

BRITISH MICROMOUNT SOCIETY



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MINERALS OF THE PALABORA OPEN PIT, SOUTH AFRICA

Jon Gliddon

Introduction

The Palabora open pit copper mine is located in the great lowveld plain of the north eastern Transvaal, some 550 km north east of Johannesburg. Immediately to the east lies the Kruger National Park and the border with Mozambique, while the Limpopo river and the border with Zimbabwe lie some 175km to the north.

Geology

The Palabora Igneous Complex, located in the Archean Shield of the Transvaal, is unique among the many African alkali complexes in that its carbonatite member hosts an economic copper deposit. A number of by-products, including magnetite, baddeleyite, uranothorianite and precious metals are recovered from the copper mining operations, while the peripheral ultramafic rocks host economic deposits of apatite and vermiculite. The Complex is an eclipically shaped vertical pipe of igneous origin, with surface dimensions of approximately 7km by 3km. Its main component is a "pyroxenite", comprising varying proportions of diopside, phlogopite and apatite. In the centre of the complex, however, is a younger alkaline intrusive pipe with surface dimensions of approximately 1.4km by 0.8km and elongated in an east-west direction. This is a composite intrusion with a concentric, interbanded structure. The outer part of the pipe consists of foskopite, which is composed of olivine, magnetite, apatite and phlogopite, and which is the host rock for baddeleyite. The central portion of the pipe is carbonatite, which hosts the major copper sulphide mineralisation which is therefore the location of the Palabora open pit. The complex has been dated at 2,030 +/-18 Ma using U-Pb and Rb-Sr isochron methods.

The entire complex is cut by dolerite dykes of Waterberg age (1,600 Ma), which trend NE-SW with a near-vertical dip. These dykes are of particular interest to the mineralogist as they host spectacular zeolite (and other) minerals.

History

The original carbonatite outcrop was a large hill known as Loolekop, and had attracted the attentions of prospectors, geologists and hunters since the first explorers entered the region some three centuries ago. The surface of the hill was riddled with primitive workings where the local tribesmen, and possibly more ancient people, gouged out surface concentrations of malachite and azurite. Primitive smelting was carried out in the surrounding hills, a process which was witnessed by the first European travellers in the area.

The Arabs, and possibly the Phoenicians before them, traded for slaves, gold, ivory and copper in Africa and were followed by the Portuguese, who were among the first Europeans to penetrate the interior. The copper and iron deposits of Loolekop were also known to the Dutch East India Company, because in 1725 they sent one Francois de Cuiper to find the "mountain of iron and copper" which, because of its unique geological

association, was almost certainly Loolekop. In 1868 the famous German explorer Carl Mauch made the following entry in his diary: "Copper ore, for which large mines are established at Phalaborwa, is smelted by the tribesmen there and fashioned into ornaments".

Although a considerable tonnage of copper must have been produced over the centuries, very little of the final product has ever been discovered. The only copper articles found in the area are about twenty strangely shaped ingots known as *marale* (singular *lirale*), and a larger number of armlets. The richest find of artifacts was made in the foundations of a house in the town of Phalaborwa, where a few dozen interlinked armlets were discovered. These were found to be of a very high purity, containing 97.5% copper and 1.65% iron.

When the Palabora Mining Company started to strip the surface of Loolekop in 1964 in preparation for mining, they intersected ancient underground mines with shafts to a depth of 20 metres. What was particularly noteworthy was the narrowness of the stopes, some of which were as little as 38cm wide. The walls were heavily smoke-stained, and charcoal fragments recovered from the floors of two stopes indicated ages in the range of 1,000 to 1,200 years ago.

Modern mining started in 1932, with the commencement of apatite extraction for the fertiliser industry. Due to its remoteness, however, the venture was short lived, but interest in the area remained high and active prospecting continued on the occurrences of vermiculite.

In 1946 the famous South African geologist Hans Merensky started intense prospecting on Loolekop to prove the existence of economic apatite deposits in the foskorite rock. In the early 1950s, the presence of radioactivity attracted international attention and a prospecting programme demonstrated that the uranium alone was sub-economic, but that there was a very large low grade copper sulphide ore body which was potentially exploitable.

