

BRITISH MICROMOUNT SOCIETY



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EDITORIAL

Microbe Mounting.....The Little Bugs Beat Us to it!

I was amused to read in a recent *Daily Telegraph* article (kindly supplied by Mike Rothwell), that scientists in the US Geological Survey have found good evidence that gold nuggets found in Alaska arise through the efforts of bacteria. It seems that a bacterium by the name of *Pedomicrobium sp.* absorbs dissolved gold and then converts it to the metal. It seems to me that this proves that microbe-mounting has been a hobby for an awful lot longer than we thought!

On a slightly more serious note, I'd like to thank everybody who's contributed to this Newsletter. There are a couple of "controversial" contributions, and nothing would please me more than to receive a couple of written opinions or ripostes with which to stir the pot in the next edition.

AN UPDATE ON ZEOLITES

Alan Dyer

1. What is a Zeolite?

Classically zeolites are aluminosilicate minerals whose structures are based on tetrahedral building blocks joined at each corner to give a three dimensional molecular structure. This produces a "sponge-like" framework with water and metal ions (sodium, calcium, barium etc) in the holes and channels of the sponge. Zeolites can be made synthetically on a laboratory or commercial scale and these synthetic minerals are of extreme industrial importance (e.g. as catalysts used in the production of petrol and other fuels; as water softeners in washing powders and liquids; for gas separation processes such as natural gas purification and the production of oxygen from air, and as desiccants).

There is accordingly a huge research effort in zeolites and there are approximately 100 scientific publications appearing each week describing their synthesis and properties.

2. Zeolite Occurrences

Originally, zeolites were thought to be formed only under conditions of basaltic volcanism which produced most of the prized specimens collected today. Now it is known that zeolites are readily created in soils and in saline lakes as well as in marine sediments. These are powdery minerals, but in some locations are present in high purity and in megatonne quantities. This new mineral resource is finding use in the treatment of waste water and nuclear waste, as well as in animal feeds and soil supplements.

Zeolites also form under geothermal (geyser) activity and in hydrothermal ore deposits. Zeolites from "geoautoclaves" and of magmatic origin have also been reported.

3. Zeotypes etc.

The synthetic materials made to date also include "zeotypes" which often have the same framework as known aluminosilicate zeolites but have other elements in the tetrahedral building blocks. Common elements which can be incorporated include phosphorus, boron, cobalt, titanium and gallium. In fact the latest bible of zeolites (*Zeolites, Vol.12, No.5*), published in 1992, includes many zeotypes and some structures close to zeolites but which have incomplete frameworks (e.g. roggianite and partheite). It also lists some forms of silica which are crystalline and contain sponge-like holes, analogous to the natural silica polymorph melanophlogite. To complete the confusion it also lists many feldspathoid minerals because their cage structures often are the same as the cavities in zeolites, i.e. the holes in the "sponge".

The arbiter of this bible is the Structure Commission of the International Zeolite Association which works with the blessing of the International Union of Pure and Applied Chemistry (IUPAC) and the International Mineralogical Association (IMA). It is interesting to note that there are now several zeolites which have been identified as natural species only after they have been prepared in the laboratory. These are mazzite (synthetic analogue ZSM-4), perlielite (synthetic zeolite L) and tschernichite (synthetic zeolite beta). Similarly, synthetic zeolite rho has the same framework as pahasapaite, a natural beryllophosphate.

Several natural minerals are thought to have the analcime framework, but with framework atoms other than just aluminium and silicon. For example, viseite is a natural silico-alumino phosphate (SAPO) and hsianghualite is another beryllosilicate. Kehoite, thought to be an aluminophosphate (AIPO) adopting the analcime structure, has recently been discredited. Two beryllosilicates, chiavennite and lovdarite have unique "zeotype" structures.

4. Anomalies

The listing in *Zeolites, Vol. 12 (op.cit)* also highlights some discrepancies - yet to be resolved. The minerals stilbite, stellerite and barrerite have identical frameworks and differ only in their metal content. Stilbite contains sodium and calcium, whereas stellerite has only calcium and barrerite contains sodium alone. Stilbite and stellerite are recognised minerals but barrerite has been discredited.

Similarly, herschelite, the sodium rich form of chabazite is no longer recognised, but the potassium rich form willhendersonite is. In contrast four minerals are recognised with the gismondine framework - gismondine (Ca) itself, amicitite (Na,K), garronite (Na,Ca) and gobbinsite (Na). Similarly, four other minerals share the natrolite structure - natrolite (Na) itself, mesolite (Na,Ca), scolecite (Ca) and gonnardite (Na,Ca).

This looks to be a clear indication that barrerite and herschelite should be reinstated.

5. New Zeolites

A mineral found in vesicles in scoria from Pollena, Monte Somma, Vesuvius in Italy has been recognised as a new zeolite species and given the name "montesommaite". It was originally thought to be related to merlinoite and gismondine but it is now known to be a unique structure.

Cowlesite still has not been confirmed as a zeolite.

6. Zeolite Localities in the UK

Some of the more recent finds include phillipsite at Oisgill Bay (Neil Hubbard) and offretite at Floddigarra (Isabel Geldart), both on Skye, and stellerite at Todhead near Stonehaven (Alan Dyer and Oneta Wilson). All of these are thought to be "first time finds" in Scotland. New locations for zeolites include heulandite (Neil Hubbard and Roy Starkey) near Gargunnoch, Stirling; mordenite at the same location and at Todhead (Alan Dyer and Oneta Wilson). Various zeolites (analcime, natrolite and stilbite) have been found on the Isles of Isla (near Kildalton Cross), Colonsay (on the beach near Colonsay House) and Jura (on the path to the headland overlooking Scarbra) - found by Craig Williams and Jill Smethurst with Alan Dyer and Oneta Wilson. Samples have been collected from sites named in old reports such as heulandite from Sands Geo (Hoy, Orkneys), and less convincingly on Shetland. But visits to these locations are recommended more for the scenery than for good zeolites.

