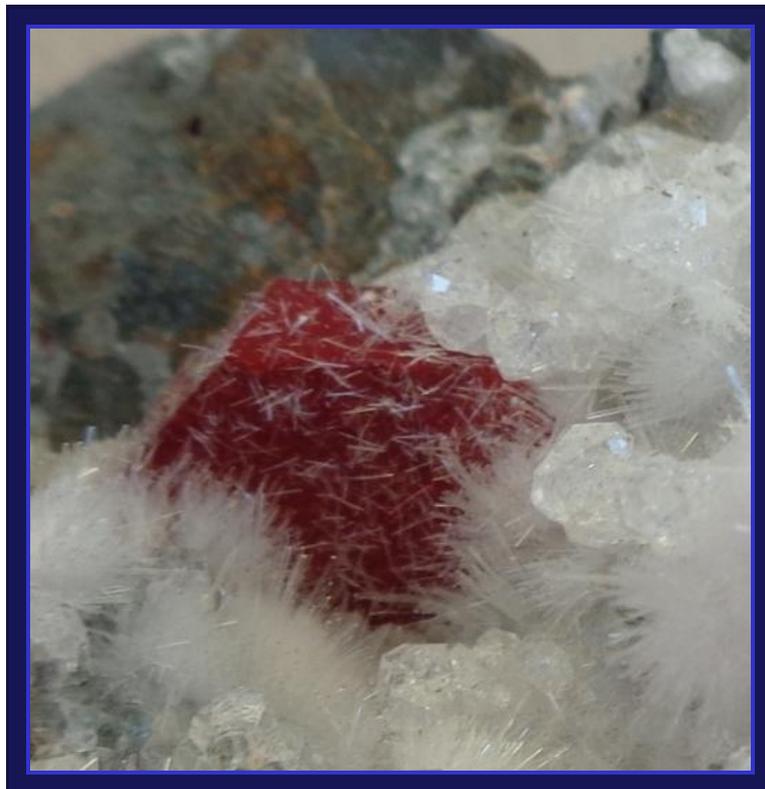




The Mineralogical Society of Victoria  
Incorporated  
A0001471E

**Newsletter No. 236**

**January 2019**



10mm red calcite on natrolite & analcime  
Flinders Vic

Print Post Approved PP100003094

The Mineralogical Society of Victoria Inc.  
P.O. Box 153  
Lara, Victoria, 3212

**Patron:** Professor Ian Plimer FTSE, Hon FGS, FAIG, Hon SGA, BSc(Hons), PhD  
Dr Bill Birch AM, BSc(Hons), PhD

**Office Bearers:**

President:	Alex Blount	Publicity	Alex Blount
Vice President:	John Haupt	Committee Persons:	John Haupt
Secretary:	Fred Kapteina		Carol Kerslake
Treasurer:	Ed Richard		Shayz Yuen

Excursions: John Haupt / Fred Kapteina  
General Programs: Committee

**Newsletter:** Editor & Layout: Michael Hirst  
Assembly and Circulation: John Haupt

<b>Contact Numbers:</b>	Excursions John Haupt	Micro-mineral Group Jo Price (03) 9836 6200	Mineral Appreciation Group Alex Blount 0407 879 097
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**Membership Details:**

Joining Fee	\$5.00		
City Adult Member	\$25.00	Country Adult member	\$20.00
City Family membership (2 adults & children under 18)	\$35.00	Country Family Membership (2 adults & children under 18)	\$30.00
Student Member (full time)	\$15.00	Newsletter only	\$15.00

(N.B. - Country membership - more than 50 km from Melbourne G.P.O.)

Applications for membership can be obtained by writing to:-

The Secretary, Mr Fred Kapteina,  
P.O. Box 153  
Lara, Vic, 3212.

General meetings are held on Wednesday evenings every two months (except January and Public Holidays). Please see the Forward Diary in this Newsletter for upcoming meeting dates and locations.

Visitors are most welcome.

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Newsletter of the Mineralogical Society of Victoria  
P.O. Box 153  
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**January 2019**

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## **FORWARD DIARY - 2019**

**PLEASE NOTE** - General Meetings are held approximately every second month on Wednesday evening.

Jan 13 Mineral Appreciation Group: 10:00am, Nunawading Lapidary Club, Oval Way, Nunawading.  
Sunday Topic: Minerals from Broken Hill, NSW.

Jan 27 Micro Group Meeting: George Lysiuk's home  
Sunday Topic: Minerals from the Cloncurry region, Queensland.

Feb 13 GENERAL MEETING  
Wednesday 8:00pm, at Royal Society of Victoria Building, Cnr La Trobe and Victoria Streets, Melbourne  
Speaker: John Haupt (MinSoc). Topic: Nickel

Feb 17 Mineral Appreciation Group: 10:00am, Nunawading Lapidary Club, Oval Way, Nunawading.  
Sunday Topic: Minerals from Central and South America (excluding Mexico).

Feb 24 Micro Group Meeting: George Lysiuk's home  
Sunday Topic: Minerals from the Flinders Ranges, South Australia.

Mar 17 Mineral Appreciation Group: **11:00am**, Nunawading Lapidary Club, Oval Way, Nunawading.  
Sunday Topic - Minerals acquired in 2018 - could have been purchased, swapped or self-found.

Mar 24 Micro Group Meeting: George Lysiuk's home  
Sunday Topic: Minerals that have Australia as their type locality.

### **MAR 18-24 FIELD TRIP**

Extended trip (1 week) planned to Mooralla (Western Victoria) for quartz collecting.

Apr 10 GENERAL MEETING  
Wednesday 8:00pm, at Royal Society of Victoria Building, Cnr La Trobe and Victoria Streets, Melbourne  
Speaker: Fred Kapteina (MinSoc) - A report on the 2019 Tucson Show

Apr 28 Micro Group Meeting: George Lysiuk's home  
Sunday Topic: Sulphide & sulphosalt minerals.

May 19 Mineral Appreciation Group: **11:00am**, Nunawading Lapidary Club, Oval Way, Nunawading.  
Sunday Topic - "My favourite mineral species".

June 12 ANNUAL GENERAL MEETING  
Wednesday 8:00pm, at Royal Society of Victoria Building, Cnr La Trobe and Victoria Streets, Melbourne  
Speaker: Alex Blount (MinSoc President), Topic - To be advised

- June 16      Mineral Appreciation Group: 10:00am, Nunawading Lapidary Club, Oval Way, Nunawading.  
 Sunday      Topic – Evaporites
- July 21      Mineral Appreciation Group: 11:00am, Nunawading Lapidary Club, Oval Way, Nunawading.  
 Sunday      Topic: Tsumeb and other Namibian localities.

For any of the usual attendees to MAG meetings, if you would love a particular topic to be covered or even re-covered please let us know and hopefully it will be in time for the due newsletter.  
 I'm happy to substitute your topic in May or June.