In 1956 the Palabora Mining Company was formed as a joint venture between RTZ and Newmont Mining. Between 1957 and 1962, the ore body was proved by diamond drilling and pilot plant operations, and a decision was taken to exploit the deposit by large scale open pit mining. Production commenced in 1966, since when Palabora has become one of the largest copper mines in the world, delivering up to 125,000 tonnes of recoverable copper annually. The open pit reserves will be exhausted shortly after the turn of the century, but there are firm indications that copper mining will continue through underground mining.

Minerals of the Open Pit

Some 54 different mineral species have been recorded from the Palabora open pit, but only those of interest to the collector are considered here. The minerals can be divided into four groups according to their host rocks:

- minerals associated with dolerite dykes
- minerals associated with the carbonatite
- minerals associated with the foskorite
- minerals associated with the ultramafic rocks

1. The Dolerite Dykes

Authigenic zeolites occur in joints and fractures in the dolerite dykes. Most commonly these minerals are expressed as chalk-like, powdery coatings, but in the wider fractures, and particularly in faulted areas, free growing crystals also occur. The following minerals have been recorded:

Analcime: as classical colourless to milky icositetrahedra up to 4mm. Occasionally the crystals are hollow, with crumbly white laumontite growing in the cavities.

Chabazite: occurs as colourless rhombohedra to 1cm across, and frequently as penetration twins associated with analcime, apophyllite and heulandite.

Datolite: rarely as 1mm snow-white globular aggregates of microscopic crystals coating and included in calcite crystals.

Fluorapophyllite: common in all the dykes as good crystals of various sizes and habits. Often in two generations with the second occurring as smaller crystals.

The best crystal groups were found in an open cavity system in a fracture zone of the Main Dyke on bench number 24 in 1982. Prehnite, mesolite and calcite were in association. The crystals were up to 2cm across and of pseudo-cubic habit. The underlying prehnite gives these crystals an attractive greenish tint. A later generation of 1-3mm water clear colourless crystals of prismatic habit and with pyramidal terminations occur occasionally on prehnite. Colourless transparent bipyramidal crystals to 5mm have been found in the same dyke on bench 22.

Heulandite: occurs sporadically in crystals to 1cm with classical shape and pearly lustre.

Laumontite: common in the deeper regions of all dykes as tiny white crumbly masses inside hollow analcime crystals and as radiating clusters of colourless to silky white crystals of classical habit to about 0.5-1mm long. Occasionally found as larger crystals of the same habit.

Mesolite: has only been recorded on bench 24 of the Main Dyke in beautiful specimens ranging from delicate sprays of needles to about 1cm in diameter to silky snow-white composite crystals to 2cm in length completely lining cavities.

Natrolite: occurs rarely as colourless transparent long prismatic crystals to 2cm.

Pectolite: found occasionally in open cavities as delicate needles to 3cm coated with minute clear fluorapophyllite crystals.

Prehnite: form characteristic pale green crusts of compact radiating blades up to 1cm thick with terminations on the surface of the crust. Occasionally small individual platy crystals up to 3mm across are found sitting directly on dolerite,

Scolecite: a few attractive specimens were found showing delicate transparent needles to 3mm on sheaves of stilbite crystals (to 4mm) which are in turn growing on fluorapophyllite.

Stilbite: locally common as groups small single crystals, as opposed to the more common sheaf-like aggregates.

Thomsonite: collected from a single boulder from the Main Dyke on bench 26 as white radiating blades to 5mm on clear cuboidal apophyllite crystals to 8mm.

Xonotlite: collected from a single boulder from the Ramp Dyke on bench 31 as radiating fibrous masses.

Calcite: commonly found in the dykes, usually as rather small transparent highly modified rhombohedral crystals, but also as larger yellowish-brown cuboid crystals to 15cm on edge. Small cavities in some zones produced the most beautiful transparent cuboidal crystals.

