SMLS JOURNAL - Number 243

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Back to the list of Journals

Contents

SUSSEX MINERAL & LAPIDARY SOCIETY

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" The Society was founded in August 1972 with the object of increasing the knowledge and experience of its members in rock, mineral, gemstone and fossil collecting and their cutting, polishing and preparation for jewellery and display"

SOCIETY OFFICERS

Chairman and treasurer:	Trevor Devon
Vice-chairman	Nick Hawes
Secretary	Colin Brough

OTHER COMMITTEE MEMBERS

John Burgess	Helena Carter	Terry Denney
Peter Hay	Caroline May	Jo & Ivan Tingley

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Field trip Co-ordinator:	John Burgess
Journal Editor	John Pearce
Show Organisers	Mark Oddy, Trevor Devon and Colin Brough
Librarian	Terry Denney
Technical Adviser (Minerals)	John Hall
Technical Adviser (Lapidary)	Derek Underdown
Circulation of Journals	Pam Pearce
Equipment Loans Co-ordinator	
Web Master	Gary Atkinson

SOCIETY SUBSCRIPTIONS

Subscriptions are:
£13.00 for first member in a family (£10 for "online members")
£11.00 for second member of the same family (£8 for "online")
£11.00 for associate members (£8 for online")
£6.50 for student members (£4 for "online")

(no family need pay more than £24.00) - and become payable on 1st August each year.
Persons up to 17 years of age and persons taking full-time study up to 21 years of age may opt for student membership.
Persons living over 60 miles from Haywards Heath may opt for associate membership.
Anyone joining the Society after January 31st pays half the appropriate annual subscription.

MEETINGS

Meetings are normally held on the first Friday of each month at the Age Concern Hall, attached to Clair Hall, Haywards Heath from 7.30 - 10.30

Chairman & treasurer:	F/Trip Coordinator:	Secretary:
Trevor Devon	John Burgess	Colin Brough
Battle Barn Farm	The Old School	1 William Allen Lane
Sedlescombe	168 North Cray Road	Lindfield
Battle	Sidcup	Haywards Heath
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CLEANING AND PREPARING MINMERAL SPECIMENS:
What? When? Why? & How?

It goes without saying that all of us from time to time have experience of the cleaning and preparation of specimens. This might simply involve washing under the tap to remove the mud and dust of a quarry or an attempt to detach a small well mineralised section from a large mass of "ugly" or "uninteresting" matrix. However, it can be something much more complex and involve considerably more alteration of the specimen. Even those who acquire material via the "silver pick" at shows or on-line can be assured that the specimens have been processed to a greater or lesser degree, usually to maximise their aesthetic appeal and commercial potential.

This subject has been addressed before in Russell Society publications. In the very first volume of the Russell Society Journal in 1982 and 1983 Bob King provided a series of articles on "The care of minerals" with part 1 addressing cleaning and part 2 covering "development". A strict distinction was drawn in these between removing material foreign to the natural mineral assemblage ("cleaning") and removal of one or more components of that assemblage to expose or highlight one species ("preparation").

Although there is these days much information available, both in print and on-line, about cleaning mineral specimens a lot of the written material is now a little long in the tooth - witness the Bob King articles which are some 30 years old and Richard Pearl's book "Cleaning & Preserving Minerals" that was first published in 1947. The relevant physics and chemistry involved will not have changed but the availability of tools, equipment and cleaning chemicals probably will – to say nothing of the modern emphasis on health and safety considerations and collectors' perceptions of what is desirable or permissible. In recent conversations with John Pearce, long-time RS member and stalwart of the Sussex Mineral & Lapidary Society, we wondered if it might be appropriate to revisit this topic with our memberships to see what attitudes currently prevail and what techniques are currently being used. We felt it might be possible to arrive at some sort of overview of mineral cleaning and development practices from the point of view of amateur collectors in the second decade of the 21st century.

To this end we would be delighted to hear from you on any and all aspects of mineral cleaning and preparation. The headings below are just some of the topics and issues that arise when thinking about cleaning mineral specimens:

The Objectives **(What are you trying to accomplish?)**

- To make a specimen more appealing to the eye?
- To expose or highlight one area or aspect of a specimen?
- To remove mud, dust clay etc?
- To remove algae, lichen and other biological material?
- To remove iron stains and coatings?
- To remove mineral coatings and overgrowths?
- To prevent or control specific problems like "pyrite rot"?

The Ethics: **(The "When?" and "Why?")**

- What information does a specimen contain and what might be lost?
- What is the primary purpose for which the specimen is intended?
- When to remove unwanted material and when not to?
- How far to go? How much is too much?
- How acceptable is the repair and restoration of damaged material?
- How acceptable is "improvement" (oiling, crack filling, surface coating etc.)?
- How should you record details of any treatments or repairs?

The Techniques: (The "How?")

- Physical, e.g.
  - Washing (Under the tap).
  - Washing (High pressure).
  - Brushing (Bristle, wire).
  - Trimming and breaking.
  - Picking & prying (dental tools, bamboo splinters etc.).
  - Grinding/Abrasion (Dremel type tools, sand blaster etc).
  - Ultrasonication.
  - Sources of useful equipment.

- Chemical
  - Good sources of information and "recipes".
  - Use of detergents & soaps.
  - Ammonia/bleach (removal of lichens, algae etc).
  - Acids – Strong (carbonate removal etc.).
  - Acids – Weak (milder, slower action with fewer side-effects
  - Reducing and oxidising agents (i.e. converting ferric to ferrous iron to facilitate removal).
  - Chelating agents (i.e. oxalic acid or citrate to hold dissolved materials in solution)
  - Organic solvents (Includes alcohols, ketones, halogenated compounds, aromatics etc.)
  - Glues, fillers, coatings etc.
  - Sources of useful chemicals.
  - Safety in the storage and use of chemicals.
  - Disposal of chemicals and residues.

Your thoughts, ideas, information, suggestions etc would be very welcome. Please communicate them to me at m.t.doel@talk21.com or to John Pearce at jppearce@talktalk.net
We look forward to hearing from you.

Michael Doel

(This article appeared in the Russell Society Newsletter, Number 62, March 2013 and was based on collaboration between the editors of this newsletter and SMLS journal)

SMLS BBQ 2013

Please note the change of date: Saturday 31st August at the Keepers Cottage, Scaynes Hill (just East of Haywards Heath)

THE MINERAL GRID

The answers to the MINERAL GRID introduced in the last journal, can be found in the following pages of this journal. Apologies, a typo appeared in the listing of the minerals: "boulangerite" appeared as "boulanerite". Although I only put the Mineral Grid in the journal for a bit of fun, it brought out the competitive streak in some members, who wanted to beat my record breaking: 3 days, 5 hours and 40 minutes The best time I have received to date is from Roy Starkey with a time of 4 hours 30 minutes. Well done Roy.