(This is the transcript of Alan's paper delivered at the eleventh BMS Symposium at Leicester University in September 1992.)

JUST A MATTER OF CONTROVERSY

Kemp Meikle

During a recent conversation with a fellow member - who, I believe, may have been called Max but who shall otherwise remain nameless - I was subjected to some pressure to contribute to the Newsletter, and one of his injunctions was: "make it as controversial as you can to induce other members to contribute a response." Well, that seemed to me a pretty tall order, for we all know how little controversy there is in mineralogical matters. (Witness all those so-positive identifications we all make on our field trips.) We don't invite or encourage much controversy then, do we? However, after some reflection, it occurred to me that the quarry alongside the A74 near Beattock is pretty controversial.

Take for example the name: I say COATESGATE, but perhaps you would say COATSGATE. I know that the owners, Kings & Co., Tarmac Ltd., use the latter, but then the transport cafe across the road uses the former style and has done so for much longer. Also, the 1965 revision of the Ordnance Survey map shows that Coates Hill is the one being quarried, while two roadside buildings which then existed are labelled Coatsgate. So there, from all that controversy you can take your pick, and of course we know, don't we, that we can each name our own property *Chez Nous* or whatever, as we choose. So why shouldn't the quarry owners adopt the name they do? It's a new sign and they're unlikely to change it now anyway, even if it is proved wrong. I suppose that in any event, we'd have to consult title deeds if we wished to pursue the matter further!

Other aspects of the quarry in question are also controversial, and much more related to our mineralogical inclinations. For example, I collected both chabazite and gmelinite amongst other species there. But there could be a suggestion that the gmelinite is in fact the phacolite variety of chabazite, as a comparison with that from Dean Quarry (on the Lizard), or indeed, reference to Rudy Tschernik's *Zeolites of the World* might tend to show. [*Further notes on the gmelinite/chabazite controversy are given in the following article - Ed.*]

Another and perhaps more controversial matter concerns the garnet from this locality - and not simply whether it is andradite, spessartine or grossular - but what is the composition of the needle-like inclusions which are so abundant in some of the (?) andradite? Could this be an amphibole, similar to the free-standing, elongated, greenish, transparent needles and fibrous masses which, at the outset, were mistaken for mesolite, but which SEM and XRD analysis in fact confirmed as an amphibole? Pursuing this matter has proved difficult but the proposition is that these needle inclusions may in fact be pyroxene, following optical and EDX examination of the garnets, some of which were "thin-sectioned" to expose the needles and latterly, further reduced in thickness using an old but clever technique to facilitate optical determination. Neither of these exercises has reached a definitive conclusion so far, but this question has been, and continues to be, an engrossing sequel to the act of collecting the specimens.

There are, of course, other controversial aspects of the mineralisation at Coatesgate, related to similarities perhaps, with the mineralisation at Loanhead Quarry, where the dyke is of similar age and composition, but intrudes lavas as opposed to greywacke at Beattock. I'm sure that other members must have some interesting - perhaps even controversial - observations to make on this subject.

Yet another controversial subject that springs to mind relates to acanthite growths on native silver found at Boyleston Quarry, then again at Hartfield Moss and at Loanhead Quarry. But that is another story and dealt with in some detail in another place. However, allied to this issue is the question of why similar growths appear on specimens from Red Gill, Caldbeck, or indeed on selected mounts of manufactured silver wire from some of our Reference Collection specimens. So now, hopefully, I'm handing this controversial matter back to you Max!

BRITISH MICRO LOCALITIES

No. 20: SOUTH NANTYCAR, RHAYADER, POWYS WALES

Steve Rust

The South Nantycar mine (SN 885.608) is located 22 km south west of Rhayader on the north side of the Rhiwnant stream. Permission to visit must be obtained from the farmer, after which the mine can be reached by a 2.5 km walk from the parking area. The lower dumps contain mainly primary minerals, while the dumps around the higher adit (in sandstone) contain many supergene specimens. The mine was opened in 1852 to develop the southern continuation of a north-south vein system in a mudstone and sandstone sequence of Ordo-Silurian age. The mine is located on the southern limb of an anticline. It was worked intermittently for 31 years for copper, lead and zinc ores.

The following minerals have been found:

Anglesite occurs as typical colourless bladed crystals to 1mm. It has also been found in the (lower) dumps of primary material as blocky rhombic crystals to 2mm.

Aragonite is rare at this locality, but forms colourless but opaque hexagonal prisms to 10mm. It occurs as single crystals and as divergent crystal groups in brown masses of altered ferroan dolomite.

Aurichalcite is found as white to light blue-green laths intergrown with malachite. It also occurs as masses of lath-like crystals in ferroan dolomite which has been extensively altered to iron oxides.

Azurite is a rare associate of malachite in quartz-hosted cavities, where it occurs as dark inky-blue masses to 5mm.

Brochantite occurs as thin drusy emerald-green crusts with linarite.

Caledonite is found as very rare pustules and tiny light-blue green prismatic crystals with a leadhillite-like species and another unidentified mineral.

Cerussite occurs in a number of habits from acicular to tabular and in crystals to >2mm.

Chalcopyrite forms bright sphenoidal crystals in a vughy quartz veinstone. Crystals to 4mm are not uncommon.

Covellite occurs as a dark iridescent coating on chalcopyrite.

Dolomite (Fe-rich) is occasionally found as brown (altered) rhombs to 20mm lining cavities.

Galena is a common primary ore mineral.

Hemimorphite occurs rarely as thin colourless or white drusy crusts to 1 or 2 mm in thickness.

Hydrocerussite only occurs as thin, pearly platings on highly corroded masses of galena.

Hydrozincite occurs as scattered small white botryoids in altered ferroan dolomite. The mineral is identified by its characteristic blue fluorescence in ultra violet light.

