which had to be returned after the meeting.

Anyone requiring further directions should give Jean Spence a ring on 01302 710244.

**PENBERTHY CROFT MINE**  
**John Betterton**

Interested collectors will be pleased to know that Penberthy Croft Mine has now reached 21st Century status via the internet with a regularly updated web site which includes a list of minerals and references from the famous Cornish locality. This also contains brief details on geology, mineralisation and ownership information. The site can be found at:

**<http://www.mineralman.f9.co.uk/mines/pencroft/pencroft.htm>**

**AN INTERNATIONAL NOTE**  
**Mike Dannatt**

When I purchased a copy of Quintin Wight's book "The Complete Book of Micromounting", I little imagined that, a few months later, I would be privileged to be invited to his home in Ottawa to spend a microscope evening with fellow collectors!

## New and re-joining members

Mark Bosanko	Rosevean, 3 Bonecellar Row, Tresillian, Cornwall, TR2 4BL	01872 520321
Andrew Coster	39 Crescent Road, Billericay, Essex, CM12 0JQ	01277 623503
R J Eslick	5 Bell Lane, Lanner, Redruth, Cornwall, TR16 6AR	0771 913 9617
Robin Selley	23 St Day Road, Redruth, Cornwall, TR15 2ET	0771 913 9617

## Changes of address, telephone or e-mail details:

Member	New or corrected details.
Richard Bell	E-mail: richardbell_rockhound@bigfoot.com
Harry Foy	Telephone: 028 9079 5117
Ron Gibbons	Postcode: DY1 3UB
Jane Randle	Telephone: 01865 880606

### NEWSLETTER EDITOR

Mike Dannatt

Ashcroft, Smalldale, Bradwell, Hope Valley, Derbyshire, S33 9JQ

Tel: 01433 621801

E-mail: the.dannatts@care4free.net

The deadline for articles for Newsletter 58 will be 1<sup>st</sup> February 2001. Please let me have contributions as soon as possible. Articles or reports on PC disc are particularly welcome. Articles sent by E-mail can either be "attached" or part of the body of the E-mail message. Clearly printed documents are acceptable and can be scanned and read into the PC.