2. The Carbonatite Rocks

The carbonatite is generally of little interest to collectors except for a very localise area on the eastern boundary where small cavities have been found associated with foskorite xenoliths within the carbonatite. These cavities have been found *in situ* on only one occasion and were seen to have a sub-parallel, horizontal orientation. The following minerals occur:

Aragonite: rare, as clear acicular sprays to 1cm.

Barite: tabular, honey-coloured crystals to 1cm and rarely as smaller pale yellow/green prismatic crystals.

Chondrodite: in beautiful brilliant red to reddish-orange transparent crystals of exceptional quality and up to 1cm in size. Associated with magnetite and clinocllore.

Fluorborite: very rare as silky white fibrous tufts up to 1cm long in association with magnetite and calcite.

Fluorapatite: although a major constituent of the carbonatite the occurrence of crystals is rare. The few that have been found are less than 8mm in length and of a pale green colour.

Fluorite: as minute purple cubic crystals coating magnetite.

Iowaite: The Palabora pit is only the second world occurrence of iowaite, a chloride analogue of pyroaurite. It occurs rarely as beautiful dark olive green to turquoise coloured hexagonal platy crystals to 1cm. It occasionally exhibits a composite crystal structure forming blocky pseudo-octahedral crystals to 5mm. The mineral also occurs in heavily jointed and fractured carbonatite stringers which have intruded the western foskorite. Here the mineral rarely forms sub-millimetre bipyramidal crystals. It would appear that the association of both carbonatite and foskorite is necessary for its development.

Hydrotalcite: occurs rarely as pale blue or pale brown rosettes to 4mm.

Magnetite: the commonest species found in the cavities occurring as sharp octahedral crystals ranging from 1mm to 4cm in size. One distinguishing habit noted is the parallel growth of crystals resulting in tadpole-like structures.

Native silver: noted only from one cavity as single 1mm long filaments on valeriite-coated bornite nodules.

Gypsum (var. selenite): found in only one cavity as a transparent foliated infilling.

Sphalerite: found occasionally as 1cm nodules which exhibit a crystallised surface.

Valleriite: a common constituent of the carbonatite ore body where it forms coatings, but rarely in the cavities. It occurs as small radial aggregates to 3mm and more rarely as distinct bronze coloured platy crystals of rounded outline. It has been noted on one occasion as botryoidal crystallised masses with calcite in joints in the carbonatite.

Brucite: occurs fairly commonly as a pale blue infilling of joints and shear zones but locally it is found as superb crystals up to 2cm in size and of a deep blue colour. It is occasionally associated with crystals of hydromagnesite and dusted with small pyrite crystals.

Celestite: occasionally found with brucite in joints and shear zones as typical blue crystals to 1cm.

Strontianite: found on only one occasion as single white prismatic crystals up to 3mm long and associated with iowaite in joints in a carbonatite stringer within the foskorite.

3. The Foskorite Rocks

Although the foskorites are not generally notable for mineral specimens, they do host Palabora's best-known rare species:

Baddeleyite: is found widely throughout the foskorite occurring as crystals embedded in the apatite or olivine up to 4cm in length. The largest crystal on record which was worked from its apatite matrix is a full 18cm in length. Baddeleyite is a commercial by-product at Palabora and up to 20,000 tpy of concentrate are produced.

4. Micaceous Pyroxenite Rocks

Although of significant importance in respect of the economic deposits of vermiculite and apatite, the micaceous pyroxenite contains little of interest to the collector. The main exception to this is the occurrence of the rare species zirkelite, for which Palabora is one of the best localities in the world.

Zirkelite: occurs as black resinous masses to 10cm in diameter associated with apatite, phlogopite and olivine.

INTERESTING LACK OF ADDITIONS TO THE BMS COLLECTION

(Nos. ??? to ???; January 1996)

Max Wirth

I usually write up the latest batch of 50 specimens, but I have only received 34 specimens since the Leicester Symposium in 1994! Are specimens just drying up or are too many separate collections sprouting? Never mind, I have been promised more specimens....for years!