Linarite is quite rare, and occurs as scattered blue bladed crystals.

Malachite is fairly common, occurring as spherules to 5mm in diameter and occasionally as thin botryoidal crusts. It also occurs as compact radial crystal masses to 8mm and in bow-tie like crystal sheaves. Rare examples of malachite apparently replacing octahedral galena have also been found.

Quartz is a common gangue mineral.

Sphalerite is a common primary ore mineral.

Pyromorphite occurs as white to pale green rounded drusy crusts. It also occurs as yellow-green drusy crusts composed of prismatic crystals to 1mm. Occasionally it is found in association with wulfenite, where the scattered pyromorphite crystals rarely show a subtle orange colour.

Wulfenite is sparsely distributed as blocky, platy or bi-pyramidal crystals to 1mm, scattered on pyromorphite and quartz. The colour ranges from orange to yellow.

Unidentified minerals:

Three minerals have not yet been identified: The first (#1) occurs as tabular "hexagonal" crystal aggregates to a few mm with caldonite, hydrocerussite and unknown #2. The second unidentified mineral (#2) is a white to colourless species which occurs very rarely. It forms very thin, divergent and dendritic aggregates of lath-like crystals to 0.6mm. It resembles lanarkite, but a recent x-ray diffraction analysis at the BM (Natural History) could not be matched to any known species. The third (#3) occurs as light to royal blue bladed crystals with hydrocerussite, lining a small cavity in quartz. Only a single specimen has been found.

A ZEOLITE FROM DEAN QUARRY - GMEINITE OR CHABAZITE?

Isabel Geldart

In October last year I visited Dean Quarry (SW 803.204) on the Lizard, with a group of collectors staying with Sheila and Steve at the Chichester Guest House. Sheila asked me if I was familiar with phacolite; I knew it was a variety of Chabazite as I had previously collected specimens from Craighuliar Quarry in Northern Ireland. We collected "phacolite" at Dean Quarry and I was very pleased with the specimens - like tiny flying saucers as Sheila described them.

Then I read that gmelinite from Dean Quarry has been donated to the BMS reference collection by Kemp Meikle (specimen no. BMS 1232; see Newsletter 33). I had not heard of gmelinite from Dean Quarry before, so I was keen to look at the specimens in the BMS collection. From the last Newsletter they sounded very like the specimens we had been finding. I borrowed them and, sure enough, they are the same.

Gmelinite is a very rare mineral in the British Isles, although it has been reported from Talisker Bay on the east coast of Northern Ireland. Alan Dyer has also collected gmelinite from Talisker Bay. Gmelinite crystals are typically very smooth in appearance and have flat terminations. Phacolite crystals, on the other hand, are uneven or rough in appearance because of numerous re-entrant faces, and they have rounded terminations. On the Dean Quarry specimens the re-entrant faces can be seen quite clearly.

Therefore, I think that the specimen in the BMS reference collection is in fact phacolite, a variety of chabazite and not gmelinite as originally suggested.

ETTRINGITE FROM TRESAVEAN MINE, LANNER, CORNWALL

Paul and Peter Wallace

Ettringite ($\text{Ca}_6\text{Al}_2(\text{SO}_4)_3(\text{OH})_{12} \cdot 26\text{H}_2\text{O}$) was found in October 1991 at Tresavean Mine, near Lanner in Cornwall. It occurs in vesicle-like cavities in a "breccia" matrix, as snow-white acicular crystals with a pearly to silky lustre. In some instances the cavities are completely filled with matted, hair-like crystals, while other specimens have much longer hexagonal prismatic crystals with a glassy lustre. Some of the prismatic crystals have bichroic terminations. The material was collected adjacent to the old engine house at Tresavean. Ettringite was confirmed by x-ray diffraction (XRD) at the Natural History Museum in London (reference number 8840F).

The "breccia" in which the ettringite occurs is most unusual. The clasts include pieces of massive quartz, chalcocopyrite, fluorite, a possible mica, and a material which resembles thin laths of wood, all set in a light grey to white groundmass. The whole very much resembles a concrete. An alternative to the "concrete theory" is that this matrix could be a decomposing granite, and that the fibrous wood-like clasts are relict tourmaline. We very much hope that further work can be done on the specimens at the Natural History Museum in order to determine the origin of the matrix.

(A version of this article has also been submitted to the Russell Society - South West Branch)

THE JOHANNESBURG AND PRETORIA MINERAL MUSEUMS

Malcolm Southwood

A few spare hours on a recent business trip enabled me to visit, or rather to revisit, South Africa's two principal mineral museums. The Johannesburg Geological Museum is located on an upper floor of the city's main public library. When I first moved to South Africa the museum was without a curator and the displays were in need of attention. It was therefore heartening to see a number of improvements; presumably due to the appointment of a full time curator since the mid 1980s, when the post was taken by Mr Joe Irish. He has recently been succeeded by Mr Patrick Bender who, unfortunately, was unavailable at the time of my visit.

The mineral display occupies a single gallery which also contains a number of general geological exhibits. However, by far the majority of the available space is devoted to minerals. The specimens are, for the most part, displayed in flat-topped, poorly lit Victorian-style cases, supplemented by a few modern cabinets with fluorescent lighting. An impressive array of native gold specimens (recently featured and photographed in the *Mineralogical Record* - Vol.23, Number 3) welcomes the visitor immediately inside the door. Personally, I'm not particularly fond of gold as a mineral species but this display is quite awesome if only on account of the intrinsic value of the material. Much more to my liking, is the fine collection of Tsumeb minerals which occupies seven cabinets arranged along the right-hand side of the room.