### **MINERAL RELATED EVENTS**

- Mar 9-10      **Victorian Gem Clubs - Gem, Mineral and Fossil Show – Gemkhana**  
 Logan Park, Howitt Street, Warragul, Victoria
- Apr 19-22      **55th National Gem and Mineral Show – GEMBOREE**  
 Rockhampton Showgrounds, Rockhampton, Qld
- Aug 31- Sep 1      **42st Joint Mineralogical Societies of Australasia - Annual Seminar**  
 “Traps in Mineralogy, Pseudomorphs, Look-Alike and Fakes and Synthetics”  
 State Library, Perth Cultural Centre, Western Australia

### **NEXT ISSUE**

**PLEASE NOTE:-** Material for the March 2019 Newsletter to be with Michael Hirst by **February 23<sup>rd</sup>**.

### **FROM THE COMMITTEE**

**W**elcome to 2019 and the Society's 43rd year.  
 If there was any doubt about our future, last year's seminar in Ballarat hosted by this Society clearly shows that we are still a force to be reckoned with.

Hiccups and other problems are there only to be a challenge and make us stronger by overcoming them.

One of these hiccups was the sudden resignation of our treasurer Cornelis Moorhoff in the second half of last year. We thank Cornelis for having given the position a go. This position has now been filled by one of our newer members, Ed Richard. We thank Ed for stepping up to fill the breach.

Our other committee members are a small but dedicated team with the non-formal roles being covered as required. All positions receive assistance from the rest of the committee and it is hoped that the general MinSoc Vic membership will also do their bit to help. There are a number of vacant committee positions and talking from experience, you only learn about the different roles by being on the committee. So if someone comes up to you at one of the meetings and taps you on the shoulder and asks you to join the committee, please say “yes” and give it a go. Also, past committee members, there is nothing stopping you from coming back on the committee. Only by being on the committee will you have a real influence on the direction the Society takes.

On a sad note we have to advise that Frank Robinson, a long-time member of MinSoc Vic passed away last year. Frank contributed greatly to the Society especially in the photographic area. He will be sorely missed.

However, on a more positive note, our membership has stabilized, with some past members re-joining. One of these is Dr Paul Van den Bergen who had left a few years back to complete his PhD. We welcome Paul back.

One of the major changes for the Society is that we now have a new Newsletter Editor. We congratulate Michael Hirst for stepping up to take on that role. With Michael in the chair we know that the Newsletter will

again be coming out on a regular basis after several years of uncertainty. To assist Michael we ask that everyone contribute in the way of articles; a regular “what’s new in the mineral world would be great” or how about some swap and sell adverts for the newsletter.

We are maintaining and strengthening all our other activities. The Micromounters Group and the Mineral Appreciation Group have strong supporter cores that meet on a regular basis, usually every month where possible. These Groups are the forum where education about minerals plays a major part. Please check out the forward diary in this newsletter or the MinSoc Vic web site. We would love you to come along.

To help push our profile the Society also has a Facebook page. This is a good forum for members to publish about our activities. So, if you have pictures from our meetings or fieldtrips etc., please post them so we can reach a wider audience and perhaps get more members.

After the successful field trip to Cairns Bay, Flinders in December 2019, of which there is a short article in this newsletter, we hope to have more regular fieldtrips. If you have a favourite spot you know about or would like to have a fieldtrip to, let one of the committee members know. Our next fieldtrip will be to Mooralla. This will be a week-long, or two day trip dependent on your commitments, probably towards the end of March.

We need everyone to support the various activities of the Society. With more attendees it will make meetings and field trips more vibrant and it will help the Society to grow. So make a **real** effort to come along.

Fred Kapteina  
Secretary

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### **SHORT TALKS**

As always, it is a struggle to find speakers for the Short Talks. Aside from a few regular contributors and some generous offers, it is left to the Committee to nominate people from those who we expect might be attending the General Meetings. Given the smaller numbers of attendees as General Meetings, it is also becoming nearly impossible to ‘volunteer’ people for short talks – as we are never quite sure who will be present! Whilst we have seen some exceptional presentations in the past year, we are regularly left without a short talk for the meeting.

We are happy to entertain ANY suggestions for alternative activities, ways to encourage more people to attend and present something... anything at all. These are your meetings so please let the Committee know what you would like to see or hear?

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### **MUSEUM FUND**

Donations to the Museum Fund are always appreciated and can be made through your annual membership renewal form, through buying or donating specimens for sale, or by contacting a Committee member at any time.

### **EXCURSIONS**

#### **MAR/APR FIELD TRIP**

An extended trip (1 week) planned to Mooralla (Western Victoria) for quartz collecting, the week of 18-24 March, to be led by Fred Kapteina. Smoky quartz crystals up to 3-4 cm in size in various forms including double-terminated, phantoms and some with liquid bubbles and gaseous inclusions have been found here, sometimes associated with drusy quartz, amethystine to pink or lilac quartz, and milky quartz.

Also see Mindat:- <https://www.mindat.org/search.php?search=mooralla>

Contact Fred Kapteina for further info.



*Above: Very similar formation!*

*Left: Double terminated*

*Specimens & Photos: Michael Hirst*



*Right & Below: 3 examples of geode pieces*

*Specimens & Photos: Michael Hirst*



## **EDITORIAL**

Friends, Colleagues, Mineral Collectors! Lend me your eyes.

With the start of a New Year, the Mineralogical Society of Victoria Newsletter has a New Editor. Well, sort of. I've resumed the role as Editor after a break of several years. For those members of old who know me well, I need no introduction. And for the new(er) members who don't see me at the General Meetings or MAG, a short intro might be in order.

But firstly a big Thank You to Alex for handling production of the Newsletter during that break.

I've been interested in minerals and mineral collecting since my teens (a loooong time ago now) and joined MinSoc Vic during its first year but I'm not a foundation member. In those early days and beyond I attended most meetings, field trips and seminars, both here in Victoria and interstate. Also sat on the MinSoc table, behind a microscope and specimens, at quite a few Gem & Mineral Shows when they were a frequent and regular event around the suburbs. So I have seen both the rise and decline of popularity and membership in mineral collecting, Gem Clubs and Mineralogical Societies. And the loss of a lot of our favourite mineral collecting areas such as Bundoora Quarry, the Broken Hill mines and dumps, Phillip Island, Lake Boga Quarry etc.

Since retiring from work I have moved away from suburbia and no longer attend meetings as regularly as previously. And now for me there are so many pursuits more interesting than breaking a large boulder of rock down into fine gravel....

Being an optimist I always hope that we will see a revitalisation of interest in mineral collecting again, new collecting localities becoming available along with a resurgence in membership and activities in our Society.

In the meantime I hope that some of you will help me to keep the Newsletter going as the official contact document of MinSoc Vic, by putting fingers to keyboard and writing an article or two for inclusion in future issues. And thus also help out poor John Haupt, who has been the major contributor of feature articles for quite a few years now.

At this stage I hope to publish 4 issues a year, in March, June, September and December; timed to capture the latest updates on activities from Committee meetings and the Annual General Meeting. (This may not be strictly adhered to, depending on how the Forward Diary develops through the year). BUT I do want to try to make the Newsletter a regular publication again.

Finally for now, a call to all the mineral dealers out there – as the situation arises, please provide a short item on "What's New In Minerals". Whether it is new finds, new ID's or even new specimens arriving locally that might be of interest to members. A few words and even a photo or two would help both me (as Editor) and fellow mineral collectors to keep up-to-date of what is happening.

**THIS IS YOUR NEWSLETTER.** Please help me to keep it in production, filled with items of interest and relevance **TO YOU!!** On that note I will finish off, and hope to receive articles for inclusion in the Newsletter from you soon.