John Pearce

THE GRID: HORIZONTAL MINERAL NAMES

Q	L	U	B	V	Z	L	D	H	P	C	I	T	L	E	T	I	R	E	T	I	S	S	A	C	U	I	I	U	N
Z	V	A	X	T	V	C	N	U	M	O	F	V	E	T	I	K	S	V	O	R	E	P	C	H	S	B	T	H	A
K	V	H	T	H	J	I	O	R	C	V	Q	C	W	S	A	S	J	F	S	G	T	Q	Z	R	D	E	A	O	U
V	C	N	S	T	N	N	M	M	M	G	D	C	P	O	G	K	Q	V	S	B	I	X	B	Y	I	T	E	L	G
Y	L	G	F	U	S	E	A	P	Y	R	R	H	O	T	I	T	E	T	I	N	N	A	M	S	U	A	H	E	R
K	C	L	Q	M	K	S	I	I	M	E	R	C	U	R	Y	U	A	E	H	S	I	N	Z	O	J	F	F	T	H
K	O	A	D	S	U	R	D	I	P	V	S	H	A	U	E	R	I	T	E	H	L	J	W	B	J	I	U	I	F
X	M	U	N	I	T	A	L	P	A	L	D	G	K	F	T	O	N	I	A	A	K	Q	Q	E	V	T	Y	H	W
V	O	C	A	B	T	L	O	E	N	I	C	K	E	L	I	N	E	T	I	C	N	I	Z	R	P	E	B	C	M
W	L	O	E	C	E	C	G	B	T	S	C	C	T	U	L	W	T	L	H	R	A	T	M	Y	P	O	B	E	Y
N	Y	D	T	R	R	H	R	X	I	V	F	L	I	S	L	V	I	A	X	Y	R	M	I	L	U	T	N	N	A
B	B	O	I	Y	U	A	A	Z	M	D	B	M	N	N	E	E	L	B	K	O	F	V	I	L	Y	D	U	A	D
T	D	T	T	R	D	L	P	A	O	Y	N	R	A	P	V	C	A	O	O	L	A	N	A	T	A	S	E	M	X
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G	T	I	R	A	U	I	E	A	Z	X	B	R	S	B	Y	R	S	Y	R	R	G	O	R	G	U	B	E	T	M
L	E	E	P	E	N	T	L	A	N	D	I	T	E	A	L	B	A	I	C	M	A	U	V	D	E	C	T	I	F
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E	A	J	T	K	E	A	A	D	R	N	E	U	E	I	U	I	K	D	T	D	R	N	R	L	R	M	P	V	V
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O	Y	I	T	G	O	E	R	P	A	H	A	A	I	W	I	T	J	I	I	J	B	T	T	L	N	T	T	V	A
E	A	L	N	N	C	D	Y	R	I	N	H	L	G	T	F	N	J	M	C	U	E	E	M	E	D	E	R	E	W
X	T	W	V	B	K	R	G	N	D	P	N	Z	L	A	E	U	E	P	Z	O	H	O	L	T	U	C	U	S	F
A	K	E	T	I	I	I	I	Z	E	L	J	I	P	I	Q	N	Z	M	Y	A	N	J	Q	A	M	U	A	C	U
C	K	X	M	T	T	T	E	T	I	R	P	U	C	A	T	Y	G	C	L	E	T	I	S	U	L	O	R	Y	P
A	K	I	E	E	E	E	S	Z	G	Y	X	V	Q	A	H	E	M	A	T	I	T	E	T	P	N	U	H	K	B
L	I	Z	J	I	Q	K	R	H	Z	A	B	W	E	Q	U	U	A	U	M	A	Y	K	N	E	X	G	N	U	O

THE GRID: Vertical mineral names

Q	L	U	B	V	Z	L	D	H	P	C	I	T	L	E	T	I	R	E	T	I	S	S	A	C	U	I	I	U	N
Z	V	A	X	T	V	C	N	U	M	O	F	V	E	T	I	K	S	V	O	R	E	P	C	H	S	B	T	H	A
K	V	H	T	H	J	I	O	R	C	V	Q	C	W	S	A	S	J	F	S	G	T	Q	Z	R	D	E	A	O	U
V	C	N	S	T	N	N	M	M	M	G	D	C	P	O	G	K	Q	V	S	B	I	X	B	Y	I	T	E	L	G
Y	L	G	F	U	S	E	A	P	Y	R	R	H	O	T	I	T	E	T	I	N	N	A	M	S	U	A	H	E	R
K	C	L	Q	M	K	S	I	I	M	E	R	C	U	R	Y	U	A	E	H	S	I	N	Z	O	J	F	F	T	H
K	O	A	D	S	U	R	D	I	P	V	S	H	A	U	E	R	I	T	E	H	L	J	W	B	J	I	U	I	F
X	M	U	N	I	T	A	L	P	A	L	D	G	K	F	T	O	N	I	A	A	K	Q	Q	E	V	T	Y	H	W
V	O	C	A	B	T	L	O	E	N	I	C	K	E	L	I	N	E	T	I	C	N	I	Z	R	P	E	B	C	M
W	L	O	E	C	E	C	G	B	T	S	C	C	T	U	L	W	T	L	H	R	A	T	M	Y	P	O	B	E	Y
N	Y	D	T	R	R	H	R	X	I	V	F	L	I	S	L	V	I	A	X	Y	R	M	I	L	U	T	N	N	A
B	B	O	I	Y	U	A	A	Z	M	D	B	M	N	N	E	E	L	B	K	O	F	V	I	L	Y	D	U	A	D
T	D	T	T	R	D	L	P	A	O	Y	N	R	A	P	V	C	A	O	O	L	A	N	A	T	A	S	E	M	X
C	E	W	S	A	I	C	H	K	N	K	S	P	V	R	O	L	H	C	E	I	O	N	M	H	E	C	K	O	I
M	N	E	U	G	T	O	I	E	Y	P	A	S	L	P	C	I	W	L	J	T	G	Q	E	N	I	V	M	R	G
Q	I	T	O	L	E	C	T	M	H	Z	T	V	Y	Q	Y	A	B	W	O	E	F	B	E	Z	J	A	A	U	M
G	T	I	R	A	U	I	E	A	Z	X	B	R	S	B	Y	R	S	Y	R	R	G	O	R	G	U	B	E	T	M
L	E	E	P	E	N	T	L	A	N	D	I	T	E	A	L	B	A	I	C	M	A	U	V	D	E	C	T	I	F
Y	P	L	A	R	G	E	N	T	I	T	E	L	R	G	I	M	T	R	T	Y	E	R	L	A	J	H	C	L	W
A	F	O	O	C	R	T	C	Q	E	Z	E	S	A	S	D	E	J	E	G	E	V	N	G	P	C	R	U	E	Q
F	F	B	B	I	E	R	K	A	Y	L	E	L	M	E	T	I	S	A	B	Y	L	O	P	Y	O	O	K	S	D
E	A	J	T	K	E	A	A	D	R	N	E	U	E	I	U	I	K	D	T	D	R	N	R	L	R	M	P	V	V
S	T	E	Y	C	N	H	B	B	O	N	T	T	N	T	B	J	B	R	D	P	J	I	I	I	U	I	Y	C	Z
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X	T	W	V	B	K	R	G	N	D	P	N	Z	L	A	E	U	E	P	Z	O	H	O	L	T	U	C	U	S	F
A	K	E	T	I	I	I	I	Z	E	L	J	I	P	I	Q	N	Z	M	Y	A	N	J	Q	A	M	U	A	C	U
C	K	X	M	T	T	T	E	T	I	R	P	U	C	A	T	Y	G	C	L	E	T	I	S	U	L	O	R	Y	P
A	K	I	E	E	E	E	S	Z	G	Y	X	V	Q	A	H	E	M	A	T	I	T	E	T	P	N	U	H	K	B
L	I	Z	J	I	Q	K	R	H	Z	A	B	W	E	Q	U	U	A	U	M	A	Y	K	N	E	X	G	N	U	O

THE GRID: Diagonal Mineral Names

Q	L	U	B	V	Z	L	D	H	P	C	I	T	L	E	T	I	R	E	T	I	S	S	A	C	U	I	I	U	N
Z	V	A	X	T	V	C	N	U	M	O	F	V	E	T	I	K	S	V	O	R	E	P	C	H	S	B	T	H	A
K	V	H	T	H	J	I	O	R	C	V	Q	C	W	S	A	S	J	F	S	G	T	Q	Z	R	D	E	A	O	U
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S	T	E	Y	C	N	H	B	B	O	N	T	T	N	T	B	J	B	R	D	P	J	I	I	I	U	I	Y	C	Z
O	Y	I	T	G	O	E	R	P	A	H	A	A	I	W	I	T	J	I	I	J	B	T	T	L	N	T	T	V	A
E	A	L	N	N	C	D	Y	R	I	N	H	L	G	T	F	N	J	M	C	U	E	E	M	E	D	E	R	E	W
X	T	W	V	B	K	R	G	N	D	P	N	Z	L	A	E	U	E	P	Z	O	H	O	L	T	U	C	U	S	F
A	K	E	T	I	I	I	I	Z	E	L	J	I	P	I	Q	N	Z	M	Y	A	N	J	Q	A	M	U	A	C	U
C	K	X	M	T	T	T	E	T	I	R	P	U	C	A	T	Y	G	C	L	E	T	I	S	U	L	O	R	Y	P
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L	I	Z	J	I	Q	K	R	H	Z	A	B	W	E	Q	U	U	A	U	M	A	Y	K	N	E	X	G	N	U	O

ROBBERS FAIL TO LOOT TOMB, BUT…

Because of the increasingly stringent weight and security restrictions imposed by airlines I have resorted to burying my hammer and chisel in a remote part of Lanzarote between Quemada and Playa Blanca (see figure 1) at the end of each visit. Few visitors reach this barren, desert-like stretch of the island, 3-4 km and over three barrancos from Quemada, only very dedicated walkers and the boys looking after the goats. I have done this over a period of three years. On the first occasion there was a landslide in the burial area during the year and that hammer was never seen again. On the second occasion I could not locate the exact place I had buried the hammer or one of the goat-herders had discovered it. On the third attempt I dug a hole two foot deep and lined it with rock and then levered a very large boulder on top of this tomb.