A single modern cabinet contains good examples of the minerals for which Tsumeb is most famous. A 15cm group of blocky lustrous azurite crystals to 1.5cm on matrix; a 25 x 15cm jackstraw cerussite, with individual crystals to 6cm set on a contrasting, dark grey sulphide-rich matrix; a honey-coloured wulfenite group, 30cm across, and a large cobaltian smithsonite all remain firmly in my mind. The remaining six flat-topped cabinets are devoted to particular minerals or groups of minerals. My favourite of these is undoubtedly the cabinet of calcites: maybe 15 calcites are included, none of them less than 15cm across and all are showy and undamaged. Notably, no two of these specimens are remotely alike - from the blood-red angel wing group to the green cuprian calcites, the white, nailhead variety and the group of clear iceland spar crystals on a matrix of olivenite.

The rank of Tsumeb cabinets continues with cases devoted to other well-known localities in Southern Africa. I was disappointed with most of these, and in particular with the cabinets containing minerals from Shaba (Zaire) and Broken Hill (Zambia). Of rather better quality is the Ernest M.Skea collection of minerals from the Pilgrims Rest district of the Transvaal. This historically important gold mining district yielded fine specimens of epidote on orthoclase in its hey-day, and a good example resides in the Ernest Skea collection.

The centre of the room is devoted to the systematic collection. This is an interesting display, although one which is sorely in need of curatorial attention. I was surprised to find that British minerals are very poorly represented - a few small and disappointing fluorites identified as "probably from Castleton, Derbyshire", and really very little else. (I remember from the early 1980s a fine group of Cornish chalcocite crystals (from Geevor I think), but for some reason this is no longer on display.) My favourite specimens in the systematic

display have to be the beautiful (though not exceptional) groups of wolframite and arsenopyrite from Panasqueira; a small but delightful group of the gemmy rhodochrosite scalenohedra from the N'Chwaning I mine in South Africa's Kalahari Manganese Field, and an 8cm group of crocoite crystals from Dundas, Tasmania - one of the nicest I've seen.

A final highlight of the mineral collection is a case containing 15 specimens of descloizite from the famous Berg Aukas mine in northern Namibia. As with the Tsumeb calcites, this display demonstrates the wide variety of colour and habit exhibited by this rather less common species.

A sad and all-too-familiar parting comment is that it is difficult to find any specimens in the display with post 1980 accession numbers. Lack of funding has meant that the museum has missed out almost completely on the significant South African mineral discoveries of the past decade.

Moving on to Pretoria, the Museum of the Geological Survey is an entirely different kettle of fish. It occupies a large multi-chambered gallery of the Transvaal Museum in Paul Kruger Street. The curator is Roger Dixon, an old friend of mine from the South African Micromount Society. He is a fanatical mineralogist and he has made vast improvements to the display since my last visit in 1986. Once again the museum covers all aspects of geology, but as in Johannesburg, minerals are afforded a very high priority. The displays in Pretoria are spacious and modern and to my pleasant surprise, British minerals are relatively well represented. My favourite is a very good specimen of linarite from Red Gill - 10 x 10cm and with a diagonal gash filled with gemmy crystals to 5mm. Roger told me that the Geological Survey acquired its "British Collection" in 1896, and that much of it remains in storage - pieces that I was unable to see apparently include a spectacular Herodsfoot bournonite.

Once again, the Pretoria museum has a reasonable display of Tsumeb material, although it comprises rather fewer specimens than the Johannesburg collection. The highlight has to be a 20cm tall, water-clear and partially reticulated group of cerussite crystals, although unfortunately the specimen is slightly damaged.

For species collectors, the large though unspectacular group of portlandite ($\text{Ca}(\text{OH})_2$) crystals from the Wessels mine in South Africa's Cape Province is of special interest; this is allegedly the world's first occurrence of crystallised portlandite. Roger is fortunate in that he has an annual budget of R23,000 (about £5,000) for mineral acquisitions. By judicious allocation of funds he has been able to acquire examples of many of the more recent South African discoveries, so that contemporary South African mineralogy is better represented than in Johannesburg.

In summary, both museums have much to interest anyone who is seriously interested in minerals, although frankly, they do not compare with the major mineral museums of Europe and North America. Having said that, I'll certainly be visiting again next time I'm in the country.

SOME INTERESTING ACQUISITIONS FROM THE SYMPOSIUM

Max Wirth

I am fascinated by the variety of minerals present in the glacial erratics of Thurstaston Beach, Wirral, Merseyside. Many of these have been described by Mike Rothwell and John Dickinson (*UK Journal of Mines and Minerals, No.6, pp.38-43*).

I selected a handful of Thurstaston specimens from the grab table at the Leicester Symposium and have looked at two of the minor minerals in some detail.

First, there are numerous slender needle-like crystals, most of which are presumably amphiboles - they are flat, bladed, and faintly green. Others are colourless, however, and have a hexagonal section - although this is difficult to see because they are so fine. These appear to be apatite. They are soluble in HCl and adding sulphuric acid to the resulting solution demonstrates the presence of calcium with the formation of little stars of calcium sulphate. Furthermore, the optical properties indicate apatite; the crystals have a higher refractive index than the zeolites and they are length-fast. This is indeed an interesting habit for apatite!

I also found some little dogtooth crystals which effervesce with acid. The optical properties point to aragonite rather than calcite as there is no good cleavage and they are biaxial. Exceptionally, calcite can be biaxial, but the lack of cleavage seems to rule it out in this case. Aragonite, the less-stable form of calcium carbonate, forms from solutions at temperatures below 90°C.

Somewhere in the laboratory at Leicester I picked up a packet labelled "Wheal Jewel; £1", and another labelled "Gunheath Pit". I have no idea who offered these but if it was you, please let me know so that we can communicate.

To be honest, I was not expecting much in the Wheal Jewel parcel, but this is an old locality and we have no specimens in the reference collection from there. Actually, I found a number of interesting things. There is a lot of cassiterite in quartz matrix, but also some very clean tetragonal crystals with a smoky quartz appearance. A mica, presumably muscovite, is mostly in matrix, but there are also some good free-standing books. Associated with the cassiterite I found excellent olivenite as coarse (0.5mm) free-standing crystals with the typical habit (see an intelligent textbook). There were also beds of randomly orientated olivenite needles, and little brushes reminiscent of gadolite.