Michael Hirst  
Editor

## Frank Robinson 1924-2018

### Obituary

Frank (Francis William), a long-time member of the Mineralogical Society, died suddenly at his home on the 10<sup>th</sup> December, a month short of his 95<sup>th</sup> birthday.

Frank, an only child, was born in Mentone and after marrying Muriel built and lived in their home in Parkdale for 65 years.

He had an active outdoors life, being keen on tennis, squash and golf and until recently he continued playing 9 holes with his aged friends. He had a long career as a surveyor starting with the Department of Crown Lands and Survey in 1941, finishing as the Deputy Registrar at the Land Titles Office at the time of his retirement. He enlisted for service in 1942, and was engaged with Australian Survey Corps in surveying and mapping in Far North Queensland and Dutch New Guinea for 4½ years.



Frank joined the Mineralogical Society in March 1979, maintaining his membership up to the time of his death. He became a keen mineral collector with his close mate Jack Leach and their spouses, going on numerous mineral collecting trips during the 1980s & 90s, especially to Broken Hill. After retiring, for many years he and Jack volunteered for a day a week in the Mineralogy Department of the Museum, where they catalogued and registered new acquisitions to the collection.

Frank was a keen photographer, which extended to his minerals. He prepared and ran a course in mineral photography for members of Min Soc. and led the Society's photographic group in overseeing the production of photographic albums on various Victorian mineral localities and Broken Hill.

With Muriel becoming ill in 1997, he had to reduce his mineral pursuits. However, Frank still retained a keen interest in minerals and it seems appropriate that his article on a visit underground at the North mine in Broken Hill is published in this issue.

Vale Frank  
John Haupt

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## PUBLICITY

### **Micro Group Report**

By Jo Price. Photographs by John Haupt



### **September 2018**

The topic for our September meeting was minerals containing tungsten, molybdenum or chromium.

Amongst the molybdenum bearing minerals were many specimens of wulfenite. Specimens from some of the more interesting localities were the Avondale mine, Lyndhurst, S.A. and with fornacite from Whim Creek, W.A. Notable overseas wulfenite localities were the Zelidja mine, Toussit, Morocco; Tsumeb, Namibia (very good crystals); as orange blades from the Maricopa mine, and bright red crystals from the famous Red Cloud mine, both in Arizona; and pale yellow crystals from Mapimi, Mexico. Other molybdenum minerals included molybdenite from Deepwater & Kingsgate, N.S.W and Wolfram Camp, Queensland; and yellow sprays of ferrimolybdate also from Kingsgate, N.S.W.



Above: A 2mm crystal of wulfenite from Whim Creek, WA.

Amongst the tungsten minerals, there was a very rich ferberite specimen from the Yaogangxian mine, Hunan Province, China, nice specimens of raspite and stolzite from Broken Hill, which also occurred with cuprotungstite from the Cordillera mine, Tuena, N.S.W.; and a very good hubnerite from Peru.

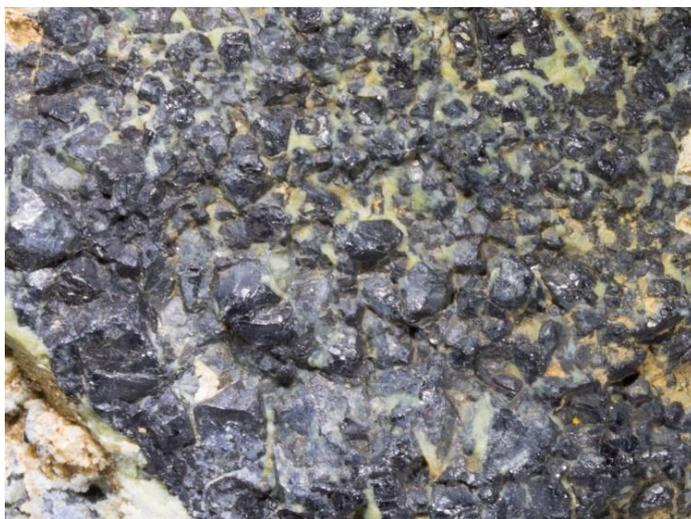
Amongst the chromium minerals were chromite and stichtite from Dundas in Tasmania and a specimen of chromite from Dolodrook creek near Licola, Vic. Also from Dundas were attractive specimens of crocoite from the Adelaide mine; with green pyromorphite from Platts prospect; and with yellow cerussite from the Kapi Mine. Nice attractive specimens of the green chrome garnet, uvarovite were from Outokumpu, Finland and green shuiskite, (T.L) Permskaya Oblast, Russia. Chromate minerals included fornacite, from the Kintore opencut, Broken Hill and vauquelinite from the Moon Anchor mine, Arizona.

*Below left: Raspite 1mm FOV.*

*Below right: Cuprotungstite, 3mm FOV.*

*Both specimens are from the Cordillera Mine, Tuena, NSW.*

*Below: Fluorite cubes on wulfenite from the Avondale mine Lyndhurst S.A. 2mm FOV.*



*Above left: Chromite crystals from Dolodrook creek, Vic. Specimen is 15mm across.*

*Right: A 2mm crystal of uvarovite from Outokumpu, Finland.*

*Below left: Crocoite on pyromorphite from Platts prospect, Dundas, Tas 4mm FOV.*

*Below right: Twinned crystals of yellow cerussite on crocoite. Kapi mine, Dundas, Tas. 4mm FOV*



### **October 2018**

We did not meet this month as several regular members were away.

### **November 2018**

The meeting topic was minerals from the Iron Monarch mine.

With 164 different minerals recorded from Iron Monarch listed on MINDAT and the type locality for 6 species, there were many specimens to look at and discuss at this meeting. Species shown included alunite, atacamite, deep reddish-brown bermanite, green beyerite, brochantite, yellow cerussite, clinobisvanite, connellite, crandallite after wardite, cyrilovite, faustite, fluorapatite, varying in habit, pale green francisite (T.L), gibbsite, gorceixite as yellowish balls with hematite, black hausmannite, tabular/platey hematite with flashes of red, lustrous crystals of jacobsite, kidwellite, kleemanite (T.L) as pale sprays, lepidocrocite, millisite on wardite, metaswitzerite, mitridatite, montgomeryite, mottramite, naumannite as

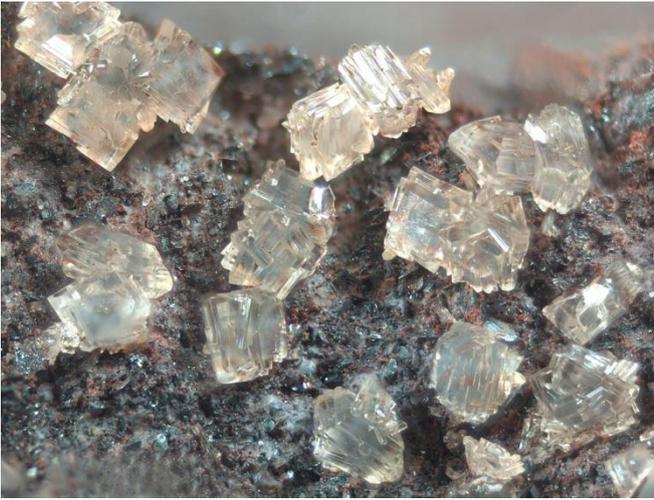


sparkling brown flakes on quartz, nissonite, seamanite on hausmannite, strengite, fine-grained sussexite, clear blue turquoise, variscite, and wavelite. We also noted that only one zeolite, phillipsite, was found at Iron Monarch.