Please remember, this is your collection and you can borrow items whenever you like by post, but do also try to contribute something that is not already represented.

At our September (1995) meeting, there were a number of items available from Jim Wooldridge's spare material. Well, I bought a few packets to occupy me during the winter months. It feels almost like sacrilege to examine these bits of rough, but I think that Jim would have liked to know that they are not just wasted. I ration myself to just one packet a month.

The first came from Clevedon beach and I thought that Roy had given me everything that could be found there. Actually I have now added cerussite and anglesite to the collection; not exciting perhaps, but they should form part of the suite of minerals from Clevedon. I also got more phosgenite for my own collection.

The second packet came from Eaglebrook mine (a.k.a. Nantycagal), but this was bare of any interest. Well, Jim would hardly leave the best for me! The last packet I am examining now is rough from Greystones Quarry in Cornwall. It did not look promising at first, but a lump of pure white quartzite turned out to have many apparently enclosed fissures lined with hemimorphite and small spherules of rosasite (I presume). Unlike the usual sprays of hemimorphite, these lie almost flat on a quartz surface. There were also the occasional hemispheres of a very fresh pale green chlorite. Other bits of rock carried pale blue-green blebs which I thought might be rosasite, however, the HCl solution thereof dried up completely indicating the absence of zinc; it was all malachite.

Surprisingly I can find no mention of Greystones Quarry in Embrey and Symes' *Minerals of Cornwall and Devon*, and yet we have some fine specimens in our collection, many of which were contributed by Peter Braithwaite. If anyone has a literature reference to this quarry please let me know.

AN EVEN RARER ARTICLE ABOUT NEWQUAY

Frank Sharp

My brief study of minerals found at Flory Island, Newquay, was handicapped by a shortage of material; another case of finding something interesting back home and wishing I had collected more. I noticed that the cavities containing the micro-crystals of pyrolusite discovered by Sheila Harper (see Newsletter 42), sometimes contained a soft, white, almost powdery material which looked like kaolinite and is clearly a late arrival. Careful wet chemical testing confirmed that it contained lead, a phosphate, and a chloride, clearly implying it was some form of pyromorphite. I have seen similar material at Dry Gill in Cumbria. Later I saw a fist-sized lump labelled "pyromorphite from Flory Island" in a dealer's shop.

Lead is known to be present and Sheila has wondered what the effects of lead and manganese would have been on the iron smelted by the ancients. Perhaps the lead would have made it more malleable and the manganese might have hardened it. The presence of lead was further confirmed when I found four 1mm crystals of phosgenite about a metre above high water mark. These were of classic shape and correctly striated. I must revisit Flory Island.

Sheila also took me to the beach at Grave Hills and I now have over 100 micromounts taken from one galena-bearing boulder, and this raises a major problem which plagues us all. How can the amateur identify finds too attractive to sacrifice for destructive testing, and not important enough to justify sending for microprobe analysis?

Specimens in the national BMS collection, if of confirmed identity and provenance, may give some help by providing side-by-side comparison, but many instances must arise when such visual comparison will be inconclusive or even misleading.

Having now acquired a computer it occurs to me that photographing minerals through a microscope can be done digitally, either by directly using the latest Kodak camera fitted with a micro-chip in place of a film, and containing a disc, or by sending conventional slides to Kodak to have them digitised and put on a compact disc. 100 slides can be placed on one disc at a cost of about £65, or 65p per slide, which is not excessive. The cheapest digital camera, however, costs £650, which would only break even if more than 1,000 slides were involved.

I have no idea whether this would help identification, but it does offer a way round my colour-blindness handicap, by enabling my computer to change a specified colour, such as pale green which I cannot distinguish in a specimen, to one that I can locate easily, such as bright blue! Now I need a hand-held version to use on the dumps.

Kew Horticultural Centre is in the process of digitising its entire data bank in order to make it available world-wide via the Internet. Perhaps this is the way to go with any national mineral collection. I applaud Austin Lockwood's initiative in seeking common ground with the Russell Society with this and related topics.