Dark green spherules are I believe, cornwallite - either clean on quartz or in a bed of chrysocollo. They are certainly arsenates because a nitric acid solution treated with a crystal of silver nitrate precipitates dark red crystals of silver arsenate. The phosphate, pseudomalachite, would give the yellow silver phosphate. For me, these two minerals are not distinguishable from their optical properties.

There are a few prisms of pale yellow mimetite. I say mimetite because all these supergene minerals seem to be arsenates. Then most surprising of all, I found several blades and books of metatorbernite. At first I thought these must have come from another site, but

their association with the cassiterite suggests that they probably are from the same place. On another piece I found deep blue rosettes of needles which I think may be connellite. These are associated with similar dark green rosettes - presumably brochantite. Both are sulphates. Finally from Wheal Jewel, a buff-coloured group of earthy crystals with the habit of hematite or barite clusters. This is no doubt a pseudomorph of something after something (a pretty safe bet!).

The Gunheath Pit bag also provided some nice specimens such as well crystallised turquoise, already represented in our collection. Cacoenite is usually found as dense, yellow sprays of needles, but here I found smooth, waxy hemispheres, dark brown and translucent. When broken open the radiating needle structure is apparent - an interesting habit.

Looking at my own specimens, I found that some Gunheath Pit ones are missing from the BMS collection. Richard Bell or Roy Starkey or Peter Braithwaite might be able to spare a good topaz, a cassiterite, a pseudomalachite and an apatite from this site. Any other offers?

SHARING OUR KNOWLEDGE AND EXPERIENCE

John Pearce

Following up one of the ideas I started in the last Newsletter, there are two specific ways in which I think we might pool our ideas and experiences:

1. Production of Visual Identification Kits

I envisage sets of about 12 micromounts robustly mounted in boxes. One set might contain the 12 most common zinc minerals, another zeolites or minerals from Gunheath China Clay Pit. In each case there would be notes to describe the minerals in terms of colour, shape, individual characteristics etc., as you see them through the microscope.

Firstly, we need to be sure that there is a need for such kits. If there is, then we might draw on micromounts which already exist in the BMS Reference Collection, or make kits of micromounts from scratch and persuade two or three members to produce some guiding notes.

2. Publication of a series of BMS Short Papers

These might be short booklets providing basic information on a number of topics of interest to micromounters and amateur mineral collectors in general. I wouldn't want to see these become too academic or comprehensive; rather that they should be useful, short, informative, readable and cheap. The exact details of such publications - their length, style, format, approach and cost would obviously need to be debated.

The following titles, which are given as ideas only, are intended to make the concept more concrete:

An Introduction to Micromounts (with an annotated bibliography)
Micromounting Techniques

Microscopes
Photography through the Microscope

Identification Methods for Amateur Mineral Collectors:

- a) *Paper Chromatography*
- b) *Optical Properties of Minerals*
- c) *Wet Chemical Methods*

Minerals are Chemicals
The Chemistry of Secondary Mineral Formation
Mineral Associations

Mineral Shapes

Locating Mineral Sites

The basis for some of the above already exists; in our BMS Symposium proceedings, the BMS Newsletter or in other publications. In some cases, members are working on similar projects at the moment. At this early stage I should find it very helpful if you would:

- a. give me some reactions to the ideas developed above. In particular, do you support either (or both) the production of the kits or the short papers.
- b. consider offering to produce (either individually or in groups) some materials so that we can explore the ideas and some drafts at the 1993 Symposium.

RECENT ADDITIONS (Nos. 1251-1300) TO THE BMS COLLECTION

Max Wirth

Who can resist a good wulfenite? No. 1252, contributed by Phil Jackman, is a really photogenic orange wulfenite with tiny purple fluorites against white barite and an unidentified green material. It came from Winster in Derbyshire. Tim Neall provided eulytite from Buckbarrow Beck (1254), in which the mineral occurs as minute colourless tetrahedra. At the other end of the country, Gravel Hill Mine is most famous for its strunzite, but Kelvin Phillips found whitmoreite (1256), characterised by acute rhombohedral, needle-shaped crystals which become darker towards their terminations.

Mike Leppington gave us a very pretty blue hemimorphite (1257) from Potts Gill, nestling in colourless quartz. Tim Neall donated an interesting barite (1267) with an elongated habit from Cleator Moor. The Leicester Symposium grab table generated specimen number 1271 from Thurstaston Beach; I claim that this is apatite, based on its chemical and optical properties (see Max's article on Symposium acquisitions elsewhere in this Newsletter).

Brian Young sent us a quartz pseudomorph (1273) after beta-quartz (look it up!) from Armboth Dyke in Cumbria. The main crystal is lying on its side and characteristically, there is no sign of prism faces. George Fletcher had a lucky find of vesignieite ($\text{Cu}_3\text{Ba}(\text{VO}_4)_2(\text{OH})_2$) at Bardon Hill. It forms yellow plates on specimen 1276. Some of the associated green material may be volborthite, not to be confused with the malachite which is also present. Roy Starkey found a really peculiar capped calcite (1279) from Strontian, an area renowned for its variety of calcite habits.

Alan Dyer and Oneta Wilson gave us stellerite and mordenite (1289/90) from the Grampian region. Both are rare zeolites in the UK. John Fisher contributed our first specimen of boulangerite (1291) from Tresungers in Cornwall. George Fletcher found beautiful barite and goethite pseudomorphs at Tenter Hill (1292-1295). These are so nice that I entered two of each in the collection.

Finally, Steve Rust who has in the past contributed many interesting specimens has now sent us another 34! Specimen numbers 1296-1299 are all susannites, with most interesting habits such as staggered piles of plates, from Frongoch Mine in Wales. From the same mine comes caledonite (1300). As for the others.....wait for the next instalment.