*Above: Atacamite crystals 6mm FOV.*

*Left: Gibbsite crystals, 4mm FOV.*

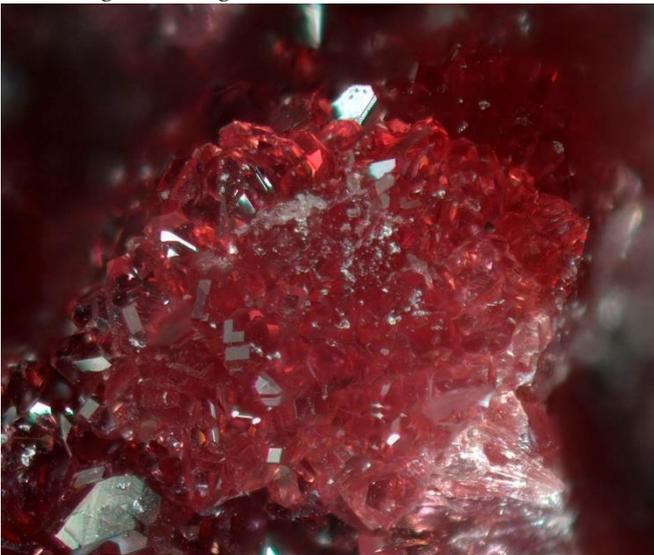
*Below: Wardite crystals, 4mm FOV.*



*Below: A 1mm group of rare nissonite crystals.*



*Below: An attractive 2mm group of red variscite crystals.  
Below right: Strengite on wavellite. 3mm FOV.*



The Group welcomes new members. Our meetings are informal and tea, coffee and cake are provided. It's only necessary to bring your lunch, microscope and any minerals you may have for the day's topic.

No minerals? No problem – come anyway as many minerals will be tabled for all to see, but if you haven't attended one of these meetings before, do let the host of the day know you are coming so that there will be enough seats for everyone.

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### **Mineral Appreciation Group Report**

The meetings are an open show and discussion format and all society members are welcome to attend. Meetings typically aim for people to arrive around 10:00am for a 10:30am start, allowing time for people to unpack specimens. If you wish to attend, have any questions or have suggestions for topics you would like to see covered then please catch up with Alex Blount or simply show up to a meeting!

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## **SOCIETY MICRO-MINERAL COLLECTIONS**

Broken Hill Collection  
Iron Monarch Collection  
Victorian Collection  
Western Australia

The collections currently contain over 600 micro-mineral specimens from their respective regions. We are always looking for new donations of specimens (preferably mounted but not essential), especially from new or recent finds, but updates or multiples of existing species are also appreciated.

The collections are available to all members to borrow on a monthly basis and they provide an excellent way to compare your own material from field-trips with 'already identified' reference specimens. If anyone wishes to borrow the collections or peruse a copy of the catalogue, please catch up with the curator Alex Blount.

### **LOOKING FOR A GOOD HOME**

Contact John Haupt on 0407345806

1.

An educational set of 100 rock specimens prepared by Specimens & Co in Clayton. Housed in 5 trays within one long wooden box.



2.

A box of A4 folders containing a wide range of articles on minerals that was collated by Val Hannah. Very useful for anyone wanting to learn more about minerals and or/for preparing talks.

## Field Trip To Cairns Bay, Flinders Victoria

On Saturday, December 1 2018, seven mineral enthusiasts met up in the Flinders township on the Mornington Peninsular; six MinSoc Victoria members and one guest. Only two of the attendees had ever been to this site previously.

The weather was absolutely perfect with a brilliant blue sky, temperature in the mid to high 20 degrees centigrade and an off shore breeze. Thanks to the excellent planning by our Field Officer John Haupt, who unfortunately could not attend, the tide was just on the way out. This enabled us to maximize the time we could spend on the headland where the zeolites occur.

The track down from the parking lot to the beach was easy going, as although there were a few steep spots, the track was dry and there was no danger of anyone slipping as would have been the case after rain.



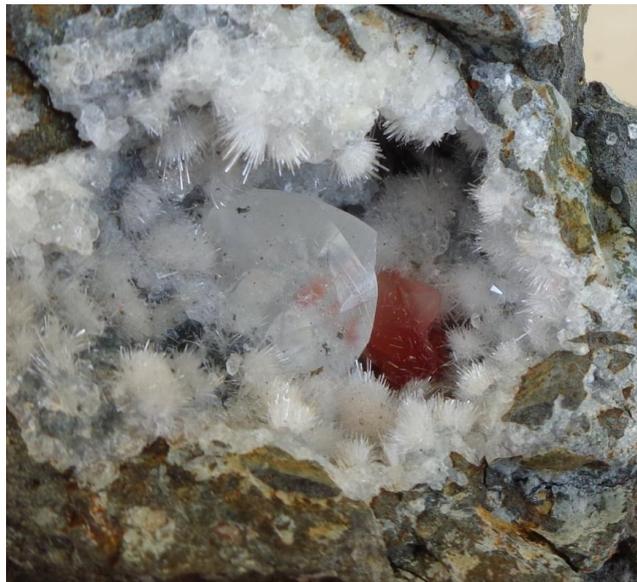
At the collecting site, everyone headed off to their individual boulder that looked promising. Vesicles on the surface of boulders unfortunately were not always a good indicator of what could be found inside. A few hints to the newcomers by the more knowledgeable members soon had everyone finding good representative specimens for the area, natrolite, analcime, gmelinite and chabasite.



A few outstanding specimens were found which included the one illustrated on the cover of this newsletter. It is of an intensely crimson red coloured calcite multi twinned crystal of about 10mm across perched on snowy white natrolite and analcime. A few individual natrolite crystals are also attached to the calcite. The red colour is probably due to a layer of oxidized hematite. The whole specimen is about 45mm across.

FOV: 40mm

Only two other specimens were found showing the intense red colouring. One was a specimen of analcime, the other was a vug that had two calcite crystals inside, one clear white about 15mm in size, the other red, 10mm, together with natrolite and analcime.



FOV: 60mm

Other specimens found were analcime, natrolite, natrolite with gmelinite and calcite crystals in scalenohedral form with natrolite and thomsonite. The combination of calcite crystals with thomsonite is apparently rare.



FOV: 50mm



FOV: 25mm



All too soon the tide started coming in, covering the rock benches, which is always a good indicator to leave the site and make ones way back. The track back to the parked cars tested the fitness of most, burdened as we were with the additional weight of collected specimens and then there was also the increase in temperature by then into the low 30's. Never the less, everyone commented that they had a great time.