The good news is that the burial chamber, when opened up at 1015 hours on February 8th 2013, had not been looted and I recovered my hammer and chisel. I immediately scrambled to the nearby zeolite site and happily swung my hammer for around 20 minutes breaking into superb cavities containing lustrous micro phillipsites. Then disaster struck. The hammer head flew off. The end of the wooden shaft had totally rotted despite the very dry conditions in Lanzarote for most of the year (see figure 2).

When I returned to my faithful hardware shop I insisted that I needed a plastic shaft for my new hammer.

Fig 1. **X** marks the burial chamber

Fig. 2 The hammer head departed from its shaft

John Pearce

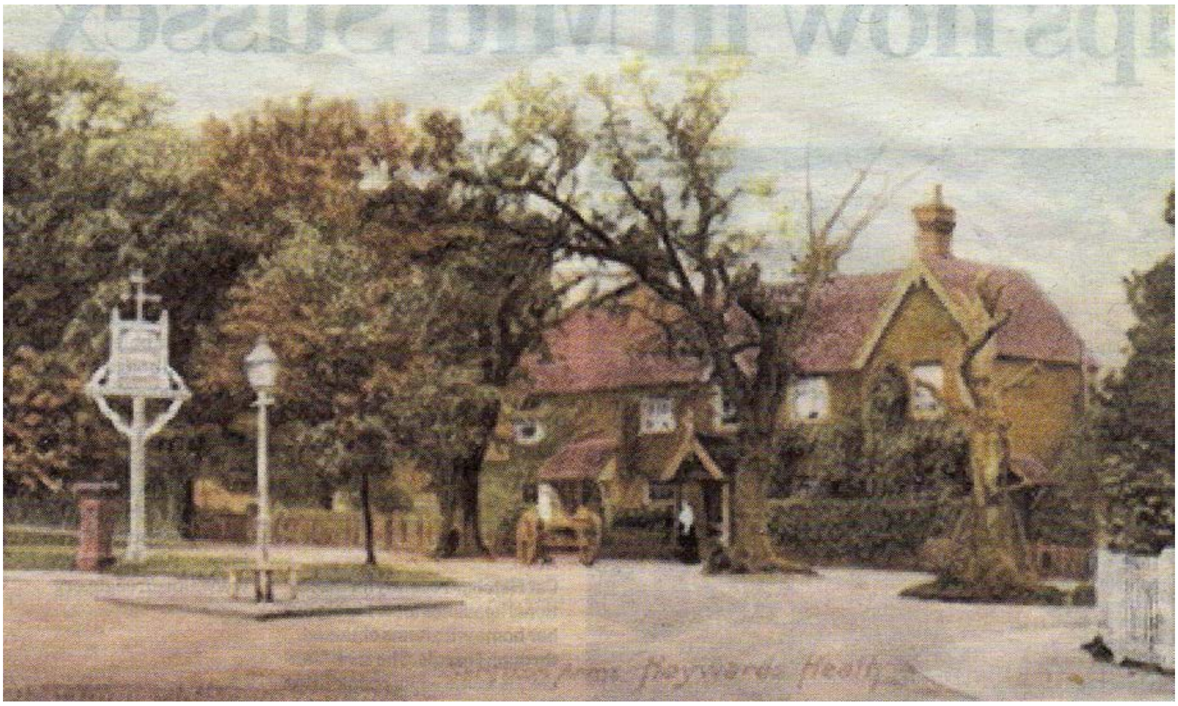
FOSSIL ROCK ANTHEM

Feeling blue. Take a look at this**:** **http://youtu.be/ClJ5lwl_wM0**

ISLE OF SHEPPEY FIELD TRIP

The field trip to the Isle of Sheppey has been rearranged for Sunday June 2nd. RV 11.00 a.m. See ***Dates For Your Diary.*** Please let John Pearce know if you are coming.

THE SERGISON ARMS (aka The Dolphin Pub)



The Dolphin pub, just to the west of Haywards Heath on the A272, has been the meeting place for long distance SMLS members for many years as well as a convenient place to wine and dine our speakers. In the last few months the pub has been upgraded to a gastro pub and reverted to its name, the Sergison Arms. In some ways this change in name has been beneficial since there is a Dolphin Sports Centre less than a mile away which can confuse people. The change in name does mean that we have had to change the name on our location maps on our website and on our Shows posters.

PAULINE FITCH
1920 – 2013

Pauline was a member of the SMLS for many years, both serving on the Committee and, for 4 years (1978 – 1982), as Journal Editor.
Her late husband Ken was a very active founder member of the Society, with a keen interest in mineral and fossil collecting and lapidary. His excellent gem cutting ability was achieved using home made equipment, which often exhibited innovative areas of design. He held many roles in the Society including, at various times, Chairman, Treasurer, and Secretary.
Pauline, although interested in the minerals and fossils, particularly in the cut gems and jewellery that Ken had made and presented her with, seemed generally more interested in British wildlife. Over the years she was proud of the various birds she managed to attract to their large garden and was a Life Fellow of the RSPB. Also, until some years ago, both Pauline and Ken were active members of what is now The Sussex Wildlife Trust and they held regular fund-raising Garden Parties for the Trust.
Pauline was what could be considered these days to be one of the 'old school'. Always strong in her beliefs and actions, and since losing Ken, determinedly independent. She always referred to Ken as 'Kenneth' and one had the opinion that she would have liked others to do the same, but to everyone else in the SMLS Kenneth was 'Ken'. Although having a few health problems in recent years Pauline maintained a relatively active mind and was always pleased to have a chat with any visitors. She also exercised her right in never disclosing her age to friends or neighbours.
Following a fall at home Pauline passed away peacefully during a short stay in hospital a few days after her 93rd birthday.

John Hall

MIKE SMITH

Sadly Mike Smith died late in January. He was not a member of SMLS, but he was a great friend to the Society. Over the years he led us on field trips to Hope Gap near Seaford looking for fossilised chalk sea urchins and he gave the Society talks on Geology and fossils. He also gave several Junior Corner talks at our Show mainly on Sussex fossils and dinosaurs, which captivated his young audiences. Mike was one of the leaders operating the community-led Grange in Rottingdean and SMLS mounted several mineral displays there over the years, which promoted our Society and our Show.

Mike was closely connected to the Kipling Society and wrote several books e.g.Kipling's Sussex, Sussex Cavalcade, Essentials of Geology and a Ladybird book on Fossils.

He was formerly a senior Geography master at Kings School, Peterborough and at Seaford College, Petworth before becoming a lecturer at Brighton Training College.

Our condolences go to his wife Audrey and family.

Terry Denney and John Pearce

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THE DEMISE OF BMLDA

The BMLDA (The British Lapidary and Mineral Dealers Association) has been running Mineral Shows around the UK for over 40 years, most recently at Harrogate, Ilkley and Warrington. Sadly the Association has closed as a result of falling numbers at their events and an ageing population.

AN INTRODUCTION TO GEOCHEMISTRY
FOR AMATEUR MINERALOGISTS

Fig. 1 Karen Hudson-Edwards

Karen Hudson-Edwards, reader in environmental geochemistry and mineralogy at Birkbeck College, University of London gave us a brilliant talk on Friday 1st February, which she had designed specifically for SMLS members.

Karen started by considering the structure of atoms in terms of their neutrons and positively charged protons in the nucleus, orbited by negatively charged electrons. Fig. 2 shows an atom of the element helium with 2 protons and 2 electrons where the electric charges balance out. Similarly figure 3 shows a carbon atom with 6 protons in its nucleus and 6 electrons orbiting it.