A NORTHERN GROUP FIELD TRIP REPORT Mick Wolfe

On August 2, 1992, four regulars from the Bircotes group - John Bottomley, Peter Braithwaite, Jean Spence and myself - met on the Meadowfoot Smelter site at Wanlockhead. This site is now partially covered with hardcore and is becoming rather unproductive. However, finds of elyite and chenite were made, especially in the furnace bricks rather than in the usual slag lumps found here.

The following day we visited Loanhead Quarry near Beith (having earlier obtained permission). The morning was spent unproductively on the upper quarry level where we found very little apart from prehnite. The driving rain made it almost impossible to locate rocks containing cavities, let alone mineral specimens. After lunch we tried the lower level of the quarry. The rain had stopped by this time and cavities became much more visible. As well as the usual finds of analcime, garnet, epidote and calcite, there were several large holders containing small cavities with sphene (titanite) inside them. The sphene is of the "cockleshell" form and is pale green in colour. Initially with a hand-lens, I mistook it for more h---y prehnite, but Peter corrected me. It has been found here before and identified by Mike Rothwell using x-ray diffraction. The sphene crystals are on a bed of chlorite (?) which lines the cavities and ranges from dark green to black in colour. Some of the cavities contain as many as six sphene crystals, occasionally associated with flesh-coloured albite. They all make very attractive micros as attenders at the Symposium will agree. Other finds that afternoon included natrolite, native copper in calcite and thomsonite. By 4.30 the rain had begun again in earnest, so we beat a hasty retreat to our base in Sanquar.

Tuesday brought the promise of yet more heavy rain, so we decided to check out the "man-made dumps" and recently renovated tearooms at Wanlockhead before making our way

home. The "man-made dump" is located about 200 yards before the cemetery on the left-hand side of the road which leads from the museum to the smelter site. It has been created I believe, from material from the Glencrieff Mine especially for mineral collectors. It is intended that it will be turned once a year with a JCB, so there is no need to dig big holes in it. An hour here produced a nice cross-section of minerals associated with this area. Once again the promised rain arrived and we retreated to the shelter of the tearooms. These are a vast improvement on the old establishment, with hot and cold food available and ample toilet facilities. The museum has also been vastly improved, with a shop (now stocking the *UK Journal of Mines and Minerals* - thanks to Jean) and a superb selection of local minerals on loan from the National Museum of Scotland.

All in all this was an excellent field trip in spite of the typical British summer weather. Please note that access to Loanhead Quarry is by permission only, which can be obtained from the quarry manager, Mr G. Anderson, on (0505) 52534.

A VISIT TO OXFORD UNIVERSITY MUSEUM: 31/10/92

Mike Rothwell

This visit, which was attended by nine members, was arranged by Roy Starkey and was hosted by Dr Brian Atkins, curator of the Museum and Monica Price, curator of Mineralogy. We were met by Brian and Monica promptly at 11.00am and taken straight for a welcome cup of coffee in the staff common room. After this the party moved upstairs to view the main university collection.

The collection contains over 26,000 specimens all housed in specially built cabinets. Unfortunately, the cabinets are made of oak which is not the best of woods to use. Nevertheless, Brian says there are no plans to throw them out. In addition to the minerals there is also a collection of old labels and crystallographic instruments, so there was more than enough to keep us happy.

Following a good session with the collection, lunch was taken in the "Eagle and Child" or "Bird and Child" as it is known to the locals. A plaque in the pub commemorates J.R.Tolkien who was a regular, as was C.S.Lewis. After lunch we returned to the museum and spent some time admiring the minerals on show in the main galleries, some of which have been donated by BMS members. A cup of tea and another good chat about things mineralogical brought the visit to a close at around 16.15pm. Our thanks to Brian and Monica for giving their time and hosting such a pleasant visit.

BMS DISPLAY TAKES SECOND PLACE IN F.L.A.G.S. COMPETITION

Ken Luff

On November 7, 1992 at University College, London, the Geologist's Association held its annual re-union of members. For some years the Federation of Lapidary and Geological Societies (FLAG), comprising twelve societies, mainly from the south-east, has supported this event. This support has given the societies the chance to provide displays of their work, specimens and contributions to the hobby. Each year a competition is held to find the best

display put on by a FLAGS member society. In the years the BMS has been affiliated to the Federation, Elsie Hansford of her own volition has been contributing a display demonstrating the aims of the BMS. Although a small display, the public has always been interested in the use of the microscope and carousel of minerals, as well as the photographs of micromount specimens.

Last November, Elsie was joined by Austin Lockwood and a display was produced including two microscopes and carousels of micromounts, photographs, and a system of five sets of stereo-paired photographs which could be viewed through optics to produce three dimensional images. The BMS won second prize with this display and an award of £30 which has now been donated to South East Group funds.

The GA reunion for 1993 will be held at the same venue in Gower Street, London on Saturday, November 6, commencing at 12.30 pm approximately. Besides educational displays there are also some selling tables. Put it in your diary and support your society this year; it's a very interesting afternoon!

MINERAL PHOTOGRAPHY GROUP

Mick Cooper

An interesting proposal developed during discussion following my brief *critique* of members' mineral photography at the last BMS Symposium: namely the circulation of a number of specimens to interested members, each of whom would photograph each specimen and send them on to the next person on the list. The resulting pictures (slides only please) would be retained to be shown and discussed at the next Symposium. We hope that this action would stimulate lively debate on photographic techniques and philosophy and be a worthy substitute for the defunct photographic competition which, whatever its shortcomings, was once a popular Symposium event. The specimens need not be micromounts, but should be small (to make packing and postage easier and cheaper) and should require some magnification to be seen at their best. As a start I suggest that anyone interested in joining this group contact me. (John Hall, Nigel Hoppe and myself have already put our names down.) The next step would be for each member of the group to send me a number of specimens, the exact number being dependent on the number of interested parties.