Gmelinite crystal, 15mm across on blue montmorillonite

## THE NORTH MINE BROKEN HILL

A combination of information on a notable mineral locality  
Edited by John Haupt

### Part 1 JOINING THE BROKEN HILL MINERS UNDERGROUND - OCTOBER 1979 by Frank Robinson

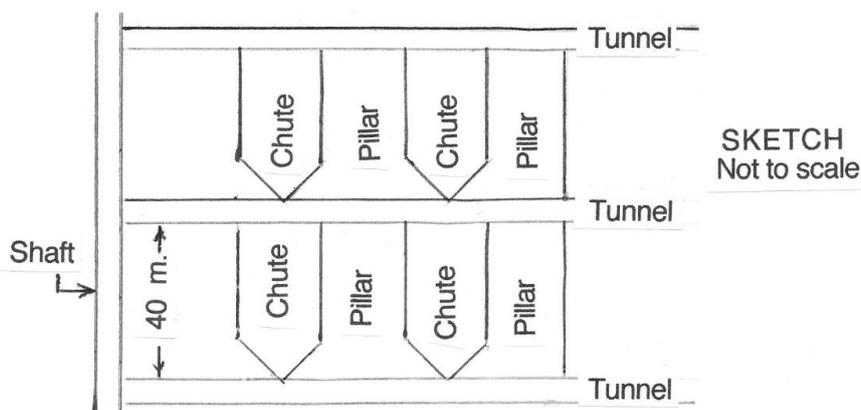
It is seldom that members of the public are invited to experience the underground wonders of an active deep mine.

On the 31st. of October 1979 Jack Leach, my long-time mineral collecting companion and I were introduced to an underground-mining engineer employed at the North Broken Hill Company's mine and were invited to see the underground workings of that mine the following morning. Arriving at the mine as arranged, we were taken to the changing room. Here we stripped to underclothes and socks and were provided with boots, overalls, belt, luminous vest and safety helmet before being introduced to David Edwards, a mining engineer, who was to be our guide underground. In addition to the equipment mentioned previously, we each received a miner's lamp which was attached to our helmets, and a respirator. Each respirator had a one hour capacity and was to be used to escape in the event of smoke or other air contamination occurring.

Next came our descent down a shaft into what seemed to me to be the bowels of the earth. Our transport down the shaft was by way of a two-deck cage with Jack, David and I on the lower deck, while the upper deck was occupied by miners. As the cage travels up or down the shaft at 1000 feet per minute, the descent was rather breathtaking, and when it reached Level 15, which was our first destination, we were 2000 feet below the surface. As a matter of interest there are 30 levels to the bottom of the mine.

The following information and accompanying sketch as supplied by David Edwards has been taken from my diary of this venture:-

All 30 levels of the mine were fully air conditioned with a constant breeze at a temperature of 27 degrees centigrade for the purpose of ventilation. At Level 15 an up to date "Pillar" Method of ore extraction was used (see sketch) which did not appear to utilize shoring.



Ore was extracted from the chutes (see sketch) leaving a pattern of support pillars, the ore then being carried away by tramways using 16 ton capacity skips, for eventual transport to the surface. When the ore in the chutes was exhausted, the voids so created were filled with sand which was consolidated to form new pillars. The ore was then recovered from the former pillars.

*Personal comment: Although not explained, the chutes and pillars must have been staggered in some manner to avoid collapse of the ore-carrying tramway tunnels.*

We were next taken down to Level 20 at a depth of 3000 feet where the older and slower method of mining was still in vogue using ladders and shoring constructed of timber, supplemented by metal scaffolding. Here we were taken through very wet conditions and used ladders to reach the work face which consisted of a "cavern" of gleaming galena. The ore at this level was being "barred" down by miners mounted high on scaffolding and transported as in Level 15.

Whilst surrounded by ore, we were permitted to collect a few specimens which contained a little calcite and rhodonite. This “bonus” concluded a most informative underground venture, but it was very pleasant to once again have the blue sky above when we again reached the surface.

*The North mine No. 3 shaft complex c1980.*

*Photograph: G. Grundmann collection.*

*Copyright: Nucolorvue Productions Pty Ltd.*



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## **Part 2: THE HISTORY OF THE NORTH MINE**

Extract from the Supplement to the 1983 Annual Report of North Broken Hill Holdings Limited with additions.

### **Foundation**

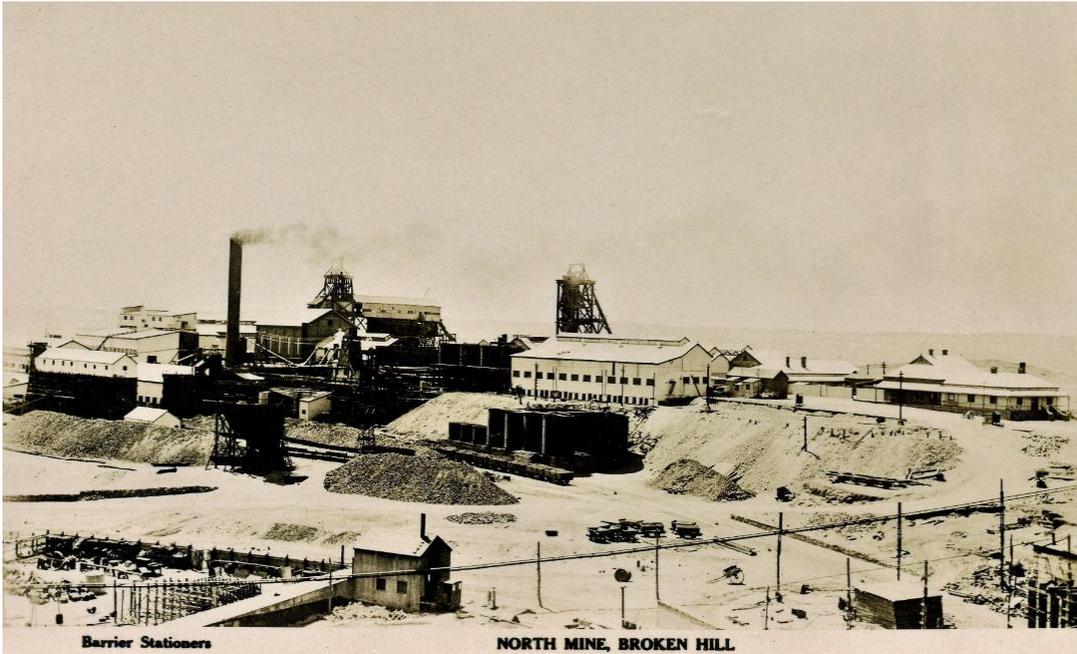
North Broken Hill originated with Block 17, which was located at the northern end of the original seven Line of Lode leases. The lease was pegged out in December 1883 by Julius Nickel and James Anderson as the Cosmopolitan mine and two shafts were sunk on the lease. The mine was sold to a Melbourne syndicate for £15,000 and renamed as the Broken Hill North Silver Mining Company (North mine).

In 1888, rich carbonate ore was located at the 200ft level. The ore was smelted at Dry Creek in South Australia and at the concentrating mill at the Junction mine by the Barrier Ranges Concentrating Company. The Barrier Ranges Concentrating Company failed in 1889 and the mine was forced to erect its own mill which began concentrating in 1890. By this time, mining operations had exhausted the easily treated ores and sulphide ores were being encountered. The North mine proved unable to successfully treat the sulphide ores and operations ceased in November 1894.

In 1895, the mine was purchased by Mr Halliburton Sheppard for £1,750 and a new company called Broken Hill North Silver Mining N.L. was formed. Another mine – the Victoria Cross mine, located on Mining Lease 43 to the north-east of the North mine – was worked intermittently until c1902 when operations ceased. Mr W L Baillieu purchased a controlling interest in the Victoria Cross mine, which was eventually sold to the North mine in 1904 for £10,000 in shares, with Baillieu becoming a director of the North mine.