Atoms can become charged ions when they lose an electron, $X - e \rightarrow X^+$ or gain an electron,

$Y + e \rightarrow Y^-$ Metals are inclined to lose electrons to form positive ions e.g Na^+, Cu^{2+}, Al^{3+}

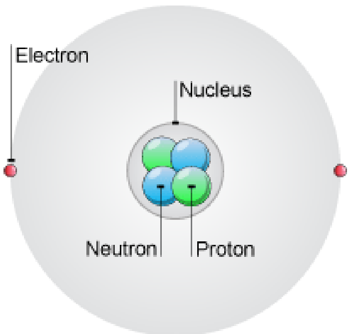


Fig. 2 Helium atom

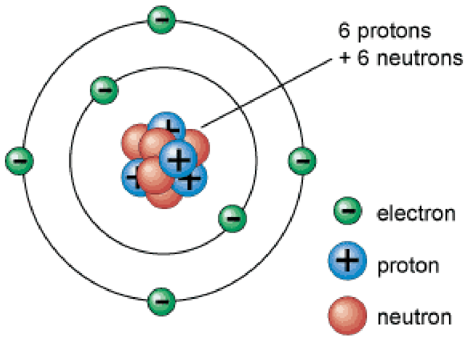


Fig. 3 Carbon atom

while non-metals are inclined to gain electrons, to form negative ions, e.g. Cl^-, O^{2-}, S^{2-}.

It is the ionic bonding between these oppositely charged ions, which forms the strong bonds in minerals which hold the ions of different elements in place resulting in their various properties including their crystalline shape.

It may be useful at this stage to recall a definition of a mineral:
A naturally occurring inorganic, solid substance whose composition is either fixed or varies between certain fixed limits. What makes each mineral unique is a combination of its chemical composition and the internal arrangement of the constituent atoms.

The number of protons in an atom defines an element, i.e helium has 2 protons, carbon 6, lead 82 and the classic Periodic Table (Fig, 4) is arranged in increasing order of the number of protons each element has – i.e. the atomic number of an element. This number is written immediately above each element in figure 4.

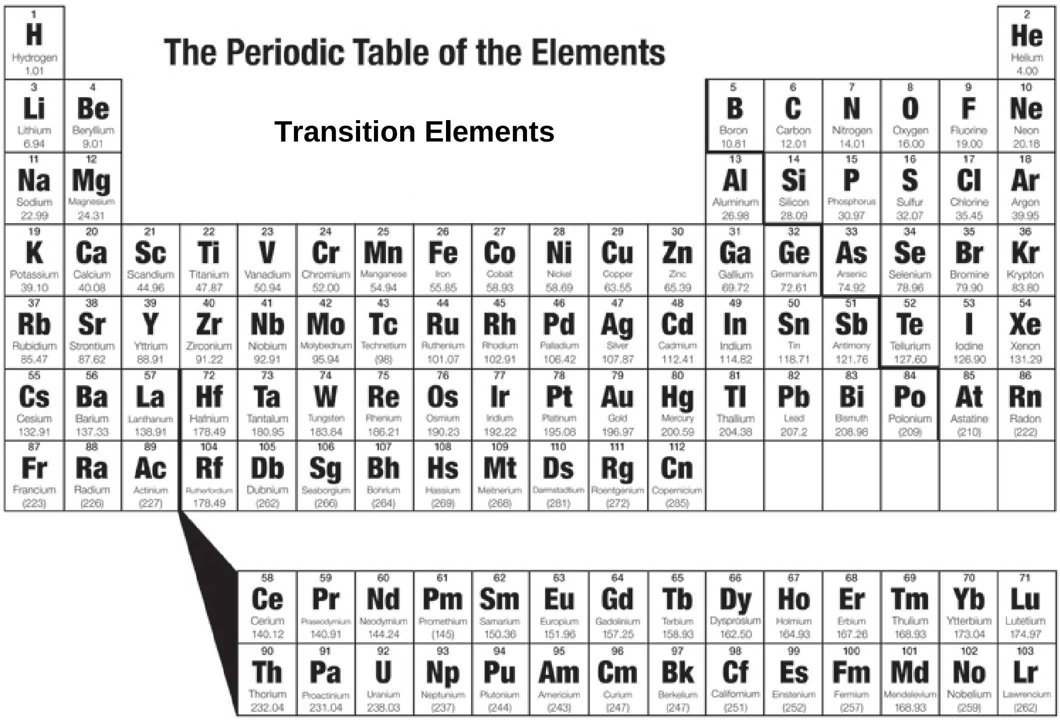


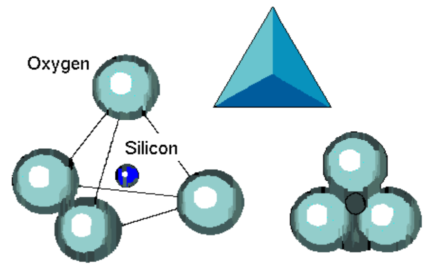
Fig. 4 The Periodic Table

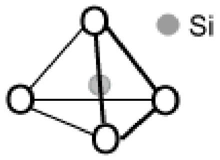
There are 92 different natural elements, of which 90 are found on the Earth with the heaviest uranium (atomic number 92), plus a number of elements with more than 92 protons in their nucleii which are formed by nuclear reactions or synthetically made in the laboratory. The table is so arranged that elements having similar properties are positioned vertically above or below each other. So, for example, the elements on the far right, the Noble Gases (He, Ne, Ar, Kr, Xe and Rn) are all very similar in being unreactive. On their immediate left are the non-metal halogens F, Cl, Br, I and At. On the far left of the table are the alkali metal elements (Li, Na, K, Rb, Cs and Fr) which have very similar properties to each other, while to their immediate right are the alkaline earth metals (Be, Mg, Ca, Sr, Ba and Ra).

In between these main groups are the Transition elements which include some of the precious metal elements such as gold (Au), silver (Ag) and platinum (Pt) as well as the many metals which we use in everyday life, such as copper (Cu) and zinc (Zn). These transition elements are often responsible for some of the colours in minerals e.g the blues and greens of copper minerals (azurite and malachite), the pink of cobalt minerals (e.g. erythrite) or the orange/red of some chromium minerals (e.g. crocoite).

The groups of elements to the right of the Transition elements can be thought of as being somewhere between metals and non-metals, with the non-metals being to the right of the zig-zag line in figure 4 above. Some of these provide the basic building blocks for minerals and rocks, in particular the elements carbon, oxygen and silicon.

Silicon ions, Si^{4+} combine with oxygen ions O^{2-} to form the basic tetrahedral silicate ions: $(SiO_4)^{4-}$ with a silicon atom at the centre of a regular tetrahedron and an oxygen atom at each apex. This is the basic building block for silicate minerals and rocks and is shown diagrammatically in figure 5.





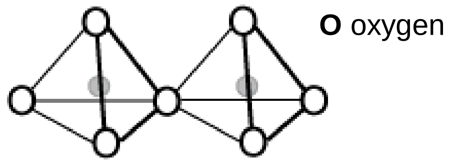


Fig. 5 Silicate tetrahedron

Fig. 6 An isolated tetrahedron

Fig. 7 a linked pair

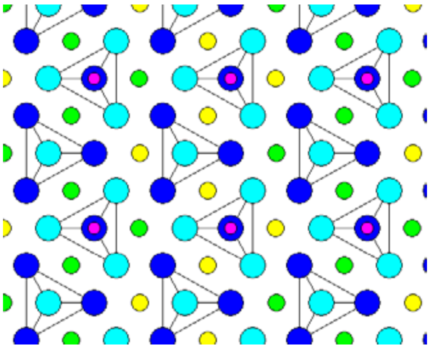


Fig. 8 Isolated tetrahedra in olivine

The silicate tetrahedron can exist in isolation in a mineral (see Fig. 6). For example in olivine, a magnesium, iron silicate $(Mg,Fe)SiO_4$ (see Fig. 8) you can see the isolated silica tetrahedra with the Mg^{2+} and Fe^{2+} ions bonded in the spaces between them.

Some silicate minerals have two silica tetraheda linked through an oxygen atom (see figure 7), e.g epidote group minerals or chains of silicate tetrahedra e.g. amphiboles (Fig. 9).

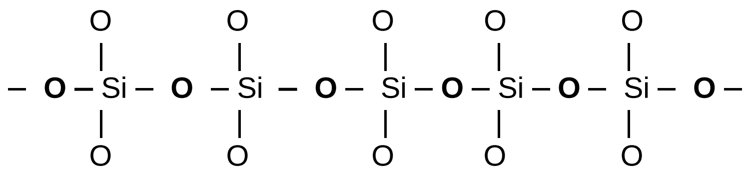


Fig. 9 A chain where many (SiO_4) units share two oxygen atoms

Some silica tetrahedra can form 6 membered rings (Fig. 10), e.g. beryl, $Be_3Al_2Si_6O_{18}$ (Fig. 11) where the crystal's cross section is hexagonal, corresponding to the 6 membered ring of silicate tetrahedra.