This is intended to be a learning experience - not a show off! So please don't be put off simply because you don't rate your own photographs. Since everyone will be photographing the same pieces and since *all* the photographs must be shown (no high-grading the good ones!), the inevitable mixture of successes and failures will be most informative. It will also afford the opportunity to assess the effects of different lighting styles, film types etc. and possibly help us to arrive at guidelines for best practice.

WARRINGTON BRANCH NEWS

Isabel Geldart

During 1992 members of the Warrington Branch continued to meet on the first and third Tuesdays of every month. We bring along our microscopes and recently collected specimens and we pool our knowledge to try to identify them.

Last spring (1992) quite a few of our members flew to Greece with the Warrington Mineral and Lapidary Society on a week's mineral collecting holiday. The party was led by Dr R.S.W Braithwaite who knows the area well. A minibus was hired to visit various sites and really worthwhile specimens were found by all.

Two members visited mid Wales for a week, working from Llanidloes to Aberystwyth and visiting all mines in between. Some mines were very productive while others produced nothing. The finds from the "good mines" were sufficiently encouraging to persuade others to visit and a few weekends have been spent at Eaglebrook and Frongoch.

Finally, three members spent a week with Sheila and Steve at Chichester Guest House in Newquay. We visited various sites in Cornwall - Wheal Owles, Megilggar Rocks, Gravel Hill mine (where we got lost in the fog on the sand dunes) and Dean Quarry (in pouring rain). In spite of the weather it was an excellent week!

NORTHERN GROUP MEETING REPORT

Mick Wolfe

Some members of the Northern Group have to travel nearly 100 miles to attend our regular meetings at Bircotes library near Doncaster. In the winter months this can be a very long journey, especially for those who have to cross the Pennines. A typical winter meeting was held on November 21, 1992 when, despite heavy rain, a dozen members made the trip successfully. We would have been more, but Malcolm Southwood had the misfortune to break down and spent a miserable afternoon waiting for the AA. The rest of us soon covered the library tables with microscopes, lights, specimens, etc., and spent the next three hours pleasantly (sorry Malcolm!) talking minerals, swapping, getting specimens identified and planning field trips. During the afternoon the buffet, laid on by Jean Spence, was of the usual high standard, and Mike Rothwell showed us some slides of his recent field trip to Buckbarrow Beck in Cumbria where he investigated the bismuth mineralisation. Jean Spence, David Green and Peter Braithwaite planned a field trip to Sacheveral Farm near Winster in Derbyshire to see if anything remained of the two blocks of fluorite containing wulfenite (see *UK Journal of Mines and Minerals*, No.11, p.33). Mick Wolfe would like to have been there too, but he was representing the BMS at the Dudley Rock and Fossil Fair that day. As it turned out, no trace of wulfenite could be found and it looked as if the two blocks had been hammered away by collectors. The meeting broke up with the date of the next meeting being set for March 13 (not March 27 as originally arranged). See you there!

SOUTH EAST BRANCH NEWS

Austin Lockwood.

Twenty-eight members of the South East Group attended the November 1992 meeting at the Ringway Community Centre, Grove Park, London. During the meeting, Austin Lockwood circulated a questionnaire to find out what sort of activities group members would be prepared to support. It seems that we have a positive lot in the south east, as virtually all of the ideas drew an enthusiastic response from the vast majority. Among the activities suggested were:

- Organisation of one day, weekend or week-long field trips.
- Workshop sessions on micromounting techniques and mineral identification.
- Formation of a SE Group study collection of micromounts, primarily to assist new members.
- Lectures and discussions on various topics of interest.
- Establishing and maintaining our own record of sites, with names and addresses of owners, directions for access and lists of the minerals likely to be found.
- Establishing contact with other societies - particularly the Russell Society - with a view to joint field trips.
- Bulk buying of consumable supplies such as plastic bags, boxes, glue etc.
- Recording members' recent finds at each meeting and announcing those of particular interest so that other members can see them.

After nine years of organising the BMS South East Group meetings, Elsie Hansford has now stepped aside. Her duties have been taken up by Austin Lockwood. A vote of thanks was given to Elsie by all of the members who recognise and appreciate the hard work she has done; not only for the South East Group, but for the BMS as a whole.

Finally, dates for the 1993 meetings of the South East Group were agreed on. They are:

- Sunday May 9; Sunday August 15; Sunday November 21.

THE BRITISH DIRECTORY OF MICROMOUNTERS

Mick Wolfe

Enclosed with this Newsletter, unless you joined the BMS within the last two years, you will find a copy of your entry in the fifth edition of the *British Directory of Micromounters*. The sixth edition is now in the course of preparation. This will be your only opportunity to update, amend, alter or correct it before publication. New members with no previous entry in the Directory are invited to submit one in the same general format as the specimen page sent to you. It should not exceed ten lines.

All amended and new entries should be sent to me at the address given below before the end of March 1993. If nothing is received I will assume that you are happy with the entry in the 1991 edition and this will be used again unchanged. Please send entries to: Mick Wolfe: 16 Collington Street, Beeston, Notts. NG9 1FJ.

GEOLOGICAL FIELD COURSES

The Department for Continuing Education at Bristol University is organising the following study tours in 1993:

- Pompeii and Herculaneum. Provisional dates: 7 - 14 May. Approximate cost: £640
- The Geology of Arran. 12 - 18 June. Cost (excluding travel and accommodation): £95.
- Geology and Archaeology in South-West USA. 12 - 26 September. Expected cost in the region of £1,400 - 1,500.
- Santorini - Living With a Volcano. 5 - 19 October. Approximate cost: £600

Further information is available from the Department, Wills Memorial Building, Queen's Road, Bristol BS8 1HR. Tel. (0272) 303 629.

AGAL'MATOLITE

(Whatever's that?)