### **The floatation process**

W L Baillieu had, with Auguste de Bavay, established the De Bavay Treatment Company, in order to treat ore using de Bavay's floatation process. The job of making de Bavay's process work was entrusted to Herbert Gepp, a young engineer. Gepp spent a considerable amount of time and £65,000 to turn the idea into a usable process. By 1909, the plant was working successfully, and a company was floated as Amalgamated Zinc (de Bavay) Ltd. A new mill was constructed at the North mine near the Victoria Cross mine's shaft. This plant used the de Bavay process until 1917 when the North mine erected its own plant using the Minerals Separation process. With the North mine moving to treat its own ore, Amalgamated Zinc lacked a source of ore and eventually ceased operations.



*The North mine c1908. The No. 1 shaft is in the centre and Victoria Cross shaft and Amalgamated Zinc (De Bavey's) plant is on the left.*

*Photograph:  
G. Grundmann  
collection.*

*Copyright: Barrier  
Stationers Broken Hill.*

### **Consolidation**

Early in 1923, the British Broken Hill Propriety Limited mine (Mining Leases 15 & 16) went into liquidation and was reformed, in March 1923, as British Australian Broken Hill (Ltd). This reorganisation was unsuccessful and operations ceased in October 1923 when the mine was sold to the North mine for a mixture of shares and cash. The North mine made the purchase on the understanding that there were considerable ore resources on the site. The British mine had two developed shafts (Thompsons and Blackwoods) which worked different sections of the lode; and the Marsh shaft, which was on the northern edge of the lease. The mine had its own concentrating plant developed from the original plant erected in 1894, which, by 1923, was very similar to that in use at the North mine. In 1927 it was decided to treat all the crude ore at the North plant, which was modified to be an all floatation process. The British mine operated until June 1930 when it was closed due to low ore prices.

In October 1929, the North mine purchased the Junction mine from the Sulphide Corporation. In May 1931, the Junction North mine was purchased for £2,750. Both mines had been struggling to make a profit for some time. The Junction North had been made insolvent due to lack of provision for Workers' Compensation. These mines were closed until the decision was made to reopen the British mine in August 1936. By these acquisitions, the North mine had secured an important section of the Line of Lode which, although it had been mined for some time, had the potential to be further developed to exploit new ore bodies with lower grade ore being extracted from older areas.

At the start of the 1930s, the North mine was geographically dispersed along the Line of Lode. Only two areas were worked; these being the British section (focused on the old British BHP mine) and the North section. The British Section consisted of two shafts – Thompson's and Blackwood's – with other shafts within this section not being further developed. In the early 1930s, maintenance only was being undertaken in the British section due to low metal prices. It was intended to bring the shafts into production, however, once prices rose. The North section consisted of No. 1 shaft (and its associated facilities and mill) and No. 2 shaft which was being sunk, initially to form a new service shaft. In the north section, it was intended to follow the Line of Lode to the north. This required that No. 2 shaft be developed for skip haulage of ore out of the mine.

In 1930, No. 1 mill was extensively refitted to install an all floatation process which was developed at the North mine. This was the first use of this process in a concentrating mill. The advantage of the all floatation process was the ability to recover both lead and zinc materials by floatation. The main change was the construction of a new grinding section which ground the ore much more finely, resulting in a better product for floatation.

### **Revitalisation**

No. 2 shaft was commenced in 1928 (near the original Victoria Cross shaft) and substantially completed in 1934. The structural steel headframe was completed in 1932 and the current cage winder installed in 1936. A crushing station was constructed at the headframe at No. 2 shaft and underground arrangements were made for all ore to be removed from the mine via No. 2 shaft from 1933. A large and well-equipped surface change house was completed in 1934.

In 1936, planning began for a new mill to the north-east of No. 2 shaft. The design of this new all flotation mill was based on 30 years' experience but used gravity (the slope of the hill) to facilitate the flow of material through the mill. No. 2 mill was located to the north-east of No. 2 shaft, on the crest of a ridge (probably the northern end of the Broken Hill ridge). Construction commenced in 1936 with the completed mill being opened on 11 April 1939. The mill took ore from the North mine and the British section (which was trucked in) and later, ore from Block 14 (which was acquired in by the North mine in 1941). The ore flowed downhill to the granular lead concentrate bins or the filter section where concentrate was loaded onto railway wagons (initially narrow gauge). Residues and sands were taken back up the hill through a residue classifier and stored in residue dumps (previously the site of residue dumps from Amalgamated Zinc). The renovation of the North mine, which transferred the focus of the mine to No. 2 shaft, was developed as the major production area of the mine. However, it is notable that these works lacked the trappings of the industrial 'welfareism' demonstrated by similar works at Freeman's shaft. This may reflect the attitude of the management of the North mine to the workers, which seems to have been more inflexible than that of the Zinc Corporation.

*The North mine No. 2 shaft and new mill c1940.*

*Photograph: G. Grundmann collection. Copyright: Barrier Stationers Broken Hill.*



MURRAY VIEWS No. 15. GENERAL VIEW NORTH MINE, BROKEN HILL

### **Post World War Two**

In the post World War Two era, it was understood that the ore body extended further to the north and that a new shaft would be required at some point. Sinking of what would become No. 3 shaft commenced in 1948. Full scale sinking, with the aim of reaching the first operational level of 3,070ft, commenced in 1951. In the mid-1950s, the No. 3 shaft area was developed as the main working area and most of the functions that were located around the No. 1 shaft area, were transferred to purpose-built buildings at No. 3 shaft area. The project was completed in 1956.

The works involved the construction of the No. 3 shaft and brace, No. 3 upcast ventilation shaft, a breaker station and associated conveyor and mullock bin, surface workshops for fabricating steel and timbers and associated roadways and tramways. There was a sub-surface brace which incorporated the change-house, offices for underground staff, a lamp room, ambulance room, fire station and a waiting room for men going underground. A modern company office building was later erected in 1965.

In 1958, the No. 2 mill was modified again to an all flotation process. All the jigs and tables were removed and some modifications were made to the grinding process. In 1962 the British section (including the Junction mines and Block 14) were closed and sold to South Broken Hill Limited.

Mining at North Broken Hill remained focused on developing the lodes to the north. In 1981, it was thought that the ore reserves at the North mine were running out. At No. 1 mill, most of the buildings and facilities closed in 1975 were to be demolished in 1979 as the area was to be part of an open cut mine developed in late 1980's. The Fitzpatrick area, located further to the north, was a newly discovered ore body which kept the mine operating until the mid 1990s. Like the mines of the Southern Leases, the North mine used its existing operations to fund exploration works and the development of other mineral resources.

Footnote: The currency used at the time has been retained. Decimal currency was introduced in 1966 with £1=\$2

## Pasminco

Pasminco was formed in 1988 by the merger of the North (North Broken Hill Limited) and the Zinc and NBHC mine operations (ZC Mines Pty Limited). The North mine had produced an estimated 34 Mt of ore typically 14% lead, 230 g/t silver and 11.5% zinc to a depth of 1.7 km prior to its closure in 1993, mainly from the underground operations. Between 1991 and 1993, a total of 80 000 t of zinc lode ore grading 5.5% lead, 100 g/t silver and 9.5% zinc were mined at the North mine from a measured and indicated resource of 175 000 t. Between 1991 and 1995, ZC Mines produced 89.6 Mt of ore. In 1996, 2.5 Mt of ore was produced from the Pasminco underground operation at grades of 5.5% lead, 54 g/t silver and 7.7% zinc. Pasminco went into administration in 2002 and its Broken Hill assets were purchased by Perilya.