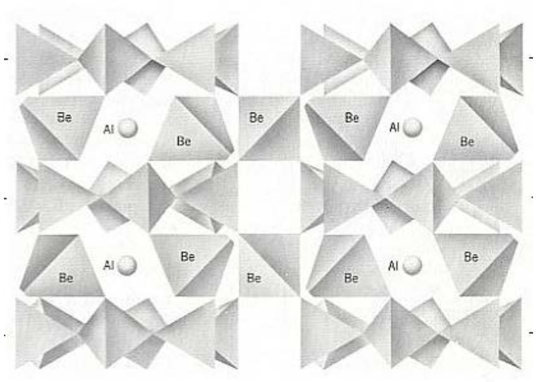


Fig. 10 The 6 membered ring of silicate tetrahedra

Fig. 11. A beryl crystal

Looking again at olivine (Fig. 8), it is interesting to look at the work of Victor Goldschmidt, who is considered to be one of the founder fathers of geochemistry. He developed some most important rules about the substitution of ions in minerals:

For one element to substitute for another element in a mineral structure, the following rules must be obeyed:

- The size of the two ions must be within 15% of one another.
- The charges on the ions must be the same.

In the case of olivine, $(Mg,Fe)SiO_4$ the ionic radii are:

Mg^{2+} 0.80Å
Fe^{2+} 0.86Å (1 Å = 1 x 10^{-10} m)

Both metal ions carry a charge of 2+ and their ionic radii are within 15% of each other, so both criteria are met.

In fact, the bracket around the magnesium and iron in the formula of olivine, $(Mg,Fe)SiO_4$ indicates that these two ions can replace each other.

Olivine forms a solid solution series where the composition can vary from 100%Fe^{2+} 0% Mg^{2+} to 100%Mg^{2+} 0%Fe^{2+} and all proportions in-between:

	Forsterite ($MgSiO_4$)	**Olivine**	**Fayalite** ($FeSiO_4$)
Mg^{2+}	100%	50%	0%
Fe^{2+}	0%	50%	100%

Table 1 Composition of olivine's solid solutions

The two end members are forsterite, $MgSiO_4$ and fayalite, $FeSiO_4$ and these two minerals have different colours (green and brown respectively) and their other properties also differ.

The pyroxenes take this idea one step further by having two different sites in the mineral which have ions which can be replaced by other ions.

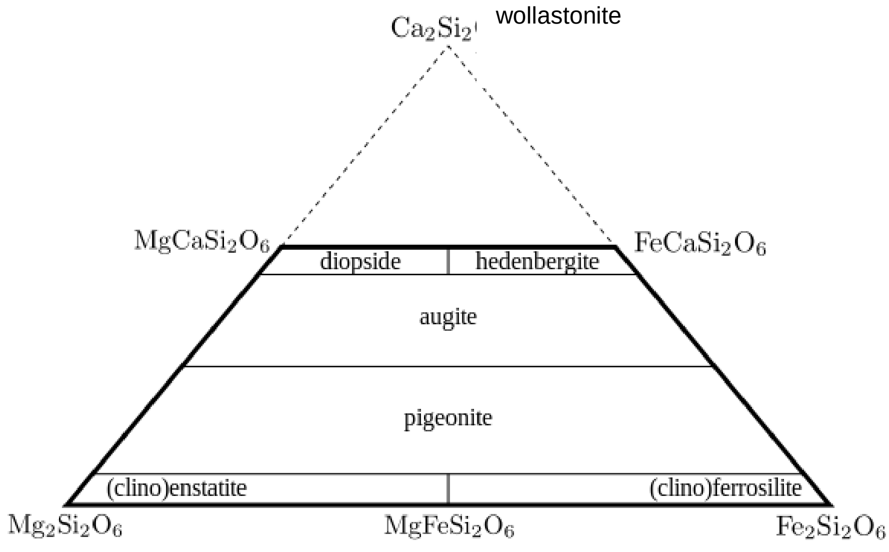


Fig. 11 Solid solution of aluminium free pyroxenes –
the common calcium, magnesium, iron pyroxenes

Pyroxenes have the general formula: $XY(Si,Al)_2O_6$ where

$X = Ca^{2+}, Fe^{2+}, Mg^{2+}, Zn^{2+}, Mn^{2+}$ etc. (metal ions with a charge of +2)
$Y = Al^{3+}, Fe^{3+}, Cr^{3+}, V^{3+}$ (metal ions with a charge of +3)

the X ions can substitute with each other, also one Y ion can replace another Y ion, but you cannot substitute a X ion (2 +ve charges) with a Y ion (3 +ve charges) on a one-to-one basis (but see the section on coupled substitution below).

Very quickly you can see how many different pyroxenes might result. If one just considers the common aluminium free pyroxenes with just the substitution of $Ca^{2+,}$ $Fe^{2+,}$ $Mg^{2+,}$ then the corresponding pyroxene solid solution minerals can be shown on a triangular diagram with the three end members at the apeces (see Fig.11 above):

Wollastonite	$Ca_2Si_2O_6$
Enstatite	$Mg_2Si_2O_6$
Ferrosilite	$Fe_2Si_2O_6$

and two of the in-between minerals:

diopside,	$CaMgSi_2O_6$
hedenbergite	$FeCaSi_2O_6$

while pigeonite, $(Mg,Fe,Ca)(Mg,Fe)\ Si_2O_6$ and augite $(Ca,Mg,Fe)_2Si_2O_6$ in the centre of the diagram, contain all three metal ions: Ca^{2+}, Mg^{2+} and Fe $^{2+}$.

Another form of substitution that is allowed in minerals is ***coupled substitution***, where two ions can substitute for another two ions as long as the total overall charge is the same.
For example, Na^+ and Al^{3+} (1 + 3) can substitute for Ca^{2+} and Mg^{2+} (2 + 2). So, for example, diopside ($CaMgSi_2O_6$) can form jadeite ($NaAlSi_2O_6$).

Silicates are not the only building blocks for rocks and minerals, others include:

Carbonates XCO_3, e.g. calcite $CaCO_3$ and witherite $BaCO_3$.

Sulphides XS, X_2S, XS_2 e.g. ZnS (sphalerite), Cu_2S (chalcocite), FeS_2 (pyrite).

and even native elements X, such as Au (gold), Ag (silver) and Cu (copper) might be considered to be mineral building blocks..

Most of the discussion has been concerned with one aspect of geochemistry; the distribution and movements of chemical elements in different parts of the Earth and in minerals, but there are other areas of geochemistry, which include:

Igneous geochemistry focusing on magmas, their composition etc.

Cosmochemistry including the analysis of elements and their isotopes in the cosmos.

Biogeochemistry focusing on the effect of life on the chemistry of the Earth.

Organic geochemistry involving the study of the role of processes and compounds that are derived from living or once-living organisms.

Aqueous geochemistry considering the role of various elements in watersheds, including copper, sulphur and mercury and how elemental fluxes are exchanged through atmospheric-terrestrial-aquatic interactions.

Exploration geochemistry including applications to environmental, hydrological and mineral exploration studies, e.g. metal mining.

Isotopic geochemistry involving the determination of the relative and absolute concentrations of the elements and their isotopes in the Earth and on the Earth's surface. e.g. used in the dating of rocks.

Karen looked briefly at two of the above, **aqueous geochemistry** and **biogeochemistry** both of which reflect some of her current research interests.

Aqueous Geochemistry

One of the worst pollutants from many metal mines is the acidic effluent resulting from decaying pyrite and it often contains the mineral jarosite, $KFe_3(SO_4)_2(OH)_6$. Jarosite is stable under acid conditions (pH < 5), but what happens when lime is added to raise the pH and neutralise the effluent? Will it dissolve the jarosite, what products will form and does the addition of lime improve or worsen the situation? Early experiments suggest that the jarosite is converted to goethite,

$$\underset{\text{jarosite}}{KFe_3(SO_4)_2(OH)_6} + \underset{\text{lime(alkali)}}{OH^-} \longrightarrow \underset{\text{goethite}}{FeOOH} + \underset{\text{potassium ions}}{K^+} + \underset{\text{sulphate ions}}{SO_4^{2-}}$$

but potassium (K^+) and $(SO_4)^{2-}$ ions are also formed in the process. The formation of solid goethite is fine, but further research is needed to assess the affects of the two other products, potassium and sulphate ions, on the environment.