SOUTH EAST BRANCH NEWS

Austin Lockwood

On Saturday November 4, 1995, Elsie Hansford and Peter Wallace mounted a display, on behalf of the BMS at the GA Reunion and FLAGS Exhibition held at University College, London. Unfortunately, we did not win the cup again this year but the judge, Dr Bob Symes was very complimentary about our exhibit. The cup was in fact won by the Sidcup Lapidary and Mineral Society with their display of minerals etc from the Isle of Skye.

At our meeting held on November 19, Peter Wallace reported on new finds by members and, being more or less the end of the collecting season, there was plenty to talk about. Cornwall was again well represented. Martin Stolworthy had some very nice torbernites from Gunheath, as well as torbernite with chalcocite from Stowe's Shaft. Fred Cornwall had excellent cubic fluorite with arsenopyrite and tourmaline from Hingston Down Quarry, and ceruleite from Wheal Basset. The Wallace family had very fine torbernite from West Wheal Owles, together with some as-yet-unidentified uranium minerals which are currently with Monica Price at Oxford University Museum. (Watch this space! We may have "wallacite" yet.)

Coming further east, Steve Burchmore and Eddie Foy had a very nice suite of minerals from Hampstead Farm Quarry, Chipping Sodbury, and in addition to the usual species displayed some of the rarer finds from this locality.

Moving north, the Caldbecks were represented by specimens with large susannite crystals from Silver Gill, and lanarkite, mattheddleite and leadhillite from higher Roughton Gill, all collected by the Wallaces. Crossing the border into Scotland, Jean Terry showed some very nice orange analcime with clear tabular thomsonite from Talisker Bay, Isle of Skye.

This year's field trip is to be a combined event with the Sidcup Lapidary and Mineral Society, and will be to North Wales, with the group based in the Panorama Hotel at Barmouth. The trip will be held from Saturday May 18 to Saturday May 25. June and Austin spent Christmas in Snowdonia and were forced to leave some material behind for the summer visit as much of the ground was under snow.

The November meeting was our fiftieth South East Branch session and to mark the occasion, June had kindly made a celebration cake. The inaugural meeting was held on September 3, 1983, and membership fees have been held at only £2.00 annually ever since that time. Elsie Hansford was instrumental in setting up the Branch, with considerable assistance from Roy Starkey, and the two of them were formally invited to cut the cake in recognition of their efforts and success.

The next meeting (after this Newsletter is published), will be held on Sunday May 12, at the usual Grove Park venue.

THE GEOLOGISTS' ASSOCIATION Austin Lockwood

Supplementary List of Speakers

The secretaries of some 18 Local Groups and over 40 Affiliated Societies of the Geologists' Association have recently been sent the newly produced 1996 Supplementary List of Speakers. This list contains the names, addresses and telephone numbers of over 100 speakers, providing for a total of some 320 talks, many of which are of mineralogical interest. All speakers have agreed to their names being maintained on a computer database and the list is divided, for convenience, into five geographical regions. A number of Local Groups and Affiliated Societies were experiencing some difficulty in finding suitable local speakers and it is hoped that this new list will resolve that problem for the foreseeable future.

Recruiting Campaign

As a result of their recent recruiting campaign, which was launched in August 1995, membership of the Geologists' Association had increased by almost 20% before Christmas with over 400 new members joining. The eventual increase could exceed 25% which must be regarded as a considerable success bringing, as it will, an additional income in excess of £10,000, excluding receipts from covenants. Many of these members are new to geology and will, no doubt, be interested in joining a Local Group or Affiliated Society of the Association which, in turn, will help to strengthen these groups. The G.A. now represents the interests of over 7,000 'geologists' and the G.A. Circular, their bi-monthly magazine, is very widely read. Societies may advertise their meetings and field trips in the Circular, free of charge. The annual subscription of the G.A. is currently set at £21.00 for an Ordinary member, and £33.50 for Joint membership for two plus an additional £12.50 for each additional member at the same address. For Student members and Members under 22 the subscription is £10.00 and there is also an Associate Membership for £12.50, where you will not receive copies of the Proceedings or certain other documentation. A Society having more than 12 of its members who are also members of the G.A. may apply to be recognised as a Local Group of the Association which carries certain benefits. Other Societies may apply to become affiliated and for this there is an annual subscription of £15.00, a charge which is not levied against a Local Group. There is an annual meeting of all Local Groups and Affiliated Societies, which is held in London in November, and this provides an opportunity for their views to be put to the Officers of the Council and to discuss issues amongst themselves.