## Perilya

Perilya was established in 1987. The foundation for the company's rapid growth came with the purchase of the Fortnum gold mine in Western Australia in 1994. Fortnum had ore reserves of 55,000 ounces and over the next six years, the mine produced 540,000 ounces of gold. This operation generated surplus funds of more than \$70 million up to the closure of the mine in August 2001. With this, Perilya embarked on an aggressive evaluation and acquisition program and identified Broken Hill as an operation that could provide Perilya with significant and sustainable cash flows to grow the company. In May 2002 the company successfully acquired the Broken Hill mines from Pasminco Limited for \$90 million, giving Perilya the opportunity to grow into a major mining company.

In January 2005, Perilya acquired the Daisy Milano gold mine, southeast of Kalgoorlie. In 2007 mining was suspended when Perilya decided to divest its gold assets and focus on base metals. In August 2007, the gold assets comprising the Daisy Milano mine and the Mount Monger, Moyagee and Honeymoon Well exploration projects were sold. Perilya commenced mining at the Beltana zinc mine in March 2007. Mining and crushing operations at Beltana have been completed with the high grade zinc ore shipped to smelters in Asia. In 2008, the operations at the Broken Hill mine was restructured, resulting in a significant improvement in productivity, profitability and cash flows giving an extension to the life of the mine to approximately 10 years.

## Shenzhen Zhongjin Lingnan Nonfemet

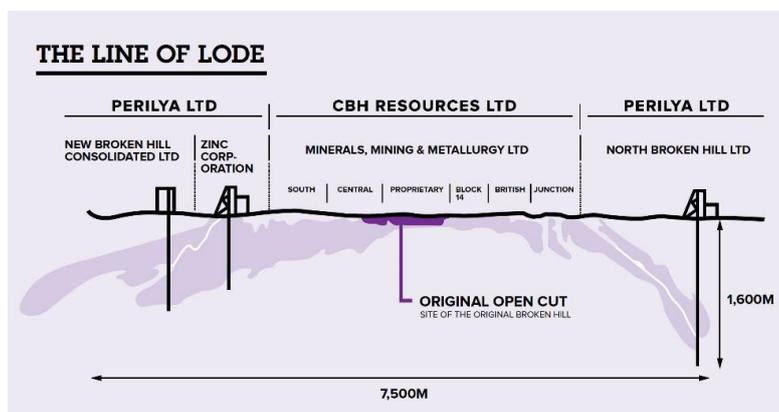
In February 2009, Shenzhen Zhongjin Lingnan Nonfemet Co. Ltd, China's third largest zinc producer, acquired a 50.1% interest in Perilya. In January 2011, Perilya successfully acquired 100% of GlobeStar Mining Corporation, giving access to the low cost Cerro de Maimón copper, gold and silver mine in the Dominican Republic. Also in 2011, Perilya Limited acquired Pinnacles Mining Pty Ltd when it went into liquidation in 2011. The Pinnacles deposit was considered to have potential as an open pit mine that could be integrated into Perilya's other Broken Hill mining operations.

In addition to its mining operations, the Perilya has an active exploration and development program which includes exploration and development programmes in the Broken Hill region and in the vicinity of its Beltana zinc silicate project in South Australia. The Company also has extensive exploration programs underway on its Dominican Republic mining and exploration concessions that include a laterite nickel project and highly prospective copper, gold & silver targets near its Cerro de Maimón mine. The Company is reviewing options for the development of the Mount Oxide copper project in the Mount Isa region in Queensland. In addition, the Company has a 60% interest in the Moblan lithium project located in Quebec, Canada, which is currently undergoing a development study.

On 19 December 2013 Shenzhen Zhongjin Lingnan Nonfemet Co Ltd acquired all the shares in Perilya taking its ownership of Perilya to 100%. Zhongjin Lingnan's prime business activities include the mining and processing of lead, zinc and other non-ferrous metals and the company has been operating for over 50 years. Zhongjin Lingnan is listed on the Shenzhen Stock Exchange. Little public information is available on the company's operations.

In December 2017, the NSW Government granted approval to Perilya to reopen the North Mine with production planned to commence in early 2018.

However a decline in zinc prices during 2018 has probably delayed this happening.



*The Companies operating along the Line of Lode in 2018.*

### Part 3: MINERALS FROM THE NORTH MINE

The following mineral species from the North mine are listed on MINDAT. Photographs of some of these minerals are shown below. Photographs c John Haupt.

<u>Acanthite</u>	<u>Allargentum</u>	<u>Anatase</u>
<u>Annite</u>	<u>Antimony</u>	<u>'Apophyllite'</u>
<u>Arsenopyrite</u>	<u>Axinite-(Mn)</u>	<u>Bannisterite</u>
<u>Barite</u>	<u>Bournonite</u>	<u>Breithauptite</u>
<u>Bustamite</u>	<u>Calcite</u>	<u>Cassiterite?</u>
<u>Chalcopyrite</u>	<u>Clinocllore</u>	<u>Cubanite</u>
<u>Dyscrasite</u>	<u>Fluorapatite</u>	<u>'Fluorapophyllite'</u>
<u>Fluorite</u>	<u>Gahnite</u>	<u>Galena</u>
<u>Ganophyllite</u>	<u>Graphite</u>	<u>Grunerite</u>
<u>Gudmundite</u>	<u>Gypsum</u>	var: <u>Selenite</u>
<u>Hedenbergite</u>	<u>Manganooan Hedenbergite</u>	<u>Ilmenite</u>
<u>Inesite</u>	<u>Johannsenite</u>	<u>Linnaeite</u>
<u>Löllingite</u>	<u>Miargyrite</u>	<u>Molybdenite</u>
<u>Nickeline ?</u>	<u>Polybasite</u>	<u>Proustite</u>
<u>Pyrrargyrite</u>	<u>Pyrite</u>	<u>Pyrosmalite-(Fe)</u>
<u>Pyrostilpnite</u>	<u>Pyrrhotite</u>	<u>Quartz</u>
<u>Rhodonite</u>	<u>Siderite</u>	<u>Silver</u>
<u>Spessartine</u>	<u>Sphalerite</u>	<u>Stannite</u>
<u>Stephanite</u>	<u>'Sturtite'</u>	<u>'Tennantite-Tetrahedrite Series'</u>
<u>Tephroite</u>	<u>Tetrahedrite</u>	<u>Valleriite</u>
<u>'Wolframite'</u>		