Biogeochemistry

Organisms such as bacteria, worms and fungi are often intimately involved in the formation and dissolution of minerals and some minerals we collect are a result of this biological activity. It has often been assumed that one mineral changes to another just as a result of chemical reactions. However it has been shown that biological reactions can also take place, sometimes speeding up the chemical processes.

For example it was found that bacterium NT 26 eats arsenopyrite to obtain energy (the equivalent of our breathing oxygen) and converts the arsenopyrite (FeAsS) to the mineral yukonite $Ca_7 Fe_{11}(AsO_4)_9O_{10}.24H_2O$. It changes As^{3+} to As^{5+}.

This was a fascinating talk. It progressed from basic ideas on atomic structure to establishing a silica tetrahedron as the basic building block for silicate minerals and rocks, which opened up the possibility of introducing some of the basic rules for substitutions within minerals. Finally Karen gave us an insight into some of her cutting-edge research into aqueous geochemistry and finally biogeochemistry. It was unbelievable how much absorbing material was covered in an understandable form in an hour. A very fluent and absorbing presentation in which scientific jargon did not get in the way!
Thank you Karen.

References

Duffin, C.	2006	Silicate Minerals BMS Occasional Paper No 21
Pearce, J.P.	1994	Minerals are Chemicals BMS Occasional Paper No 3.
Pearce, J.P. and Woodbridge, A.	1999	Minerals are Chemicals. Part 2: The Periodic Table BMS Occasional Paper No 13.

John Pearce

(Many thanks to Austin Woodbridge for his comments on the first draft of this report.)

FIELD TRIP TO PLUMPTON PLAIN 10th March 2013

On a cold, grey, windy but dry Sunday morning nine members, including Colin Brough our Field Trip leader, gathered at 10.00am in the car park of the Half Moon Inn car park at Plumpton, East Sussex, before setting off to climb the nearby Chalk escarpment to Plumpton Plain in search of columnar calcite. Trevor and Fiona Devon arrived a short while later and joined us at the top. Notwithstanding the farmer`s kind offer for us to drive up to the top of the hill using his well maintained concreted track, most made the ascent on foot -good cardiovascular stuff, as the hill is quite steep However, we consoled ourselves with the thought that gravity would be in our favour on the way down.

Unlike several in our group I had not visited this site before. Considering the name of our destination I shouldn`t have been so surprised to find, at the top of the hill, such a large area of comparatively level ground. Apart from some copses of trees most of the area is farmland consisting of fields which were lying fallow prior to being ploughed and planted. Despite the recent heavy rain the fields were fairly dry, a reflection of the well-drained character of the underlying Chalk. Having reached the Plain we set off on our quest for the columnar calcite that exists in this area. In the car park Colin had shown us a large specimen which he had collected on a previous SMLS visit, so we had a good idea of what to look for. Colin said that good places to look were around the field boundaries as this is where farmers disposed of any large lumps of rock that got in the way of their agricultural operations.

Within a short space of time our group had dispersed in many directions. After about half an hour of searching the calcite remained elusive but I had, in the process, turned over innumerable flints. The fields are so generously covered in them that it is hard to imagine that any worthwhile crops can be grown at all! At one stage I caught up with Caroline May who was carrying a large piece of calcite-rich rock she had found, which gave me some hope of finding something similar. However it was not to be.

Some time later I noticed that most of the team had congregated at one of the field boundaries and even at a distance I detected an air of excitement and heard the sound of hammering and chiselling. When I reached the group it transpired that John Hall had gone straight to this area where he had found columnar calcite on a previous visit and had discovered a very large boulder, about 0.6m in diameter. This was in the process of being broken into portable pieces by Ivan Tingley and others. The boulder was found to consist mainly of very attractive radiating arrays of cream coloured translucent columnar calcite. Typically the crystals were 60 to 120mm long. Apparently it is not known for certain how this type of calcite, which fluoresces in UV light, was formed, but it is conjectured that it is the result of recrystallisation within solution cavities in the chalk. Some chalk matrix was noted to be present in the boulder, as was the occasional small flint. In at least one fragment small vugs were present where the columnar calcite had not entirely filled the cavity.

Having chosen specimens to take home, rucksacks were packed - some becoming seriously heavy! There was a general feeling of “mission accomplished” and all were agreed that it was time to make our way back, particularly as wind-chill was beginning to become an issue notwithstanding the many layers of warm clothing that were being worn. Gravity did, indeed help us on the way down but, for some of the group, things were not quite so easy because of the weight of rocks that were now being carried! Having found a fairly sheltered spot on the way down Helena Carter and Caroline May enjoyed a picnic with a splendid view looking north over Plumpton and the Weald.

Back at the car park several of the group went off to have lunch at the Half Moon Inn and no doubt a drink to celebrate what was, I think, a very successful field trip. I had a family commitment that afternoon so wended my way home having enjoyed my first visit to Plumpton Plain, and my first field trip with SMLS.

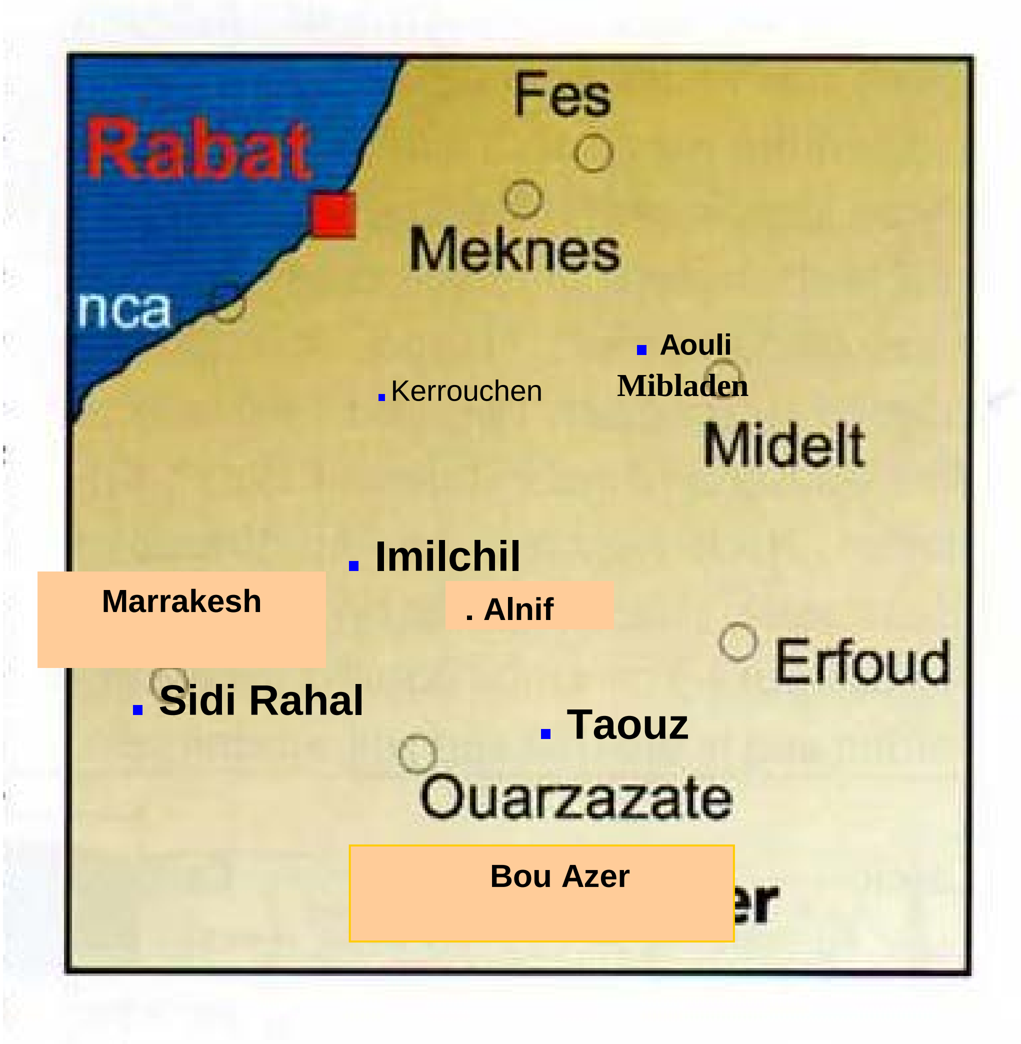
Fig 1 Looking down over Plumpton College from Plumpton Plain (Peter Martin photo)

Fig. 2 Ivan Tingley among others reducing a calcite boulder (Helena Carter photo)

Peter Martin

MINERALS FROM MOROCCO
Jolyon Ralph - 1 March 2013

Most mineral collectors are familiar with, and indebted to, Mindat.org for providing a wealth of information about minerals, sites, and shows. In recent years Mindat has also begun to organize conferences combined with collecting trips. The second such conference was held in Morocco in November 2012 and was the basis of Jolyon Ralph's talk on Morocco's minerals. In addition to helping organize the trip, serving as host for the conference, and acting as its official photographer, Jolyon also managed to get in some mineral collecting and he described some of the highlights of his experience and displayed a few of his finds.