The G.A. have recently negotiated a Public Liability Insurance Scheme, suitable for Local Groups holding occasional organised field trips, with Zurich Municipal where the annual premium amounts to only £25.00. If your Society is paying too much for insurance why not affiliate to the G.A. and take out a Zurich policy. For a total of £40.00 this must be the bargain of the year! Why not become a member of the G.A. yourself? Bob Symes will be installed as their President at the AGM in May and, thereafter, membership may become obligatory! If you can't get through to Sarah Stafford at the G.A. office on 0171 287 0280, give me a ring on 0181 650 5566 and I can send you details.

OBITUARY - MAURICE GRIGG, 1925 - 1995

John Pearce

Amateur mineral collectors across the whole of the UK will feel the loss of Maurice Grigg, who died suddenly but peacefully, on December 5th, 1995, because he gave so much pleasure to so many. He took many groups into the china clay pits and guided them around the vast white expanses to the best locations - having carried out a full reconnaissance during the previous days. He would wander around slowly, picking up a mineral here or chipping off another there and usually giving it to someone nearby.

Maurice had the best Cornish teaching museum, where collectors from across the UK and beyond were invited to look at, touch, and where appropriate view his specimens under the microscope. His collection of mainly Cornish specimens was superb and no one will ever forget his beautiful black sceptred quartzes from the Treviscoe china clay pit. At one stage he had small groups of children from local schools into his museum to share his enthusiasm for minerals.

Maurice was actively involved in the Russell Society and the British Micromount Society, and it was particularly fitting that he should take the first prize in the new Micromineral Competition at the BMS Symposium in September 1995 with a beautiful specimen of tourmaline and libethenite from Gunheath china clay pit. The applause which greeted his award reflected the special relationship he had established with so many collectors over the years. A special "Maurice Grigg" trophy is currently being created by his friends in Cornwall for this competition in future years.

Maurice was active and in contact with several BMS members shortly before he died. He and Sylvia were planning to visit the Sussex Mineral Show at the end of November (they were honorary members of the Sussex Mineral and Lapidary Society), but had to postpone the visit because of illness. Richard Belson was in contact in-between breaking his leg and collecting while down in Cornwall at that time. Chris Jewson was getting Maurice to help him sort out a quantity of china clay minerals he had recently acquired.

I attended Maurice's funeral in Truro on Tuesday December 12th. The chapel was so packed with his friends (upwards of 250 attended) that I joined other mineral collectors in the standing alcove just outside the main chapel. His long standing collecting friend John Jones was there, also Monica Price, David Roe, Nigel Hoppe, Avril Woodburn, Barry Gamble, Paul Lowe, and several other Cornish mineral dealer friends, Russell Society members and ex-colleagues. Maurice had worked for 48 years in the china clay industry, apart from an interruption for war service in the Royal Navy, becoming one of the first Royal Marine commandoes. He was a senior electrical engineer when he retired. He had many diverse interest over the years including rough shooting, football, boxing, golf, bowls, singing in a male voice choir, drummer in a dance band and belonging to the Freemasons as well as minerals, of course.

Whilst in Truro I made a pilgrimage to the Royal County Institute to check the copper arsenates lironite, olivenite and clinoclase, as well as the cog-wheel bournonites. But I particularly went to see the cyrilovite from Gunheath pit donated to the museum by

Maurice. It again reflected Maurice's generous nature in wanting to share something special with others. This specimen has good neighbours; wavellite (Filleigh), and arthurite (Hingston Down Consols) donated by Richard Barstow, and a ludlamite (Wheal Jane) donated by Paul Lowe, whilst two cabinets down is an interesting quartz pseudomorph after scheelite donated by Nick Carruth. Maurice has left instructions that a number of pieces from his collection are to be donated to the County Museum.