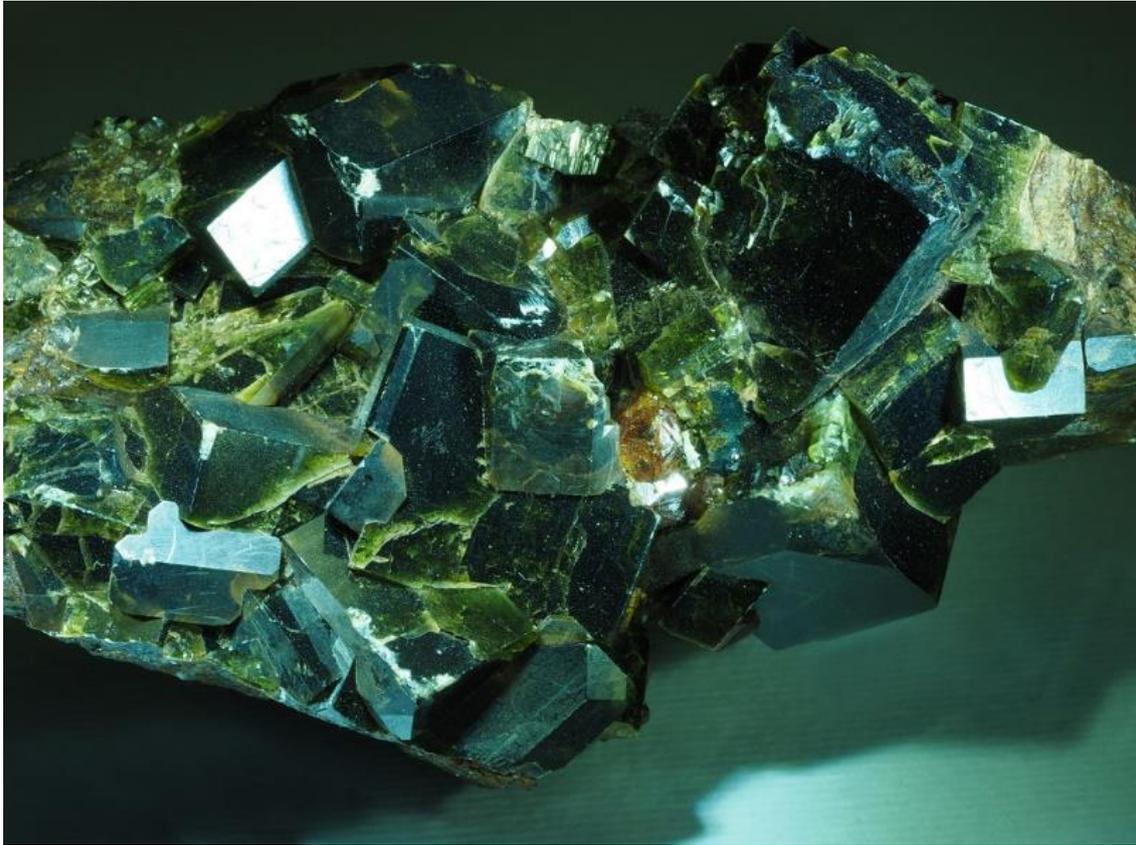


*Above left: Needles of bustamite with quartz & calcite on hedenbergite, 2.5cm across. Specimen: M. Newnham.*

*Above: The fibrous amphibole in the grunerite-cummingtonite series, 10cm tall. Specimen: M. Newnham.*



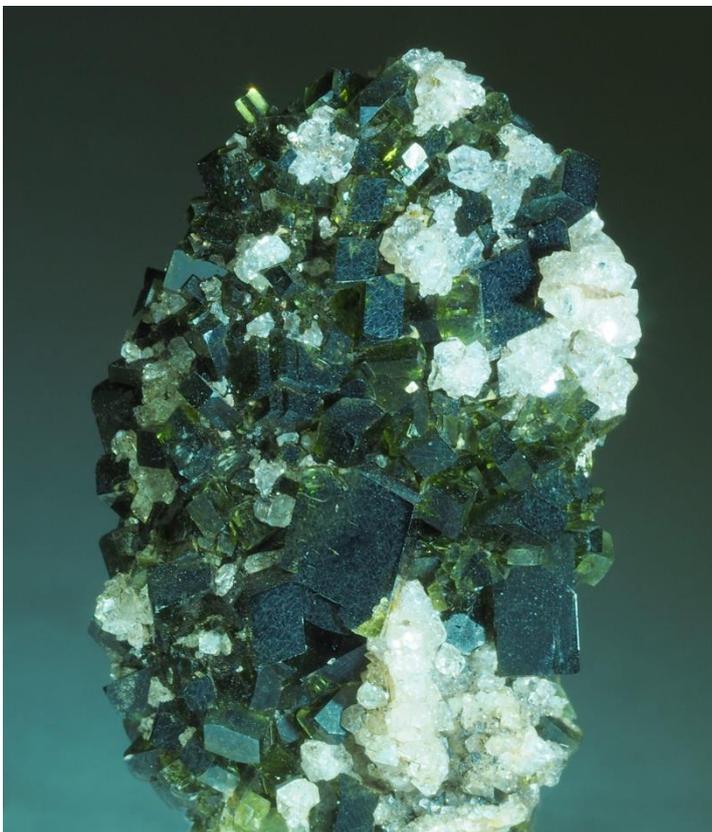
*Left: Uncommon dodecahedral crystals of fluorite, 4mm FOV. Specimen: J. Haupt.*



*Above: Blocky crystals of hedenbergite, 8cm across. Specimen: M. Newnham.*

*Below left: Hedenbergite with fluorapophyllite, 4cm tall. Specimen: M. Newnham*

*Below right: A gemmy rhodonite crystal 3.5cm tall. Specimen: M. Newnham.*





*Above: A group of spessartine garnets on galena, 6cm across.*

*Specimen: J. Haupt*

*Above right: Rhodonite crystal 3cm tall*

*Specimen: M. Newnham.*

*Right: Spessartine garnet, 3.5cm across. Specimen: J. Haupt.*



#### **Acknowledgements:**

Thank you to Günter Grundmann for permission to use early photographs of the North Mine from his collection and Iain Stuart to use his North mine article. Also to Michael Newnham for access to his North mine specimens to photograph

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# THE MINERALOGICAL SOCIETY OF VICTORIA INC.

A0001471E  
PO Box 153  
Lara Vic 3212

## MEMBERSHIP RENEWAL AND APPLICATION FORM

Membership fees for the year ending 31 March 2020  
are due and payable on 31 March 2019

Surname: \_\_\_\_\_ First Name: \_\_\_\_\_

Family Members: 1: \_\_\_\_\_ 2: \_\_\_\_\_

3: \_\_\_\_\_ 4: \_\_\_\_\_

Address: \_\_\_\_\_

Suburb: \_\_\_\_\_ Post Code: \_\_\_\_\_

Telephone: Home: \_\_\_\_\_ Business: \_\_\_\_\_

Email: \_\_\_\_\_ Mobile: \_\_\_\_\_

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

### MEMBERSHIP RENEWAL AND APPLICATION FEES

Membership application fee \$ 5.00 \_\_\_\_\_

#### Melbourne Metropolitan Membership Annual fee

Adult \$25.00 \_\_\_\_\_

Family (2 adults plus children 12 - 17 years) \$35.00 \_\_\_\_\_

Student \$15.00 \_\_\_\_\_

#### Country/Interstate Membership Annual fee

Adult \$20.00 \_\_\_\_\_

Family \$30.00 \_\_\_\_\_

#### Donation to Museum Victoria - Mineral Purchase Fund

(Optional Donation) \$ \_\_\_\_\_

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