Map of Morocco

The group travelled in a rough arc that encompassed many of Morocco's most well known mineral locations. They began in Marrakech, then went southeast over the High Atlas to Ouarzazate and Bou Azer. The next leg of travel was east/northeast in a line roughly parallel to, and in between, the High Atlas mountains and the Algerian border, to sites that included Taouz, the Erg Chebbi sand dunes and the town of Erfoud. The final leg took them north/northwest, re-crossing the High Atlas, to arrive in Midelt, situated on a plateau at the intersection of the High Atlas and Mid Atlas ranges.

The group assembled in Marrakesh and the first day of field collecting was in the nearby village of Sidi Rahal where there are quarries of basalt that host agate, amethyst, various types of geode and occasionally some odd, boxy epimporphs. The local miners hosted the group for lunch and showed them their specimens for sale. This was also the group's first introduction to the ubiquitous clusters of curious, friendly and entrepreneurial children that they would encounter throughout the trip, eager to sell any stones they could lay their hands on as "un dirham" souvenirs.

The second day was spent travelling to Ouarzazate across the High Atlas, with stops to admire the views and visit roadside stands selling rocks and fossils. There was further sightseeing at the local Kasbah once they reached their destination.

Most of the following day was spent nearby at the famous cobalt locality of Bou Azer (it turns out that the correct English transliteration of the Arabic name has only one "z"). This is home to the world's best erythrite specimens. Some mines were still working while others were closed. The group was able to collect on dumps at the Aghbar mine and near the Agoudal quarry, where they found much evidence of cobalt – cobaltoan calcite, roselite, and erythrite. The group then had several hours of travelling to the imaginatively named hotel Kasbah Meteorite, near the town of Alnif, where they spent the night. The hotel's rooms were insufficient for such a large group, so many stayed in colourful tents on the hotel grounds.

The next day included a visit to Alnif, where fossils are sold, and an opportunity to hunt fossils at Jebel Issimour, where a long trench across a hill marks the place where many local fossil collectors earn their living. Participants found at least parts of trilobites and one of them found a fossil fish jaw with teeth. The group then proceeded on to Merzouga where they would spend two nights.

The following day began with a visit to Taouz; the road was hardly discernible and they had to organize a fleet of 4x4s to reach the area. Taouz had been a site of commercial lead mining but all of the activity now is small-scale, carried out by individual miners or small groups or cooperatives. There was vanadinite to be found in a river bed and on mine dumps, as well as in the stocks of local mineral dealers. The vanadinite from this area is sometimes associated with goethite, making a striking combination. The area also hosts rock carvings said to be 10,000 yrs old and whose subjects indicate that this environment had been wetter in the past. The group returned to their hotel and mounted camels to ride to the Erg Chebbi dunes and watch the sunset. Although this part of Morocco is close to the Sahara, Erg Chebbi is one of the few opportunities to visit a genuine desert landscape.

The next day the group headed towards Midelt. There was a stop at Erfoud to visit a "fossil factory" (not a place where they make fossils but a workshop where fossil-bearing rock is cut, polished and turned into decorative items). There was also a visit to quarries at Hameda, where barite and fluorite are found.

The conference venue in Midelt was the Hotel Taddart, which featured its own display and showroom of high quality mineral specimens (surely any mineral collector's definition of five-star accommodation). The conference took place over three days. The first day included a short trip north to the village of Mibladen, a lunch organized by local people and visits to mineral dealers. The final night of the conference was celebrated with a surprise party. It was held underground, in an abandoned mine adit, complete with carpets, dinner service, and live music. Local people had earlier cleaned and renovated the site and during this preparation they discovered some fossil dinosaur footprints on the ceiling (perhaps indicating that dinosaurs knew how to party as well).

After the conference there was a day of collecting at Mibladen. The participants divided into groups to visit some of the sites, including former mines and dumps but also many small-scale operations. The latter account for much of the area, so it is not possible to simply collect without permission. The groups visited, and were entertained by, some of these miners who eke out a living in small mines excavated with their own labour, as it is impossible to get permission to use dynamite. The group was able to find samples of vanadinite and wulfenite (although these never occur together) as well as cerussite and baryte.

The collecting at Mibladen was Jolyon's last day in Morocco, but most others stayed on for a day or two. Unfortunately, cold weather and significant snowfall caused the planned collecting at sites well-known for malachite and azurite (Aouli, Sidi Ayed, and Kerrouchen) to be curtailed or cancelled.

This excellent talk was informative on a number of levels. For many who knew about the conference and wished they had been there it was nice to hear a summary of the event, and to admire the logistics of moving 100 participants (and 20 others) in 9 mini-buses across Morocco, getting everyone in and out of hotels, tents, mine shafts, tea breaks, and parties. The talk confirmed that mineral collectors know how to have fun (Jolyon's photos only hinting at the damage limitation that may be required on some participants' Facebook pages). It was also a useful introduction to Morocco as a tourist destination with the distinct bonus of having minerals and fossils for sale at seemingly every souvenir stand, even if what was on offer included fake fossils and meteorites, or the imaginative "galena geodes", formerly made by gluing bits of galena to the interior of low quality geodes but now often manufactured from tennis balls. While the fakes are amusing, the thought of so many legitimate mineral and fossil dealers in little towns and villages throughout the country is astounding.

The talk was also a very useful lesson on where our specimens come from, and not only the geological setting. It was fascinating to learn about the organization of mining that is responsible for bringing many of Morocco's specimens to collectors. Although the country's mineral wealth is so extensive and diverse that it would be unwise to make generalizations, and there is a great deal of conventional commercial mining going on that also produces specimens, visits to several well-known sites (Taouz and Mibladen) found miners working individually, or in small groups, searching for galena they can sell to the smelters while keeping their eyes open for colourful mineral specimens that provide welcome additional income, many of which make their way to the international market.

Most of Jolyon's photos and more information on the conference are available at:
http://www.mindat.org/article.php/1601/Mindat.org+Conference+2012+-+Morocco

Additional information and photos from a co-organizer of the trip can be found at:
http://www.spiriferminerals.com/133,XI-2012---8211--2nd-Mindat-org-Conference--part-I.html
http://www.spiriferminerals.com/134,XI-2012---8211--2nd-Mindat-org-Conference--part-II.html

Rob Tripp

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SOUTHAMPTON MINERAL & FOSSIL SOCIETY'S
RUBY ANNIVERSARY PUBLICATION

The Southampton Mineral and Fossil Society has produced an excellent, illustrated chronological history of their Society's past four decades of activities. It is superbly produced and makes very interesting reading. If anyone would like to borrow a copy, please contact me (John Pearce).

Wolfe, Anita. (2012) Four Decades of SOTON-MIN-FOSSICKING. 1971-2011.

THE PAPERLESS OFFICE

It was a day before we were due to return from Lanzarote. Around 8 kilos of assorted minerals had been packed in cartons ready for the flight back to the UK. It was at this time while exploring a "new volcano" that I found an amazing piece of lava (see below), it had the fine twirls associated with a draining lava tube and colours ranging from black, red to yellow according to the iron oxides present. It weighed in at about 7 kilos and was over 18 inches wide and I was unsure how I might get it back to the UK. Our luggage was already slightly over the limit and I was unclear about the attitude of the authorities to removing geological specimens of that size. So I decided to post it to myself as a gift for scientific study.

I went to the post office in Puerto del Carmen having packed it carefully in a post office regulation box. There were only two people in the queue at the post office so I quickly reached the counter where I was given a form to fill in. I filled in the top copy to which there were four duplicates underneath (who would receive these?) and re-joined the queue. 15 minutes latter I reached the counter again. All the information I had filled in was then laboriously entered into the Post Office's computer and then my filled-out form **was fed through a photocopier!** Finally every paper copy of the form received an official stamp. Thanks goodness for the electronic age and all the forests that will be saved in our paperless offices.