Maurice was an experienced and skilful collector, who enjoyed sharing his knowledge. He was a great friend and we shall miss him. Our sympathy goes to Sylvia, his wife of 44 years, and other members of his family. There were no flowers at his funeral, but donations can still be made to "The Diabetic Unit (Treliske Hospital)". The BMS has made a donation on behalf of the Society, but if anyone would like to make an individual donation, please send it directly to Mr G. Blunt, Glencairn, Chapel Road, Indian Queens, St Columb, Cornwall TR9 6QT.

**INTERNATIONAL ASSOCIATION OF COLLECTORS
OF SLAG MINERALS
Richard Lamb**

Many members of the BMS collect slags chiefly for the often beautiful and colourful compounds contained therein, and which in fact can shed light on the nature of smelting, ore/gangue minerals, and the important process of oxidative weathering that produces them.

It may not be appreciated that there exists a select society devoted entirely to the study of such compounds, namely the *International Association of Collectors of Slag Minerals*, based in South Africa. It is organised by Horst Windisch, who publishes a newsletter four times a year containing cosmopolitan articles on slags, smelting processes, lists of species etc. He is anxious that this society should continue to flourish and welcomes both new members and prospective authors. (For example, David Green's *The Minerals of the Meadowfoot Smelter* and *The Occurrence of Thiosulphates*, etc. by Braithwaite *et al* have both recently been republished.

It might perhaps be particularly useful if members could ultimately promote the publication of a joint work, in colour, to display the beauty and immense variety of slag compounds from the major localities, including the details of formation of the slags, and their subsequent oxidation as a means of widening the appeal of this undoubtedly fascinating branch of mineralogy.

Further information for potential new members or authors can be obtained from Horst at P.O.Box 17273, Groenkloof, South Africa, 0027.

MORE ON MOUNTING

Malcolm Southwood

I was very interested to read Austin Lockwood's innovative mounting method using aluminum rivets (*BMS Newsletter 42*). I must also confess to being of the traditionalist school that favours permanent mounting, but when it comes to matters practical I'm afraid I have two left feet, and I'm also rather impatient. Over the years, therefore, I've developed a very simple, but very fast method of mounting which might be of interest to other members.

One of the most time-consuming stages of many mounting methods is painting - particularly if two coats of paint are necessary, and if pedestals and boxes have to be painted separately. This method had been designed to avoid painting altogether.

Like Austin, I use the hinged plastic boxes with a black base and a clear top. I have found that light reflections from the sides of the box generally present no problem; on the other hand, reflections from the base of the box are extremely annoying, and something has to be done to convert the base of the box to a matt black surface. This I do with squares of heavy gauge black cartridge paper, bought from a local art shop, and cut to fit exactly into the base of the box using a sliding-type guillotine. I prepare several hundred such squares at a time.

My pedestals are made from corks and I have a large supply of sixes XXXX up to XX for this purpose. To blacken corks, I put perhaps a hundred at a time into a water-tight jar with about 25mls of black Indian ink. I shake the jar for five minutes, and turn out the contents through an old kitchen sieve. The wet corks are then put on several thicknesses of kitchen towel and placed in the microwave on "high" for two minutes to dry them. It is absolutely vital that this particular step is carried out when Angela is out shopping!

To mount a ready-trimmed and cleaned specimen, I cut the top of a blackened, suitably sized cork to the angle needed to support the specimen, put a dab of UHU glue on it and press it to the underside of the specimen. This assembly is then placed upside down on an old bath sponge to dry. While it is drying, I glue one of my black paper squares into the base of a box, again using UHU glue. Finally, I put another spot of glue on the base of the pedestal and use a pair of curved tweezers to pick it up and position it onto the paper-lined base of the box.