Max Wirth

There follows an extract from "Tuva or bust! Richard Feynman's last journey" by Ralph Leighton (*Viking, 1991*). Note that it is claimed that Tuva is the exact centre of Asia.

"The Bai-Taiga Mountains are famous for their ancient stone-cutting traditions...I found Saaya Koghel, a shepherd and well-known sculptor, and his friend Donduk Doibukhaa, whose ancestors were sculptors too, in pastures high in the mountains. Koghel told me that finding the rare mineral agal'matolite* is about as difficult as carving a figure out of it. Deposits can only be found on the summit of one mountain, and they lie several metres deep."

*In English agal'matolite is pyrophyllite (see BMS Reference Collection specimen 909 from Cumbria). It is structurally identical to talc (soapstone), but the magnesium of talc is replaced by aluminium.

"Here in Tuva a sculptor has to be a geologist and a mountain climber.", Koghel remarked. "It's a challenge to find the stone, and then you've got to dig it up carefully and carry it down unharmed." Chonardash, which literally means carveable stone, has its secrets. It is perfectly pliable after it's dug up, but the stone becomes hard as iron fairly soon. It may become shot with silver, red, gold or grey. Miniature sculptures that repeat the themes of local lore have always been popular in Tuva."

THE STATE OF THE BMS

John Pearce

I was corresponding with Max Wirth about aspects of the BMS and he included this superb comment, which I think captures the essence of what makes the BMS special:

"The present state of the BMS is a happy one. It is like a forum in the Roman sense - an informal meeting of kindred spirits - to argue, boast, compare and even learn. We should at all costs avoid over-organising the Society; that is best achieved by and others."

IN BRIEF.....

Muriel Swindell is still trying to locate all of the Society's nine volumes of Goldschmidt's *Atlas Der Krystallformen* which are on loan to various members. Please will any members in possession of volumes get in touch with Muriel and let her know the number of the volume(s) in their possession.

Mike Holahan and Graham Reeks are two of a five man team from the **South African Micromount Society** researching the Argent silver-lead deposit in the Transvaal, South Africa. They plan to publish a book on this fascinating micromineral locality sometime after 1995. Some interesting assemblages of minerals occur at Argent - notably an extensive suite of lead chromates, lead oxychlorides, and many other secondary copper and lead minerals. In addition, the site includes an old lead smelter, and the surrounding slag dumps have yielded a great variety of slag minerals. Mike and Graham are very keen to obtain some British material for comparison with the minerals they are finding at Argent. Some articles in the *UK Journal of Mines and Minerals* have indicated that specimens from the Meadowfoot Smelter, Tynebottom Mine, Esgair Hir Mine, and Llechwedd Helyg Mine might be of particular interest to them. Please can anyone offer to exchange some minerals from these localities? Mike's address is: 208 Main Avenue, Ferndale Ridge, Randburg, 2194, South Africa.

The next **BMS Northern Branch** meeting will be held at the Bircotes library on Saturday March 13 and not March 27 as originally arranged. Details are available from Jean Spence.

Jean Spence has a microscope for sale. It is a Meiji zoom stereo model EMZ-1, with 10x and 20x eye-pieces. Also included are photographic accessories. Jean is looking for offers around £350, and can be contacted on (0302) 710244.

David Nieto (Brandebeemd 71, 4824 NV Breda, The Netherlands) would like to exchange micromounts with BMS members. He is a systematic collector and has provided a list of over 300 minerals for exchange. Please contact him if you are interested.

CHANGES OF ADDRESS / PHONE NUMBERS

Please note the following new addresses.....

David Clough: "Ashwood", Main Road, Crowlas, Penzance, Cornwall TR20 8DS
Nicola Holland: Glenisla, Chafford Lane, Fordcombe, Kent TN 3035
John Houghton: 26 Crawford Ave. Tydesley, Manchester M29 8FT
Chris Jewson: Lower Carneggy Cottage, Greenbottom, Truro, Cornwall TR4 8QL
Kevin Phillips: 24 Sercombes Gardens, Starcross, Exeter, EX6 8SB
John Stevens: 499 St George Street. P.O.Box 26, Annapolis Royal, Nova Scotia
BOS 1AD Canada
Muriel Swindell: 3 Thornby Gardens, Wigston Magna, Leicester. LE18 1QY
(Muriel's telephone number is unchanged.)
Henry C.Twiggs: 277 Lakeview Circle, Kingsport, Tennessee, 37663 USA

.....and telephone numbers:

Trevor Bridges:	(0661) 833 634	David Ifold:	(0409) 261 517
Isabel Geldart:	(0704) 540 362	John and Pam Pearce:	(0444) 233 958
Richard Taylor:	(0938) 862 340	Beverly & Elizabeth Yates:	(05394) 35 705

NEW MEMBERS

New members are urged to inform the editor should any of their particulars (as noted below) be incorrect:

Edward Foy: "The Pines" 36 Coleshill Place, Bradwell Common, Milton Keynes, Bucks.
MK13 8DN. Tel: (0908) 666 233
Alan Hanton: 79 Drayton Road, Norwich, Norfolk NR3 2DN Tel: (0603) 406 849
Kip Jeffrey: 41 Church Street, Appleby Magna, Swadlincote, Derbyshire DE12 7BB
Tel: (0530) 286 836
Arthur Natrass: 61 Shaftesbury Street, Ryhope, Sunderland SR2 0AQ Tel: (091) 5212203
Nicholas Peters: 2 Chatsworth Ave. London SW20 8JZ Tel: (081) 542 9405
Harry Woolgar: 52 Mill Lane, Shoreham-by-Sea, BN43 5NA

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Malcolm Southwood
9 Gascoigne, Werrington, Peterborough, PE4 5EH

(Please note that the deadline for articles for Newsletter 35 will be June 1, 1993. Please let me have contributions as soon as possible in order to spread the typing load. Thanks.)