By this time the queue was out of the door!! I shall never complain about my local UK post office ever again,

P.S. My parcel did arrive unopened, unchallenged and in good shape 7 days later.

John Pearce

Post script. Since writing the above, our SMLS Competition has taken place and I was delighted that this spectacular piece of lava was awarded first prize in class 2A.

MINERALS FROM DEVON by David Aubey-Jones

Over the last couple of years we have enjoyed David's sojourn around the mines of Cornwall, but on this occasion he turned his attention to what is often considered as the poor relation, the mines and minerals of Devon. David explained that some sites are better than those in Cornwall, and it's closer to Sussex. The talk bounced around the locations recently visited by David with the goal of convincing collectors amongst the audience that Devon is underestimated and worthy of some more focussed collecting.

The mineralogy of Devon is influenced by the Dartmoor Granite and most minerals are associated with this Granite. The Cornish border has primarily copper and arsenic deposits and along the River Tavy is lead. North towards Oakhampton is a scarn deposit including lead mines and the wavellite deposit at High Down, while East Cornwall is known for its lead and gold.

First stop was more or less in the centre of Devon at Birch Tor and Vitifer Tin mine, worked up to 1925 with some additional working up to the 1950s. We then moved on to the alluvial tin deposits at the North Dartmoor Consols, where the results of the alluvial workings make interesting scenic photographs. The cassiterite looks different to Cornish material, a black to grey colour on a yellow background.

We passed Wheal Betsy, a lead/silver mine at Mary Tavy, for a picture of the engine house. Unfortunately there was little to collect from the dumps except siderite.

On to Meldon Quarry which was a famous location for very good minerals in the past, but it is now closed with little new material left to explore. Next was Rowden Farm, Widecombe in the Moor, where you can find good specimens of quartz and smoky quartz.

Red-a-Ven Mine at Meldon is a scarn deposit and produces garnets and malayite, the latter a UV fluorescent mineral. Collecting in daylight shows almost nothing but at night with a UV lamp the tips light up. An evening trip was almost rained off with storms over dinner, but being collectors they braved the weather. The rain stopped and the stars came out with lightning providing a backdrop to a great evening's collecting.

Ramsley mine is close by and looks like a small volcano. Garnets are common and the location is famous for pseudomorphs of quartz after scheelite.

Next was Fullabrook mine, an overgrown location with plenty of bats. It was a manganese mine and the best specimens of pyrolusite are reported to come from near the adit. The dumps were located beneath the undergrowth but the adit was not found, a job for another day.

Next we moved north to High Down for the wavellite. A location well known to SMLS members and still producing great specimens.

We then moved to West Dartmoor and the Bedford United copper/arsenic mine. It has a similar mineralogy to the Wheal Gorland Mine in Cornwall. Collecting underground is possible and specimens of langite, clinoclase and olivenite can be found. One of the few areas in the UK where these minerals can be found.

Next on to Wheal Josiah, one of the five mines making up the Devon Great Consols Mine, the largest deposit in the west of England. Each of the 5 mines was named after a wife of the shareholders. The arsenic was extracted by passing the gases from the smelting up and along brick flues.

Boys were then used to scrape the arsenic from the walls. The area is now popular with walkers and the contaminated areas are all fenced off and parts of the flues removed. Wheal Anna Maria is an adjacent mine and is also fenced off with clear hazard warning signs. Siderite is common on the dumps together with arsenopyrite and francolite, a variety of fluorapatite. Breaking open the larger rocks can reveal bright fresh material. There are some examples of gold specimens labelled from Wheal Josiah, and although this has never been proved conclusively, it is possible.

A change in mineral and a lead mine, the George and Charlotte mine. It is now a tourist attraction with a good train ride into the workings. During an extension good examples of childrenite up to 10mm were found. David and some colleagues were fortunate to get permission to go underground as collectors and to also collect on the adjacent dumps.

The final stop was Tavistock and a short underground visit to the New East Wheal Russell mine where it is possible to collect chalcoalumite and brochantite, before moving on to the Virtuous Lady Mine, named after Queen Elizabeth 1st. It is situated where the river Tavy meets the river Walkham and the valleys give great scenic views. It was a chalcopyrite mine opened in 1558 and operated until 1807. From 1830 to 1875 it was worked as a specimen mine with many rare and unusual minerals. David's last trip was underground which was interesting but there was not much to find after 140 years of amateur collecting. Specimens included anatase, pyrite cubes embedded in shale up to 15mm and siderite on quartz. Maybe the legend of the Abbot was true, he had a dream about a cave full of gems and then went to the mine and found them all. Unfortunately on his way back, loaded with his find, he fell into the river and was never seen again.

Material on the dumps is very weathered, although the collecting location next to the river bank provides a nice setting on a dry day. It is possible to find quartz completely covered in weathered siderite which can be dissolved in acid. David had a great example from an earlier trip which had dissolved slowly over several months to reveal an impressive quartz group 10cm across. The location is also famous for capped quartz where a clay layer covers the quartz followed by a secondary growth.

It is also known for epimorphs of siderite/pyrite covering baryte or maybe selenite. The original crystal dissolves leaving a cast in the shape of a slipper, hence the name 'Ladies Slippers'. Box epimorphs can also be found, with excellent examples to be found in the NHM.

An interesting personal review of collecting in Devon, setting us up for the field trip in May or June.

Colin Brough

SMLS HITS THE UV WAVES

SMLS member Richard Belson wrote an excellent, well illustrated feature article in ***UV Waves*** (the newsletter of the Fluorescent Mineral Society) on the UV display at last year's Sussex Mineral Show. (Volume 43, No 21 March – April 2013 pp 3 –5).

DATES FOR YOUR DIARY

April 19 – 27	**SMLS Field trip to Morocco** Co-ordinator: Peter Moore. Leader Pierre Clavel
Fri May 3	General Meeting: **Recent Anglesite Discoveries at Parys Mountain** by Tom Cotterell (National Museum of Wales) Display: **Anglesite**
Sun May 12	Oxford Mineral and Fossil Show 10-30 – 4 Exeter Hall, Oxford Road, Kidlington, North Oxford
Sun May 19	**Haywards Heath Spring Show** 1.30 – 4.00. SMLS are mounting a display
May 25 - 27	**Long Weekend Field Trip to Devon** Co-ordinator: John Burgess Leader: David Aubrey-Jones
Sat June 1	**Lindfield Village Day** All day. SMLS are mounting a display
Sun June 2	**Rearranged field trip to the Isle of Sheppey**. RV 11.00 a.m. Warden car park, Coordinator: John Pearce
Fri June 7	General Meeting**: Field Trip to the Eifel** By Trevor Devon Display: **Agate**
Sat-Sun June 8 – 9	Rock n Gem Show 10-5 Kempton Park Racecourse, Staines Road East
Fri July 5	**AGM and Members' Evening** Display: **Ammonites** Talk: **Isle of Wight Field Trip** by Nick Hawes
Sun July 7	Oxford Mineral and Fossil Show 10-30 – 4 Exeter Hall, Oxford Road, Kidlington, North Oxford
Sat-Sun Aug 3-4	Rock n Gem Show 10-5 Kempton Park Racecourse, Staines Road East
Sat Aug 31	**SMLS BBQ at Scaynes Hill** (just east of Haywards Heath) Hosts: Nick and Louise Hawes

UK JOURNAL OF MINES AND MINERALS, No 34, 2013

There were several entries referring to SMLS in this latest issue of the UKJMM:

- Page 2, Subscriptions. SMLS were thanked for their kind donation to the UKJMM.
- Pages 4 – 7. We had a very well illustrated article "SMLS 40 Years On" to celebrate our society's ruby anniversary.
- Page 28 Courtenay Smale in his excellent article "The Bryce McMurdo Wright Miniature Collection at Caerhays Castle, Cornwall", wrote in his acknowledgments:
  " It has been a great privilege to be honorary curator of such an important collection, to travel with it to some of the world's great mineral shows including the Tuscon and Munich Shows in 2011 and the Sussex Mineral and Lapidary Society show in Haywards Heath in 2012), and to act as a guide for like-minded enthusiasts**.**
- Page 62. A half-page advertisement for our 2013 Sussex Mineral Show on Saturday 16th November.