Using this method, I find I can mount about a dozen specimens quite comfortably in one hour. I catalogue them as I mount them, simply by typing the necessary information into my database, and this database later drives the manufacture of printed labels which are fixed to the bottom of the box, and a small accession number label which is fixed to the lid.

All in all I find this to be a good compromise between speed and efficiency on the one hand, and artistic appearance on the other.

BMS OCCASIONAL PAPERS
John Pearce

- OP5. Using the Mineralogical Literature** by Roy Starkey
An introduction to the use of the mineralogical literature is provided, together with a review of sources and a practical literature research methodology. An extensive bibliography and worked examples to guide the newcomer make the paper easily accessible to all readers. £1.50 (£2.00)
- OP6. Stereomicroscopes** by Michael Edwards
The stereomicroscope is a specialised form of the familiar compound microscope which gives the operator a real sense of depth when observing specimens with a solid structure, and generally operates at low magnification. Stereomicroscopes are especially useful for the study of objects in their natural, unprepared state, for manipulation and dissection, and for tasks such as small component inspection, where large depths of field, three-dimensional imaging and long working clearances are advantageous. £1.50 (£2.00)
- OP7. Photography of Minerals Through the Microscope** by Elsie Hansford
Micromounts are among the most visually spectacular of mineral specimens. However, microscope photography has many pitfalls and first attempts are commonly disappointing. Experimentation over many years has led the author to a reliable method of microscope photography described in this paper. £0.75 (£1.00)

Prices in brackets are for non-BMS members.

Copies can be ordered from John Pearce, 7 Condor Way, Burgess Hill, West Sussex, RH15 9QB (p & p £0.75 per three papers).

In Brief...

We record with sincere regret the passing away of **Colin Horstman**, on December 1, 1995. Our sympathy goes to all of his family and friends, and an obituary will be printed in the next edition of the Newsletter.

Jaques Chabot (26, rue de l'Argile; Hull; Quebec; Canada J8Z 3G2), would like to exchange microminerals with BMS members. He is a systematic collector, and has a most impressive list of material for exchange, including many of the rarer species from Mont St Hilaire.

The University of Bristol's Department for Continuing Education is running the following study tours in 1996:

- Geology in Crete (May 14 to May 28)
- Geology in North-West Scotland (June 30 to July 5)
- Santorini: Geology and Scenery (September 7 to September 21)

Further details are available from **Shirley Adrian**, of from the University department on 01272 287 172.

For those few collectors of **Tsumeb** minerals in the BMS, it is notable that a fairly large pocket of descloizite was encountered at the eponymous mine late in 1995. The find is noteworthy because descloizite has hitherto been a rarity from Tsumeb, although descloizite specimens from the nearby Berg Aukas mine have commonly been mis-labelled as originating from Tsumeb. So beware! The old generalisation that descloizite specimens attributed to Tsumeb are probably mis-labelled is no longer reliable.

The **Excalibur-Cureton Co.** (1000 North Division Street, Peekskill, NY 10566, USA) is advertising collections of "20 different minerals of Utah - many suitable for micromounting", for a price of US\$79.00 plus \$8.00 packing and postage. A little expensive at first sight, but my understanding is that the specimens supplied are large enough for the preparation of several micromounts.

Please note the following changes of address:

Kevin Johns: 3 Hatton Road, Norwich, Norfolk NR1 2PT
Tel: (01603) 615 804

David Whipp: 47a Marlow Road, Anerley, London SE20 7YG
Tel: (0181) 659 6233

NEW MEMBERS

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

Leslie Fox: 4 Undercliffe, Bakewell, Derbyshire, DE45 1DH
Tel: (01629) 813 542

Ron Gibbons: 129 Wrens Nest Road, Dudley, West midlands, DY1 3RU
Tel: (01902) 678 416

Philip Groves: 15 Butts Road, Horspath, Oxford, OX33 1RH
Tel: (01865) 872 020

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(Please note that the deadline for articles for Newsletter 44 will be June 1, 1996. Please let me have contributions as soon as possible in order to spread the typing load. Many thanks.)